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MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

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Dated 16-4- 1859

Not to be folded or roughly handled

No. 20. Read the following letter from Colonel C. E. FABER, Chief Engineer; to J. D. BOURDILLON, Esq., Secretary to Government, dated 30th March 1859, No. 9122.

SIR,

With reference to Extract Minutes of Consultation No. 946, dated 16th May 1857, I do myself the honor to submit for the information and orders of Government, the following summary of the several Reports* received on the question referred to in para. 3 of Colonel McCally's letter, regarding the sinking of Wells for the supply of water to Plunge Baths, &c., the delay in furnishing which has arisen from a protracted correspondence with the District Engineer of Chingleput, on the subject of improving the water supply to the Artillery Wash-houses at Saint Thomas' Mount.

Letter from	Officer Commanding Southern Division		No. 330, dated 3rd June 1857.
do	District Engineer	Trichinopoly	No. 907, dated 31st Oct. 1857.
do	Officer Commanding Centre Division		No. 493, dated 21st July 1857 with 5 Enclosures.
do	District Engineer	Chingleput	No. 423, dated 12th Aug. 1858.
do	do	do	No. 790, dated 23rd Oct. 1858 with 3 Abstract Estimates.
do	do	do	No. 1389, dated 24th Mar. 1859.
do	do	do	No. 1223, dated 1st Feb. 1859 with 1 original Statement.
do	do	Godavery Division	No. 946, dated 27th Feb. 1858.
do	Officer Commanding Centre Division		No. 93, dated 17th June 1857.
do	District Engineer	Bellary	No. 86, dated 19th June 1857. with one Enclosure.
do	do		No. 113, dated 1st July 1857 with two Enclosures.
do	do	do.	No. 55, dated 4th June 1857.
do	Commissary General		No. 7337, dated 12th Oct. 1858.

* To be obligingly returned.

2. The Major General Commanding the Southern Division states that the Wash-houses and Plunge Baths at Trichinopoly, are supplied from distant Wells by means of Channels, and those at Jackatalla from a Mountain Stream in which method no improvement is required, and the District Engineer of Trichinopoly, while agreeing that no advantage would be gained by sinking Wells nearer the buildings where the Troops are located, considers that the present means of ablution at the European Barracks needs much improvement, and that the construction there of a Plunge Bath would be of service.

In letter No. 907, dated 31st October 1857, herewith forwarded.

3. The average quantity and cost of water supplied to each man of the Horse Artillery is according to Captain Ryves, 2 cubic feet per day, at 1½ annas 100 cubic feet, and to those of the Foot Artillery, 30 cubic feet at 2½ annas 100 cubic feet, the latter, owing to the appliance of the wheel and axle being one-sixth the cost of the supply to the European Barracks. It is therefore desirable that a similar plan should be adopted at all the Wells at this Station, and provision for the purpose could be made in the Estimates which will doubtlessly be ordered for carrying out the improvements suggested by Captain Ryves.

4. With respect to Jackatalla, the District Engineer concurs in considering the supply of water derived from the Stream noted by General Budd, to be amply sufficient for all the buildings, but omits to mention the average cost hitherto, or likely to be incurred.

5. At Cannanore, the water made use of by the Troops (European) is readily obtained from adjoining Wells, but its cost Captain Bean fails to furnish.

6. European Troops are no longer located at Palamcottah, Captain Oakes however informs that the supply of water was conveyed along a masonry channel from a Well situated at a distance of 10 yards from the Bath, and that each man was supplied daily with upwards of 22 cubic feet of water, at a monthly expense of 4 annas.

7. In Madura, Tanjore, South Arcot and Salem, there are no European Soldiery located, and no opinion on the desirability or otherwise of sinking Wells is given by any of the Dis-

trict Engineers of these Districts, except of Tanjore, who expresses himself in favor of Wells sunk to a moderate depth, and at a convenient distance from the Plunge Baths or Wash-houses.

Vide letter herewith forwarded No. 493, dated 21st July 1857, with enclosures.

8. With reference to the Centre Division, the Major General Commanding, forwards reports regarding the Stations marginally noted.

Poonamallee.
Palaveram.
Saint Thomas' Mount.

9. At Poonamallee and Palaveram, the Baths are supplied with an abundance of water from Wells sunk quite close to them, and the system is stated to work satisfactorily.

Vide letter No. 433, dated 16th June 1857.

10. The Officer Commanding the former Station is greatly in favor of the plan recommended by Colonel McCally, he having from experience found that wherever Wells have been sunk, the supply of water has been obtained much more expeditiously, and at a considerable less expense, than by the old method of bullocks, &c.

11. The Baths for the European Infantry at Saint Thomas' Mount, are also plentifully supplied with water from Wells situated at a convenient distance, but improvements are required in the Barracks occupied by the Foot Artillery, the cost of which, it is estimated, will amount to Rupees 3,630.

Vide the following correspondence.

From	District Engineer	Chingleput	No. 423 dated 12th August	1858.
To	do	do	No. 3593 of 13th September	1858.
From	do	do	No. 790 dated 23rd October	1858.
To	do	do	No. 5119 dated 5th November	1858.
From	do	do	No. 1223 dated 1st February	1859.
Do	do	do	No. 1389 dated 24th March	1859.

12. The saving that would accrue by carrying out these works is represented by Captain Moberly to be as follows :

	Rs.
Present monthly cost.....	114
Probable cost after pipes are laid down....	37½

annual saving Rupees 918 or upwards of 25 per cent. on the outlay, and as there can thus be no doubt that great advantage would attend the execution of the work I recommend, that the sanction of Government be granted for the expenditure of the estimated amount, Rupees 3,630 in laying down cast Iron Pipes to the Artillery Barracks and Married Men's Quarters; due provision having been made in the Estimate for the improvements suggested by the Officer Commanding the Foot Artillery.

Vide accompanying letter No. 1389, dated 24th March 1859, from District Engineer and letter No. 193 of 22nd June 1857, from Officer Commanding Artillery Details.

