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MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No.	211	Presd Mis.
Dated	9-1-5	18

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
27th January 1864.*

No. 591. Read the following Diary of W. FRASER, Esq., C. E., for December 1863, dated Red Hills, 10th January 1864:—

MADRAS WATER SUPPLY.

1. Being now in a position to explain somewhat in detail what appears to me to be the most practicable scheme (in connection with the Cortelliar and the Red Hill lake), I append to this report a tracing upon which are marked in red the results of the trial and other surveys which were made up to the end of December 1863.

2. The heights above mean sea level of the several points referred to are marked in red figures upon the tracing. These figures will show what the ground to be occupied by the channels and other works will permit us to do. As these heights are important I will repeat them here.

This report being merely intended to give a general idea of what the project is likely to be the heights are given in the nearest round numbers:—

	Feet.
Mean level of the sea	00
Spur tank, low part	15
Poonamallee road where line crosses	19
Railway where line crosses	31
Land at do.	21
Paddy fields at the Red Hill lake	21
Calingulah of do., solid part	31
Top of dam stones of do.	36 highest.
Proposed calingulah...	40 by Captain O'Connell, may be higher.
Land at Cholavaram lake	45
Calingulah of do.	47
Top of dam stones of do.	50
Proposed calingulah	59 to 62
Summit on the line to the Cortelliar	71
Bed of Cortelliar where dam is to be	60
Land at do., general line	78
Top of proposed dam	69 may be higher.

The Spur tank, Red Hill lake and Cholavaram lake are colored a deep blue on the tracing.

3. The general design is:—

- I. To construct a dam across the Cortelliar at the point marked A.
- II. To cut a supply channel to Cholavaram lake A, B, C, about eight miles in length.
- III. To raise this lake, say, 12 feet.

The bund will be about one mile in length.

IV. To connect this lake with the Red Hill lake by the channel marked D, E, about four miles in length.

V. To raise the Red Hill Lake from 9 to 12 feet. This bund is about one mile in length.

VI. To cut a channel from the Red Hill lake to Spur tank in Madras. This channel will be about eight miles in length.

VII. To connect Nos. IV and VI by the short channel marked F, G.

VIII. To construct a filter and a pure water basin in the Spur tank.

These works would leave the water ready for distribution by whatever means might subsequently be approved of.

4. No. I. The point selected for the dam is the lowest on the river that will enable us to give a sufficient fall to the supply channel A, B, C, and to raise Cholavaram lake about 12 feet.

permit us to do: As these heights

Proceedings of the Madras Government, Public Works Department,
27th January 1864.

No. 11. There is no reason to believe that the level of the channel is higher than the level of the lake, and therefore that water will flow from the lake into the channel.

No. 12. The level of the channel is higher than the level of the lake, but it is not of much value. The level of the channel is higher than the level of the lake, but it is not of much value.

No. 13. The level of the channel is higher than the level of the lake, but it is not of much value. The level of the channel is higher than the level of the lake, but it is not of much value.

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27th January 1864.

If the Red Hill lake become exhausted it would be better to draw directly from Cholavaram by the connecting channel F. C., than to run the water from the latter lake into the former and then on to Madras.

The ground along which this channel can be taken presents no peculiar difficulty; but it requires to be carefully surveyed and laid out as the fall is only about 6 inches in a mile.

5. If we assume the population of Madras to be 500,000 and that they would consume 20 gallons per head per day, the whole quantity required in a year would be about 22 millions of cubic yards.

The two lakes, enlarged as suggested above, would hold about 90 millions of cubic yards, so that after Madras was supplied there would be a large quantity which could be used for the cultivation of a portion of the land now lying waste between them and the sea.

These two lakes are well situated for this purpose, as they command the whole country down to Cochrane's Canal, and between the Coom on the south, and the Corielliar on the north.

They could be replenished from time to time from basins constructed on the Naggery river and its branches as formerly proposed.

This part of the scheme will of course depend on the result of the observations now being made on the quantity of surplus water discharged by the Naggery and Corielliar rivers.

6. The design described above and shown on the tracing is that which I am now having surveyed in detail, and I trust that my proceedings will meet with the approval of Government.

After having traversed the country in all directions, and having before me the results of numerous lines of levels, I am of opinion that if the Red Hill lake is to be made use of, the general design now suggested is the best the country affords.

I also believe that all the necessary works up to the delivery of the water in the Spur tank, and including compensation for damages, would not cost more than 3 lacs of Rupees; but this opinion is expressed now on insufficient data, and is only intended to give to Government some idea of the probable cost.

