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(3) Initials of the Referencer _____

MADRAS RECORD OFFICE.**Government of Madras.***Public works* **DEPARTMENT.**

G.O. No.	492	Press
396-398		~~Mis~~
Dated	18/2	1871

Not to be folded or roughly handled

Read the following papers :—

No 396 From the Superintending Engineer, 4th Division, to the Chief Engineer for Irrigation, dated Madras, 16th December 1870, No 3,894.

I HAVE the honour to forward, for your information, a report from Captain Scott on the subject of certain leaks on the Red Hill reservoir. I do not consider, from One report inspection that I have made, that any of the leaks need be touched again, except No 2, which has not been puddled; the others may be said to be cured, as the leaks are so insignificant and may puddle themselves.

2 It would be hardly worth while to run out the water as proposed by Captain Scott to puddle No. 2 leak; but I would propose, if the water is too high in March or April, that a ring bund be made and then the puddling operations commenced, which I have no doubt will effect a cure.

From Captain A DE C SCOTT, R E, Executive Engineer, Madras Water Works, to the Superintending Engineer, 4th Division, dated Red Hills, 14th December 1870, No 501

THE water in the Red Hill Tank having attained a level 6 feet above the crest of the old calingulah of the tank, I have to report on the state of the bund as regards leakage in accordance with the directions received from the Acting Chief Engineer for Irrigation.

2 The amount of leakage along the whole length of the embankment has been observed from time to time since the reservoir began to fill, but, as it is more particularly at five points that leaks were visible last year (at four of which puddle has been laid), it is at these places that a comparison of the state of the embankment—this with what it was last year—can best be made.

The leaky portions in question are situated as follows —

No 1 extends from the Polal irrigation sluice southwards for a distance of 204 feet opposite Teid's Bungalows. The sub-soil is gravel.

No 2 commences at a distance of 471 feet to the north of the Polal sluice and extends a distance of 104 feet. Soil, gravel and rock.

No 3 commences 787 feet north of the Polal sluice and has a length of 215 feet. This leak is at the junction of the gravel and the clay which lies at the bottom of the flat valley crossed by the Red Hill embankment.

No 4 commences 1,550 feet from the Polal sluice and has a length of 220 feet. Sub-soil, clay.

No 5 lies to the north of the northern irrigation sluice between the sluice and the old calingulah. The base of the bund here rests on gravel and rock.

3 At No 1 leak a puddle wall has been laid for a depth of from 12 to 15 feet below the level of the inner toe of the revetment, or 4 feet below the level of the ground outside the tank, and a retaining wall of laterite masonry has been built for a length of 170 feet at the outer toe.

*Proceedings of the Madras Government, Public Works Department,
18th February 1871.*

At No 2 a retaining wall has been built outside, but no puddle has been laid. The ground at the toe of the revetment is hard gravel or rock

At No. 3 both puddle has been laid and retaining wall built.

At Nos 4 and 5 puddle has been laid, but no walls have been built.

4 Major Mullins inspected all these places with me on the 24th October; at that date the water in the tank was standing 2½ feet above the crest of the old calingulah. The appearances at each of the places in question then and on several subsequent occasions are noted below, as also the simultaneous depth of water in the tank

None of the leaks had up to the latest date assumed a dangerous appearance. It is impossible to say how much increase of head of water the embankment would have borne with safety, and unfortunately we have no means of practically testing this point by letting down water from the upper reservoir during the present season, as the failure at the head works and the Cholaveram embankment cut off the supply, and there is at the present moment in the Cholaveram reservoir only sufficient water for the wants of the cultivators.