Vide letter No. 138, dated 17th June 1857, from Officer Commanding Horse Artillery.

Vide Extract Minutes Consultation No. 34 of 5th January 1859.

13. With respect to the arrangements recommended by Major Mein for the Horse Artillery Barracks, Captain Moberly reports that the sanction of the Estimate for their execution was postponed in Extract Minutes of Consultation No. 4590, dated 21st December 1858, of the Military Department.

14. No European Troops are quartered in the Districts of Cuddapah, Nellore and North Arcot, but each Officer states his views on the subject under review.

15. The District Engineer of Cuddapah believes that in most cases, a considerable saving would be effected by sinking Wells close to Baths, whilst the District Engineers of Nellore and North Arcot, give it as their opinion that no fixed plan can be determined on for the supply of water, the cost and efficiency of any, or every method followed, depending entirely on local circumstances, they consider however that wherever Wells are sunk, they should be placed as near as possible to the Baths, and that double actioned pumps should be made use of for raising the water.

16. Referring to the Northern Provinces of the Presidency, the Brigadier Commanding the Hyderabad Subsidiary Force reports that the Wells from which the supply of water is obtained for the Baths are conveniently situated, and that to sink fresh Wells, would be perfectly useless and unnecessary.

17. The Major General Commanding the Ceded Districts, considers the method adopted for supplying water to the new European Barracks at Bellary, objectionable; on the grounds of its frequent liability to accident and stoppages, an opinion in which the District Engineer fully concurs. To remedy the evil, small cisterns were constructed under the belief that the supply could be much better regulated and distributed, but the result has not yet been communicated. I have however now called upon Captain Fisher, to submit an early report on the subject, with the view of transmitting the same to Government for their orders.

Vide the following correspondence herewith forwarded.

From	District Engineer	No. 55, dated	4th June 1857.
To	do	No. 1161, dated	13th do.
From	Officer Commanding Ceded Districts	No. 93, dated	17th June 1857.
Do	District Engineer	No. 86, dated	19th June 1857 with enclosure.
Do	do	No. 113, dated	1st July 1857, with 2 enclosures.
To	do	No. 2109, dated	18th July 1857.

18. The cost of filling a Bath from a Well close to it, Captain Fisher considers would be about the same as from Wells at a distance, but beyond recommending the substitution of Iron Pipes for those of clay already laid down, he does not advise any change in the original plan followed for supplying water to the new Barracks.

19. The arrangements adopted for the supply to the Foot Artillery in the Lower Fort, is considered satisfactory by the Major General, who is of opinion that no new Wells are wanted there, the large bourie close at hand being sufficient to meet the wants of the men.

20. Captain Fisher's suggestions regarding the construction of a Plunge Bath at Ramandroog is worthy of consideration, an Estimate for the work was called for so far back as the 13th June 1857, but has not yet been received.

21. In Canara there are no Baths at any of the Military Stations, but should any be hereafter built, the District Engineer considers that as a rule, Wells should be sunk at a convenient distance for the supply of water, as the soil is found to be so porus, as to render it unfit for the formation of Tanks.

22. There are no Plunge Baths in the Districts of Ganjam and Kurnool, or in the Godavery and Kistnah Divisions, but Captain Rundall reports that he had recommended the construction of one, for the use of the European Sappers at Dowlaishwaram, which was objected to by the Commander-in-Chief, but the reasons His Excellency was pleased to assign, have not been found to be borne out by the collective opinion of Officers Commanding European Regiments, recently communicated by the Secretary to the Government of India in the D. P. W.

Vide letter No. 946, dated 27th February 1858.
Vide Extract Minutes Consultation No. 303, dated 3rd February 1859.

23. The cost of sinking Wells 9 feet in diameter in the Godavery Division, is stated to be about 6¼ Rupees per lineal foot.

24. From the foregoing precis, it will be observed that such of the District Engineers as were able, have not with few exceptions, furnished the information required concerning the cost, &c., in the supply of water, although they really all advocate the plan of sinking Wells, and I cannot but feel that the result of the reference to the Provinces is far from being satisfactory, considering however, the time which has elapsed since the subject was first started, and the desirability which exists for the question being finally disposed of; I deem it advisable, to no longer delay the submission of the papers herein referred to, merely observing with regard to the remarks therein contained in Colonel McCally's letter No. and date as per margin, that I entirely concur with him in considering that the arrangements for the supply of water for ablutionary purposes, should rest with the Officers concerned, care being taken to sink Wells wherever it may be found that a saving of expenditure would result.

No. 7337, dated 12th April 1858.

Letter from Lieutenant J. G. RYVES, District Engineer of Trichinopoly; to Colonel C. E. FABER, Chief Engineer, dated Trichinopoly, 31st October 1857, No. 907.

SIR,

Adverting to Circular No. XXII and official Memo. dated 21st Instant, I have the honor to state my opinion that little or no advantage would accrue from sinking Wells nearer the Washing places of the Barracks here.

2. The supply of water and means of ablution in the European Barracks is wretched, and I am of opinion steps should be taken to improve it by enlarging and altering the Wash-house, constructing a Plunge Bath, and either enlarging the present Well or forming a bawady outside the Barracks to be supplied from the Wyacondaun, or even by raising water for washing direct from the latter: the water to be fettered on its way to the Bath.

3. At present the 93 men of the Horse Artillery are supplied with about 2 cubic feet per man, per diem, no account being taken of women and children, at a cost of 1 anna 3 pice per 100 cubic feet, while the 84 men of the Foot Artillery have per head 30 cubic feet of fresh water per diem, which is supplied at the cost of 2¼ pice per 100 cubic feet.

The rough application of the wheel and axle in the latter case reduces the cost to ⅛th of the cost of the lift by unaided manual labor as applied at the European Barracks.

The women and children of the Foot Artillery are supplied with about 5 cubic feet of water per head, reckoning a child as half an individual.

The Plunge Bath of the Foot Artillery holds about 80 or 90 cubic feet per head of the strength of the company.

