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MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

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Dated 5-4-1877.

Not to be folded or roughly handled

Office of the Chief Engineer for Irrigation
Fort St. George, 24 March 1877.

N^o 160 W.

Note by the Chief Engineer for Irrigation

Enclosure 8.

With his letter N^o 2746 of the
1st Instant the District Engineer
Cuddapah has transmitted estimates
for embanking the Cheyair river below
the Railway bridge.

2 In many respects the way in
which these estimates have been
prepared is creditable, but there re-
main several points on which the
information afforded is insufficient
to allow of the propriety of embank-
ing being determined. It is stated
that designs and estimates for 16
head sluices for river channels have
to be completed and submitted.

The embankments are in sections
which are either connected by high
ground

ground or hills or which have no such connection, and these sections are:-

Right bank.	1 Bridge to Railway Bungalow hill. Length - 0.73 —————	Rupias 15,180
	2 East of Railway Bungal. low hill. Thallapauk embankment. Length - 2.32 ———	" — 17,830
	3 Pennagaloor embankment. Length - 7.61 ———	" — 41,550
Left bank.	1. Addipoor embankment Length - 0.50 ———	Rupias — 2,350
	2 Leback — do Length - 2.10 ———	" — 11,000
	3 Tungatoor do — " — 2.54 ———	" — 38,900
		<u>52,250</u>
		<u>126,810</u>
		Superintendence — 5,990
		<u>Total Rupias — 1,32,800</u>

3 The reasons for proposing the embanking of the several sections are, no where sufficiently fully stated, but the undersigned has had an opportunity of conferring with the District Engineer, and the recommendations that will now be made are based partly on the papers and partly on information

information obtained from Colonel A. S. Moberly, coupled with some personal knowledge of the locality. It is mentioned in the Report that great expense was incurred in clearing out channels which were filled with sand by the flood of 1874, and the embankments are intended to obviate such expenditure for the future, but though the names of the channels are given no particulars of outlay incurred have been shown. Again, much land is stated to have been covered with sand by the flood waters, but there is no information as to its area and value or as to the loss of revenue which resulted, and such details are essential to a decision on adequate data as to the need of embankments.

4 It is considered that there is no adequate reason for proposing to run an embankment between the Railway and the Railway Bungalow hill

hill. The ground which such an embankment would protect will on the completion of the flood bank above the Railway bridge on the right side of the river be liable only to submergence and not to any current of importance. Consequently a flood bank would not be of much value at any time and might not on the whole be an advantage. The estimate amounting to Rupees 180 is therefore not recommended for sanction.

5 The next section on the right bank is the Thallapank embankment. It is questionable whether any adequate advantage would result from extending the length of the short embankment hitherto in existence to the length of $2\frac{3}{4}$ chains proposed. It will certainly be desirable to improve the old flood bank from the Railway Bungalow hill to just below the Thallapank Appayahrajuo channel head, a distance of 32 chains.

and it may possibly be well to continue it to cross section No. 27, a further distance of 30 chains, beyond this for 50 chains the ground is every where above flood level of 1874 except for about 4 chains between C.S. Nos. 19 and 18, and there is rather a low place at the bandy track to Thallapank between C.S. 20 and 19, which two places might be raised to 2 or $2\frac{1}{2}$ feet above F.L. The estimate as submitted does not admit of the cost of these parts of the section being stated but from the general level of the ground it may be assumed that the cost will be about $\frac{3}{4}$ of the average for the whole section or *for 66 chains. say Rupees 4600. The exact figures can no doubt be readily given by the District Engineer. It may be added that should a further extension of this flood bank be hereafter shown

shown to be necessary, it is very im-
probable that any advantage would
result from carrying it beyond the
high ground between C. S. 7 and 6
for a bank beyond this would be
liable to be taken in rear by the
Poolungair, which falls into the
Cheyair close by and no doubt
overflows its banks. The align-
ment of the section shown on the
survey appears to be as good as
the circumstances will allow.