IMPROVEMENT OF THE COOM.

7. The plans for this project have been ready for some time, but it was considered advisable that the proposed sewer across the Coom and on to the north of Black Town should answer the purpose of the main sewer of the general drainage scheme now under consideration by Captain Tulloch. It therefore became necessary to delay the submission of the Coom project until the general drainage scheme was sufficiently matured to enable Captain Tulloch to lay down the main sewer.

The projecting of this main drain involved a good deal of consideration. I have been frequently in consultation with Captain Tulloch about it, and I believe the Plans will be ready shortly when the Coom project will be sent up.

GENERAL REMARKS.

8. On the 7th of December, Mr. Stephenson, one of the two temporary Surveyors employed, became sick, and was obliged to leave.

He subsequently accepted an appointment under the Irrigation Company on a salary 70 Rupees a month more than he received on this Survey.

This reduced my party to two, Mr. Surveyor Osman and Mr. Ward. The latter was employed on the detailed survey and sections of Cholavaram lake, the former was principally engaged with myself on the trial sections and surveys, and in receiving instructions on the ground.

All this preliminary work having been settled a considerable portion of my own time has been occupied in detailed surveying and levelling.

9. I should be glad if Government would be good enough to give me such an Establishment as would prevent the occupation of my own time in detailed surveying and levelling, and enable me to get the necessary detailed Plans prepared speedily.

When the preparation of such Plans drag on from month to month, it becomes not only vexatious to the Engineer, but unsatisfactory to Government.

permit us to do: As these heights

*Proceedings of the Madras Government, Public Works Department
27th January 1864.*

10. In my letter No. 75, dated 28th December 1863, I had the honor of explaining how I thought a cheap and effective Establishment could be organized, and the advantages that would accrue from having it. Since that time I have received the Order of Government No. 4, dated 4th January 1864, conveying instructions about three other projects besides the one on which I am engaged.

Had I the means, I could go to work at once on these projects, and submit the Plans and Estimates within a reasonable time, a course which would not only be the most economical but the most satisfactory to Government.

11. It is, I believe, a novel thing to find an Officer complaining that he has not enough to do, but this is really my case.

My present staff is not able to make Surveys and prepare Plans as fast as I can examine the ground, make trial sections, decide on the design, and mark the work out.

I need not again explain that it is not economical to permit me to be employed in any other way. In conclusion I trust that I shall be excused for again referring to this subject.

No. 592 ORDER THEREON, 27th January 1864, No. 293.

1. The proceedings reported in paragraphs 1 to 6 are approved.
2. Mr. Fraser will be requested to enter fully into the details not only of that part of the project which relates to the storage, but also of those involved in the distribution of the water. On these matters, however, Mr. Fraser will require definite instructions, and to enable the Government to furnish them he will be requested to submit for its decision such points relating to the character and amount of the supply, the mode of distribution, payment for water, &c., as will require to be considered previous to the discussion of the details of the plan.
3. The Government quite agrees with Mr. Fraser that he should be provided with an Establishment sufficient to keep him fully employed. Ample provision for that purpose has accordingly been made in the Budget for 1864-65.

(True Extract.)

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

To W. Fraser, Esq., Special Executive Engineer.

Edw. S. T. Augustin.

Red Hills

*10th January 1864
Diary of W. Fraser Esq. &c.
for December 1863*

Madras Water Supply

1. Being now in a position to explain somewhat in detail, what appears to me to be the most practicable scheme (in connection with the Corbettan and the Red Hill Lake) I append to this report a tracing upon which are marked in red the results of the trial and other Surveys which were made up to the end of December 1863.
2. The heights above mean sea level of the several points referred to are marked in red figures upon the tracing. These figures will show what the ground to be occupied by the Channels and other works, will permit us to do. As these heights

are important I will repeat them
here:—

This report being merely intended
to give a general idea of what the
project is likely to be, the heights
are given in the nearest round numbers.

