I.R.O. 1—77,006—8-6-57.

(1) Number of pages_____

(2) Date of repair_____

(3) Initials of the Referencer_____

# MADRAS RECORD OFFICE.

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## Government of Madras.

Public works **DEPARTMENT.**

G.O. No. 2692 Press
566-567 Mis. 1

Dated 27. 8. 1866.

***Not to be folded or roughly handled***

## *Proceedings of the Madras Government, Public Works Department, 27th August* 1866.

No. 566. Read the following letter from the Commissioner for the Government of the Territories of His Highness the Maharajah of Mysore, to the Secretary to Government, Public Works Department, dated Bangalore, 7th August 1866, No. 2,043-14 :—

With reference to your letter, No. 86-417, dated 2nd February 1866, I have the honor to transmit, for the information of His Excellency the Governor in Council, copy of letters Nos. 1,260-174 and 1,691-229, dated respectively 6th and 26th July 1866, from the Officiating Chief Engineer in Mysore, reporting on the subject adverted to in the enclosures therewith received.

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From the Officiating Chief Engineer of Mysore, (Civil Works,) to the Secretary to the Commissioner for the Government of the Territories of His Highness the Rajah of Mysore, dated Bangalore, the 6th July 1866, No. 1260-174.

1. With reference to your docket, No. 5,026-695. of the 6th February 1866, forwarding copy of Colonel Orr's letter, No. 86, of the 2nd idem, with annexures from the Superintending Engineer of the 5th Division (Madras Public Works Department), on the subject of the leakage of the main sewer, which carries off the drainage of the Cantonment Bazaar of this station, I have the honor to report for the Commissioner's information the action which has been taken in the matter, and to offer such observations as appear requisite with reference to the supply of the Ulsoor tank, which is mainly involved in the question at issue.

2. Regarding the original ground of the request preferred by the Madras Government, that as the sewer was built originally by this Department, the repairs should of course be undertaken by us, it is not, within my province to decide ; I need only therefore observe that the work was undertaken almost exclusively for the health of the Troops in garrison, that it cost the Mysore State Rupees 1,36,101, and that in the transfer to the Madras Department, ordered in Proceedings of the Government of India, No. 3,796, of the 26th August 1863, it is observed that, "if, as is stated, the main object of constructing the sewer, was to preserve the health of the "Troops, it would appear but right that the cost of maintaining it in an efficient state should be "a charge against the Military Division of Bangalore."

3. Captain Tulloch, in his letter to the Superintending Engineer, observes that, according to his calculations, "from 40,000 to 50,000 gallons escape every day from the Ulsoor tank "through this sewer." At first sight to those unacquainted with the real facts of the case, this statement is sufficiently alarming; it appears to me, therefore, desirable to show, how, supposing it for a moment to be absolutely correct, such a continued drain would affect the Ulsoor tank.

4. The tank has a surface of 5,000,000 square feet, and supposing not a single drop of rain to fall during five months, the total effect of a steady daily drain of 50,000 gallons would only amount in all this time to a total reduction of a depth of the tank of three inches! Such being the case, it is unnecessary for me to observe, that the remark of the Executive Engineer that, "while the Cantonment is crying out for water, it is lamentable to think that such waste "should be taking place," appears somewhat out of place.

5. Had the Executive Engineer further taken the trouble to examine the sewer before making the statement which immediately follows, that "there can be no doubt in the mind of any unbiased person, that the water now running to waste is being drawn from the Ulsoor tank," I have no doubt he would have arrived at a very different conclusion.

6. The Officer of this Department who examined the sewer, found a jet of water two inches in diameter projected from a hole in the short portion passing immediately under the bed of the tank near the outlet, and at a point about thirty feet from the bund ; he also found some water sweating through in other places. To remedy both defects I waited till this portion of the tank was sufficiently dry, and after getting the hole plugged had a casing of good puddle put over the whole length of the brick-work of the sewer outside, filling all in afterwards with

well rammed clay. These measures have, I believe, been quite effectual, and were both simple and inexpensive.

7. But the further examination of the sewer, if I may so say, "inland," where it passes under ground at some distance from the tank margin, showed that the chief portion of the leakage resulted from a continued sweating through the invert in the part immediately under Major Taylor's compound, where, during first construction, most serious difficulty was encountered in keeping down the springs, which were here both numerous and powerful.

