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MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No.	431	(W)	Press
B.P. No.			Mis.—
Dated	15-2-		1875.

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
15th February 1875*

Read the following papers —

No 350 Docket from the Government of India, Public Works Department,
(Military Works,) dated Fort William, 23rd July 1874, No 1,210 M W

The following extract forwarded to the Government of Madras, in the Public
Works Department, for necessary attention

(By order,)

(Signed) W A CROMMELIN, Colonel, R E,
Deputy Secretary to the Government of India

*Extract from a letter from Brigadier-General A HOWLETT, C B, Quartermaster-
General, to Colonel A C SILVER, Secretary to Government, Military Depart-
ment, dated Head Quarters, Ootacamund, 7th May 1874, No 44-3,497*

In returning letter from the Secretary to the Government of India, Military
Department, No 1,116, dated 22nd ultimo, I have the honor, by order, to observe
that the inquiry therein put, "in what respect the maintenance and improvement
of the Dhobies' Wells and Ulsoor Tank require further consideration," is not
understood.

2 His Excellency the Commander-in-Chief is not of opinion that they
require further consideration, but, as stated in paragraph 3 of this Office letter,
No 103-759, dated 29th January 1874, thinks that the supply is excellent, and
that the works should be maintained and improved. The improvement being
chiefly the substitution of a better and more powerful engine for the old one now
working the pumps at the Dhobies' Wells and the maintenance of the two filters in
thoroughly good working order, a point to which they have never yet been
brought.

No 351 Endorsement of the Secretary to Government, Military Depart-
ment, dated Ootacamund, 17th August 1874

From Brigadier-General A HOWLETT, C B, Quartermaster General, to Colonel
A C SILVER, Secretary to Government, Military Department, dated
Head Quarters, Ootacamund, 6th August 1874, No 232 5,482

With reference to O G, 15th July 1874, No 2,232, I have the honor, by
order of the Commander-in-Chief, to bring to notice that the Deputy Secretary
to the Government of India, Public Works Department, appears to have acted under
a misconception in referring to the Chief Commissioner of Mysore the question of
providing a more powerful engine for the Dhobies' Wells at Bangalore and the
maintenance of the two filters in good working order.

2 These, in common with all Military Public Works in the cantonment of
Bangalore, are under the Madras Government (Public Works Department,) and
funds are provided by that Government.

3 The supply of a new engine and the placing of the filters in thorough
working order are matters of great importance, and His Excellency the Com-
mander-in-Chief requests that they may be borne in mind in providing funds
for the Military Works of the Madras Presidency

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4 The scheme of providing a new reservoir for both the town and cantonment of Bangalore is an excellent one, which, it is hoped, will soon be undertaken by the Mysore Government. But it will necessarily take considerable time to mature and complete. In the meantime, the Ulsoor Water Works, which are purely Military, demand and deserve the attention which His Excellency the Commander-in-Chief is very desirous should be given to them.

REFERRED with the previous correspondence to the Public Works Department for observations with advertence to Proceedings of Government in this Department, No 3,833, dated 19th November 1873

(Signed) A C SILVER, Colonel,
Secretary to Government, M D.

No 352 Endorsement of the Secretary to Government, Military Department, dated Ootacamund, 24th October 1874.

From Brigadier-General A HOWLETT, C B, Quartermaster-General, to Colonel A C SILVER, Secretary to Government, Military Department, dated Head Quarters, Ootacamund, 19th October 1874, No 425 7,237

I HAVE the honor to report that, after the recent visit of His Excellency the Commander-in-Chief to Bangalore, information was called for from the Officer Commanding Mysore Division of the amount of work which had been executed at the Ulsoor Water Works during the current year.

2 The reports of the District Engineer, as received from Major General Borton, are now forwarded for the information of Government. Nos 188-A and 191-A, of the 22nd and 23rd September. No 211-A, of the 5th October 1874.

3 From these it appears that the erection of the iron cisterns in the Female, Artillery, and Cavalry Hospital is now approaching completion. Three of them are finished, and the iron columns of the fourth are placed in positions.

4 That for covering the pure water cisterns at the Ulsoor Rock, the iron work of the trusses is ready, as also the corrugated iron to cover the cistern, also bricks for the buttresses, but that, in consequence of the early setting in of the rainy season, the work has been very considerably delayed, and must be postponed until next hot weather.

5 No estimates have yet been sent in for the remaining three cisterns at the Agram, Parade, and Ulsoor Barracks, or for the restoration of the second filter at the Ulsoor Rock.

6 This last work is, in the opinion of the Commander-in-Chief, of such great importance, to ensure an uninterrupted supply of wholesome water to the troops at Bangalore, that an estimate was called for, and is now submitted to Government.

7 The approximate estimate appears very high, Rupees 12,580, and Sir Frederick P Haines would recommend that the proposal should be most thoroughly scrutinized in the Department of Public Works, not so much with a view to reducing the expenditure as to ensure this work being carried out to completion.

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in the way that may be considered most likely to avoid all chance of failure in its future construction.

8 In paragraph 4 of the District Engineer's letter, No 211-A, of the 5th instant, he states it would be very desirable to commence the work during the current year, and asks for a grant of Rupees 2,500, with which to commence the work. Sir Frederick P Haines would submit, for favorable consideration, that, if that amount can be made available from the savings this year, it may be applied for the important and necessary work of renewing the second filter.

From Captain H M VIBART, R E, District Engineer, to Major-General A BORTON, C B, Assistant Quartermaster-General, Mysore Division, dated Bangalore, 22nd September 1874, No 188-A.

WITH reference to Quartermaster-General's letter, bearing your endorsement, No 412, dated 21st September 1874, I have the honor to inform you that this year an allotment of Rs 2,000 was asked for and obtained for the Ulsoor Water Project with the view of erecting the iron cisterns in the Female, Artillery, and Cavalry Hospital.

2 This work is now approaching completion. Three of the cisterns have been erected, and the iron columns of the fourth have also been placed in positions.

3 With the exception of the second filter and these iron cisterns, the Ulsoor Water Project is complete.

4 Since the failure of the repairs to the filter last year, nothing has been done to it, no orders having been received.

5 There are no funds at my disposal for the repair of the filter, as it is probable that the whole of the allotment this year will be required for the iron cisterns.

6 The cost of the repairs to the filter will be considerable, probably not less than Rs 5,000.

From the same officer, dated Bangalore, 23rd September 1874, No 191-A.

IN continuation of my letter, No 188-A, dated 22nd September 1874, I have the honor to inform you that a separate estimate has been sanctioned for covering in the pure water cistern at Ulsoor Rock, amounting to Rupees 5,500.

