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(2) Date of repair _____

(3) Initials of the Referencer _____

MADRAS RECORD OFFICE

Government of Madras

Public works

DEPARTMENT

G.O. No.	2176	Press
B.P. No.		Mis.
21, 22		
Dated	1. 9.	1958.

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
1st September 1873.*

Read the following papers:—

No. 21. From Colonel F. J. MOBERLY, R.E., District Engineer, Chingleput, to Lieutenant-Colonel J. MULLINS, R.E., Chief Engineer for Irrigation, dated Guindy, 1st February 1873, No. 513.

I HAVE the honour to report that on inspection of the Kesaveram Anicut I find it and the adjacent works more seriously damaged than Mr. Goodchap had led me to expect, there having been too much water in the river when he visited it.

2. This dam is built across the Cortiliar to supply the old Bungairoo; to prevent scour in the bed of this irrigation channel a rough-stone apron, 180 feet long, was laid, abutting on wing-walls. The left wing is connected with the anicut by a head wall 180 feet long, from the back of which starts the bank dividing the river from the channel.

3. This head wall with both the adjacent wings have been carried away, the bank is breached for 537 yards, and the calingulah, 75 feet long, by which surplus from the Bungairoo repassed to the Cortiliar, is injured. The rough-stone regulating apron is nearly all gone.

4. No provision was made for such floods as we have had this year, which are, I believe, quite unprecedented; the water passed $1\frac{1}{2}$ over the wing-walls.

5. The anicut itself has not suffered much.

6. I have instructed Mr. Goodchap to remove the debris, and to prepare materials for the restoration of the work, raising wing-walls $4\frac{1}{2}$ feet and lengthening the anicut by 60 feet. This will leave 48 feet of head wall between the anicut and channel wings, otherwise I propose only to restore all to their previous condition, as it appears to me that all the damage has been caused by water passing over the wings. The estimates with plans, etc., will be prepared, I hope, in a few days.

No. 68.

MEMORANDUM.

With reference to the letter, No. 513, of the 1st instant, from the District Engineer, Chingleput, reporting the damage sustained by the Kesaveram Anicut, the undersigned has the honour to request that it may be considered whether it will not be advisable to construct a head sluice to the old Bungairoo.

2. The drainage basin of the Cortiliar above the Kesaveram anicut can be obtained from the Atlas Sheet No. 78, and the flood discharge can perhaps be approximately calculated and compared with the rain-fall so as to deduce the proper length for the anicut with a given maximum depth on the crest.

3. The undersigned thinks that it is probable that Palar water had much to do with the unusual floods in the Cortiliar this year, and that these waters were received partly through the Cauverypauk tank and partly by over-flow from the channel leading from the Palar anicut. It will be advisable, in due course, to see what works are necessary to prevent the Palar freshes from causing inundation, and the undersigned believes that the main channel from the anicut is in anything but a satisfactory condition. The surveys taken by Captain Lindsay and Lieutenant Purchas in 1867-68 will be of use in showing what is required. The discharge into the Cortiliar from the Cauverypauk tank can be estimated from the depths on the surplus calingulahs, the quantity of other Palar water cannot be probably even guessed at, though doubtless some information will be forthcoming as to the state of the country from Arcot to Conjeveram, and the damage sustained by the railway between the latter place and Arconum junction will be a further indication.

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4. As much information as possible should be obtained regarding flood levels all over the basin of the Cortiliar, in order that the measures to be taken may be determined from the best data available. The treatment of the numerous tanks in this basin and in that of the river falling into the Palar at Chingleput will depend in a great measure upon this information. It seems probable that the water-sheds of many of the minor branch catchment basins were submerged, and that tanks were breached not so much by the drainage of their own basins as by over-flow from much larger areas.

5. Much of the work to be done in this part of the country will have to be settled by the District Engineers of Chingleput and North Arcot in concert, and a copy of this memorandum will therefore be sent to the latter officer.