Letter from Major General R. BUDD, Commanding Southern Division; to Colonel C. E. FABER, Chief Engineer, dated Trichinopoly, 3rd June 1857, No. 330.

SIR,

With reference to your Circular No. XXII of 1857-58, dated 25th May 1857, I have the honor to state, in advertence to para. 3 of Colonel McCally's letter, that no improvement is required in the method of supplying water to the Wash-houses and Plunge Baths at Trichinopoly and Jackatalla.

At Trichinopoly, the Wash-house in the Infantry Barrack Square, now occupied by B. Troop Horse Artillery, is supplied from a Well in the Square, and the water runs from the Well into the Wash-house by an under ground channel.

There is no Plunge Bath in these Barracks.

At the Foot Artillery Barracks the water is supplied from a Well at a considerable distance; but it runs through channels, both above and below ground, to the Bath and Wash-house.

At Jackatalla the supply is from a mountain Stream, and needs no remark.

Palamcottah is no longer a station for European Troops.

Letter from Major General M. BERESFORD, Commanding Centre Division; to Colonel C. E. FABER, Chief Engineer, dated 21st July 1857, No. 493.

SIR,

With reference to Extract from the Proceedings of the Chief Engineer, under date the 25th May 1857 No. 22, I have the honor to forward Reports from the Officers Commanding the Stations, noted in the margin, on the subject of ablution, which have direct reference to the 3rd para. of Colonel McCally's letter No. 61, dated 31st March 1857.

Saint Thomas' Mount, Palaveram, Poonamallee.

Letter from Captain (Major) J. D. MEIN, Commanding A. Troop Horse Artillery; to the Deputy Assistant Quarter Master General, Centre Division, Madras, dated Saint Thomas' Mount, 17th June 1857, No. 138.

SIR,

Having reference to the documents (a) noted in the margin, copies forwarded for my information, I do myself the honor to report, that the Horse Artillery Barracks at this Station have not Wash-houses for the men or families. The men now wash in the open air, the tubs furnished for this purpose ranged at the side of the Barracks under the roof water spouts.

(a) Circular No. XXII 1857-58, being Extract from the Proceedings of the Chief Engineer, under date 25th May 1857, and several accompaniments.

is worthy of consideration, an Estimate for the work was called for, so far back as the 13th June 1857, but has not yet been received. —

21 In Canara, there are no baths at any of the Artillery Stations, but should any be hereafter built the District Engineer considers, that as a rule, Wells should be sunk at a convenient distance for the supply of water, as the soil is found to be so porous, as to render it useful for the formation of Tanks. —

22 There are no Plunge Baths in the Districts of Ganjam and Vizagapatam, or in the Godavery and Kistnah Divisions, but Captain Pennycuick reports that, he had recommended the construction of one, for the use of the European Sappers at Bezwada, which was objected to by the Commander in Chief, And the reasons His Excellency was pleased to assign, have not been found to be borne out by the collective opinion of Officers Commanding European Regiments, recently communicated by the Secretary to the Government of India in the Military Department.

Vide letter from Govt dated 27th February 1858

Vide Public Letter dated 31st February 1858

23. The cost of sinking wells 9 feet in diameter in the Godavery Division, is stated to be about 6/8 Rupees

6¼ Rupees per lineal foot.

24 From the foregoing tables it will be observed that most of the District Engineers as were able, have met with few exceptions, furnished the information required concerning the existing supply of water, although they nearly all advocate the plan of sinking wells, and I cannot but feel that the result of the reference to the Provinces is far from being satisfactory, considering however, the time which has elapsed since the subject was first started, and the desirability which exists for the question being finally disposed of, I deem it advisable, to no longer delay the submission of the papers herein referred to, merely observing with regard to the remarks therein contained in Colonel McCally's letter No. and date as per margin, No. 7337 dated 12th Oct. 1857 that I entirely concur with him in considering that, the arrangements for the supply of water for ablutionary purposes, should rest with the Officers Commanding, care being taken to sink wells wherever it may be found that, in saving

The Barrack is so confined from the position of the present Out-offices there is not a site to erect a Wash-house for the men in Barracks, for the families one could be erected near to their Quarters.

II. The only feasible arrangement that occurs to me, is to convert the Harness Room into a Wash-house, a Harness Room to be provided elsewhere.

III. Referring to the 3rd para. of Lieutenant Colonel McCally's letter (*b*) (which forms a portion of the correspondence under reply) should the Harness Room be converted into a Wash-house it is conveniently situated to the well from which the Plunge Bath is supplied with water, and by laying Iron pipes from the Well to the Harness Room, the supply of water would be most ample, and obtained at nearly one ¼ less, the expense now incurred in filling the wooden washing Tubs. The family Wash-house I propose, could in the same way be supplied with water.

(*b*) No. 61 dated 31st March 1857, addressed to the Military Secretary to Government.

IV. While on this subject, perhaps it may not be considered out of place to mention that the arrangements I adopted in the Washing Room at Jaulnah was appreciated by the men, it was thus :

In the Wash-house, were three moderately sized chunam Cisterns, and two shallow foot Baths, also 15 to 20 metal Basons of ordinary size, ranged on a raised brick and chunam platform, a man at pleasure from the Cisterns filled a bason, three or four small leather Buckets also in the room, by which a man could from a Cistern souse his body with water. The floor, granite, raised in the centre, with side drains in the room, which freely carried off the waste water.

V. The foregoing arrangements would do away with the expensive large wooden washing Tubs now supplied, and I am of opinion in a very short time, the cost of building Cisterns and Foot Baths, together with the supply of metal basons, would be under the expense now incurred in the wear and tear of the large wooden Tubs. The arrangement also more cleanly, at present about 15 men wash at a Tub in the same water.

No. 215.

Arty. Cen. Division Office.

(Signed) P. J. BEGBIE, Colonel,
Commanding Arty. Centre Division.

No. 245.

Saint Thomas' Mount,
26th June 1857.

(Signed) ÆNEAS SHIRREFF, Brigadier,
Commanding the Mount.