Mean level of the Sea	0
Spur Tank, low part	15
Poonaallee road where line crosses	19
Railway where line crosses	31
Land at D ^o	24
Paddy fields at the Red Hill Lake	20
Balingula — of D ^o solid part	31
Top of Dam stones of D ^o	36
Proposed balingula	40
Land at Choolavaram Lake	45
Balingula of D ^o	47
Top of Dam stones of D ^o	50
Proposed balingula	59
Summit on the line to the Cortelliar	71
Bed of Cortelliar when Dam is to be	60
Land at D ^o general line	78
Top of Proposed Dam	69
The spur of D ^o	69

3
Lake and Choolavaram Lake are
colored a deep blue on the tracing.

3 The general design is:—

- I To construct a dam across the
Cortelliar at the point marked A
- II To cut a supply channel to Choolavaram Lake ^{A. B. C.} about 8 miles in length.
- III To raise this Lake say 12 feet.
The bund will be about 1 mile in
length:—
- IV To connect this Lake with the
Red Hill Lake by the channel
marked D. E. about 4 miles in length.
- V To raise the Red Hill Lake from
9 to 12 feet. This bund is about 1
mile in length.
- VI To cut a channel from the Red
Hill Lake to Spur Tank in Madras. This
channel will be about 8 miles in length.
- VII To connect nos. IV and VI by the
short channel marked F. G.
- VIII To construct a filter, and a pure
water basin in the Spur Tank.
These works would leave the

water ready for distribution by whatever means might subsequently be approved of.

4 N^o I: The point selected for the Dam is the lowest on the River that will enable us to give a sufficient fall to the supply channel A.B.C. and to raise Cholavaram Lake about 12 feet.

5 N^o II: There is no peculiar difficulty to be encountered in the line of this channel:— With the exception of a short distance close to the River, and another short reach at the summit marked **B** at both of which places the excavation must be deep, the cutting need be no more than may be required.

We can take in the two drainage streams marked on the Tracing.

The line of the proposed channel follows, for some distance, that of a channel which was excavated more than 100 years ago from the eastern

5 drainage stream to Cholavaram Lake. It was closed many years ago in consequence of a dispute amongst the Villagers.

6 N^o III: The detailed Survey and Section of this Lake are not yet completed, and I cannot therefore say how many cubic yards can be stored by raising it 12 feet: But the quantity will probably exceed 20 millions:—

Very little damage will be done by raising it, as nearly all the surrounding land is a barren waste.

One small Village, however, would be swamped, but it is not of much value.

The laterite Hills at each end of this Pond will yield any quantity of stone required.

7 N^o IV: There is no difficulty in the way of this channel: We can get any depth of cutting we require:—

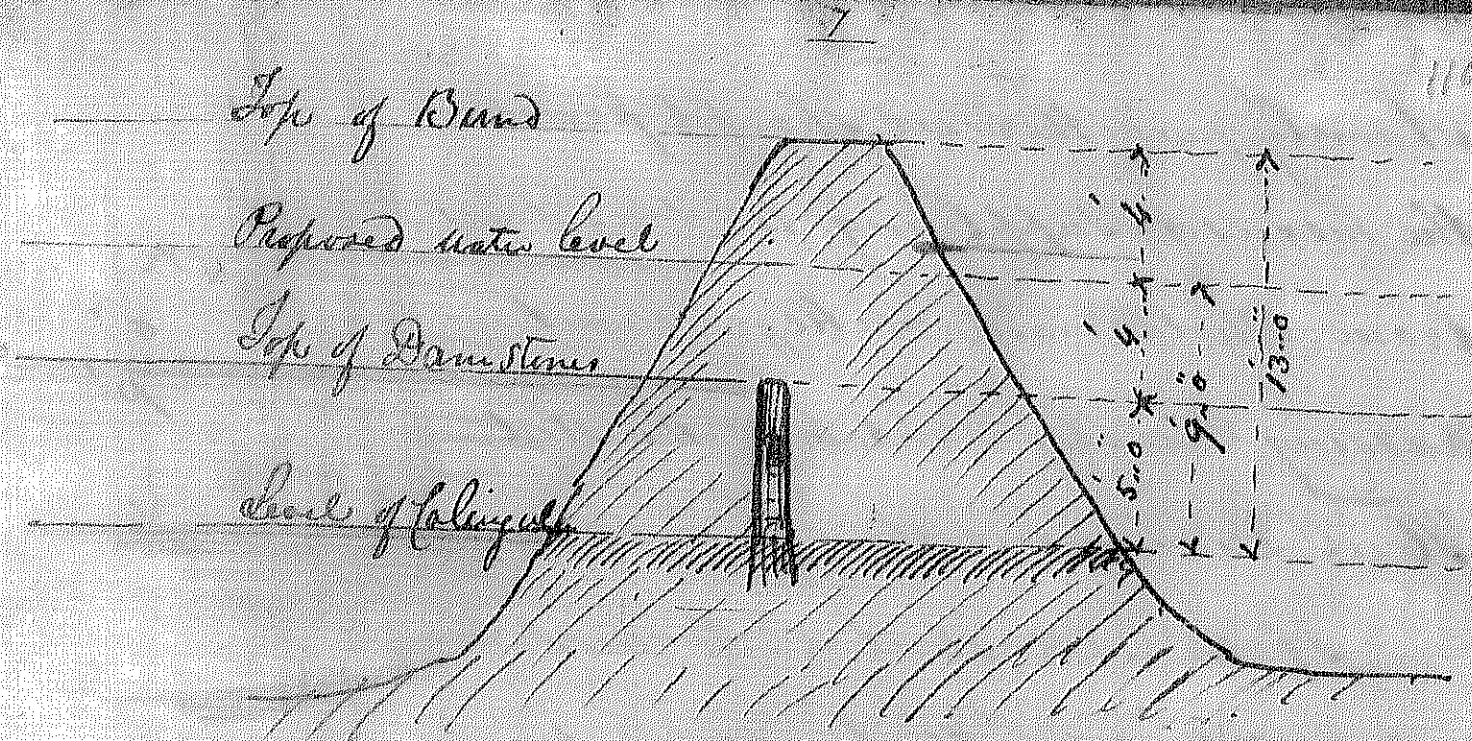
8 N^o V: The detailed Survey and Section of the Red Hill Lake not being finished I cannot yet tell how many cubic yards

