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MADRAS RECORD OFFICE

Government of Madras

Public Work DEPARTMENT

G.O. No. / B.P. No.	3398-99	(2) Press / Mis.	
Dated	13. 12.	1876.	

Not to be folded or roughly handled

Proceedings of the Madras Government, Public Works Department,
13th December 1876. *No.* 3,399.

Read the following papers:—

No. 316. From Major-General W. A. CROMMELIN, R.E., Officiating Secretary to the Government of India, Public Works Department, (Civil Works—Irrigation,) to Major-General G. W. WALKER, R.E., Secretary to the Government of Madras, Public Works Department, dated Simla, 2nd November 1876, No. 470 I.

I AM directed to acknowledge receipt of your letter, No. 1,620, of the 27th June, and enclosures regarding the Perryaur Project in the Madura District; and to reply that even if full and reliable data for this project were now available, the Government of India is not at present in a position to undertake it.

2. The interval that must elapse before the investigation by the Revenue Officers of the question of probable returns can be completed, and before the project can be finally dealt with by the Government of India; might, if His Grace the Governor in Council thinks it advisable, be taken advantage of to depute an officer to Europe and America to inquire into facts in reference to dams constructed or projected in other countries under exceptional conditions; to visit the works or confer with practical Engineers acquainted with such works, and to report to the Government of India fully the result of his inquiries and observations; and I am to suggest that Captain Pennycuick, who appears to have given this project intelligent attention, might be selected for this duty and deputed at once to England.

3. With reference to paragraph 3 of your letter, I am to point out that before a final decision can be come to as to the design for the dam, it will be necessary to ascertain not only what is "believed" to be, but what actually is, the nature and condition of the underlying rock at the site.

No. 317. MEMORANDUM.

THE existence of sound rock at a moderate depth below the surface of the ground at No. 4 site was, it is believed, conclusively proved.

2. Natural rock undoubtedly exists in the bed of the Perryaur river at the bund site, and it also appears in the bed of the stream below the escape saddle.

3. The first trial pits that was sunk were intended to determine whether there was sound rock in the little hill on which the north end of the bund rests. This small hill is connected with the high hills to the north of the river by the saddle in which it is proposed to cut the escape. To this end pits were sunk for a considerable distance up the main hill across the escape saddle and on to the top of the small detached hill. In all of these good rock was found.

4. It may here be observed that, with one exception, sound rock was never considered to have been reached, unless the pits had been sunk through some feet of water before reaching the rock. Of the whole number of pits sunk only a very small number were considered to have got down to rock. Numbers of pits were stopped by large boulders; in others, although sound rock appeared to have been reached, its level did not agree with that of the rock in the adjacent pits, and it was therefore rejected; in others the rock at the bottom of the pit was not sound, although it was too hard to sink further through.

5. The exception noted in paragraph 3 was in the case of the pits on the top of the small detached hill. Hard rock was apparently reached, and its level agreed with that of the rock found in the pits on both the saddle and on the river side of the hill, but there was no water overlying it. Eventually Mr. Smith, the Executive Engineer in charge, gave orders that a very large pit should be sunk on the summit of the hill; its bottom dimensions were, it is believed, 20 feet × 10 feet, and as the whole surface of the rock thus exposed appeared to be sound when struck with a heavy crowbar it was taken to be true rock.

6. Trial pits were sunk down the whole length, and on both sides of the little stream running from the escape saddle, and rock was found to exist the whole way below the escape into the deep bed of the Perryaur river, and also at the sides of the valley.

7. On each side of, and parallel to, the bed of the Perryaur a very large number of pits were sunk in long parallel lines, in order that a regular contoured survey of the surface of the rock might be made. From this survey the tunnel proposed for the escape of the river water during the construction of the bund was laid out.

8. At the time that these pits were sunk, it was supposed that the tunnel would be designed on the north side of the river; and consequently many more pits were sunk on the north than on the south side. When it was eventually decided to have the tunnel on the south bank, it was too late in the season to sink more pits. The existence of rock at, or very near, the level given on the south bank is, it is believed, proved beyond a doubt.

9. In the event of the work ever being carried out, as it is absolutely necessary that there should be a certain thickness of solid rock above the escape tunnel to withstand the great internal pressure, it would appear to be only a safe precaution before commencing the boring of the tunnel to have the upper surface of the rock immediately above the tunnel exposed throughout its entire length. It is possible that there might be some sudden dip or fault in the rock between two of the trial pits, whose existence, were this precaution not adopted, might only be discovered by the bursting of the tunnel during the construction of the bund—an event which could not fail to be most disastrous.