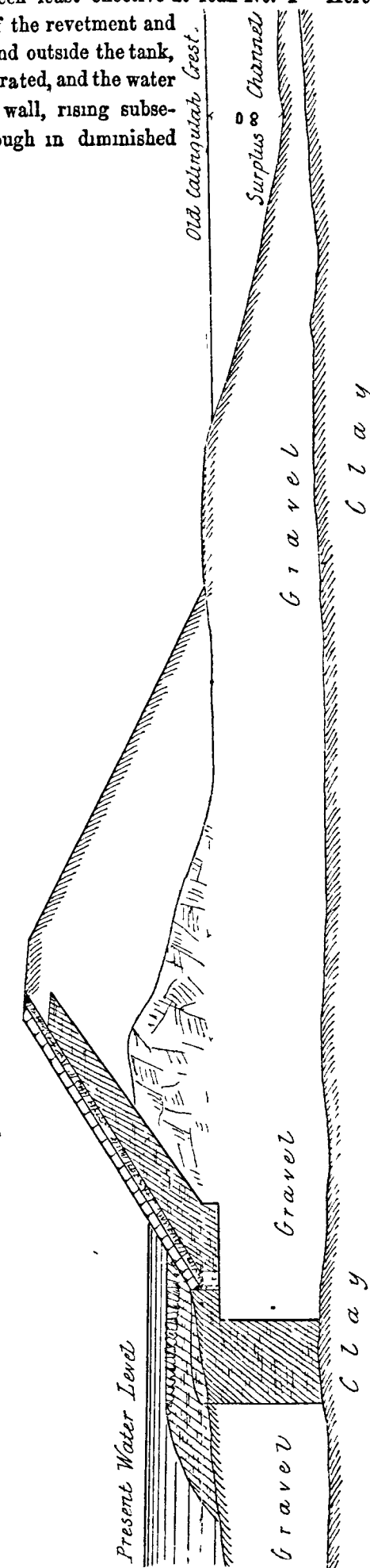
Level of water over old calingulah.	Date	LEAKS.				
		No 1	No 2	No. 3	No 4	No. 5.
+ 2 58	24th October	A very slight oozing, might be soakage from rain.	At one place a small spring issuing upwards with perceptible force	No leakage visible	No leakage visible	No leakage visible
+ 3 66	26th October	Leakage apparent, but slight clear water running through weep holes and out of the ground at the north end of the wall. The leakage is more considerable	Streams issuing from the ground upwards in three or four places with perceptible force	Leakage barely perceptible in two or three places. Water issues slowly	Ground wet and oozy, but no water is seen to issue	No leakage visible
+ 4 48	29th October	Leakage decidedly manifest, especially at north end of wall.	The water issues from the same places with increased force	A slight trickling is seen in two or three places	The ground is wetter than before and small pools collected in irregularities of the ground, but no stream is seen.	No leakage was visible when the puddle was placed
+ 5 01	2nd November	The flow of water slightly increased.	A slight increase in the flow of water	In the same condition as on the 29th October.	In the same condition as on the 29th October.	In the same condition as on the 29th October
+ 6 04	23rd November	The leakage has slightly increased. Streams of water of small size take issue from below the wall. Water clear.	Three or four small streams issue from under the wall and run with considerable rapidity. Water quite clear	There is a very slight increase of leakage, water issuing	The length of the space of oozy ground has increased.	No leakage.
+ 6 00	5th December	All the leaks are in the same state as on the 23rd November				

5 The effect of the puddling has been most satisfactory at leak No 5. At this point the section of the embankment and the ground on which it rests is that shown below. It will be seen that below a bed of gravel 14 feet in thickness clay was found, and that the puddle in the trench was connected with this clay

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18th February 1871.*

The puddle wall has been least effective at leak No. 1. Here, though it was carried down 12 to 15 feet below the toe of the revetment and 4 feet below the level of ground outside the tank, the bed of gravel was not penetrated, and the water appears to pass under the wall, rising subsequently to the surface, though in diminished quantity.

Section of Embankment and No 5 Leaks



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18th February 1871.*

6 The conclusion to be drawn from the results of the work already executed as a guide for further operations would seem to be that the puddle wall should be carried, if possible, down to clay, or to a depth of not less than 10 feet below the level of the land outside the embankment

Exception will have, however, to be made at those parts of the ground when it is rocky, as an excavation of the depth, which would probably be necessary to reach the level here assigned, would be both tedious and expensive.

7 It is necessary that a decision should be come to as soon as possible in reference to the extent to which the tank should be lowered out during the ensuing year and puddling laid in

There can be no doubt that the most economical way in which to execute the work would be to lay the tank dry as soon as the irrigation of the early crop is completed, that is to say, about the end of February. The excavation would thus be carried on without hindrance from water, and good clay could be procured from the deep bed of the reservoir. If the water is only lowered sufficiently to admit of excavation going on to the required depth with a certain amount of baling and so long as the bed is covered the difficulty of procuring clay for puddling is very great, in fact, it would have to be carted from a considerable distance, and operations would thus be immensely delayed.