8. A study of the facts connected with the tank proves to my mind, that it has long ago puddled itself in such a manner, as to preclude the idea of the above leakage resulting in any way from percolation through the bed. There are, for instance, four large wells sunk close up to the margin of the tank (viz., Light Cavalry, Artillery, European Infantry wells, with another in the reclaimed ground for the use of the Bazaar people), and it was found absolutely essential, in order to get any water to percolate into these through the soil, to cut nullahs from the tank, and convey water close up to the revetting stone work of each, in order to insure their having any constant supply. Even now when these cuts are dry, although the wells themselves are very much deeper, the latter become almost perfectly empty and unserviceable.

9. A large reservoir lately excavated close to the tank, and with its sole several feet below the present level of the water, has hardly a single drop in it.

10. Even under the bund of the tank, where percolation, if anywhere, would show itself, there is but one very small spring visible at the deepest point; and this is at once traceable to a "creep" along the surface of the rock, against which the bund abuts at this point.

11. Under these circumstances I conclude that this, the greater portion of the leakage, which is found in the inland part of the sewer, in no way diminishes the supply of water in the Ulsoor tank, and simply arises from under-ground springs unconnected with it; consequently with the stoppage of the small leakage in the portion of sewer passing under the tank, it does not appear essential to do anything more to rectify the trifling filtration in the other places, which is of no importance, and from which, I believe, no sewer ever yet constructed is entirely free.

12. To deal with the sweating adverted to by means of plaster applied, as recommended, to the inside, would, considering its origin, be, in my opinion, both expensive and useless.

13. Having now shown that the alarming picture drawn of the effects of the supposed leakage had really no sufficient grounds, and that the measures already taken under the circumstance would answer all practical purposes, I might fairly close this report, were I not satisfied that the real question which underlies the representation made by the Madras Department, is in fact nothing less than how to ensure the Ulsoor tank receiving such a supply as will guarantee the requisite quantity of water being stored each year for the new water-works?

14. This perfectly legitimate inquiry is even more essential than would at first sight appear, as it is clear to my mind that Colonel Lawford's system of storing water at the highest points of the catchment basin, must ere long be followed up by the construction of one or more tanks on tthe northern feeder of the Ulsoor tank, and as these reservoirs will each, in proportion to its capacity, cut off an equal quantity from the Ulsoor, the latter, unless some means are devised, might in time be left with only possibly one-half of its present supply.

15. Without wishing to enter at any length into the means by which this threatened loss could be made good, I may be permitted to state generally what I consider would prove a safe, practical, and economical remedy.

16. Some years ago, Sir Arthur Cotton projected a scheme for bringing in pure water to Bangalore from a tank that was to be constructed at the base of Nundidroog, and the channel from which was to lead into Miller's tank, as the storage reservoir from which distribution was to take place over the bazaars, barracks, &c.

17. Though the scheme itself broke down, for reasons which it is unnecessary here to enter upon, yet in the series of levels then taken, it was shown that a contour line, leading from the Cody





(waste weir) of Miller's tank, swept off to a distance of some eight or nine miles in the direction of Maloor; and from this it is at once clear, taking into consideration the great height of Miller's tank above the Ulsoor, that the latter cou'd be fed by any required length of channel taken along the country to the east.

18. A small open channel carried for a few miles in this direction would probably collect much more than sufficient water for making good any curtailment of the Ulsoor supply from the construction of upper reservoirs; and which, I have not the slightest doubt, must take place some day by the formation of a chain of small tanks on the northern feeder, similar to that now nearly completed by this Department on the upper portion of the channel, which passes through the Cantonment bazaar.

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From the Officiating Chief Engineer of Mysore, (Civil Works) to the Secretary to the Commissioner for the Government of the Territories of His Highness the Rajah of Mysore, dated Bangalore, 26th July 1866, No. 1,691-229.

1. Being desirous of ascertaining the direction which the feeder proposed for the Ulsoor tank (paragraph 18 of my letter, No. 1,260-174, of the 6th instant,) would take, I had the line of channel laid down, starting from the east corner with the high water (or waste weir) level for datum, and rising six inches in the mile, and it will at once be observed from the rough survey herewith forwarded,* showing the result of this, that although the line is only carried to the fifth mile-stone on the Palmanair road, the drainage of a very large extent of country is intercepted, which now passes off into the Dummaloor and Agram tanks.

* Herewith forwarded to be obligingly returned.

