(1) பக்கங்களின் எண்ணிக்கை 20

(2) புதுக்கித் திருப்பிய நாள் 11/92

(3) ஆதாரங் குறிப்பவர் சுருக்கொப்பம்

தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

P.W.D துறை

அரசாணை எண். / மு. கோப்புத் தாள் எண். 2498

அச்சகம் / பலவகை

நாள் : 29-9-1893 199 .

10

மடிக்கவோ கண்டபடி கையாளவோ கூடாது.

ஆவண. கா. 1—18,006—6-9-90.

9th August 1893, No. 699 I., Public Works.

2498/1

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following paper:—

NOTE.

By G.O., No. 429 I., of 15th May 1893, two points are referred to me for decision; first, whether any intermediate vents should be constructed between those at present in use and the 60-foot level where the permanent tunnel was expected to be built, and, second, what proportion of rubble should be allowed in the front and rear of the main dam.

With regard to the first point, no intermediate vents are required; it will be seen from the papers connected with the construction of the tunnel, which were sent out about a fortnight ago, that I propose to put the sill of the tunnel at 55 and that a vent at this level is included in the design for the masonry work.

If it can be done without inconvenience it would be as well to build up the semicircular seating for the closing caisson in front of the northernmost of the three vents now in operation to 46 or five feet above the sill of the vent itself, so that the top of the caisson will be at 66 or eleven feet above the sill of the new tunnel, giving a larger discharge through the latter before the caisson is topped than can be given with the top of the caisson at 61.

The reduction in the discharging capacity of the three existing vents by thus raising the masonry in front of one of them will not be serious and will be more than compensated by the greater facility of working when we wish to pass the water into the permanent tunnel. It is not however essential, and need not be done if there is any practical difficulty about it—a point on which I am not certain, as I have not seen the present vents.

With regard to the quantity of rubble to be allowed, my intention always was that only a thin skin, to serve as a framing for the concrete, should be allowed; in the early part of the work, before the machinery was in full swing, it was necessary to use a large amount of rubble in order to enclose the foundations as quickly as possible and to raise the water level of the lake to enable the machinery to work; for some time the latter could not work fast enough to utilise all the material available and all rubble work became a clear addition to the total quantity of work done, as we had a large number of masons whose services it was desirable to utilise. For this reason I approved of rubble being used up to a maximum of one-third of the total thickness of the dam.

The causes which compelled the use of a much larger quantity of rubble than was originally intended no longer exist, and the only question is whether the additional rate of progress attained by the use of this material compensates for its extra cost as compared with concrete.

If the whole of the available material can be used up in concrete, then certainly the rubble should be reduced to the mere skin originally intended; but if not, and if the use of rubble enables us to make an absolute increase in the total quantity constructed in any period, I see no reason why it should not be used up to the limit already fixed of one-third of the total thickness of the dam at any point; the extra cost is slight compared with the advantage of increased speed of construction.

There has been a tendency to make the rubble wall too uniform in thickness, *i.e.*, too straight in plan; it should be made as irregular as possible, either crenellated in plan or with buttresses of irregular length at short intervals.

I wish to take this opportunity of expressing my regret at the very serious mistake which appears to have been made in attempting to raise the water level from a vent at 21 to one at 41 in a single lift.

Mr. Pears says that "the principal lesson to be learned from this month (March) is that twenty feet is too great a lift to attempt from one vent level to the next." The lesson is one that should not have been required; under no circumstances should a lift of more than fifteen feet be attempted, so that a substantial discharge through the upper vent should be attainable before the caisson closing the lower vent was topped.

Reliance appears to have been placed upon the absorbing power of the lake between the two vents, a reliance which past experience has shown to be unwise as we are never safe for a month together from a fresh sufficient to fill this space in a few days, and once filled it cannot be emptied again except through the upper vent, which if the interval exceeds fifteen feet cannot be made sufficient use of except at a level which will top the caisson closing the lower vent.

In the discussion on the general question of the disposal of surplus water which took place shortly before I left India, Mr. deWinton suggested, amongst other proposals, that the vents should be in pairs with a lift of about fifteen feet between them. I approved of this arrangement, but said that even fifteen feet was too great an interval for ordinary use and that the two vents of each pair should have their sills at different levels so as to divide the interval into two stages of seven and a half feet, and explained in detail how this should be done and how to avoid the necessity for shutting off the water entirely from the turbine channel; no notice appears to have been taken of these instructions and the neglect has not only caused the serious danger, delay and expense described in the report for March, but had in January caused a delay of some three weeks by the stoppage of the machinery—a delay which would have been entirely avoided if the instructions in question had been followed.