8 In order to admit of the emptying of the Red Hill reservoir in the manner suggested without much loss of revenue, it had been intended to store up as large a supply as possible in the Cholaveram reservoir, with which to feed the channels in the bed of the Red Hill lake leading to the irrigation sluice, so that the second-crop cultivation could have been carried on. The unfortunate accidents which have occurred to the head works as well as to the Cholaveram embankment will prevent this aid being given to the Red Hill cultivators in the event of the supply now in their tank being drained off as proposed. On the other hand, it must be borne in mind that after the ensuing year it will not be possible to interfere with the tank supply without causing inconvenience to the people of Madras, who will probably be drawing from it for domestic use, and it seems to be clear that during the ensuing season the necessary work could be carried out with less loss and inconvenience than it would cause at any subsequent period

No. 17.

No. 397. *NOTE by the Chief Engineer for Irrigation*

It will be seen from these papers that the works executed during the past season with a view to stop leakage at the Red Hills Tank have been quite as successful as was anticipated. No. 2 leak, extending over a length of 104 feet, is now the only one of considerable magnitude or importance, and there the soil at the toe of the revetment is hard gravel or rock. Captain Scott thinks that it will be advisable to draw off the water from the tank at the end of February, or on the completion of the irrigation for the season, as thus the work could go on more rapidly and good clay could be obtained from the tank bed: the Superintending Engineer considers that No. 2 leak is now the only one which needs attention, and that, to carry out work at this, a ring bund might be thrown up. If the discharge of water to waste can be avoided without detracting from the future efficiency of the tank, it will certainly be advisable to save the water; but I would not recommend that the desire to retain a supply should be allowed to stand in the way of doing the work completely once for all, and I would suggest, therefore, that Captain Scott be requested, through the Superintending Engineer, to retain as much water as possible, but to carry the work, remaining to be done to stop all considerable leakage, to completion as rapidly and as efficiently as possible. Captain Scott will

*Proceedings of the Madras Government, Public Works Department,
18th February 1871.*

probably by this time be able to form a tolerably accurate opinion as to what quantity of water, if any, he will require to get rid of, and what time will be needed to run this water through the irrigation sluices. He should, therefore, make a further report, but, in the meantime, go on with the work, and, if really necessary, commence lowering the water. This latter operation will proceed but slowly, and if, on further information, it should appear to be necessary to stop it, this can readily be done.

2. I agree with Captain Scott in considering that, where the sub-soil is rocky, the puddle trench need not be carried down to so low a level as elsewhere. Probably 3 feet below the level of the outside ground, where that is rocky and of the same character as the soil inside the tank, would do.

FORT SAINT GEORGE,
1st February 1871.

(Signed) J. MULLINS, Major, R. E.,
Chief Engineer for Irrigation.

No. 398.

ORDER THEREON, 18th February 1871, No. 492.

IRRIGATION, No. 21.

THE Government are glad to find that the work recently executed at the Red Hills Tank with a view to stop leakage has been attended with a fair measure of success, and, as His Excellency the Governor in Council is desirous that all risk of accident to the tank from leakage should be removed, so far as remedial measures can secure this, the recommendations of the Chief Engineer for Irrigation are approved, and the Superintending Engineer, 4th Division, will accordingly be requested to instruct Captain Scott to proceed as rapidly as possible with the completion of this work. The Government wish to learn, as early as may be practicable, what quantity of water it may be deemed necessary to run to waste, when, if requisite, further orders will be issued.

(True Extract.)

Major, R. E.,
Joint Secretary to Government.

To the Superintending Engineer, 4th Division.
,, Chief Engineer for Irrigation.

Exd. A. S. Rodgers.

N^o 3894
From,

Sup^r Engr. Office 14th Dec^r
Madras 16th December 1870

To, Colonel C. F. Wilkinson P. E.
Superintending Engineer 14th Dec^r
Major John Mullins
Chief Engineer for Irrigation

Sir,

Enclosure
Report

I have the honor to forward for your information, a report from Captain Scott on the subject of certain leaks in the Red Hill reservoir. I do not consider from inspection that I have made that any of the leaks need be touched again, except N^o 2 which has not been puddled. The others may be said to be cured, as the leaks are so insignificant and may puddle themselves.