6 The lowest section on the right
bank is that from Utriala to
Pennagalur, and from the report
alone no reliable opinion as to its
necessity could be formed; but Col.
General Moberly has mentioned that
the part from the upper end to just
below the Hobly Channel head sluice
is greatly needed, and this length

4
appears to include the part formerly
but insufficiently embanked. The
length of this portion is 3 miles 30
chains, while the old bank measured
2 miles $9\frac{1}{2}$ chains. The alignment
will require very careful considera-
tion as it will occupy a position
exposing it to considerable strain,
and though the presence of several
channels may appear to interpose
difficulties in the way of a good
alignment it is probable that with-
out extra expense and perhaps with
some saving new channels might
be cut on a better line, and the
flood bank formed with the spoil.
The cost of the 3 miles and 30 chains
of embankment will be as follows.

Earth works	Ruppes	7725-10-8	
Tamping	—	1054-5-4	
		8780-—	
Sundries	—	440-—	9220.
Revetments	—	5272-11-0	
Backing to do	—	1866-6-	
Sundries	—	337-15-	7497
Total Ruppes	—	16717	

An improved alignment will it is con-
sidered be likely, to reduce materially
the heavy item for revetments, and give
time for the formation of mangrove planta-
tions to check or altogether stop erosions
with ultimately the recovery of land
which has been uselessly and pre-
judicially added to the width of the
river bed.

7 On the left bank of the river
the first is the Addipoor section, a
short length of 50 chains beginning
about 2 miles below the line of the
Railway, and extending to the head
sluice of the Ellamarazopully chan-
nel a distance of 50 chains. Below
this point there is an embankment.
The estimate amounts to Rupees 2350
and on the whole it appears to be de-
sirable to carry out the moderate
improvements provided for.

8 The next section is the Lebank
embankment. In favour of the improve-
ment

Vide latter part
of para 21 of
Memo: W. 4620
in Pros: Madras
S. 1300 of 24
May 1876.

5 improvement there is considerable but
much too indefinite evidence, and it is
thought that the latter may well
be made definite and complete before
any action is taken. The undersign-
ed has been over some of the ground
and does not remember to have seen
any signs of extensive damage. The
flood water from the river cannot
extend far, and this water must
nearly all of it return to the river on
the level of the latter falling.

9 The last section is the Tungatoo
embankment for which the estimate
amounts to Rupees 38900. There was
formerly an embankment through-
out nearly the whole length along
which it is proposed to construct
now an efficient flood bank, but the
flood of 1874 swept nearly the whole
away and the flood waters obli-
terated or filled up seven river chan-
nels

channels, breached the Komur and
Pothaper tanks and then returned
to the river some 6 miles below the
point where they left it. 9 or 10 square
miles of country appear to have been
inundated and also swept by the
flood. Very little has been done for
the restoration of the irrigation works
it having been considered useless
to spend much money on these until
an efficient flood bank had been
provided for. The longitudinal sec-
tion shows that the ground level
is throughout very low though for
23½ chains from the upper end there
is an embankment not much below
the proper level. The estimate whether
compared with the length of bank
2½ miles, or with the area of country
to be protected say 10 square miles
is very heavy, and singularly enough
the Report and the District Engineer's
letter

6
letter submitting the estimates are
alike silent as to the necessity for
spending nearly 20,000 Rupees a
mile upon a work of this descrip-
-tion, and nothing whatever has
been said to show that the particu-
-lar arrangements estimated for and
shown in the cross sections are es-
-sential to ensure safety. Had
it been proposed to spend one fourth
of the money some explanation would
have been desirable, and though
the undersigned is of opinion that
a flood bank is very much required
in this locality he doubts whether
any justification could be made
out for expending some 4000 Rupees
per square mile of country protected.
If therefore this outlay be really
necessary it will probably be de-
-cided that the country must be
left to suffer from floods and at
any

any rate before the estimate, as it
stands, can be seriously considered
it must be shown very clearly
that the interests at stake are such
as to warrant any such very un-
equal outlay. The sections provide
for an embankment with apparent-
ly a sand core, a covering of good
soil, and a substantial stone re-
vetment on the river face to 2 feet
above F. L. of 1874. Land must be
very valuable to make it advisable
to protect it with works of this cost-
ly description.