I had no idea that any such lift as twenty feet was in contemplation or should have written a warning against it; the mistake having been made the measures taken to correct it by Mr. Pears and his staff leave nothing to be desired, and the highest praise is due to the skill, energy and devotion displayed by them, but it would have been better to reserve these qualities for emergencies (of which there has been and will be no lack) which cannot be avoided and not to go out of the way to invent occasions for their exercise.

The sections forwarded with the progress return for March show that the old vent (21) has been built up to 46·00 or only five feet above the sill of the present vents; I presume it is intended to raise and strengthen this portion of the wall as soon as possible; at all events this should be done, as this is the last place at which it is desirable for water to be going over.

In my note on the subject of the proposed tunnel in the dam, sent out a short time ago, I mentioned that I had suggested to the India office that the iron work required should be ordered at once, the approval of the Government of Madras being asked for by telegraph if necessary. I have since received a reply authorising me to order the material in question and have forwarded to the Store Department the necessary drawings and specifications.

The Mount,
Shortlands Kent,
10th July 1893,

(Signed) J. PENNYCUICK, Col., R.E.,
Chief Engineer, P.W.D.
(on furlough).

Order—dated 9th August 1893, No. 699 I., Public Works.

Communicated to the Superintendent of Works, Periyár Project, for information and guidance, with reference to G.O., No. 429 I., dated 15th May 1893, and in continuation of G.O., No. 650 I., dated 24th July 1893.

(True Extract.)

(Signed) J. HANNAN,
Ag. Joint Secy. to Govt., P.W.D.,
General, Buildings and Roads Branch.

To the Superintendent of Works, Periyár Project.
" Chief Engineer for Irrigation.

Exd. A. D. Xavier.
Spare Copies

2498
2

IRRIGATION.

Govt. of {1893} Madras.

PUBLIC WORKS.

Dated August, 9th.

Recd. *Encl.*

G.O., 9th Aug. 1893, No. 699 I.

AUGUST.

Periyar Project

Note by Colonel Pennycuick, R.E., on the construction of intermediate vents where the permanent tunnel was expected to be built and on the proportion of rubble to be used in front and rear of the main dam, communicated to the Superintendent of Works, Periyár Project.

21st September 1893, No. 818 I., Public Works.

2498/3

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following paper :—

No. 135 C.E.

Progress Report for August 1893.

General.—Except for some hindrance from heavy rain at the beginning of the month, progress has been eminently satisfactory on all works. Three of the five principal works, viz., right bank escape, watershed cutting and watershed tunnel, are rapidly approaching completion, and on the main dam arrangements are now so nearly complete that progress becomes daily more a matter of routine and less liable to accident.

Health.—The health of both camps has been bad. The hospital statistics for the month are subjoined, but are misleading as the sickness and mortality at Thekady have been, as always, decidedly worse than at Periyár and only appear otherwise owing to the unpopularity of the dispensary at the former camp, many of the sick preferring to seek relief at Periyár hospital rather than attend the hospital at their own doors. This condition of things has been brought to the notice of the District Surgeon :—

Camp.	Population.	Daily average attendance.	Total treated.	Ratio sick to 1,000 of population.	Deaths.	Ratio of deaths to population per 1,000.
Periyár	2,688	101·7	1,038	386	15	5·6
Thekady	953	16·4	372	390	3	3·1

Accidents.—The month has been very free from accidents, only one of a serious nature—compound fracture of both arms—having taken place.

Rainfall.—Periyár 9·67 inches, Thekady 5·05 inches.

Main Dam.—In the present state of the dam the normal discharge of the river passes through vents at the right flank. Any abnormal discharge is passed also over the left flank of the dam where the front wall is depressed for a length of 152 feet to a level 10 feet lower than the remainder of the front wall. The middle part of the dam is isolated from the water passing the two flanks by means of a rubble wall through the dam at the right or vents end, and by a row of piers and shutters at the left or "weir" end. The isolation from the water passing through the vents was complete, but at the weir end the piers and shutters had not been so carefully prepared as they should have been, and as the river was passing over the weir for the first 9 days of the month, some little trouble and delay was experienced from the blowing in of the sills of the shutters, the leakage in consequence being sufficient to stop all progress on the middle part for $2\frac{1}{2}$ days before it could be got under. For the remainder of the month, work proceeded without accident, but for fear of floods was confined, except a few cubic feet, to the middle portion, as shown in the accompanying sections. The quantity of concrete put in amounted to 68,159 cubic feet, in addition to which 7,010 cubic feet of rubble was built in raising the rear wall, making a total of 75,196 cubic feet put into the dam in all. This total should be considerably exceeded in September, but is much in excess of anything accomplished in previous years in August which can never be a "big" month owing to the rain; and to the working population, which dwindles down in the fever season, not yet having recovered its normal numbers.