10. It is believed that the main points of this memorandum are correct, although it is neither as full nor as definite as might be desired. It is nearly five years since the writer sunk most of the pits referred to, and at the present time he is not in possession of a single note or paper referring to the work.

KOTAPATAM,
27*th November* 1876.

(Signed) C. C. RAWSON, Lieut., R.E.,
Asst. Engineer in charge
2nd Division, East Coast Canal.

No. 318. ORDER THEREON, 13th December 1876, No. 3,398.

IRRIGATION, No. 28-A.

LIEUTENANT RAWSON'S memorandum having furnished all the information regarding the rock at the proposed site for the dam across the Perryaur which can be obtained without a special investigation;

and a further examination of value being impracticable without arrangements for clearing jungle and conducting boring operations, which would necessarily be costly, His Grace the Governor in Council resolves to transmit a copy of these Proceedings to the Secretary of State with a request that Captain Pennycuick, who is now in England on furlough, may be deputed to make the inquiries suggested by the Government of India. A complete file of the printed papers appertaining to the Perryaur Project will be transmitted for Captain Pennycuick's use, together with such a selection from the drawings as will enable him to make his report complete.

2. A copy of these Proceedings will be forwarded for the information of the Government of India.

(True Extract.)

(Signed) G. W. WALKER, Major-General, R.E.,
Secretary to Government.

No. 319. (DOCKET, No. 3,399, dated 13th December 1876.)

COPY of the above forwarded to the Government of India.

(True Extract.)

Major-General, R.E.,
Secretary to Government.

Exd. E. C. Shunker.
Spare Copies

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Letter from the Government of India, No. 470-I.
dt. 2nd November 1876.

FOR ORDERS.

Lt.-Col. Rundall
Joint Secretary to Govt.
Govt. P. W. Dept.

Agree - but the
Native Members
Govt. [illegible]
Queen proclaiming
to Princes and Chiefs
Please see the Letter
[illegible]

Captain Drummond
now in England.

Report on the nature
of the Rock has
subsequently been
obtained from
Lt Raines R.E.

Memorandum—

1. The existence of sound rock at a moderate depth below the surface of the ground at Number 4 Site, was, it is believed, conclusively proved.
2. Natural rock undoubtedly exists in the bed of the Penyan River at the Mound Site — and it also appears in the bed of the Shreigan below the escape saddle —
3. The first trial pits that were sunk were intended to determine whether the sound rock in the little hill on which the North end of the Mound rests — This small hill is connected with the high hills to the North of the River by the saddle in which it is proposed to cut the escape. To this end pits were sunk in a considerable distance up the main hill, down the escape saddle, and within the limits of the small detached hill — In all of them sound rock was found —
4. It may here be observed that with the exception, sound rock was never considered to have been reached until the pits had been

drank through one foot of water before reaching the rock — Of the whole number of pits sunk only a very small number were considered to have got down to the rock — Number of pits were stopped by large boulders — in others, although hard rock appeared it has been reached, the rock did not agree with that of the rock in the adjacent pits, and it was therefore rejected — in others, the rock at the bottom of the pit was not hard although it was too hard to sink further through —

5. The exception noticed in para. 3 was in the case of the pits on the top of the small detached hill — Hard rock was apparently reached — and its level agreed with that of the rock found in the pits outside the saddle and on the main side of the hill — but there was no water on digging it — Eventually Mr Smith the Executive Engineer in charge, finding that a very large pit

should be sunk at the Dam with the
hill — its bottom dimensions were,
its below, 20' × 10' — and as the
whole surface of the bed thus ex-
posed, appeared like Basalt, when
struck with a heavy sledge bar
it was taken for true Rock —

6. Trial pits were sunk down the
whole length, and on both sides
of the little stream running
from the Cascade Waterfall — and
Rock was found [illegible] with the
whole way below the Cascade into
the Reef bed of the Quay Arm
River — and also at the sides of
the Valley —

7. On each side of, and parallel
to the bed of the Quay Arm River
Large Boulders of White was found
in long parallel Lines, to under
that a Regular Contoured Survey
of the Rock Outlets Made.
From this Survey the Tunnel Portion
in the Cliffs of the River was
during the Construction of the
Bund, was Paced out —