2 It would be hardly worth while to run out to the water, as proposed by Captain Scott to puddle N^o 2 leak, but I would propose if the water is too high in March or April, that a ring bund be made and then the puddling operations commenced which I have no doubt will effect a cure.

I have the honor to be
Sir
Your most obedient

Wm. Wilson Col. R.E.
Sup^r Engr. 14th Dec^r

210296

Recd. 12/17/1890
From Mr. J. J. Scott
The Deputy Engineer
of the West Engineer
for the West Engineer
dated 16/12/1890
No. 3894.
For Mr. J. J. Scott
a report from the
Deputy Engineer
of the West Engineer
dated 16/12/1890
No. 3894.
1892-1893 February 1/1893

No. 501. Madras Water Works Office
Red Hills 17th December 1890.

From
Captain A. G. Scott R.E.
Executive Engineer
Madras Water Works.

To
The Superintending Engineer
4th Division.

Sir,
The water in the Red Hills Tank
having attained a level six feet above the crest of
the old Calingula of the Tank, I have to report on
the state of the land as regards leakage in accordance
with the directions received from the Acting Chief Engi-
neer, Irrigation.

2. The amount of leakage along the whole
length of the Embankment has been observed from time
to time since the Reservoir began to fill ^{but} as it is more
particularly at five points that leaks were visible
last year (at four of which puddle has been laid) -
it is at these places that a comparison of the state of the
Embankment this with what it was last year can
best be made.

The leaky portions in question are situated as follows -
No. 1 extends from the Colab Irrigation sluice southwards
for a distance of 204 feet opposite Peido's Bungalows -
The subsoil is gravel.

No. 2

No. 2. Commences at a distance of 471 feet to the north of the Polab sluice and extends a distance of 104 feet. Sub gravel and rock.

No. 3. Commences 87 feet north of the Polab sluice and has a length of 215 feet. This leak is at the junction of the gravel and the Clay which lies at the bottom of the flat valley crossed by the Red Hill embankment.

No. 4. Commences 1550 feet from the Polab sluice and has a length of 220 feet. Sub soil Clay.

No. 5 lies to the north of the northern Irrigation sluice between the sluice and the old Calingulab. The base of the bund here rests on gravel and rock.

3. At No. 1. leak a puddle wall has been laid for a depth of from 12 to 15 feet below the level of the inner toe of the revetment or 4 feet below the level of the ground outside the tank and a retaining wall of laterite masonry has been built for a length of 170 feet at the outer toe.

At No. 2. a retaining wall has been built outside but no puddle has been laid. The ground at the toe of the revetment is hard gravel or rock.

At No. 3. both puddle has been laid and retaining wall built.

At No. 4 and 5. puddle has been laid but no walls have been built.

4. Major Mullins inspected all these places with me on the 24th October at that date the water in the tank was standing 2 1/2 feet above the crest of the old Calingulab. The appearances at each of places in question then and on several subsequent occasions are noted below as also the simultaneous

simultaneous depth of water in the tank.

None of the leaks had up to the latest date assumed a dangerous appearance. It is impossible to say how much increase of head of water the embankment would have borne with safety and unfortunately we have no means of practically testing this point, during the present season as the failure at the head work and the Cholaravaram embankment cut off the supply and there is at the present moment in the Cholaravaram reservoir only sufficient water for the wants of the cultivators.

Level of water over bed Calingulab	Date	Leak.				
		No. 1	No. 2	No. 3	No. 4	No. 5
+ 2.58	October 24	A very slight ooze might be seen as a leakage from rain.	At one place a small spring issues up with perceptible force.	No leakage visible.	No leakage visible.	No leakage visible.
+ 3.66	Oct. 26	Leakage apparent but slight. Clear water running through weep holes and out of the ground at the north end of the wall. The leakage is more considerable.	Streams issuing from the ground upwards in three places with perceptible force.	Leakage barely perceptible in two or three places. Water issues slowly.	Ground wet and oozy but no water is seen to issue.	No leakage visible.
+ 4.48	Oct. 29	Leakage decidedly manifest especially at north end of wall.	The water issues from the same places with increased force.	A slight trickling is seen in two or three places.	The ground is wetter than before and small pools collect in various places. The ground is seen.	No leakage visible when the puddle was placed.