The workshops worked very steadily through the month with the exception of the W. side mortar-mixing machinery which was at a standstill on account of a bent disintegrater-staff which had to be sent to Madras to be straightened, and it was not till the 15th of the month that the east side stone-breakers could be worked, for want of new jaws which arrived only 2 or 3 days previously. The new stone-breaker from Bombay was brought into position on the escape only on the 2nd September and will not be at work for some days, but when started will furnish a valuable addition to the supply of stone. Collection of all materials was considerably impeded by bad weather, and all stocks were largely drawn upon; the completion of the steam-dredger and the improvement which may now be anticipated in the weather will enable these, however, to be recouped without difficulty.

Excavation of left flank foundations was continued and solid rock laid bare up to about R.L. + 80.

The river was too high to permit of an examination of the leaks in the rear face.

Right Bank Escape.—48,600 cubic feet of earth was removed. There now remains about 70,000 cubic feet of earth to be removed, and a few humps of rock which rise slightly above floor level. The earthwork will be completed in September. The escape is now used as a depôt for stone on its way from the road quarry—recently opened—and from some small quarries on the edges of the escape to the workshop. The humps of rock above mentioned are therefore generally covered by large stacks of stone and can only be removed as opportunity offers hereafter. The estimate for the right bank escape will therefore be closed at the end of September and the cost of levelling the floor—which will not be large—charged to the main dam in the revised estimate for which ample provision for quarrying has been made.

Watershed Tunnel.—The month under review has been the best on record on this work, the progress accomplished being 274 feet in 27 working days or about 10 feet per day.

The total figures now stand as under :—

	Feet.
Total length of tunnel	5,704
Total bored to 31st August 1893	4,311
Balance remaining ...	— 1,393

It will be seen from the accompanying section that the length remaining to be bored is in two sections, viz., between No. 1 and No. 2 shaft, and between No. 2 shaft and north end. The former of these two should be completed and a meeting effected next month. The other and longer section (and with it the tunnel) should be completed under the arrangements sanctioned in G.O., No. 2217 W./A., dated 30th August 1893, by June 1894, or about 2 years before the main dam will have attained sufficient height to pass through it.

Watershed Cutting.—Progress on this work was much in excess of expectations. About 500 feet only in length remain to be done, which is therefore the length to which labour is consequently confined. From this portion, 39,937 cubic feet of rock and 106,420 cubic feet of earthwork (at the fault before the tunnel entrance) were taken during the month. A little more than double these quantities (of each material) remains to be removed and it may therefore be expected that the work will be finished by the end of November.

Transport.—The ghaut wire-ropeway, the canal, the floating-plant and the road were maintained in efficient order throughout the month. 25,000 cubic feet of limestone were brought up the ghaut by the ropeway, of which 17,000 had been delivered at Periyár at the end of the month.

Minor Works.—The reconstruction of Periyár camp on improved lines was proceeded with, and two new lines were constructed for sawyers near No. 1 lock, the walls of the Assistant Accountant's quarters at Periyár were taken to full height, and the new line of quarters for fitters in Periyár workshop yard was completed.

Periyar,
9th September 1893.

(Signed) S. D. PEARS,
Supdt. of Works, No. I Periyár Divn.

2498/4

Order—dated 21st September 1893, No. 818 I., Public Works.

Recorded and communicated to the Government of India.

[Here enter No. 819 I., dated 21st September 1893.]

(True Extract.)

(Signed) J. HANNAN,
Ag. Joint Secy. to Govt., P.W.D.,
General, Buildings and Roads Branch.

To the Superintendent of Works, Periyár Project.
" Chief Engineer for Irrigation.
" Revenue Department.

Endorsement—dated 21st September 1893, No. 819 I., Public Works.

Copy of the above forwarded to the Government of India.

(By Order.)

(Signed) J. HANNAN,
Ag. Joint Secy., to Govt., P.W.D.,
General, Buildings and Roads Branch

Exd. C. M. Brission,
Spare Copies

IRRIGATION.

Govt. of {1893} Madras.

PUBLIC WORKS.

Dated September, 21st.

Recd. Encl.