2. The area drained by this small portion of channel, only 3,723 yards long, is, as shown roughly by the water-shed line, about 1¼ square-miles, and as one inch of rain-fall on a square-mile gives 2,323,200 cubic feet, it follows that, with a total yearly rain-fall of 40 inches, the quantity would be 116,160,000 cubic feet. Supposing that only one-fourth of this actually flows off, and would be available for feeding the Ulsoor tank, it follows that the area of the latter (as shown in my letter) being 5,000,000 square-feet, this small channel would in itself add to its depth 5·8 feet.

3. The proposed line of channel, if continued, would hold on for a considerable distance in a southerly direction, intercepting still more of the supply of the Agram tank, before sweeping again to the northward, where it would enter another catchment basin. It may thus be safely assumed that my original proposal to increase the supply of the Ulsoor tank, is not only practicable, but could be carried out cheaply and to any desired extent.

(copies.)

(Signed) L. BOWRING,
*Commissioner.*

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No. 567. ORDER THEREON, 27th August 1866, No. 2,692.

CIVIL WORKS, No. 82.

1. Communicated to the Superintending Engineer of the 5th Division with reference to his letter of the 17th January 1866, No. 59.

2. Lieutenant-Colonel Foord's attention is drawn to paragraphs 13 to 18 of Major Sankey's Report of the 6th July, in which measures are suggested for improving the supply of the Ulsoor tank, and should the scheme be considered suitable,

undertaken

***Proceedings of the Madras Government, Public Works Department,***
***27th August 1866.***

Colonel Foord will submit in due course the necessary plans and estimates for the orders of Government.

(True Extract:)

(Signed) CHARLES A. ORR, Colonel, R. E.,
*Secretary to Government.*

To the Superintending Engineer, 5th Division, with one Rough Survey Plan.

Etd. S. T. Augustin.

Mysore Public Works Department
Central Office
Current Branch.

No. 1260
174

From

Major R. H. Sankey R. E.
Offg Chief Engineer of Mysore.

To

The Secretary to the Commissioner
for the Government of the Territories
of His Highness the Rajah of Mysore.
Dated the 6th July 1866.

"Civil Works"

Sir,

With reference to your docket No. 5026/695 of the 6th February 1866, forwarding copy of Colonel Orr's letter No. 860 of the 2d idem with annexures from the Superintending Engineer of the 5th Division (Madras Public Works Department), on the subject of the leakage of the main sewer, which carries off the drainage of the Cantonment Bazar at this Station, I have the honor to report for the Commissioner's information the action which has been taken in the matter, and to offer such observations as appear requisite with reference to the supply of the Ulsoor Tank, which is mainly involved in the question at issue.—

2. Regarding the original ground of the request preferred by the Madras Government, that, as the sewer was built originally by this Department, the repairs should of course be undertaken

undertaken by us, it is not within my province to decide; I need only therefore observe that the work was undertaken almost exclusively for the benefit of the Troops in garrison, that it cost the Mysore State Rupees 1,36,101, and that in the transfer to the Madras Department, ordered in Proceedings of the Government of India No 3796 of the 26th August 1863, it is observed that: "if, as is stated, the main" "object of constructing the sewer, was to preserve" "the health of the Troops, it would appear but right" "that the cost of maintaining it in an efficient" "state should be a charge against the Military" "Division of Bangalore":—

3. Captain Bullock, in his letter to the Superintending Engineer, observes that according to his calculations "from 40,000 to 50,000 gallons" "escape every day from the Ulsoor tank through this" "sewer." At first sight to those unacquainted with the real facts of the case, this Statement is sufficiently alarming, it appears to me therefore desirable to shew, how-supposing it for a moment to be absolutely correct- such a continued drain would affect the Ulsoor Tank:—

4. The Tank has a surface of over 5,000,000 square feet, and supposing not a single drop of rain to fall during 5 months, the total effect of a steady daily drain of 50,000 gallons would only amount in all this time to a total reduction of the depth of the Tank of 3 inches! Such being the case it is unnecessary for me to observe, that the remark of the Executive Engineer that: "While the" "Cantonment is crying out for water, it is la-" "mentable to think that such waste should be" "taking place," appears somewhat out of place—

5 Had the Executive Engineer further taken the trouble to examine the Sewer before making the Statement which immediately follows, that "there can be no doubt in the mind of any" "unbiased person, that the water now running" "to waste is being drawn from the Ulsoor Tank;" I have no doubt he would have arrived at a very different conclusion.