Letter from Lieut.-Colonel J. A. CROGGAN, Commanding 1st Battalion and Details Artillery ; to the Deputy Assistant Quarter Master General, Centre Division, Madras, dated Saint Thomas' Mount, 22nd June 1857, No. 193.

SIR,

With reference to Lieutenant Colonel A. McCally's letter* dated 31st March 1857, I have the honor to state for the information of the Major General Commanding the Division, that the cost of supplying water to the Soldiers' Plunge Baths, would, I am of opinion, be considerably reduced if (as is the case in the Barrack square of the Foot Artillery at this Station) Wells were dug at a convenient distance,

* No. 61, to the Military Secretary to Government, stating that if Wells were sunk within a convenient distance the cost of filling Baths would be considerably reduced.

as one pair of Bullocks working at a mote would then be able to draw as much water as could be carried by several pairs of Bullocks drawing water casks on Carts.

2. I am further of opinion that if the Wash-houses and Plunge Baths were properly arranged, according to some established plan with connecting channels, water for both might be supplied from the well in the same manner.

3. The water discharged from the Plung Bath and Wash-houses might, I consider, be applied to some useful purposes such as cleansing the Cook-rooms and other Out-houses, Drains, &c., irrigating the Soldiers' Gardens when established.

No. 223.

Arty. Centre Division Office.

(Signed) P. J. BEGBIE, Lieut-Colonel (Colonel).
Commanding Artillery, Centre Division.

No. 216.

Saint Thomas' Mount,
26th June 1857.

(Signed) ÆNEAS SHIRREFF, Brigadier,
Commanding the Mount.

MEMORANDUM.

	Rs.	A.	P.
Employed at present in filling the Plunge Bath in rear of the Barracks occupied by the Head Quarters and A. Company 1st Battalion Artillery, Monthly pay one pair of Bullocks at the mote and Driver.....	17	8	0
Five Coolies employed in carrying water to the two Wash-houses situated at the ends of the Barracks, at a distance of about 80 and 135 yards respectively, at 6 Rupees each per mensem, 291 Europeans at 2½ annas each...	30	0	0
Total Rupees.....	47	8	0

Saint Thomas' Mount,
22nd June 1857.

(Signed) J. A CROGGAN, Lieutenant Colonel,
Commanding 1st Battalion and Details Arty.

Letter from Lieut-Colonel T. G. E. G. KENNY, Commanding European Infantry Depot; to the Deputy Assistant Quarter Master General, Centre Division, dated Mount, 16th June 1857, No. 120.

SIR,

In obedience to the instructions conveyed in Official Memo. dated 4th June 1857 No. 214, from the Station Staff Officer Saint Thomas' Mount, enclosing Extract from Minutes of Consultation by Government under date 16th May 1857, No. 916, and directing Commanding Officers at the Mount to forward their opinion on the point adverted to in para. 3 of Colonel McCally's letter dated 31st March last, No. 61, I have the honor to state for the information of the Major General Commanding the Division, that the system established for filling the Plunge Baths, and Washing-houses for the European Infantry Depôt works well, affording every facility for an ample supply of water for all necessary purposes.

No. 61, para. 3. As Officers Commanding European Corps appear to be satisfied with the working of the new system under their own arrangement and as it seems to meet the wants of the men under their Command, it may be allowed to continue, but I would take the liberty to suggest that if Wells are sunk within a convenient distance of the Baths the cost of filling them with water will be considerably reduced.

The Well from which the water is supplied for the Baths in the Barracks at present occupied by the European Infantry Depôt, is not at an inconveniently great distance, being 48 feet 4 inches from the women's bath and 80 feet 8 inches from men's bath.

No. 247.

Saint Thomas' Mount.
26th June 1857.

(Signed) ÆNEAS SHIRREFF, Brigadier,
Commanding Mount.

Letter from Captain A. RITHERDON, Commanding Palaveram; to the Deputy Assistant Quarter Master General, Centre Division, dated Palaveram, 17th July 1857, No. 390.

SIR,

Adverting to Memo. from your Office dated 2nd Ultimo, No. and subject as per margin, I have the honor, with reference to 3rd para. of Colonel McCally's letter No. 61, dated 31st March 1857, to state for the information of the Major General Commanding the Division, that the system at present adopted for working the Well of the Wash-house attached to the European Artillery Veteran Company at this Station appears to be satisfactory, the Well itself being as near to the Bath as it possibly could be, viz., about 20 or 25 feet.

No. 349 Encloses Extract Minutes Consultation 16th May 1857 No. 946, and requests opinion on para. 3 of Colonel McCally's letter.

Letter from Lieutenant-Colonel JOHN IMPETT, Commanding Poonamallee; to the Deputy Assistant Quarter Master General, Centre Division, Madras, dated Poonamallee, 16th June 1857, No. 433.

SIR,

In returning you the Proceedings of the Chief Engineer No. 946, dated 16th May 1857, together with your Memorandum No. 349 of the 2nd Instant, I have the honor to state, that the new system of filling the Plunge Bath and Wash-house at Poonamallee under Military authority is very satisfactory and fully meets the wants of the men, the water being good and plentiful, and a Well sunk close to each of the Baths in Barracks. I perfectly concur with Colonel McCally in his opinion of having Wells sunk within a convenient distance of Baths; having experienced at the Station under my Command, where Wells are almost contiguous to the Wash and Bath-houses, that the water is not only supplied more expeditiously, but at a less cost than it could be, if it had to be conveyed from a distance by Coolies or Bullocks.

Letter from Lieutenant A. S. MOBERLY, District Engineer of Chingleput; to Major E. LAWFORD, Officiating Chief Engineer, dated Camp Guindy, 12th August 1858, No. 423.

SIR,

In returning the accompanying 7 Enclosures received with your letter No. 9103 of the 19th April last, I have the honor to forward Estimates for conveying the water by pipe to the Wash-houses in the Barrack Squares, and also for conveying it to the new Wash-houses attached to the new Married Men's Quarters.

No. 3598.