6. The present state of the old Bungairoo may with advantage be compared with its condition at the time longitudinal and cross sections were taken under Mr. Lowry's supervision in connection with the Chembrumbankum tank.

7th February 1873.

(Signed) J. MULLINS, Lieut.-Colonel, R.E.,
Chief Engineer for Irrigation.

To the District Engineer, Chingleput.

From Colonel F. J. MOBERLY, R.E., District Engineer, Chingleput, to Lieutenant-Colonel J. MULLINS, R.E., Chief Engineer for Irrigation, dated Guindy, 25th February 1873, No. 754.

In reply to your memorandum, No. 68, I have the honour to observe that, so far as I am aware, the Palar freshes do not pass over its banks. Any of its water that falls into the Cortiliar passes through tanks, notably Mahindravady and Cauverypauk; but I regret to say that no registers have been, up to this time, kept at these tanks, and I am therefore unable to calculate the discharge; the channel would rather impede the supply to the tank, as I believe it is silted, but I have not been able to examine into this.

2. The railway from Arconum to Conjeveram is constructed almost throughout in sand. The old culverts I believe never afforded sufficient waterway for heavy rain, but as our road was not metalled, it was cheaper to repair breaches than to build more masonry works.

3. I have no geological knowledge of the district, but conclude that some stratum impervious to water is not far from the surface; the country is full of springs, and the upper soil was saturated some months ago; this is shown by the fact that 6 inches of rain in February, after six weeks fine weather, filled all the water courses above monsoon level, all the tanks were filled, (ring-bunds were speedily put up to those that were breached,) and they therefore maintained the pressure in the springs.

4. The old Bungairoo is much silted up, and as soon as I can manage it I propose to have it examined, but seeing how large a supply it must carry for the numerous tanks under it, including Chembrumbankum, and the means of discharge afforded by the Cooum generally, I think a head sluice is unnecessary; it must be large and costly.

5. In any case it cannot well be built this year, and if you still have any doubt on the matter, I will secure the bed temporarily with fascines instead of stone floor.

6. The whole subject of the irrigation of this basin requires fuller consideration. I was not aware how intimately connected with all systems of tanks are between the Cortiliar and Adyar or Palar. The Cooum feeds tanks which surplus into the head of the Boosykal, which again supplies tanks which run off to the Katankal, or Red Hill Tank direct; unfortunately the Cortiliar is not capable apparently of carrying its own rainfall, and I cannot see any way of overcoming this difficulty.

From the same Officer, dated Guindy, 23rd July 1873, No. 1,043.

I HAVE the honour to forward papers mentioned in the margin for repairs and new work to

4 Plans.
3 Estimates.
2 Memoranda.

the anicut at Kesaveram and its adjuncts. They have been unfortunately drawn up together, and so much delay has already occurred

that I think it better to send up the papers as they are.

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1st September 1873.*

The following are classed as new works—

Altering the calingulah to a sluice in the old Bungairoo.
Building a Rest-house.

2. The alteration of the head into a prolongation of the anicut I have put down as a repair, as also the restoration with improvement of the dividing bank.

3. I send a tracing of the sluice elevation, as it appears there is a mistake in your instruction to put the spring of the arch 7½ feet above the sill and the lift of the shutter the same. I think this form will weaken the face wall, and no object is gained by the extra stress on the cross beam or the lift of the shutter.

No. 491G.

No. 21A. Note by the Chief Engineer for Irrigation.

THE Kesaveram Anicut is a dam across the Cortiliar at the head of a large channel, called the old Bungairoo, by which Cortiliar water is conveyed into the Cooum for the improvement of the supply of a great many channels from the latter river. The high floods of November 1872 went over the wings and the dividing wall at the head of the old Bungairoo, and over the embankment between the channel and the river. Little damage was done to the anicut itself, beyond the displacement of a good many of the coping stones, and the scouring of the brick-work when thus left unprotected; but the dividing wall was carried away, and the adjacent parts of the anicut on the one side and of the regulating dam at the head of the channel on the other suffered in consequence. Very heavy damage was sustained by the dividing bank, which was extensively breached as was, under the circumstances, inevitable, and the plantations on its river side, intended to protect it from erosion, were for the most part destroyed.