2 The iron-work of the trusses is ready, as also corrugated iron to cover the cistern. Bricks for the buttresses are also at the work.

3 Had the rain not commenced so early this season (4th May), the buttresses would have been built in the month of May, and the roof would probably by this time have been completed.

4 We must now wait till the water level in the tank falls next hot weather when the buttresses will be built.

5 No estimates have been sent in for covering the other cisterns.

6 The cost of covering these (three in number) would probably amount to—

	RS
Agram Barracks cistern	11,500
Parade do do	5,000
Ulsoor do do	8,500
Total	25,000

From the same officer, dated Bangalore, 5th October 1874, No 211-A.

WITH reference to your No 442, dated 3rd October 1874, I have the honor to inform you that it is not likely that we shall be able to complete the pure water cistern cover this year, but no money, or hardly any, will be available for other work.

2 The expenditure already incurred for bricks and corrugated iron amounts to 1,700 rupees, and the Madras Workshop bill for the iron trusses amounts to 3,500 rupees without carriage which will be some 200 rupees, making a grand total of 5,400 rupees

3 The fact is, I very much under-estimated the Workshop charges, and a report will have to be sent to Government that the estimate must be increased by 900 rupees

4 In the event of Government being able to give a portion of the money for repairing the filter, it would be advisable to commence the work this year, and probably 2,500 rupees might be spent on the work

5 The estimate will be put in hand at once

P S—Having considered the work to be done to the filter more fully, I am inclined to think I very much under-estimated the cost I doubt whether the work will cost much less than 10,000 rupees

TRANSFERRD to the Public Works Department

(Signed) A C SILVER, Colonel,
Secretary to Government, M D

No 353

MEMORANDUM

ON the occasion of a recent visit to Bangalore, I carefully inspected the damaged filter near the pumping station at the Ulsoor Tank, which is referred to in the above-noted correspondence

2 The floor was covered with the filtering material of broken stone, gravel, and sand to a depth of about 5 feet, and consequently its condition could not be ascertained, but the wall bordering the road showed clear signs of having yielded to pressure, and was slightly thrown outwards, and more so at the corner abutting on the road and farthest from the tank. Here the side wall was fractured, showing that there had been subsidence at the corner which had torn the masonry there away from the other portion. Near this corner also the rock shelves down at a considerable angle, and the quantity of made earth and the depth of the wall there is much greater than at other parts

3 Captain Vibart while pointing out these appearances in the wall added that the excavations made while carrying out the repairs sanctioned in G O of the 8th May 1873, No 1,297, revealed the fact that the masonry, of which the walls of the filter was composed, was of the most inferior description, and it is noticed in a report of the Inspecting Engineer of the 14th February 1873, that the lower courses of stone are set in mud instead of lime. There appears to be no working drawing in existence showing the dimensions of the walls and the depth of the foundations as actually constructed or dug out originally, nor is it possible apparently to ascertain from the records on what the floor of the filter was founded, whether on rock, alluvium, or made earth, or, as is possible, partly on the and partly on another material

4 The last repairs carried out provided for the relaying of a new floor consisting of 18 inches of laterite gravel. A bed of concrete 9 inches thick and finally two course of brick on edge in cement, and subsequently an inner wall of brick or stone in mud resting on the floor was added and plastered in cement. All this has proved ineffectual in stopping leakage.

5. The District Engineer considers that it is necessary to rebuild the walls of the lower filter in a thoroughly sound manner, but attributing the leakage to the failure of the lower wall and not in any degree to subsidence of the floor, he has limited his approximate estimate accordingly

6. I entirely agree with Captain Vibart in the necessity for the reconstruction of the walls, but I do not consider that it would be prudent to rely on the floor either, and I would advocate the rebuilding of the whole, leaving only a margin in proximity to the wall of the upper filter to guard against any disturbance of the masonry there. The repairs to the floor executed under the direction of Captain Vibart have, I believe, been very carefully carried out, but the defect I consider lies deeper, and no reliance whatever should be placed on the original work, nor can it be used with safety in any sense as a foundation for new work

7. It is absolutely necessary that, in a construction of this nature, the floor as well as the walls should be thoroughly well founded, and that no part should rest on made ground. There is a load on the former of water and filtering material of no inconsiderable weight. Subsidence under this weight must result in fracture and leakage, and leakage acting on the foundations of a wall, the lower courses of which are built in mud, would naturally cause it to yield. I am inclined to attribute the failure of the work to the original bad construction of both portions, and for that reason I have recommended the entire reconstruction of the filter. I annex in the form of a specification the main details of the works for which it appears to be necessary to provide in the regular estimate

8. With reference to the possibility of a supply being derived from the scheme proposed by Colonel Sankey, regard being had to the levels of his reservoir and those of the barracks, I beg to annex a list of bench-marks as follows—

	FEET
Ulsoor waste weir datum	0 00
Top of stand-pipe	80 60
Floor, Royal Horse Artillery cistern	36 26
Do, Agram cistern	38 50
European Infantry Barracks cistern floor	63 65
Do do water surface fall	69 65
Iron cistern in Hospital	54 48
Do in Female Hospital	58 12
Stand-pipe (top) fed from Colonel Sankey's reservoir said to be	80 00

The head given by Colonel Sankey's stand-pipe would therefore be—

	FEET
At the water level in the Royal Horse Artillery cistern	38 74
Do do in the Agram cistern	36 50
Do do in the European Infantry cistern	10 35
Do do in the General Hospital do	25 52
Do do in the Female do do	21 78

and the head required with a 6-inch main, in order to deliver water at the average distance for the stand-pipe (say $2\frac{1}{2}$ miles) with a moderate velocity, is about 42 feet. It would seem, therefore, that the supply by the proposed water scheme to the various existing cisterns for the troops can hardly be depended on.

(Signed) A. deC SCOTT, Major, R E,
Under Secretary to Government, P. W. D.

22nd January 1875

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15th February 1875*

*Rough Specification of Work to be executed in the reconstruction of the Lower Filter Ulsoor
Water Works*

THE walls now standing to be taken down entirely, except such portions as it may be considered necessary to leave adjoining the upper filter. The stone to be cleaned and stacked.

2 The portions left standing as above described to be formed into steps not less than 3 feet horizontal to 1 foot vertical down to foundation level, and all loose stones to be carefully removed.

3 The foundations to be carefully examined, all made earth, boulders, and bad soil to be removed, and rock to be benched out level.

4 The floor is to be taken up, except a margin 8 feet wide along the upper filter wall, and in the same manner as in the case of the walls, the made earth is to be removed, rock levelled, and the ground which is on a slope is to be terraced backwards to the higher level, each terrace being carefully levelled and well rammed where necessary.