1	Detailed with Abstract Estimate for			Rupees	700
1	Do	do	do	do	1,040
1	Do	do	do	do	770
1	Do			do	1,010
1	Revised Estimate			do	1,110
1	Do			do	1,540
1	Do				

Resolved with reference to the foregoing letter, No. 423, dated 12th August 1858, to return the Estimates received from the District Engineer, Chingleput, together with the revised Estimates prepared in the Central Office, as on examination the former were found to be incorrect, the screws and nuts and fixing charges

were entirely omitted in the foregoing Estimate, Lieutenant Moberly will therefore re-submit the same as early as possible.

13th September 1858. (Signed) E. LAWFORD, Major,
Officiating Chief Engineer.

Letter from Captain A. S. MOBERLY, District Engineer of Chingleput; to Lieutenant Colonel E. LAWFORD, Officiating Chief Engineer, dated Guindy, 23rd October 1858, No. 790.

SIR,

With reference to Extract from your Proceedings No. 3598 of the 13th September last, I have the honor to forward three revised Estimates, amounting to Rupees 3,630 for placing Cast Iron Pipes for conveying water to certain Wash-houses at the Mount.

No. 5119.

Resolved that before submitting the Estimate received with the foregoing letter to Government, the District Engineer be requested to report with reference to Extract Minutes of Consultation under date the 16th May 1857 No. 946, the saving that would accrue in the monthly cost of supplying water by the works now recommended.

The Chief Engineer observes from a letter from the Officer Commanding 1st Battalion Artillery at the Mount, dated 15th June 1857 No. 185, that the present cost of conveying water to the Bath Houses in the Barrack Square amounts to Rupees 30 per month. The expense which would be saved in conveying water to the new Married Men's Quarters of the same Battalion and for the Wash-houses on the Square of the North Foot Artillery Barracks, ought to be correctly reported.

5th November 1858. (Signed) E. LAWFORD, Lieut.-Colonel,
Officiating Chief Engineer.

Letter from Captain A. S. MOBERLY, District Engineer of Chingleput; to Colonel C. E. FABER, Chief Engineer, dated Guindy, 1st February 1859, No. 1223.

SIR,

With reference to Extract from your Proceedings No. 5119 of the 5th November last, I have the honor to forward the accompanying Statement which I trust clearly shews the saving that will arise from having Pipes laid.

Statement shewing the present monthly cost of conveying water to the Buildings at St. Thomas' Mount, and the saving if Pipes are laid.

Name of Building.	Present monthly expense of conveying water.			Amount of Estimate for Pipes.			Estimated monthly expense when Pipes are completed.			Annual saving.			Remarks.
	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	
North Foot Artillery Barracks.	30	0	0	1,100	0	0	12	0	0	216	0	0	
South do. do.....	48	0	0	1,530	0	0	12	12	0	423	0	0	
Married Men's Quarters.....	36	0	0	1,000	0	0	12	12	0	279	0	0	

District Engineer's Office, Guindy, 1st February 1859.

(Signed) A. S. MOBERLY, Captain,
District Engineer of Chingleput.

Letter from Captain A. S. MOBERLY, District Engineer, Chingleput; to Colonel C. E. FABER, Chief Engineer, dated Guindy, 24th March 1859, No. 1389.

SIR

In re-transmitting the accompanying Estimates with the countersignature of the Brigadier Commanding the Mount, I have the honor to inform you, that the Estimates are for supplying the Wash-houses with water from the Wells in the Barrack Squares. The Plunge Baths are already supplied—the waste water of these will cleanse the drains—they meet the requirements of the Officer Commanding the Foot Artillery.

2. As regards the improvements required by Major Mein, I have already submitted Estimates with my letter No. 817 of 30th October 1858, which have received the approval of Government, but have been postponed, vide Extract Minutes Consultation No. 34 of 5th January 1859, forwarded with your Memo. No. 6359 of the 7th January 1859.

Letter from Lieutenant J. F. FISHER, District Engineer of Bellary; to Colonel C. E. FABER, Chief Engineer, dated Bellary, 4th June 1857, No. 55.

SIR,

With reference to your Resolutions dated 25th May 1857, forwarded with Extract Minutes of Consultation, No. 946, dated 16th May 1857, I beg to say I do not think the cost of filling a Bath with water will be at all diminished by sinking a Well near it: a pair of Bullocks to raise water from a well to fill a Bath will cost just as much if they work within 10 or 10,000 yards of the Wash-house, some little time will be saved and some saving made in the length of pipes leading from the well to the Bath by placing it near the Wash-house, but as the quantity of water to be raised is the same whatever the distance of the well, no saving will be, I should think, affected in that item.

2. Whilst on this subject I beg to bring to your notice that no Plunge Bath exists on the Ramandroog, and that one would be of great benefit to the Convalescent Soldiers at that Sanatarium.

No. 1161.

Resolved with reference to para. 2 of the foregoing letter, that the District Engineer, Bellary, be requested to submit at an early date, a Plan and Estimate for erecting a Wash-house at Ramandroog, the Officer Commanding being previously consulted on the subject.

(Signed) P. O'CONNELL, Lieut.,
Assistant Chief Engineer.

Letter from Major General D. MACLEOD, Commanding Ceded Districts; to Colonel C. E. FABER, Chief Engineer, dated Bellary, 17th June 1857, No. 93.

SIR,

No. 61 of 31st of March 1857, to the Secretary to Govt. Mily. Dept.

With reference to para. 3, of Colonel McCally's letter, as per margin, in your Circular Extract of Proceedings under date 25th Ultimo, No. 22, I have the honor to submit the following observations.

1. "New European Barracks at Bellary"—Although there is at present no European Regiment at Bellary, it is presumed, that every thing appertaining to the completeness of these fine buildings, should be maintained in perfect order for the reception of a Corps at the shortest notice; I therefore beg to remark that, although the quantity of water available for supply to the new Barracks is *fully ample*, under the new system, of supplying fresh water to the Wash-houses by means of Cylindrical earthern pipes, from the great distance the water has to flow before rising to the lowest Wash-house floor, it is not unlikely that the supply, if not occasionally entirely stopped, may be irregular, owing to accidents to the piping, and if an accident happened, it would take a considerable time to find out where it had occurred, the piping being all underground.