2. I visited the works in March last, and arranged with the District Engineer the alterations which it appeared desirable to introduce in restoring the damaged portions. These consist in raising wings and dividing wall and embankment to 4 feet above the flood level of 1872; in substituting a nose wall for the great length of flank wall before existing, and in adding the space thus gained to the length of the anicut; and in converting what remains of a waste weir in the left bank of the old Bungairoo near its head into a set of sluices.

3. The work at the anicut and nose wall calls for little remark. There is excess of masonry in the anicut extension as shown on Section C. C., but the work here has evidently been arranged to correspond as closely as possible with the old section, with which the new work has to be connected, and by this time probably much of it has been completed.

4. The design for the sluices has a defect of considerable importance, viz., that the sill is 2.75 feet above the sole of the channel. It depends upon the character of the old masonry whether this defect can be remedied, but, if not, the sluices would be useful only in high freshes and would have no effect in keeping the upper part of channel clear. In that case it would not be worthwhile to incur the expense of constructing the sluices, and it would be preferable to rebuild the fallen wing-wall to place the crest of the weir on the intended level of the sluice sill and to build light piers to carry shutters (planks) to retain the water up to intended full supply level in the channel. These piers would not probably be more than 3½

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1st September 1873.*

feet high, and with 4 feet openings the lascars would have but little difficulty in removing or replacing the planks. The new wing-wall should not be of the same dimensions at base as the old wall for, although the latter may safely carry the intended additional height owing to its being much stronger than new brickwork, proper and sufficient dimensions should be given to the new wall, viz., a base not less than one fourth of the total height. If sluices can be constructed with their sills on a proper level, i. e., $2\frac{1}{2}$ feet lower than as designed, the vents should be as high as can be conveniently managed in connection with the appliances to be used for working the shutters, and the bearing of the shutters should be angle iron (Circular 31) which is cheaper and better than cut-stone.

5. With regard to the incidence of the expenditure, there is nothing in the estimate of Rupees 31,900 for the repair of the anicut and head works, with such alterations as are necessary to obviate the necessity for heavy repairs in the future, but may properly be met from the Agricultural Repair grant. It is, however, necessary, as a part of the outlay will be debitable to the Chembrumbaukum Tank, the most important work supplied from this source, to determine what that part should be, in order that the Capital and Revenue Accounts may be correctly kept, and it will be advisable that a statement of the whole of the channels and tanks dependent upon the old Bungairoo and Cooum should be made out by the District Engineer, showing the average area of irrigation under each, and then the expenditure can be divided ratably between the Chembrumbaukum Tank and the rest of the works,* all of which latter, it is

* Taken together.

believed, belong to the class of works for which no separate Capital and Revenue Accounts are kept.

6. With regard to the rates of the estimates, it appears to me that they are generally too high: $1\frac{1}{2}$ and 2 annas for earthwork and sand filling are much higher than I have been accustomed to; 5 Rupees a cubic yard for brickwork seem high, as also $2\frac{1}{2}$ Rupees the cubic yard for filling a hole at the head of the Bungairoo with rough-stone boulders, and the entries for revetments at the division bank indicate that Rupees 1-10-0 to 1-12-0 would suffice. The District Engineer should examine carefully into the rates.

7. There is an estimate for an office and store-shed, regarding which I remember that the District Engineer made some remarks, but I do not remember on what grounds it was proposed that such a building should be constructed, and no allusion thereto is made in the District Engineer's letter.

8. Colonel Moberly mentions that great delay has occurred in sending up these estimates, but no explanations are given. They certainly ought to have been submitted three months earlier at least.

9. With these observations I beg to recommend that the estimate, for the repair of the anicut and head works, amounting to Rupees 31,900, be sanctioned, and that the District Engineer be instructed, with reference to the remarks in paragraph 4 of this Note, to reconsider the arrangements for a surplus weir or surplus sluices.