6. The Officer of this Department who examined the sewer, found a jet of water two inches in diameter projected from a hole in the short portion passing immediately under the bed of the Tank near the outlet, and at a point about 30 feet from the bund; he also found some water sweating through in other places. To remedy both defects I waited till this portion of the Tank was sufficiently dry, and after getting the hole plugged had a casing of good puddle put over the whole length of the brickwork of the sewer outside, filling all in afterwards with well

well examined clay. These measures have I believe been quite effectual, and were both simple and inexpensive.—

7. But the further examination of the sewer, (for I may so say, "inland," where it passes underground at some distance from the Tank Margin, shewed that the Chief portion of the leakage resulted from a contamination-ing through the invert in the part immediately under Major Taylor's Compound, where, during first construction, most serious difficulty was encountered in keeping down the Springs, which were here both numerous and powerful.

8. A study of the facts connected with the Tank proves to my mind, that it has long ago puddled itself in such a manner, as to preclude the idea of the above leakage resulting in any way from percolation through the bed. There are, for instance, four large wells sunk close up to the margin of the Tank (Brigade Field Cavalry, Artillery, European Infantry wells, with another in the reclaimed ground for the use of the Bazar people), and it was found absolutely essential, in order to get any water to percolate into these through the soil, to cut Nullahs from the Tank, and convey water close up to the revetting stone work of each, in order to insure their having any constant supply. Even now when these cuts are dry, although the wells themselves are very much deeper, the latter become almost perfectly empty and unserviceable.—

9. A large reservoir lately excavated close to the Tank, and with its sole several feet below the present level of the water, has hardly a single drop in it.

10. Even under the bund of the Tank, where percolation if anywhere would shew itself, there is but one very small spring visible at the deepest point, and this is at once traceable to a "creep" along the surface of the rock, against which the bund abuts at this point.—

11. Under these circumstances I conclude that this, the greater portion of the leakage, which is found in the inland part of the sewer, in no way diminishes the supply of water in the Ulsoor Tank, and simply arises from underground springs unconnected with it, consequently with the stoppage of the small leakage in the portion of sewer passing under the tank, it does not appear essential to do any thing more to rectify the trifling filtration in the other places, which is of no importance, and from which I believe no sewer ever yet constructed is entirely free.—

12.

12. To deal with the saucing adverted to by means of plaster applied, as recommended, to the inside, would, considering its origin, be in my opinion both expensive and useless.

13 Having now shewn that the alarming picture drawn of the effects of the supposed leakage had really no sufficient grounds, and that the measures already taken under the circumstance would answer all practical purposes, I might fairly close this report, were I not satisfied that the real question which underlies the representation made by the Madras Department, is in fact nothing less than how to insure the Ulsoor Tank receiving such a supply, as will guarantee the requisite quantity of water being stored each year for the new waterworks.

14 This perfectly legitimate enquiry, is even more essential than would at first sight appear, as it is clear to any mind that Colonel Lawford's System of storing water at the highest point of the Catchment basin, must ere long be followed up by the construction of one or more tanks on the Northern feeder of the Ulsoor Tank, and as these reservoirs will each in proportion to its capacity cut off an equal quantity from the Ulsoor, the Cutler, unless some means are devised, might in time be left

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left with only possibly one half of its present supply.

15. Without wishing to enter at any length into the means by which this threatened loss could be made good, I may be permitted to state generally what I consider would prove a safe, practical, and economical remedy.

16. Some years ago, Sir Arthur Cotton projected a scheme for bringing in pure water to Bangalore from a tank that was to be constructed at the base of Nundidroog, and the Channel from which was to lead into Miller's Tank, as the storage reservoir from which distribution was to take place over the Bazars, barracks &c.

17. Though the scheme itself broke down, for reasons which it is unnecessary here to enter upon, yet in the series of levels then taken, it was shewn, that a Contour line leading from the Cowl waste weir of Miller's Tank sweeping to a distance of some 8 or 9 miles in the direction of Ulsoor; and from this it is at once clear, taking into consideration the great height of Miller's Tank above the Ulsoor, that the Cutler could be fed by any required length of Channel taken along the Country to the east.

18. A small open Channel carried for a few miles in this direction would probably collect

collect much more than sufficient water for making good any curtailment of the Ulsoor supply from the construction of upper reservoirs, and which, I have not the slightest doubt, must take place some day by the formation of a chain of small tanks on the Northern feeder, similar to that now nearly completed by this Department on the Upper portion of the Channel, which passes through the Cantonment Bazar.—

I have the honor to be &c.
"Signed" R. H. Sankey Major R. E.
Off.g Chief Engineer of Mysore.

Bangalore
6th July 1866.

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Mysore Public Works Dept.
Central Office.
Current Branch.

No. 1691/229.