2. For *raising* water for the whole series of Wash-houses there is but one Pecottah, worked by Bullocks. This is the means by which 2,700 yards of piping are filled, and will be evidently insufficient, when the Barracks are occupied.

3. The Plunge Bath also is badly constructed; having, since it was originally built, been subdivided, and the partition wall consequently reduces its capabilities of holding water very considerably; this however is a matter of far less importance than that alluded to in the preceding paras. I have communicated with the District Engineer on these subjects, who will doubtless suggest any improvements which may appear to him advisable.

Regarding the supply of water to the Foot Artillery in the Lower Fort, I have only to say that the present arrangement meets the wants of the men, and that no new Wells are required as there is a large Bowrie in the vicinity of the Barracks from which abundance of water is procurable and easily supplied by Puckallies.

Letter from Lieutenant J. F. FISHER, District Engineer of Bellary; to Colonel C. E. FABER, Chief Engineer, dated Camp Purmadavenhully, 1st July 1857, No. 113.

SIR,

I have the honor to forward copy of a letter from Lieutenant Drever, Executive Officer in charge of Military Buildings, Bellary, together with an Estimate for Cisterns which I consider it necessary to construct for the conveyance of water into the Wash-houses attached to the Barracks.

2. The pipe carrying the water is so far below the level of the Wash-houses that the joints from it have to be laid at a considerable angle: this has been found very difficult to execute with these small pipes fastened only with chunam; accidents have occurred in three instances already, and it was found quite impracticable to get the water down the full length of pipes already laid down.

3. The Cisterns will, I hope, obviate this difficulty; their floors will be in a level with the main; the water will rise in them, and, after filling the first Wash-house, will be allowed to go on to the next.

4. I agree with Lieutenant Drever in considering the pipe 3 inches in diameter too small to convey the quantity of water required for a Regiment of Europeans. In my former letter, I stated the quantity of water this pipe was able to convey was 4½ cubic yards per hour; this has to be distributed among 14 Wash-houses and this allows 8½ cubic feet to each. I cannot help thinking that this will be found too little for a Regiment 1,000 strong with its followers.

Letter from Lieutenant W. S. DREVER, Executive Officer, Department Public Works in charge of Military Buildings; to Lieutenant J. F. FISHER, District Engineer of Bellary, dated 23rd June 1857.

SIR,

With reference to the personal instructions you gave me on the 19th Instant, I have the honor herewith to forward an Estimate of the cost of building Cistern Reservoirs at each Wash-house and at each place where branch tubes are connected with the main line of aqueduct.

	Rs.	A.	P.
The expenditure already incurred is	3,890	0	0
There remain to be completed 660 running yards of piping.....	815	0	0
Amount of Estimate hereto appended.....	110	0	0
Total probable expenditure...	4,815	0	0
Deduct amount of the sanctioned Estimate.....	3,000	0	0
Probable Excess in the Estimate.....	155	0	0

I have therefore to await your final orders on the matter.

I believe the proposed Cisterns will obviate the difficulty which we have hitherto experienced, viz., in connecting the branch tubes to the Wash-houses from the main line; but I am of opinion that the tubes themselves are much too small to convey the amount of water requisite for the supply of these Barracks when occupied by a Regiment of Europeans.

Letter from Lieutenant J. F. FISHER, District Engineer of Bellary; to Colonel C. E. FABER, Chief Engineer, dated Bellary, 19th June 1857, No. 86.

SIR,

I have the honor to forward copy of a letter from the Major General Commanding the Ceded Districts. I agree with the Major General in the probability of there being a deficient supply of water to these Barracks; in fact recent experiments in trying to get water to the Wash-houses to which these pipes have been led, have failed entirely, some flaws in the workmanship having been detected and other defects which are now being rectified having also been discovered. I am not prepared to give a general condemnation of the scheme, but some idea of the difficulty of executing this work may be conceived, when it is stated, that the pipes are only 1 foot long, and that there are nearly 10,000 joints and some of these at right angles to the main pipe.

2. The bore of the pipe, 3 inches, is I consider too small; the length of the pipe is said to be 2,700 yards or 8,100 feet; the head is given as 12 feet; this gives an hydraulic inclination of 1 in 675, the velocity in inches per second for this from Nevile's tables is 9.89, and from this I calculate the discharge would not be more than 5⅓ cubic yards per hour.

3. After the defects pointed out in this letter have been remedied, I will report further on this subject, but I am of opinion that iron pipes from England would be the most economical in the end.

No. 2109.

Resolved with reference to the foregoing letters, to inform the District Engineer of Bellary, that unless the work of laying the pipes to the Wash-houses is skilfully executed, the scheme will undoubtedly fail.

The Chief Engineer is at a loss to understand why pipes of only 1 foot in length should be used, thereby unnecessarily multiplying the number of joints, and so increasing the difficulty complained of in executing the work.

The Estimate of Rupees 110 for constructing Cisterns to regulate the distribution of the water is fully approved and is hereby sanctioned, and should the supply prove to be insufficient in the event of a whole Regiment being stationed at Bellary, it will be necessary eventually to make arrangements for increasing it.

18th July 1857.

(Signed) C. C. JOHNSTON,
Acting Supg. Engineer, Northern Circle.

Letter from Major General D. MACLEOD, Commanding Ceded District; to Lieutenant J. F. FISHER, District Engineer of Bellary, dated 17th June 1857, No. 94.