5 The floor as well as the walls must rest on a solid foundation. As regards the former, there are two methods by which this can be secured, and the question as to which will be most economical can only be determined by a computation of quantities based on sections of the foundations after excavation.

6 The floor as well as the wall may be built on a solid bed of concrete conforming as regards the floor to the terraces benched out and carried up with the masonry wall, or it may be laid on party walls built at intervals of about 4 feet in the clear, the intervals being filled with rubbish and bridged with rough stone slabs about 9 inches in thickness, overlaid with concrete 1½ feet thick, and brick on edge in cement with a coat of cement plaster.

7 The masonry should be built throughout in hydraulic mortar composed of stone lime with a due proportion of soorkee and sand, each course being thoroughly grouted, and all interstices filled.

8 The concrete should be made with soorkee mortar, and great care should be taken to ensure thorough junction between the walls and the floor foundation at each course. A larger proportion of mortar should be used in the upper layers of concrete to ensure the filling up of all spaces between the broken stone or other material.

9 The masonry as well as the floor should be thoroughly benched or dove-tailed into the old work, and a good lap allowed at each course.

10 A fillet should be built at the angle of the wall and upper floor surface.

11 The floor and walls should be rendered with cement.

12 If it should be observed when the excavation for the wall has been completed that there is leakage from the tank, it may be desirable to provide a rough stone drain along and inside the concrete foundation to carry off the water and prevent it from filtering into the soil on which the wall rests.

13 The above specification for the work will, of course, be subject to such modification as the District Engineer may find it necessary to suggest after the quantities are computed and the cost estimated, and after the foundations have been uncovered and a more complete examination has been made.

(Signed) A deC SCOTT, Major R E,
Under Secretary to Government, P W D

No 351

ORDER THEREON, 15th February 1875, No 431

MILITARY WORKS, No 13

It appears from the above papers that a project for supplying 10 gallons of water per head to the population of Bangalore, at an estimated cost of Rupees 5,70,000, has been sanctioned, and funds

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15th February 1875*

provided in 1875 76 for commencing the work. This scheme meets with the entire approval of His Excellency the Commander in-Chief, but, as it will necessarily take considerable time to mature and complete, he urges the improvement of the present independent and sufficient supply for the troops derived from the Dhobies' Wells and Ulsoor Tank filters. Such improvement consisting in the substitution of a better and more powerful engine for the old one at the Dhobies' Wells, and the maintenance of both the existing filters in thoroughly good working order. These views are supported by a Memorandum of the Under Secretary in the Department of Public Works, who shows that the Military population of Bangalore is not likely to benefit from the new reservoir, and enters into details regarding the filters.

2. The necessary steps have already been taken for the provision of a good engine for the Dhobies' Wells, a tender for the same received through the Secretary of State for India having been returned with Military Department letter, No 167, of 25th November 1874, for execution of the work with certain modifications suggested by the local Engineers. Provision of its cost has been made in the Military Budget of 1875 76 to the extent of Rupees 15,000. As regards the filters, the upper one appears to be in fair working order, but all attempts to repair the lower one seems to have been ineffectual, owing, it is stated, to defective foundations on a site which presented great difficulties from its extreme irregularity. An approximate estimate of Rupees 12,580 was forwarded by the District Engineer for the reconstruction of three of its walls. But he will be instructed to revise the same with reference to Major Scott's specification, and to forward detailed plan and estimate in conformity therewith for submission for orders of the Government of India, as the work is part of a large project exceeding 2 lakhs of rupees in cost.

(True Extract)
(Signed) G W WALKER, Colonel, R E,
Secretary to Government

To the District Engineer, Bangalore
,, Military Department

Exd A Grubert.

Spare Copies

*Proceedings of the Madras Government, Military Department,
7th March 1874.*

Read the following papers —

No 83 From Surgeon-Major W R CORNISH, F.R.C.S., Sanitary Commissioner for Madras, to Colonel A C SILVER, Secretary to Government, Military Department, Fort Saint George, dated Madras, 18th November 1873, No 1938

With reference to order of Government as per margin, I have the honor to refer to the concluding portion of my report for 1872, in which I have expressed an opinion in accordance with that of the Sanitary Commissioner with the Government of India, that the water from the Ulsoor tank is, from the nature of the gathering grounds and of the pollution it receives, not a fit source for the supply of a large population. The impurities washed into the tank from the tanneries are very considerable, and during my recent stay at Bangalore, I have had ample opportunities of observing the fact that a large amount of surface filth finds its way into the tank, after every storm of rain

2 The filtration of the Ulsoor water has also been very imperfect for some time past, the filter bed being out of order and the second filter under repair. In consultation with Dr Massy, C.B., we lately came to the opinion that, with the increase of typhoid fever in the Artillery and Hussars, there should be no further admixture of partially filtered water from the tank with that from the Dhobies' wells.

3 The Dhobies' wells, I may add, have not been increased to the extent suggested in my letter, No 607, of 2nd May 1871. They now yield from 25 to 30,000 gallons per diem, enough for the drinking and domestic use of the troops, but insufficient for the plunge baths and for the horses of the cavalry.

4. The growing requirements of the cantonment of Bangalore, have long since impressed upon me the need of securing a more satisfactory water service for the whole place. In 1872, I inspected, with Colonel Sankey, R.E., and other gentlemen, the proposed site of the gathering ground for a water-supply. Colonel Sankey has, I believe, had the whole land surveyed and levelled and has framed estimates of the cost of constructing the necessary works; and I have the honor to suggest that the Mysore Government be communicated with, in view to an arrangement being made for a water-supply scheme that shall provide not only for the civil but the military population.

5 If the Government desire, I shall be prepared to place myself in communication with Colonel Sankey, so that all the essential sanitary points to be borne in view in the preparation of plans and estimates may be duly discussed, before the scheme is again brought forward.

Referred, through His Excellency the Commander-in-Chief, to the Surgeon-General, British Medical Service, in continuation of Proceedings of Government, No. 3667, dated 5th November 1873.

25th November 1873

No 84 From Lieutenant-Colonel R H SANKEY, R.E., Secretary to the Chief Commissioner of Mysore, to Colonel G W. WALKER, R.E., Secretary to Government, Public Works Department; dated Bangalore, 7th January 1874, No 27.