N^o 17.

P - 6

Note by The Chief Engineer for Irrigation
It will be seen from these papers that
the works executed during the past season, with a view to stop leakage at
The Red Hill Tanks, have been quite
as successful as was anticipated. A leak
extending over a length of 104 feet,
is now the only one of considerable magnitude or importance, and there the sand
at the top of the rivetment is hard the
gravel or rocks. Captain Scott thinks
that it will be advisable to draw off
the water from the Tanks at the end
of February, or on the completion of the
irrigation for the season, as thus the
work could go on more rapidly, and
good clay could be obtained from the
Tanks bed. The Superintending Engineer
considers that A leak is now the only
one which needs attention, and that
to carry out work at this a ring
bund might be thrown up. If the discharge
of water to waste can be avoided
without detracting from the future efficiency
of the Tanks, it will certainly be
advisable to save the water, but
I would not recommend that the desire
to

Enclosed

From

The Superintending Engineer

Madras District

To The Chief Engineer

of the Division

Dated 14th Dec 1892

14/12/92

11/5/91

Reports on the state
of the Madras District
as regards leakage.

Received 11/5/91

to retain a supply should be allowed to stand in the way of doing the work completely over for all, and I would suggest therefore that Captain Scott be requested, through the Superintending Engineer, to retain as much water as possible but to carry the work, remaining to be done to stop all considerable leakage, to completion as rapidly and as efficiently as possible. Captain Scott will probably by this time be able to form a tolerably accurate opinion as to what quantity of water, if any, he will require to get rid of and what time will be needed to run this water through the irrigation sluices. He should therefore make a further report, but in the meantime go on with the work, and, if really necessary, commenced lowering the water. This latter operation will proceed but slowly, and if on further information it should appear to be necessary to stop it, this can readily be done.

2. I agree with Captain Scott in considering that, where the subsoil is rocky, the fund. trench need not be carried down to so low a level as elsewhere. Probably 3 feet below the level of the outside ground, where that is

is rocky, and of the same character as the soil inside the tank, would do.

10

Fort St George.

Colundukin

Major R.

1st February 1871

Chief Engr for Irrigation

To

The Secretary to Govt. P. W. D.

Engr'd - Public Works Department
No. 492. 11
Proceedings of the Madras Government

Public Works Department
No. 492
of the Madras Government

Proceedings of the Madras Government

Under date the 18th Feby/71.

Read the following

From The Chief Engineer for
Irrigation.

(A. E. No. 17 of 1st February 1871)

The Government are glad to find that the work recently executed at the Red Hills Tank with a view to stop leakage has been attended with a fair measure of success, and in His Excellency the Governor-in-Council is desirous that all risk of accident to the Tank from leakage should be removed, so far as remedial measures can secure this, the

Recommendations

[illegible]

Date 1st Feb 1871.
 Prof. 2nd Feb 1871.
 Ser. 3.

1817.
London-21

Cholly on a report
from the Dr. King. on
the plate of the Red.
Hills. Says him as
negant leakage.

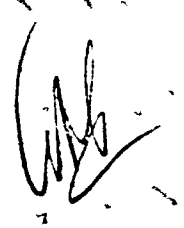
Feb 492-18 Feb 17

297

66 July 11, 1891

recommendations of the
Chief Engineer for irri-
gation are approved,
and the Supr Engineer
L. Division will
accordingly be requested
to instruct Captain
Scott to proceed as
rapidly as possible
with the completion of
this work. The Govt.
wish to learn as early
as may be practicable
what quantity of water
it may be deemed neces-
sary to run to waste,
when if requisite further
orders will be issued.

by 3/2/71



25
3

To. The Supr Engr. L. Div.
3. Chief Engr for Engrs
Despt 24/2/71

Op 506

Govt of 1871 Madras.

PUBLIC WORKS.

To The Superintending Engr.
Civil Works (Division)

Dated

Recd.

Vol 2

G O 18 Feb 1871 No 492.

No. 396 (2398

Red Hills Tank Bund. Piping

orders in the name of the Chief
Engineer for Irrigation on the
part of the Red Hills Tank
Bund, as regards leakage.