SIR,

With reference to the Chief Engineer's Circular, No. 22, dated 25th Ultimo, containing a letter, as per margin,* from Colonel McCally, on para. 3 of which my opinion is required, I have the honor to state that I have in reply pointed out, that though the supply of water to the new European Barracks at Bellary is ample, it appears doubtful whether considerable difficulty will not be experienced in supplying the whole of the Wash-houses with water by means of the small bored cylindrical earthen piping, extending about 2,700 yards, filled only by one Pakotta, when a European Regiment again occupies these Barracks. I have also remarked on the difficulty and

* No. 61 of the 31st March 1857, to the Secretary to Government, Military Department.

delay which would arise in ascertaining the exact spot where a stoppage of the flow of* water might occur, as the piping is under-ground. I shall be obliged if you will suggest to the Chief Engineer any remedy for these defects you may consider they require.

Regarding the supply of water to the Artillery in the Fort, I have given my opinion that the present system meets the wants of the men, and that no new Wells require to be sunk, as there is an abundant supply of water in the vicinity of their Barracks.

Letter from Captain F. H. RUNDALL, District Engineer, Godavery Division; to Colonel C. E. FABER, Chief Engineer, dated Camp at Bobbuhuka, 27th February 1858, No. 916.

SIR,

With reference to your Proceedings of the 25th May last, calling for information on the subject of sinking Wells for the purpose of supplying Baths for European Troops, I have the honor to state that up to this time there had been no European Troops stationed within the limits of the Godavery Division, and that therefore I have had no opportunity of affording information on the point called for in para. 3, of the Commissary General's letter.

2nd. In the Barracks however for the Europeans attached to the Sappers, I recommended in my letter of the 5th November 1857, the construction of a Plunge Bath, which however has been overruled by His Excellency the Commander-in-Chief. There are several Wells already in the Sappers Lines, but it would be necessary to sink another in the immediate vicinity of the Bath. This however could be done by the Sappers themselves without the necessity of incurring further expenses.

* Lined with Brick in Clay.

3rd. The cost of sinking Wells in hard soil amount to about Rupees 6-4-0 per foot for a Well* 9 feet diameter.

4th. In conclusion, I beg to express my regret that this communication has remained so long unanswered. This has arisen partly from my not conceiving that an answer would be required from the District, and, subsequently, from your Proceedings having been mislaid in my Office, so that I was unable to refer to the matter contained in them.

Letter from Colonel A. McCALLY, Commissary General; to Colonel C. E. FABER, Chief Engineer, dated 12th April 1858, No. 7337.

SIR,

I have the honor to acknowledge the receipt of your letter, accompanied by twenty-seven original communications, and in returning the same as requested, to state that I have nothing more to add on the subject of Wash-houses beyond what I have already reported to Government in my communication, as per date in the margin, and to reiterate my opinion that it would be advisable to allow the arrangement for the supply of water to rest entirely with Officers Commanding Corps; Wells being sunk wherever there is a necessity for the same, to reduce the rate for carriage.

No. 8430, dated 25th March 1858.
No. 61, dated 31st March 1857.

No. 21. ORDER THEREON, No. 881; dated 14th April 1859.

Referred to the Military Department for consideration with reference to Extract from the Minutes of Consultation in that Department dated 20th April 1857, No. 1272.

(Signed) W. C. SIM,
Actg. Dy. Secretary to Government.

No. 9122.

Financial Office if. F.W.
Fort Saint George
30th March 1859.

From
The Chief Engineer

To
The Secretary
to Government F.W.S.

Sir,

Military
Buildings
Plunge Baths

With reference to Extract Minutes of Consultation No. 946 dated 16th May 1857, I do myself the honor to submit for the information and orders of Government, the following summary of the several Reports received on the question referred to in para 3 of Colonel McCalley's letter regarding the sinking of Wells for the supply of water to Plunge Baths &c., the delay in furnishing which has arisen from a protracted correspondence with the District Engineer of Chingleput on the subject of improving the water supply of

to the Artillery wash houses at Saint Thomas Mount.

2. The Major General Commanding the Southern Division states that, the Wash Houses and Plunge Baths at Trichinopoly, are supplied from distant wells by means of channels, and those at Jacktatallah from a Mountain Stream in which method no improvement is required, and the District Engineer of Trichinopoly, while agreeing that no advantage would be gained by sinking wells nearer the buildings where the Troops are located, considers that, the present means of ablution at the European Barracks needs much improvement, and that the construction there of a Plunge Bath would be of service. —

3 The average quantity and cost of water supplied to each man of the Foot Artillery is according to Captain Byrnes, 2 Cubic feet per day, at 1/2 annas 100 Cubic feet, and to those of the Foot Artillery, 30 Cubic feet at 2/2 annas 100 Cubic feet, the latter, owing to the appliances of the wheel and Axle being one sixth the cost of the supply to the European Barracks. It is therefore desirable that,

a

a letter dated 23rd March 1859 herewith forwarded. —

a similar plan should be adopted at all the wells at this Station, and provision for the purpose could be made in the Estimates which will doubtlessly be ordered for carrying out the improvements suggested by Captain Byrnes. —

4 With respect to Jacktatallah, the District Engineer concurs in considering the supply of water derived from the stream noted by General Budd, to be amply sufficient for all the buildings, but omits to mention the average cost hitherto, or likely to be incurred. —

5 At Cannanore, the water made use of by the troops (European) is readily obtained from adjoining wells, but its cost Captain Bram fails to furnish. —

6 European Troops are no longer located at Palamcottah, Captain Oakes however informs that, the supply of water was conveyed along a masonry channel from a well situated at a distance of 10 yards from the Bath, and that each man was supplied daily with upwards of 22 Cubic feet of water, at a monthly expense

of

of 4 Annas. —

7 In Madura, Tanjore, South Arcot, and Salem, there are no European Soldiers located, and no opinion on the desirability or otherwise of sinking wells, is given by any of the District Engineers of these Districts, except of Tanjore, who expresses himself in favor of wells sunk to a moderate depth, and at a convenient distance from the Plunge Baths or wash houses. —

8 With reference to the Centre Division, the Adjutant General Commanding forwards reports regarding the Stations marginally noted. —

forwards vide letter No 493 dated 21st July 1857 with Enclosures

Poonamallee
Palaveram
St Thomas's Mount

9 At Poonamallee, and Palaveram, the Baths are supplied with an abundance of water from wells sunk quite close to them, and the system is stated to work satisfactorily. —