With reference to the request contained in the accompanying letter, addressed to the Chief Engineer of Mysore by the District Engineer of Bangalore, asking,

*Proceedings of the Madras Government, Military Department,
7th March 1874.*

under instructions of the Madras Government, for information as to the schemes that may be under consideration for an improved water-supply both for the town and cantonment of Bangalore, I have the honor, by desire of the Officiating Chief Commissioner, to state that the Government of India, in August 1870, sanctioned an estimate amounting to Rupees 5,69,257, for a project based on the general principles laid down in the accompanying printed memorandum by the Chief Engineer, dated 9th September 1868, and that Her Majesty's Secretary of State confirmed the sanction thus accorded, in a despatch of the 31st January 1871

2 The general scope of the scheme, as set forth in the accompanying memorandum, is to collect from ground now lying waste, and at sufficient height to command the station, without the intervention of pumping, a supply, during years of minimum rainfall, of ten gallons per head for a population of 90,000, the present population including European and Native troops, &c, being, by the last census, a little over 80,000 souls

3 Hitherto, I am to state, no progress has been made in the execution of the project, owing to the difficulty of finding the requisite funds from the ordinary budget grant, but hopes are entertained that ere long the Government of India may be disposed to treat the work as extraordinary

Transferred to the Military Department, with reference to the orders in that department, No 3667, dated 5th November 1873

FORT SAINT GEORGE,
12th January 1874

(Signed) G W WALKER, Col, R E,
Secretary to Government, P W D

No 85 From Colonel H H O'CONNELL, Officiating Quarter Master General, to Colonel A C SILVER, Secretary to Government, Military Department, Fort Saint George, dated Head Quarter, Camp near Bangalore, 29th January 1874, No 103-759

With reference to your memorandum, dated 16th instant, I have the honor, by order, to acquaint you that at the time of writing this office letter, No 8852, dated 13th December 1873, His Excellency the Commander-in-Chief was aware of the scheme for the water-supply of Bangalore, mentioned in the printed memorandum of the Chief Engineer of Mysore, forwarded with Proceedings of Madras Government, No 3794, dated 28th September 1868 That memorandum, however, merely gives a sketch of the scheme proposed by Colonel Sankey, without details or estimates, and it was under the impression that the Madras Government would be called upon to meet a portion of the expense to be incurred, that His Excellency recommended the assembly of a committee, in order that full information on the subject should be laid before Government.

2. If, however, no call is made on the Madras Government, for funds to carry out this project, His Excellency has no wish to press his recommendation for the assembly of a committee; but he trusts it may be understood that any new works for water-supply to Bangalore may be carried out so as to include the wants of the military cantonment, as well as that of the civil population, and he further suggests that, based on the Sanitary Commissioner's recommendation, the Madras Government press on the Supreme Government the early commencement of the work.

*Proceedings of the Madras Government, Military Department,
7th March 1874*

3 The present water-supply from the Dhobies' wells is excellent and, with the filtered Ulsoor tank water, sufficient, and the Commander-in-Chief wishes it to be understood that he strongly advocates the maintenance of these works and their improvement But the plentiful supply of good water to troops is a matter of such great importance that Sir Frederick Paul Haines would be glad to see a second scheme carried out, which would place the supply beyond all possibility of failure

4 This office letter, No 8852, dated 13th December, has been withdrawn That from the Surgeon General British Medical Service, No 268, dated 9th December 1873, and the Sanitary Commissioner, No 1938, dated 18th November 1873, are herewith re-transmitted

Cantonments,
Water supply

No 86 From Colonel A C SILVER, Secretary to Government, Military Department, Madras, to Colonel H K BURNE, Secretary to the Government of India, Military Department, dated Fort Saint George, 7th March 1874, No 776

With reference to the correspondence marginally noted, I am directed to forward, for submission to the Right Honorable the Governor General in Council, the accompanying papers, from which it will be observed that the military, medical and sanitary authorities in this presidency attach the greatest importance to an ample supply of pure and wholesome water being provided for the civil and military population of Bangalore

2 The Right Honorable the Governor in Council is, therefore, desirous of urging upon the Government of India, the advisability of setting on foot measures for the early adoption of Colonel Sankey's scheme, which appears to be well calculated to meet the requirements both of the town and cantonment

3 I am also to request that His Excellency Sir Frederick Haines' recommendation, in respect to the maintenance and improvement of the works connected with the Dhobies' wells and Ulsoor tank, may receive the early and favorable consideration of the Right Honorable the Governor General in Council

Exd P Runganatham

*Proceedings of the Madras Government, Military Department,
21st May 1874*

Cantonments,
Water Supply

Read the following papers :—

No. 269 From Colonel H K BURNE, Secretary to the Government of India, Military Department, to Colonel A C SILVER, Secretary to Government, Military Department, Madras, dated Fort Wilham, 22nd April 1874, No 1116

With reference to your letter, No 776, dated the 7th March 1874, on the subject of the water-supply at Bangalore, I am directed to request that the Right Honorable the Governor in Council may be moved to inform the Government of India, in what respect the maintenance and improvement of the works connected with the Dhobies' wells and Ulsoor tank require further consideration, as it was believed that the final estimates for that project were sanctioned in April 1872

2 In regard to Colonel Sankey's scheme, I am to state, the papers will be transferred to the Public Works Department for consideration, as the project is a civil work

Referred to His Excellency the Commander-in-Chief, with advertence to paragraph 3 of the Quarter Master General's letter, No 103-759, dated 29th January 1874

29th April 1874

No. 270. From Brigadier-General A HOWLETT, C B, Quarter Master General, to Colonel A C SILVER, Secretary to Government, Military Department, dated Head Quarters, Ootacamund, 7th May 1874, No 44-3497

In returning letter from the Secretary to the Government of India, Military Department, No 1116, dated 22nd ultimo, I have the honor, by order, to observe that the inquiry therein put, "in what respect the maintenance and improvement of the Dhobies' wells and Ulsoor tank require further consideration," is not understood

2 His Excellency the Commander-in-Chief is not of opinion that they require further consideration, but, as stated in paragraph 3 of this office letter, No 103-759, dated 29th January 1874, thinks that the supply is excellent and that the works should be maintained and improved. The improvement being chiefly the substitution of a better and more powerful engine for the old one now working the pumps at the Dhobies' wells, and the maintenance of the two filters in thoroughly good working order, a point to which they have never yet been brought

3 I am directed to observe that the question of an additional source of water supply for Bangalore did not originate with the Commander-in-Chief, but with other authorities.—See paragraph 3 of letter from the Secretary to the Government of India, Military Department, published in Order of Government, 21st September 1872, No 3022, and letter from the same in Order of Government, 5th November 1873, No 3667

4 Whilst His Excellency considers the supply of water from the Dhobies' wells and Ulsoor tank sufficient for the Military at Bangalore, he looks upon the question of good and abundant water supply of such importance that he cordially advocates the carrying out of the scheme urged by the Supreme Government upon the consideration of the Madras Government, in the extracts given below

*Proceedings of the Madras Government, Military Department,
21st May 1874*

Letter from the Officiating Secretary to the Government of India, Military Department, to the Officiating Secretary to Government, Military Department, Fort Saint George, dated Fort William, 2nd September 1872, No 32, paragraph 3

"The Governor General in Council, trusts that a well devised plan for gathering and distributing good water both to the town and cantonment will soon be undertaken"

Letter from the Secretary to the Government of India, Military Department, to the Secretary to Government, Military Department, Madras, dated Simla, 15th October 1873, No 380, paragraph 1

"I am directed to invite the attention of the Right Honorable the Governor in Council to paragraph 3 of Military Department letter, No 32 of the 2nd September 1872, urging the necessity of an improved scheme for gathering and distributing good water both to the town and cantonment"

No 271 DOCKET, 21st May 1874, No. 1610.