OOTACAMUND,
7th August 1873.

(Signed) J. MULLINS, Lieut.-Colonel, R.E.,
Chief Engineer for Irrigation.

*Proceedings of the Madras Government, Public Works Department,
1st September 1873.*

No. 22. ORDER THEREON, 1st September 1873, No. 2,176

IRRIGATION, No. 2.

On the recommendation of the Chief Engineer for Irrigation, the Governor in Council sanctions the estimate, amounting to Rupees 31,900, for the repair of the Kesaveram Anicut across the Cortiliar, with the head works.

2. The arrangements for returning surplus water from the old Bungairoo to the Cortiliar should receive early reconsideration, and care must be taken that this part of the dividing bank is rendered secure before the freshes of the north-east monsoon.

3. The attention of the District Engineer will be specially directed to the rates entered in these estimates, some of which are thought by the Chief Engineer for Irrigation to be capable of considerable reduction.

4. It is observed that there has been great delay in the submission of the estimates, but no explanations have been afforded, and these should now be furnished.

(True Extract.)

Lieut.-Colonel, R.E.,
Joint Secretary to Government.

To the District Engineer, Chingleput.

„ Officiating Controller of Public Works Accounts.

„ Chief Engineer for Irrigation.

Exd. S. T. Austin.
Spare Copies.

damage

MEMORANDUM

REQUESTED for reference the under-mentioned papers

Original Enclosures submitted
with Chief Engineer's Report No. 491 G
27 August 73 referred to in SC
No. 2176-1 Sept 73.

OFFICE OF THE CHIEF
ENGR. FOR IRRIGATION,
P. W. Department,

10-2-1874

To

D. M. Huntington

Head Clerk.

The Registrar of the

+ Rec-1161-1043-23/5/73
Rec-145-1-76-3
Rec-502-2-76-3
Rec-145-1-76-3

Dec 68-77675

Memor

9

Requests to return the plans & estimates
for the Casaverum Anicut across the Cortelliar
River sanctioned in G.O. 2176 of 1st Sept
73.

Dist. Co. Office
Chungabot
Jund 22nd Nov 73

Revenue Secy J.B. Sherb
Dist. Co. Office Chungabot

To The Registrar

+ 5 Plans

2 Estimate

2 Memo

Secretary D.P.M.

Dist. Secy

15-11-73

small

The present dam is a small one
built by the British in 1872
on the right bank of the river.

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1749
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the Cortilias at the head of a
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latter river. The high floods of Nov.
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and the dividing wall at the
head of the old Bungairos, and
over the embankment between the
channel & the river. Little damage
was done to the ament itself,
beyond the displacement of a
good many of the coping stones,
and the scoring of the brickwork
when thus left unprotected but
the dividing wall was carried
away, and the adjacent parts of
the ament on the one side of
the regulating dam at the
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damage

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2. I visited the works in March last and arranged with the District Engineer the alterations which it appeared desirable to introduce in restoring the damaged portions. These consist in raising wings and dividing wall & embankment to 4 feet above the flood level of 1872, in substituting a nose wall for the great length of blank wall before existing, and in adding the space thus gained to the length of the ancient, & in converting what remains of a waste weir in the left bank of the old Bungairos near its head into a set of sluices.

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constructed with their sills on a proper level i.e. $2\frac{1}{2}$ feet lower than as designed, the sills should be as high as can be conveniently managed in connection with the appliances to be used for working the shutters, and the framing of the shutters should be angle iron (Circular 31) which is cheaper and better than cut stone.