8. At the time that these pits

the Bank, it was determined that
the tunnel should be designed
on the South side of the River,
and consequently Mungo Murrays
pits was sunk on the South
then on the South side —
then it was eventually decided
that the tunnel on the South
bank, it was to take with
reason with Mungo pits — the
existence of such of any here
the land price on the South bank
is, it is believed proved beyond
a doubt —

9. In the event of the arch ever being
removed out, as it is absolutely
necessary that there should
be a certain thickness of brick
work above the Coach tunnel
to withstand the great lateral
pressure — It would
appear to be only a proper precau-
tion, before commencing the
boring of the tunnel, that
the upper surface of the rock

immediately above the tunnel exposed through the entire length — It is possible that there might be some deviation slips or faults in the rock between two of the trial pits, when in such case the precautions last adopted might only be discovered by the boring of the tunnel during the construction of the canal — an event which could not fail to put most disastrous —

10. It is believed that the Main pits of this Memorandum are correct, although its Author as full power as desirable should be desired — It is only fair to say that the water level of the pits opened by the Author of this paper opening the work —

C. Gordon
Lieut R.E.
Asst Inspecting Engineer
In Division. East Coast
Canal.

Nottingham
29th November 1876.

CHIEF ENGINEER
03 NOV
1876
FOR IRRIGATION

M 37 th. x

L'Ransome Mem.

Received 7/76

C/O 13th Dec/76 n 3398

No 317

P. W. Dept.

17

To,
The Most Hable the
Secretary of State for India.

My Lord Marquis,

We have the honor
to transmit for the con-
sideration of your
Lordship a copy of our
Proceedings as per margin
containing our resolution
on a suggestion made by
the Government of India
that an Officer should
be deputed to obtain
special information in
Europe and America
regarding dams which
have been constructed
or

or projected under ex-
ceptional conditions; and
we would recommend
Captain Pennycuick R.E.,
who is now in England
on furlough, and who
has already been employed
for a considerable period
on investigations in connect-
ion with the Periyaur project,
for this important duty.

2. We transmit a
complete file of the
printed papers, and a
selection from the Plans
relating to this project
for Captain Pennycuick's
use, should your Lordship
decide to employ him
on the investigations.
A list of these papers

is

is enclosed.

19

Genl. 4.4.12

No 3398 Public Works Department.

21

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 13 Dec 76.

Read the following :—

From The Govt of India H.C. No 470 Dd 2nd Nov 76

Mem: by Lieut: Rawes R.E. (— — — 24th —)

Transmitting Copy of Proceedings in a Correspondence with Govt of India & deputed Captain Officers to obtain Information regarding dams in America & Europe and recommending Capt Brunswick now in England for the duty

Lieutenant Rawes Memorandum having furnished all the information regarding the rock at the proposed site for the dam across the Perryaur which can be obtained without a special investigation, and a further examination of valves being impracticable without arrangements for clearing jungle and conducting boring operations, which would

would necessarily be costly.

His Grace the Governor in Council resolves to transmit a copy of these Proceedings to the Secretary of State with a request that Captain Pennycuick, who is now in England on furlough, may be deputed to make the enquiries suggested by the Govt. of India. A complete file of the printed papers appertaining to the Periyar project will be transmitted for Captain Pennycuick's use, together with such a selection from the drawings as will enable him to make his report complete.

2. A copy of these Proceedings will be forwarded for the information of the Government of India.

(H.E. Docket No. 3399 d/13 Dec/76.

Copy of the above forwarded to the Govt. of India.

Ag. 7/12

Genl.

1 - Copy to the Rev. Bd. Office 18/4/77
2 - Copies " " " " 19/4/77
Capt Pennycuick R.E. Queen to Secretary
Chief Engr. for Irrig. Rlwy - 5-2-77
Dt. Madura
Dt. Ramnad R.E. through Dt Nellore

Despd - 11 - 1 - 77

A

No. 4 Attd.

11-2-18.13 H

Govt. of 1876 Madras

PUBLIC WORKS.

To Captain Pennycuick R.E.

Dated

Issued

Recd. Encl.

G. O. 13 Rect. No. 3298, 3299

Nos. 310 - 318

319

Pennycuick Project Madura

Subject — Capt. Pennycuick R.E. to be deputed to England to attend the Parliamentary Committee

Forwarding copy of Govt. to the Protocols to depute Capt. Pennycuick R.E. to England to attend Parliamentary Committee on the Periyar Project Madura Distt.