can be stored in it at any particular height.

In his report 1892, Captain O'Connell states that by raising the Band 9 feet the capacity of the Lake would be increased to about 43 Millions of cubic yards:-

There is a misconception about this: The 9 feet was calculated from the level of the Calingulah, but the top of the Dam stones is nearly 5 feet higher, - and to this height the Mera sedars have raised the water whenever the rain fall enables them to do so: so that instead of 9 feet the proposed addition to the height of the Lake was practically only 4 feet.

This would have involved a very small addition to the height of the present Band, as the following sketch will show:



If the 9 feet be taken from the top of the Dam stones, we could probably store 70 Millions of cubic yards, but on this subject I cannot speak positively until the Survey and Sections are completed: I allude to it now only to show that in these two Lakes a large quantity of water can be stored with a moderate raising of their Bands.

No. VI. For this channel several trial lines have been levelled: - I have now reduced the choice to two, and which of these I shall recommend will depend on the View taken of the following point:-

Namely, whether we should provide
the means of supplying Madras direct
from Cholavaram Lake, without
passing the Water through the Red
Hill Lake:—

If the Red Hill Lake become
exhausted it would be better to draw
directly from Cholavaram, by the Con-
necting channel F, G. than to run
~~the~~ the water from the latter Lake
into the former and thence on to Madras.

The ground along which this
Channel can be taken presents no
peculiar difficulty; but it requires
to be carefully surveyed and laid out
as the fall is only about 6 inches in
a mile—

5 If we assume the Population of
Madras to be 500,000, and that they would
consume 20 gallons per head per day, the
whole quantity required in a year would be
about 22 millions of cubic yards:—

2
The two Lakes enlarged as
suggested above, would hold about 90
millions of cubic yards; so that after
Madras was supplied there would
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~~be~~ used for the cultivation of a
portion of the land now lying waste
between them and the sea:—

These two Lakes are well
situated for this purpose, as they
command the whole Country down
to Cochrane's Canal, and between the
Coast on the South, and the Corbelliar
on the North:—

They could be replenished from
time to time from Basins constructed
on the Aggerly River and its branches
as formerly proposed:—

This part of the Scheme will of
course depend on the result of the
Observations now being made on the
quantity of Surplus water discharged
by the Aggerly and Corbelliar Rivers:—

7 The Design described above and

shown on the Tracing is that which I am now having surveyed in detail, and I trust that my proceedings will meet with the approval of Government.

After having traversed the Country in all directions, and having before me the results of numerous lines of levels, I am of opinion that if the Red Hill Lake is to be made use of, the general design now suggested is the best the Country affords.

I also believe that all the necessary works up to the delivery of the water in the Spur Tank, and including Compensation for damages, would not cost more than 3 lacs of Rupees, but this opinion is expressed now on insufficient data, and is only intended to give to Government some idea of the probable cost.