Copy of the Quarter Master General's letter, forwarded to the Secretary to the Government of India, Military Department, for the information of the Right Honorable the Governor General in Council, in reply to Colonel Burne's letter, No 1116, ^{Cantonments} _{Water Supply}, dated 22nd April 1874

(Signed) A. C SILVER, Colonel,
Secretary to Government.

*Proceedings of the Madras Government, Military Department,
15th July 1874.*

^{Cantonments,}
_{Water Supply}

Read the following papers —

No. 249 From Colonel J CROFTON, R E, Deputy Secretary to the Government of India, Public Works Department, (^{Civil Works} _{Miscellaneous}), to Colonel H K BURNE, Secretary to the Government of India, Military Department, dated Fort William, 16th June 1874, No 263-M

The undersigned is directed to inform the Military Department, with reference to its endorsement, No 568 of the 10th instant, that extract paragraph 2 of Brigadier-General Howlett's letter, No 44-3497, suggesting the substitution of a more powerful engine at the Dhobies' wells at Bangalore, and the maintenance of the two filters in good working order, has been forwarded to the Chief Commissioner of Mysore for necessary attention

2. With reference to paragraph 4 of the Brigadier-General's letter, the undersigned is instructed to add that Colonel Sankey's scheme of water-supply for the station of Bangalore was sanctioned by the Supreme Government some years ago, and that arrangements have lately been made in communication with the Foreign Department, for the provision of the requisite funds to proceed with the work.

MILITARY DEPARTMENT, FORT WILLIAM, THE 30TH JUNE 1874
No. 1646

Copy of the above forwarded to the Secretary to Government, Fort Saint George, Military Department, with reference to his docket, No 1610, dated 21st May 1874, for the information of His Excellency the Governor in Council

(By order)
(Signed) W M LEES, Lieut-Colonel,
Asst Secy to the Govt of India

No. 250 ORDER THEREON, 15th July 1874, No 2232
Communicated to His Excellency the Commander-in-Chief and the Public Works Department.
(Signed) A. C SILVER, Colonel,
Secretary to Government.

QUARTERMASTER GENERAL'S OFFICE,

Head Quarters Ootacamund,

6th August 1874.

No. 232

5482

FROM

Brigadier General A. Howlett, C.B.
QUARTER MASTER GENERAL,

TO

Colonel A. L. Silver
Secretary to Government
Military Department

Sir

With reference to O. G. 15th July 1874
No. 2232, I have the honor, by order of the
Commander in Chief, to bring to notice of
the Deputy Secretary to the Government of
India, Public Works Department, appears
to have acted under a misconception in
referring to the Chief Commissioner of
the question of providing a more
powerful engine for the Whobes' wells at
Bangalore and the maintenance of the two
belters in good working order.
These, in common with all Military
works in the Cantonment of Bangalore, are

are under the Madras Government (Public Works Department) and funds are provided by that Government

3. The supply of a new Engine and the placing of the filters in thorough working order, are matters of great importance, and His Excellency the Commander in Chief requests that they may be borne in mind in providing funds for the Military works of the Madras Presidency

4. The scheme of providing a new reservoir for both the town and Cantonment of Bangalore is an excellent one, which it is hoped will soon be undertaken by the Mysore Government. But it will necessarily take considerable time to mature and complete. In the meantime the Elloor-Water works, which are purely military, demand and deserve the attention, which His Excellency the Commander in Chief is very desirous should be given to them

I have the honor to be

Sir
Your obedient servant

Wm. L. B. B. B.
Quartermaster General

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18415 July 1874 0724.0-250
21 Aug 1874 269-271
7 must be 1874

Military 1874 Department

21030558

From

The Joint Chiefs of Staff

OT

The Secretary to Government

Military Department

1874 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

Recd 16th August
No 88 August

210222
3482

General, commanding
on 16th July 1874 No 2232.
on the subject of the provision
of a suitable engine for the
of the 1st and 2nd Divisions
and the efficient working of
the New Waterworks.

Referred

17 Aug 1874

Witnessed
Secretary to Government

Agreed with the
General Conference. The
Public Works Department for
the same time with a view to
the 1st and 2nd Divisions
19 Dec 1873

The Public Works Dept
with 1874 17th Dec 1874 No 2232
21 Aug 1874 269 271
15 Aug 1874 249 250
249 250

No 191.87

DISTRICT ENGINEER'S OFFICE

Bangalore 23rd Sep 1874

From

The District Engineer,

Bangalore

To

The App^{ts} & Mr. General
Report & Question

SIR

In continuation of my letter
No. 188 A, dated 22^d September/74, I
have the honor to inform you that a
separate Estimate has been sanction-
ed for covering in the Pure Water
cistern at Ulloor Rock, amounting
to Rupees 5500.-

The iron work of the trusses is ready, as also corrugated iron to cover the system. Buck's for the buttresses are also at the work.

Had the rain not commenced
so early this season (4th May), the
bentropes would have been built
in the month of May and the
1st (probably by this time)

roof would probably by this time
have been completed.

J. W. 1874 Dehart.
 Prosser for February
 \$ 5221.

Sam.

The Secretary to
Genl. Military B.

Voted 17.
 Resolved 20. } Aug 6/74
 Unanimous 2. }
 Res.

Referring a
letter from the
Mr. Genl. regarding
the provision of
an Engine for the
Sholies Wells and
the working of the
Ulsoor Water works
at Bangalore.

No. 431. 15-2-75.

Ac 357

626-1-75
Cir 18-12 74
Rec'd to Act, 28 Aug 74

We must now wait till the water level in the tank falls, next hot weather, when the buttresses will be built.

No estimates have been sent in for covering the other cisterns.