5. With regard to the incidence of the expenditure, there is nothing in the estimate of Rupees 31,900 for the repair of the ancient and head works, with such alterations as are necessary to obviate the necessity for heavy repairs in the future, but may properly be met from the Agricultural repair grant. It is however necessary, as a part of the outlay will be debitable to the Chembumbaswari Tank, the

moot

most important work supplied from this source; to determine what that part should be, in order that the Capital and Revenue accounts may be correctly kept, and it will be advisable that a statement of the whole of the channels and tanks dependent upon the old Bungaleros ^{by the District Engineer} ~~House~~ should be made out, showing the average area of irrigation under each, and then the expenditure can be divided ratably between the Chembur-bankur tank and the rest of the works all of which latter it is believed belong to the class of works for which no separate Capital & Revenue accounts are kept.

* taken together

6. With regard to the rates of the estimates, it appears to me that they are generally too high: $1\frac{1}{2}$ & 2 annas for earth work and sandfilling are much higher than I have been accustomed to; 5 Rupees a cubic yard for brickwork seem high, as also 2 $\frac{1}{4}$ Rupees the cubic yard for filling a hole at the head of the Bungaleros with rough stone boulders, and the entries for revetments at the division bank indicate that 1-10-0 to 1-12-0 would suffice. The District Engineer should examine carefully into the rates.

7. There is an estimate for an office & store shed, regarding which I remember that the District Engineer made some remarks, but I do not remember

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proposed that such a building
should be constructed, and no
allusion thereto is made in the
District Engineer's letter.

8. Colonel Protherby mentions that great delay has occurred in sending up these estimates, but no explanations are given. They certainly ought to have been submitted 3 months earlier at least.

9. With these observations I
beg to recommend that the es-
timate for the repair of the
ancient head works, amount-
ing to Rs 31,900 be sanc-
tioned, and that the District
Engineer be instructed, with
reference to the remarks in
para 4 of this note, to con-
sider the arrangements for a
surplus weir or surplus sluices.

7th August 1873. } Chief Engineer for Irrigation
 The Secretary to Govt. N.W.D.

P. W. 1873 Depart
M. of Govt for Dept
No 4611.

From
The Chief Engineer
for Irrigation

To The Secretary
to Govt M. D
No 491 G.

Dated 7 August 1873
Rev 20

Such 10 + 5 Plans.

Estimate of the
work to be done

Recommend for
the sanction of Govt
estimate for repairs
& new work to the
aqueduct at Kasam.
namely certain
observations

No 21 A

No 2176. 1 Sept 73.

Produce of the Madras Government

Read the following
From the Chief Engineer
No 491 G. 7 Aug 73

In the recom-
mendation of the
Chief Engineer for
Irrigation, the go-
vernment in Council
sanction the esti-
mate amounting
to Rs 31,900, for
the repair of the
Kasam aqueduct
across the Corbier,
with the head works
2 The arrangements
for returning sur-
plus water from the
old

1873

Old Bungalows to
the Cortez, should
receive early recom-
mendation, and care
must be taken that
this part of the
dividing bank is
reconsidered, since be-
fore the fresher
of the N.E. mon-
soon.

3. The attention
of the District En-
gineers will be spe-
cially directed to
the rates entered
in their estimates,
some of which
are thought by
the Chief Engineers
for Irrigation to
be capable of con-
siderable

15
siderable reduction

4. It is observed
that there has been
great delay in the
submission of the
estimates, but no
explanations have
been afforded, &
these should now
be furnished.

by 9/8/73

Ex MR.

$\frac{32}{4}$

To The Dist Engr. Chumtapat ✓
-- Controller of M. & A. with Ab. Engineer ✓
-- Chief Engr. for Irrigation ✓

Dated 6/9/73

C No 4611

Govt. of 1873 Madras.

PUBLIC WORKS.

The District Engineer
Chingleput

Date

Recd.

Encl. 1/4

G. O. 1 Sept 1873. No. 2176.

No. 11922

Kesaveram Ancient across
the Fortiliar - Chingleput to

Estimates of Rs. 31,900.

For the repair of the Kesaveram
Ancient across the Fortiliar with
the head works, sanction of, and
attention of the P. Eng. called
to the rates in the Estimates, and
an explanation of the cause of
the great delay in their sub-
mission to be furnished.