10 The Officer Commanding the former Station is greatly in favor of the plan recommended by Colonel McCalley, he having from experience found that wherever wells have been sunk,

the

vide letter No 433 dated 16th June 1857.

the supply of water has been obtained much more expeditiously, and at a considerable less expense, than by the old method of bullocks &c. —

11 The Baths for the European Infantry at Saint Thomas's Mount, are also plentifully supplied with water, from wells situated at a convenient distance, but improvements are required in the Banacks occupied by the Foot Artillery, the cost of which, it is estimated, will amount to Rupees 3630. —

Vide the following correspondence
From Executive Engineer Chingleput No 1223 dated 12th August 1858
To — do — do — No 3598 of — 13th October 1858
From — do — do — No 790 dated 23rd October 1858
To — do — do — No 5019 — dated 5th November 1858
From — do — do — No 1223 — dated 12th February 1859
Do — do — do — No 1359 — dated 26th March 1859.

12 The saving that would accrue, by carrying out these works is represented by Captain Moberly to be as follows

Present monthly cost Rupees 116 — — —

Probable cost after pipes are laid down — " — 37½

annual saving Rupees 918 or upwards of 25 % on the outlay, and there can thus be no doubt, that great advantage would attend the execution of the work. I recommend, that the sanction of Government be granted for the expenditure

expenditure of the estimated amount Rupees 3,630 . . . ,
in laying down Cast Iron Pipes to the Artillery
Barracks and married men's Quarters, due
provision having been made in the Estimate
for the improvements
suggested by the Officer
Commanding the Foot Artillery. — .

vide a reference to letter No 1359 dated 26th March 1859 from Executive Engineer and letter No 1193 of 22nd June 1857 from Officer Commanding Artillery Nellore. —

13. With respect to the arrangements
recommended by Major Main for the Horse
Artillery Barracks, Captain Moberly reports
that, the sanction of the Estimate for their execution

vide letter No 1388 dated 11th March 1857 from Offg Commy Genl to Executive Engineer

was postponed in Extract Minutes of Consultation
No 1190 dated 21st December 1858, of the
Military Department. —

vide Collins Comm. No 34 of 5th January 1859.

14 No European Troops are quartered
in the Districts of Cuddapah, Nellore, and North
Arcot, but each Officer states his opinion on the
subject under review. —

15 The District Engineer of Cuddapah
believes that, in most cases, a considerable saving
would be effected by sinking wells close to Baths,
whilst the District Engineers of Nellore, and North
Arcot, give it as their opinion that no saving
can

can be determined on for the supply of
water, the cost and efficiency of any or every
method followed, depending entirely on local
circumstances they consider however that,
wherever wells are sunk, they should be
places as near as possible to the Baths, and
that double actioned pumps should be made use
of, for raising the water. —

16 Referring to the Northern Provinces
of the Presidency, the Brigadier Commanding the
Hyderabad Subsidiary Force reports that, the
Wells from which the supply of water is obtained
for the Baths are conveniently situated, and
that to sink fresh wells, would be perfectly
useless and unnecessary. —

17 The Major General Commanding
the Madras Division, considers the method adopted
for supplying water to the new European Barracks
at Bellary, objectionable,
on the grounds of its
frequent liability to
accident and stoppages,

vide the following Correspondence herewith forwarded
From District Engineer No 55 dated 6th June 1857
To — do No 1161 dated 13 — do
From Officer Commg Cavalry No 93 dated 17 June 1857
do do No 86 dated 17th June 1857
with Enclosure —
do — do No 113 dated 14th July 1857
with 2 Enclosures —
To do No 2209 dated 18th July 1857

an opinion in which, the District Engineer fully
concurs. To remedy the evil, small cisterns were
constructed

constructed under the belief that the supply could be much better regulated and distributed, but the result has not yet been communicated. I have however now called upon Captain Fisher, to submit an early report on the subject, with the view of transmitting the same to Government for their orders. —

18 The cost of filling a bath from a well close to it, Captain Fisher considers would be about the same as from Wells at a distance, but beyond recommending the substitution of Iron pipes for those of clay already laid down, he does not advise any change in the original plan followed for supplying Water to the new Barracks. —

19 The arrangements adopted for the supply to the Foot Artillery in the Lower Fort, is considered satisfactory by the Major General, who is of opinion that, no new wells are wanted there, the large bourne close at hand being sufficient to meet the wants of the men

20 Captain Fisher's suggestions regarding the construction of a Plunge Bath at Ramandroog

I have the honor to be
Sir
Your most obedient Servant
Alex Fraser Colonel
Chief Engineer

Central Office of Ch.
Fort Saint George
30th March 1857

amount of expenditure would result

Cons. 19th May 57 pp. 52-53
" 11th Jany 59 — " 6-7-
" 8th July — " — " 11-412-

Ex. Inst. 6. July. Despatch
9/27th Apl. 59 Cl. 1056 with
15 Encls. 29-25-
From the Chief Engr. 16th
May 59 Cl. 1136 Encl. 1pp
pp. 107-108.

No. 208 of 1.

Pub. Works 1859 Abstract
Dto Cons. 19 April
pp. 762.

From
The Chief Engineer
to
The Secretary
to Government of India

Date 30th March 1859
Answered
Encls Returned 4-5-59 9122.

No. 881. 11th April 1859.

Submits with reference to Chief Engineer's Consultation No. 986 dated 4th May 1857 a Summary of correspondence on the subject of wells in the Deep Bottom and West houses and recommends the sanction of an Estimate amounting to Rupees 9,330 for proceeding with Eleven Wells in the Bombay Fort, with a view to ascertain the practicability of obtaining water by this means for the supply of the Military Depot.

With two orders of

No. 881

Reports to the Military Department for consideration and the sanction to Expenditure from the Home Establishment Grant of the Military Department dated 20th April 1857 No. 1272.

H. Elliot

Fort St. George
11th April 59
7 Copies to the Military Despatch
Dated 15th do