The cost of covering these 3 in number) would probably amount to

Agam Barracks cistern 11500

Parade Barracks do 5000

Uluor Barracks do 8500

Total Rs 25000

I have the honor to be Sir

Your most Obedt servant
Major Genl. Stuart Capt. 186
District Engineer Bangalore

Approximate Estimate of the probable Cost of Dismantling and Rebuilding the wall at the East, West, and South sides of the Ruptured Filter at the Uluor Rock Bangalore

Quantity	Description of work	Rate Per	Amount Total
----------	---------------------	----------	--------------

34040	Cft of Dismantling walls & foundations	3 cft	532
-------	--	-------	-----

2160	Sq of floor 3m depth	96	203
------	----------------------	----	-----

Rebuilding			
21960	Cft of Excavation	2 cft	229

12200	Concrete	36	2669
-------	----------	----	------

12420	Foundation stone in chunam	36	2717
-------	----------------------------	----	------

8194	Superstructure	36	1792
------	----------------	----	------

230	Rft of stone coping over the side walls of Filter	23	
-----	---	----	--

	broad & 6" thick	12	173
--	------------------	----	-----

21960	Cft of Filling with clay	3 cft	343
-------	--------------------------	-------	-----

120	Cyds of Latite gravel for floor 18"	1	120
-----	-------------------------------------	---	-----

1620	Cft of Brickwork		911
------	------------------	--	-----

Grand Total 9689

Quantity Description of work Rate Per Amount Total

50.64 Brought over 9689
 22 Gps of Plastering with
 cement inside 22 114

20.97 Pointing with chunam
 outside 18 31

Making road 100

Levelling rock at
 bottom 500

Sundries @ 10 per cent 11434
 Total Estimate 1146

Self
 Dist Engrs Office
 Bangalore
 13th October 1874

Henry M. P. R.
 District Engineer Bangalore
 Capt. 16.6

cc: 21. Oct. District Engineer's Office
 Bangalore 5th October 1874

From
 The District Engineer
 Bangalore
 To the Chief Engineer
 Mysore Division

With reference to your letter of
 3rd October 1874, I have the honor to
 inform you that it is not likely that
 we shall be able to complete the
 water system even though the
 money or handily will be available
 for other needs.

The expenditure already incurred
 for bricks and corrugated iron amount
 to 1700 rupees and the various workshop
 bill for the iron trusses amounts to
 2500 re without carrying which will
 be some 200 re, making a grand total
 of 5400 rupees.

The fact is, I very much under-
 estimated the workshop charges and
 a report will have to be sent to go-
 vernment that the estimate must
 be increased by 900 rupees.

In the event of Government being
 able to give a portion of the money for
 repairing the gitter, it would be ad-
 -visable to commence the work this
 year and probably 2500 re might

The estimate will be put in
 hand at once
 I have seen
 Sir Henry M. Vibant Captain R.C.
 District Engineer Bangalore
 Having considered the work to
 be done to the filter more fully
 I am inclined to think it very much
 under estimated the cost - I doubt
 whether the work will cost much
 less than 20000 Rupees
 Sir Henry M. Vibant
 District Engineer Bangalore

Major
 Total amount of expenditure
 for the filter works
 estimated at Rs. 20,000
 The reports of the District Engineer,
 Bangalore, are now
 forwarded for the information of Government.
 From these it appears that the erection
 of the Iron Cisterns in the

110/6
 6
 QUARTERMASTER GENERAL'S OFFICE,
 Head Quarters Ootacamund,
 19th October 1874.
 No. 425-7237
 FROM
 Brigadier General A Howlett, C.B.
 QUARTER MASTER GENERAL,
 To
 Colonel A C Silver
 Secretary to Government
 Military Department
 Sir
 I have the honor to report that,
 after the recent visit of His Excellency the Com
 mandant in Chief to Bangalore, information
 was called for from the Officer Command
 ing Mysore Division of the amount of
 work which had been executed at the
 Ulsoor Water works during the current year.
 The reports of the District Engineer,
 Bangalore, are now
 forwarded for the information of Government.
 From these it appears that the erection
 of the Iron Cisterns in the

and Cavalry Hospital is now approaching completion. Three of them are finished, and the Iron Columns of the 4th are placed in positions.

4. That for covering the pure water Cisterns at the Ulsoor Rock, the Iron work of the Sunders is ready, as also the corrugated Iron to cover the Cistern. also bricks for the Buttresses; but that in consequence of the early setting in of the rainy season, the work has been very considerably delayed, and must be postponed until next hot weather.

5. No Estimates have yet been sent in for the remaining three Cisterns at the Agrah, Parade, and Ulsoor Barracks, or for the restoration of the 2^d Filter at the Ulsoor Rock.

6. This last work is, in the opinion of the Commander in Chief of such great importance, to ensure an uninterrupted supply of wholesome water to the Troops at Bangalore, that an Estimate was called for, and is now submitted to Government.

7. The Estimate appears very high, Rs 12,580. and Sir Frederick P. James would recommend that the proposal should be

most

most thoroughly scrutinized in the Department Public Works not so much with a view to reducing the expenditure as to ensure the work being carried out to completion in the way that may be considered most likely to avoid all chance of failure in the future construction.

8. In para 4 of the District Engineer's letter No 21st of the 5th instant, he states it would be very desirable to commence the work during the current year, and asks for a grant of Rs 2500, with which to commence the work. Sir Frederick P. James would submit for favorable consideration that, if that amount can be made available from the savings this year, it may be applied for the important and necessary work of renewing the 2^d Filter.

I have the honor to be
Sir

Your Obedient Servant

Benjamin
Bengal
Quarter Master General

16

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the

Attorney 1874 Department

2104906

St. John

St. John's Church

St. Theobald's to Government
Military Department

October 4
2104906

2104905
7237

Collected with donations,
Report from the District
Agent of 1873 and also showing
the amount of work which
had been done at the
Mason's Hall during
the same year.

Transferred

Military Department

Transferred to the
Public Works Department

Collected, 1874
2104906 1874 }
Military Department

1874

624-1-76
Exp 18-72-74

112 15. 14
Letter from Quarter Master General
Secy: Government, Military Dept.

Ex. 425
7234 of the 19th October 1874 and enclosures.

Transferred to S.H.C. by endorsement, dated 24th
October 1874. Memorandum.

On the occasion of
a recent visit to Bangalore
I carefully inspected the
damaged filter near the
pumping station at the
Ulesoor Tank, which is
referred to in the above
noted correspondence.

2- The floor was covered
with the filtering material
of broken stone, gravel
and sand to a depth
of about five feet and
consequently its condition
could not be ascertained,
but the wall bordering
the

628-1-12
18-12
P. W. 1875 Dept
No. 6750A

From

The Secy to Govt
Mily. Dept.