Improvement of the Coorum

8 The Plans for this project have

been ready for some time, but it was considered advisable that the proposed sewer, across the Coorum and on to the North of Black Town should answer the purpose of the main sewer of the general drainage scheme now under consideration by Captain Tulloch. It therefore became necessary to delay the submission of the Coorum project, until the general drainage scheme was sufficiently matured to enable Captain Tulloch to lay down the main sewer.

The projecting of this main drain involved a good deal of consideration. I have been frequently in consultation with Captain Tulloch about it, and I believe the Plans will be ready shortly when the Coorum project will be sent up.

General remarks

9 On the 7th of December Mr. Stephenson

one of the two temporary Surveyors employed, became sick, and was obliged to leave.

He subsequently accepted an appointment under the Irrigation Company on a Salary of 70 Rupees a month, more than he received under this Survey.

This reduced my party to two, Mr. Supervisor Ottman and Mr. Ward. The latter was employed on the detailed Survey and Sections of Cholawaram Lake, the former was principally engaged with myself on the trial sections and Surveys, and in receiving instructions on the ground:—

All this preliminary work having been settled a considerable portion of my own time has been occupied in detailed Surveying and Levelling. 10 I should be glad if Government would be good enough to give me such an Establishment as would prevent

13 the occupation of my own time in detailed Surveying and levelling, and enable me to get the necessary detailed Plans prepared speedily.

When the preparation of such plans drag on from month to month, it becomes not only tedious to the Engineer but unsatisfactory to Government.

11 In my letter N^o 75 dated 28 Dec: 1863, I had the honor of explaining how I thought a cheap and effective establishment could be organized, and the advantages that would accrue from having it. Since that date I have received the order of Government N^o 4 dated 4th January 1864, conveying instructions about 3 other projects besides the one on which I am engaged:

Had I the means, I could go to work at once on these projects, and submit the Plans and Estimates within a reasonable time; a course which would not only be the best

economical but the most satisfactory
to government. —

12 It is I believe a novel thing
to find an officer complaining that
he has not enough to do, but this
is really my case:—

My present staff is not able to
make surveys and prepare plans
as fast as I can examine the ground,
make trial sections, decide on the
design, and mark the work out.

I need not again explain that it
is not economical to permit me to be
employed in any other way. In
conclusion I trust that I shall
be excused for again referring to
this subject.

William H. Rouse
Genl & Insp. 2^d Regt

Then seems a well considered scheme and Mr. Fraser may be directed to go fully into the details not only of the parts of the project sketched herein but also of those involved in the distribution of the water. and then however he will require some definite instructions, namely as to the character, quantity of the supply, the mode of distribution, payment for same & in fact. The subject should be discussed by the Gov. fully before Mr. Fraser can be furnished with sufficient data to furnish him in forming his plan. he had therefore better submit for the decision of the Gov. such proposals as will require the consideration of the Gov. in the discharge of his duties. I have no objection to Mr. Fraser's plan but I think it would be better to furnish him with an establishment of his own which he is feeling compelled to do.

1884-29 January
 Submitted for the Gov. to consider
 1884-29 January
 Submitted for the Gov. to consider
 1884-29 January
 Submitted for the Gov. to consider

To Mr. Fraser 1884-29 January
 Submitted for the Gov. to consider
 1884-29 January
 Submitted for the Gov. to consider
 1884-29 January
 Submitted for the Gov. to consider

Public Works Department
 No. 293
 Proceedings of the Madras Government
 Under date the 1st January
 Read the following
 from the Special Report of the
 Public Works Department
 Submitted by Mr. Fraser
 for December 1883

The proceedings reported in papers 1 to 6 are approved.

Mr. Fraser will be requested to enter fully into the details not only of that part of the project which relates to the storage but also of those involved in the distribution of the water. On these matters however Mr. Fraser will require definite instructions and

made in the Budget
for 1864/65.

W. Fraser

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to furnish them he
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mit for its decision
such points relating
to the channels, and
amount of the supply, the
mode of distribution, pay-
ment for water, &c.
as will require to be
considered previous to
the discussion of the details
of the plan.

The Govt quite
agrees with Mr Fraser
that he should be provided
with an Establishment
sufficient to keep him
fully employed - Ample
provision for that purpose
has accordingly been
made

W. Fraser Esq^r

Special Executive Engineer

Calcutta 29th January

4th W 1864 Defacto
Proc. of Govt for Survey

N^o 298

Proc. of the R Govt
D 127 Survey 1864

Endorsement of Mr.
Ineson, Special Agent, R.R.
submitting his Diary for Review.
Dec. 1863. With Original Memoir.