G.O., 21st Sept. 1893, Nos. 818, 819 I.

SEPTEMBER.

Periyar Project

Forwarding copy of Proceedings recording the progress report of works in No. I Periyár division for the month of August 1893.

2498/7

CHIEF SECRETARY'S
29 SEP 93
GOVERNMENT OF MADRAS

GOVERNMENT HOUSE,
OOTACAMUND.

Transfd to P.W.D.

29. Sept.

2498/5

My dear Mr Price

Will you please take the necessary action on this telegram from the Secy. of State.

(by order)

R. Ellis

TELEGRAPHS Monthly Number.

rom London Sub

pm via Suez Go

From (Person) Read. at Rtp Rs two annas

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Pennycuick

South wall o

ut caisson se

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CAMUND 29 3 9

Telegraph Mas

Government of Madras.

1893.

P. W. DEPARTMENT.

CURRENT No. 8349

DISPOSAL.

No. dated

From

The Secretary of State for India

ENCLOS.

Tel No. —

Dated 28th Septr '93

Received 29 do

Recd 2.10.93

SUBJECT.

Periyar Project. Requesting that Mr. Pears may be informed that Col. Pennycuick wishes vent placed in South Wall of tunnel but caisson seating omitted

12—1,000—23-3-93.

nl 4 9.

B Ind

PUBLIC WORKS DEPARTMENT.

No. 2498 W/A d/ 29 September 1893

PROCEEDINGS OF THE MADRAS GOVERNMENT.

2498/8

UNDER date the

READ the following

Telegram from the Rt. Hon'ble the Secretary of State for India No. — d/ 28th Septr '93

Ordered that the following telegram be despatched to the Superintendent of Works Periyar Project.

"Col. Pennycuick wishes vent placed in South wall of tunnel chamber but caisson seating omitted. Act accordingly."

Tel. despd 29.9.93

JH

W

29.9

RB

No 2498 W / A d/29. September 1893.

SUPERINTENDING ENGINEER'S OFFICE,
V Circle, Madras,

No. 318 W

Chepák, 9 September 1893.

From

J. S. Davidson Esquire

Offg. SUPERINTENDING ENGINEER, V CIRCLE,

2498/9

To

THE Chief Engineer, 2498/9

Public Works Department

SIR,

Enclosures. 5.

1. Award Statt. No. 5 d/4.3.93 for land acquired for Ponniar Brick fields — Rs. 285-6-0
2. — Do — No. 6 d/4.3.93 for — do — do — 244-5-0
3. Do — No: 7 d/4-3-93 for deterioration of lands taken under the Act. 33-14-5
4. — Do — No: 8 d/4-3-93. for deterioration of lands acquired by private negotiation 150-4-9

Total, Rs. 713-14-8

I have the honor to forward herewith the 4 award Statements, as per margin aggregating Rs. 713-14-8, for land acquired both by private negotiation and under the Act, for the Ponniar Bridge Work which was completed and handed over to the Local Fund Department in March 1891 and the accounts ~~of which were~~ finally closed in February 1892.

2. The President, District Boa South Arcot, was communicated wi by the Executive Engineer in view to the amount being adjusted from Local funds, but from the Presidents reply (copy enclosed) it will be seen the Board is not prepared to pay the amoun

amount since the bridge was cons-tructed from Provincial and not Local funds.

3. I therefore request that n allotment of funds may be obtained for payment of the Land Compensation s per Award Statements.

I have the honor to be,
Sir,
Your most obedient Servt

R Davidson
Offg: Suptg: Engineer,
V Circle.

2498/10

P. W. CURRENT No. 7739

From

THE SUPERINTENDING ENGINEER,
V CIRCLE,

To

THE Chief Engineer
P. W. Department

Dated 9 } September 189 3.
Recd. 11 }

ENCLOSURES. 5

No. 318 W

Ponniar Bridge Works.

Forwards 4 award Statements for lands acquired for - and requests that an allotment of Funds may be obtained for payment.

2. C. 2/

G. O. No 2498 W dated 29th September 1893

3/

DW 24 Sep

A sum of Rs 714 is appropriated from the Provincial reserve with the Govt. to meet the cost of compensation for lands taken up in connection with the construction of the Ponniar Bridge in the South Arcot Dt.

H
23.9

WHS
22.9.93

DESPATCHED
29 SEP 93

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The S.E. V ~~IV~~ Circle with 4 encls
Exr. P. W. Accts.
Local & Municipal Dept.

9/10. Rs 2000 2.9. 2879