Dated 24 Oct
Recd. 29th - 31874.

Ex. 4.

Transferring
a letter from the
2^d Mr. General sub-
-mitting reports re-
-garding work done
at the Ulesoor Water
Works and that
still requiring
completion -

J. O. No 431. 15-2-75.

4352

18-17

the road showed clear signs of having yielded to pressure and was slightly thrown outwards and more so at the corner abutting on the road and farthest from the Tank. Here the side wall was fractured showing that there had been subsidence at the corner which had torn the masonry there away from the other portion. Near this corner also the rock shelves down at a considerable angle and the quantity of made earth and the depth of the wall there is much greater than at other parts.

Captain

16

16

3. Captain Tibbatt while pointing out these appearances in the wall added that the excavations made while carrying out the repairs sanctioned in L. O. of the 8th May 1873 No. 1297, revealed the fact that the masonry of which the walls of the filter was composed was of the most inferior description, and it is noticed in a report of the Inspecting Engineer of the 14th February 1873, that the lower courses of stone are set in mud instead of lime - there appears to be no working

4418-18-12-74

18-12-74

drawing in existence showing the dimensions of the walls and the depth of the foundations as actually constructed or dug out originally; nor is it possible apparently to ascertain from the records on what the floor of the filter was founded - whether on rock, alluvium, or made earth or as is possible partly on one and partly on another material.

4. The last repairs carried out provided for the relaying of a new floor consisting of 18 inches of Laterite gravel. a bed of concrete quiches thick

17 3 1/2
thick and finally two courses of brickwork edge in cement and subsequently an inner wall of brick or stone in mud resting on the floor was added and plastered in cement. all this has proved ineffectual in stopping leakage. 5. The District Engineer considers that it is necessary to rebuild the walls of the lower filter in a thoroughly sound manner, but attributing the leakage to the failure of the lower wall and not in any degree to subsidence of the floor he has limited his approximate estimate accordingly.

6. I entirely agree with
Captain Tibart in the
necessity for the recon-
-struction of the walls
but I do not consider
that it would be prudent
to rely on the floor either
and I would advocate the
rebuilt of the
whole, leaving ^{only} a margin
in proximity to the wall
of the upper filter to
guard against any dis-
-turbance of the masonry
there. The repairs to the
floor executed under the
direction of Captain
Tibart have I believe
been very carefully car-
-ried out but the defect
I consider is deeper
and no reliance whatever
should be placed on the

18 6 18
original work nor can
it be used with safety
in any sense as a founda-
-tion for new work.
y. It is absolutely neces-
-sary that in a construction
of this nature the floor as
well as the walls should
be thoroughly well
founded, and that no
part should rest on
made ground. There is
a load on the former
of water and filtering
material of no incon-
-siderable weight. Sub-
-sidence under this weight must
result in fracture and
leakage, and leakage acting
on the foundations of a
wall the lower courses
of which are built in
mud, would naturally

18-12-74

18-12-74

cause it to yield I am inclined to attribute the failure of the work to the original bad construction of the portions & for that reason I have recommended the entire reconstruction of the filter. I annex in the form of a specification the main details of the works for which it appears to be necessary to provide the regular estimate.

8. With reference to the possibility of a supply being derived from the scheme proposed by Colonel Launey regard being had to the levels of his reservoir and those of the barracks.

Upper Waste Discharge	feet
Top of stand pipe	80.60
Floor Royal Horse Artillery Cistern	36.26
do Agram do	38.50
European Barrack Cistern floor	63.65
do water surface fall	69.65
do cistern in Hospital	56.48
do Female do	58.12
Stand pipe (top) fed from Coll. Launey's reservoir	80.00
said the	

19
15 10
Meg to annex a list of bench marks as follows.

The head given by Coll. Launey's stand pipe would therefore be at the water level in the Royal Horse Artillery Cistern - 38.74
do Agram Cistern - 36.50
do European Infantry Cistern - 10.35
do General Hospital do - 25.52
do Female Hospital do - 21.78

and the head required with a six inch main in order to deliver water at the average distance for the stand pipe (say 2 1/2 miles) with a moderate velocity is about 42 feet. It would seem therefore that the supply by the proposed water scheme

22-1-76
18-12-74

Other various existing
cisterns for the troops
can hardly be depended
on.

22/1-76 Arkel

Thompson

18-12-74

Rough Specification of work to be ex-
-cuted in the reconstruction of the lower
filter & lower water works.

The walls now standing
be taken down entirely
except such portions as it
may be considered neces-
-sary to leave adjoining
the upper filter. The stone
be cleaned and stacked.

2. The portions left stand-
-ing as above described
be formed into steps not
less than three feet hori-
-zontal to one foot vertical
down to foundation
level, and all loose
stones be carefully
removed.

3. The foundations
be carefully examined,
all made earth, boulders

1 m. 18. 12. 74

and had soil be removed
and rock be benched
out level.

4. The floor is be taken
up except a margin 8 ft
wide along the upper
filter wall and in the
same manner as in the case
of the walls the made
earth is be removed,
rock levelled and the
ground which is on a
slope is be terraced
backwards to the higher
level. Each terrace being
carefully levelled and
well rammed where
necessary.

5. The floor as well as
the walls must rest on
a solid foundation.
As regards the former
there are two methods
by

22 19
by which this can be
secured and the question
as to which will be
most economical can
only be determined by a
computation of quantities
based on sections of the
foundations, after exca-
vation.

6. The floor as well as
the wall may be built
on a solid bed of concrete
conforming as regards
the floor to the terraces.
The floor be carried
up with the masonry
wall or it may be laid
on party walls built
at intervals of about
four feet in the clear
the intervals being filled
with rubble and bridged
with

with rough stone slabs
about 9 inches in thickness
overlaid with concrete
1 1/2 feet thick and brick
on edge in cement
with a coat of cement
plaster.

7. The masonry should
be built throughout
in hydraulic mortar
composed of stone lime
with a due proportion
of loam and sand.
each course being tho-
roughly grouted and
all interstices filled.

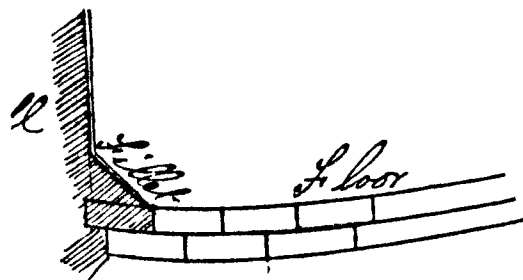
8. The concrete should
be made with loam
mortar and great care
should be taken to
ensure thorough junction
between the walls and
the

23 18 23
the floor foundation at
each course. A larger
proportion of mortar
should be used in the
upper layers of concrete
to ensure the filling up
of all spaces between
the broken stone or other
material.