From

Major R. H. Sankey R. E.
Off.g Chief Engineer
of Mysore.

To

The Secretary to the Commissioner
for the Government of the Territories
of His Highness the Rajah of Mysore.

Dated 26th July 1866.

Civil Works.

Sir,

Being desirous of ascertaining the direction which the feeder proposed for the Ulsoor Tank (para 18 of my letter No. 1260/174 of the 6th Instant) would take, I had the line of Channel laid down starting from the east corner with the high water (or waste weir) level for datum and rising six inches in the mile, and it will at once be observed from the rough Survey herewith forwarded, shewing the result of this, that although the line is only carried to the fifth mile stone on the Palmanair road, the drainage of a very large † Extent of Country is intercepted, which now passes off into the Dummaloor and Agram Tanks.

2. The area drained by this small portion of Channel only 3.723 yards long is, as shewn roughly by the water shed line, about 1¼ Square Miles, and as 1 inch of rain-fall on a Square Mile gives 2,323,200 Cubic feet, it follows that with a total yearly rain fall of 40 inches, the quantity would be 116,160,000 Cubic feet.— Supposing that only ¼th of this actually flows off and would be available for feeding the Ulsoor Tank, it follows that the area of the latter (as shewn in my letter) being 5,000,000 Square feet, this small Channel would in itself add to its depth 5.8 feet.—

3. The proposed line of Channel if continued would follow for a considerable distance in a Southerly direction, intercepting still more of

† Erroneously for: — would be obligingly returned

of the supply of the Agram Tank, before escaping again to the Northward, where it would enter another Catchment basin. It may thus be safely assumed that my original proposal to increase the supply of the Ulsoor Tank, is not only practicable, but could be carried out cheaply and to any desired extent.—

I have the honor to be &c.
Signed R. H. Sankey Lt. R.
Offg Chief Engineer of Mysore.

Bangalore
26th July 1866.

"Copies"

L Bowring
Commissioner

117

General No. 2043 } 1866/67.
Civil Works No. 14 }

Mysore Commissioner's Office

From

The Commissioner for the Government
of the Territories of His Highness
the Maha Rajah of Mysore.

To

The Secretary to Government
Public Works Department
Fort Saint George.

Dated Bangalore 7th August 1866.

Sir,

With reference to your letter No. 86/417 dated 2nd February 1866, I have the honor to transmit for the information of His Excellency the Governor in Council, copy of letters Nos. 1260/174 and 1691/224 dated respectively 6th and 26th July 1866 from the Offg. Chief Engineer in Mysore, reporting on the subject adverted to in the enclosures therewith received.—

I have the honor to be
Sir
Your most Obedient Servant

L Bowring
Commissioner.

From The Chief Engr & Secy for August
The Commissioner of Mysore

To The Secretary to Government
Public Works Department
Fort Saint George

Dated 7th August
Despatched —
Received 9th " —

Enclosure No. 2 { 1. Ch. Engr's letter & 1 plan
1 Rough Survey

General 2043/14 } 1866-67.
Civil Works

With reference to No 86/447 dated 2d February 1866 transmits copy of letters Nos 1260/174 & 1691/229 of respectively 6th & 26th July 1866 from the Offg Chief Engineer of Mysore reporting on the subject adverted to in the enclosures therewith received. —

No. 566

Recd 15th Augt 1866. Read 18th

Ency 2692 - 27th Augt 1866.

Public Works Department.

No 2692

# PROCEEDINGS of the MADRAS GOVERNMENT

Under date the 27th August 1866
Read the following

From the Commissioner of Mysore (Here enter No. 2043/14 dated 7th August 1866)

Communicated to the Offg Engineer of the 5th Dn. under reference to his letter of the 17th January 1866. No 59.

To Col. Foord's attention is drawn to Paras 13 to 18 of Major Sankey's Report of the 1st July, and which measures are suggested for improving the supply of the Blacor Tank, and should the scheme be considered suitable, Col. Foord will submit in due course the necessary Plans and estimate for the orders of Govt.

To Lt Col 5th Dn with one rough survey Plan. Dispd 28th Augt

P. W. 1860. Department.

Bo: of Govt for Mysore

No. 2692.

PROCEEDINGS OF GOVERNMENT. of Mysore

Dated 27th August 1860.

A

Report submitted by the Commissioner of Mysore, relative to the repair of a sewer and the supply of Ulsoor Tank Bangalore, communicated with certain instructions to the Superintending Engineer of the 5th Division

Rec. 566. 564.