9. The masonry as well
as the floor should be
thoroughly benched ^{or dovetailed} into
the old work and a good
lap allowed at each
course.

10. A fillet should be
built at the angle of the
wall and upper floor
surface.

11. The floor and walls
should be rendered with
cement.



12. If it should be observed when the excavation for the wall has been completed that there is least 2 feet from the tank it may be desirable to provide a rough stone drain along and inside the concrete foundation to carry off the water and prevent it from filtering into the soil on which the wall rests.

13. The above specification for the work will of course be subject to such modification as the District Engineer may find it necessary to suggest after the quantities are

24 9 24
computed and the cost estimated and after the foundations have been uncovered and a more complete examination has been made.

Adm. S.

25 10 July 1875

P. W. D.

Proceedings of the Madras Government,
Under date the 187 .

Read the following -

431

From
The Government of India. (H. E. D. 1210 M. H. of 23rd July 75)
Endorsement from the } (" " " " of 14th Aug 75)
Mily: sept^r } (" " " " of 24th Oct 75)
do } (" " " " of 22 January 75)
do }
Memo by the Under Secy }
S.O.H. }

M. 27/11

It appears from the above papers that a project for supplying 10 gal. of water per head to the population of Bangalore, at an estimated cost of Rs 5,40,000 has been sanctioned and funds provided in 1875-76 for commencing the work. This scheme meets with the entire approval of His Excellency the

18-12-74
Commander-in-Chief;
but as it will necessarily
take considerable time
to mature and complete,
he urges the improvement
of the present independent
and sufficient supply for
the troops derived from the
Dhobie Wells, and also
Sanki Filters. Such im-
provement consisting
in the substitution of a
better and more powerful
engine for the old one
at the Dhobie Wells,
and the maintenance of
both the existing filters
in thoroughly good working
order. These views are
supported by a Memo:
of the Under Secretary
in

26 11 25
in the S.O.P. who shows
that the Military popu-
lation of Bangalore
is not likely to benefit
from the new Reservoir,
and enters into details
regarding the filters.
2- The necessary steps
have already been taken
for the provision of a
good engine for the Dhobie
Wells, a tender for the
same received through
the Secretary of State
for India having been
returned with Military
Department letter No. 167
of 23 November 1874 for
execution of the work
with certain modifica-
tions suggested by the

local Engineers. Provision
of its cost has been made
in the Military Budget
of 1875-76, to the extent
of Rs 15,000. As regards
the filters the upper one
appears to be in fair
working order, but all
attempts to repair the
lower one seems to have
been ineffectual, owing
it is stated, to defective
foundations on which
which presented great
difficulties from its
extreme irregularity.
An approximate esti-
-mate of Rs 12,580 was
forwarded by the Dis-
-trict Engineer for the
reconstruction of 3 of
its

27
its walls. But he will be
instructed to revise the
same with reference to
Major Scott's specifications,
and to forward detailed
Plan and Estimate in
conformity therewith
for submission for orders
of the Govt of India, as
the work is part of a
large project exceeding
2 lakhs of Rupees in
cost. L.M.W.

12

[Faint handwritten notes]

Read the following:—

Yours

23/12 For follow

inspiration that we shall
in so will be kept by
this theme the question
should be asked. but I
fully

Rs 5,70,000 has been re-
-tioned and funds pro-
vided in 1875-76 for com-
mencing the work. This
scheme

18-12-74

minutes

Scheme meets with the
 entire approval of the
 excellency the commander
 in chief; but as it
 will necessarily take
 considerable time to ma-
 -ture and complete, he
 urges the improvement
 of the present independ-
 -ent and sufficient
 supply for the troops
 derived from the Pho-
 -bias Wells, and also
 Tank Filters. Such
 improvement consisting
 in the substitution of a
 better and more power-
 -ful engine for the old
 one at the Phobias Wells;
 and the maintenance
 of

fully to put to find
 that the Nelson works
 must be looked upon
 as our final source of
 supply - In this case
 we must not be startled
 by the proposed outlay,
 the two filters are indeed
 feasible -

Lapse with H. 2. a report
 the filters ~~and~~ I am
 fuller & correct the lot
 takes the same view
 23/12 1874

These views are supported
 by the H. 2. report
 of the 18.12.74. which
 states that the
 population of the
 district is increasing
 and the water supply
 is becoming more
 scarce. It is therefore
 suggested that the
 filters should be
 improved.

The filters are
 in good order.

of both the existing fil-
 -ters in thoroughly good
 working order.

2 The necessary steps
 have already been taken
 for the provision of a
 good engine for the
 Phobias Wells, a tender
 for the same received
 through the Secretary
 of State for India having
 been returned with military
 Dept Letter No 167 of
 25th Nov 1874 for execution
 of the work with certain
 modifications suggested
 by the local engineers.
 Provision of its cost has
 been made in the ^{Military} Budget

of 1875-76, to the extent
 of Rs 15,000

as

As regards the filters
the upper one appears
to be in fair working
order, but all attempts
to repair the lower one
seem to have been in-
effective, owing it is
stated, to defective found-
ations on a site which
presented great diffi-
culties from its extreme
irregularity. An approxi-
-mate ^{Estⁿ} of Rs 12580 is now
forwarded for the re-
-construction of 3 of its
walls.

Is the Sp. ul com.
menue here?
M

The
District Engineer will
prepare the necessary
detailed Plan and
Estimate

has been sent to
the District Engineer
for his consideration
and the same will be
forwarded to the
District Engineer for
his consideration and
the same will be
forwarded to the
District Engineer for
his consideration

estimate for submission
for orders of the Govt: of
India, as the work is
part of a large project
exceeding 2 lakhs of Ru-
pees in cost. Meanwhile
an entry of Rs 10,000 will
be made in the Budget
of 1875-76 on its account.
C. M. W.

To
The D. G. Bangalore
Distt. Department
Dated 17-2-75

0 4839
52

GOVT. OF INDIA, Madras
PUBLIC WORKS.



Mr. Inga
Bangalore

Dist.

Rail

Encl.

G.O. 15 Feb. 1875, No. 43

No. 350-354

Procl. Filler

~~Regarding~~ The P.
Bangalore instructs
rise the Estimate
for the reconstruction of
of the walls of the lower
filler with reference to
Major Scott's specifications
the forward details of
in conformity with the
in conformity with the