It has to be noticed that the
longitudinal sections do not in some
cases distinctly show that they abut
at their termini on ground well
above flood level, but the undersign-
ed understands from Colonel Moberly
that such is the case. The survey
might have been made more
useful

useful had it shown the names of all
villages referred to in the papers, and
the positions of all irrigation works.
roads &c affected; there was perhaps
no sufficient reason for omitting to
ascertain by levels the extent of
spread of flood water, while clearly
the damage actually sustained in
each locality in 1874 should have
been ascertained as accurately as cir-
cumstances would allow. Again
the proper alignment of embank-
ments is in part dependent upon
ground levels, which would show,
independently of other considerations
which have to be taken into account,
what is within certain limits the
least costly line for a flood bank
to follow, and the line selected should
be the least expensive which other
considerations will allow to be adopt-
ed. The longitudinal and cross sec-
tions

Sections have been very well prepared, but there is no evidence such as should have been afforded in a careful review by the District Engineer himself, after an examination on the ground of every part of the proposed arrangements, of the propriety of these as shown in the papers.

11 The rates are unusually high, and the District Engineer in his letter requested attention to the data list prepared by the Range Officer. It is difficult however to accept these data which can hardly bear examination. An example will be referred to in detail. For the Tungatoor embankment 34,268 cubic yards of earth work are said to be required and for 31,980 cubic yards the rate shown is ^{as} 3-10 a cubic yard made

made up as follows

1 Cubic yard excavation in loamy soil	0-1-0	uke
150 yards carriage	0-0-10	and
6 " lift	0-0-6	ding
2 " clearing sand for pits	0-1-6	ry

Now that 150 yards lead should be a necessary average for nearly 2 miles of embankment is very improbable as also that 2 cubic yards of sand should have to be removed for every cubic yard of good soil to be put in the bank. Moreover as even in the sections of the Tungatoor flood bank which are special about half the soil to be used is in each half of the height of the bank an average of 6 yards lift would mean a bank ^{to 14} 12 yards high. Now the highest part of the bank appears to be that shown at C.S. 13 and here the top of the earthwork referred to in the

from bottom
2 hits

the rate is 14.84 feet above the lowest point but only 9.82 feet above ground level; for the lower 5 feet there is then no lift for the first yard above ground level there should be no special rate, and the average lift becomes then for this highest section about 4 yards. Probably a general average of $2\frac{1}{2}$ yards would be proper. There is then clearly no justification for an allowance of 6 pice per cubic yard for lift.

$$\begin{array}{r} 9.84 \\ 3.00 \\ \hline 2)12.84 \\ 6.42 \\ \hline 5.58 \\ \hline 12.00 \text{ feet} \end{array}$$

12. There seems to be no objection to the following parts of the embankments being taken up at once if required to afford work to Famine relief labour.

- Right bank {
1. Thallapank flood bank for 66 chains from the Railway Bungalow hill.
 2. Uttriala bank for ^{m. ch.} 3.30 from the upper end.
- Left bank {
3. Addipoor bank - 50 chains

but the estimates require revision; and before any other of the embankments can be recommended for sanction definite information regarding damage done in 1874 is necessary as also, in the case of Tangatoot, a full explanation of the need for such costly arrangements.

Whitcomb Lieut. Col. R.E.

Chief Engineer for Irrigation

To
The Secretary to Government
P. W. D.

3.2.77. No 370.
 1.2.77 - 318.
 30.1.77 - 400.
 23.12.76 - 3830.
 20.12.76 - 3574
 24.5.76 - 1500

1877.

From
 The Chief Engineer for Irrig.

P.W.D.

27 MAR 77

NR-3276

Dated 24th March 1877
 Recd 27 - do.

W. 160-W. Enclod.

Cheyair Embankments below the
 Railway bridge. - Cuddalore District.
 Note remarking on the estimate
 submitted by the D.E. for the - and
 recommending that the Thalakur
 flood bank, the Pettrale bank &
 the Addipon bank may, at once,
 be undertaken, if necessary,
 as famine relief works.

4 @ 5th April 77 Lb. 119

Civ. E. I. Form No. 22.

No 1160
~~No 1000~~

11 - Irrigation
 Public Works Department.

PROCEEDINGS of the MADRAS GOVERNMENT

UNDER date the

Read the following:—

Note by the Chief Engineer for } (H.E. No. 160-W. of 24 March 1877)
 Irrigation.

Communicated to the Revenue
 Department. It will be seen that
 the Chief Engineer for Irrigation
 is of opinion that the Cheyair
 Embankments mentioned in
 para 12 of his note may, at once,
 be undertaken as famine
 relief works, if necessary.

W. 26/3

H. Cuddalore
 Secy. P. W. D.

with 8 Enclosures -
 Cong. Eng. for Rep.

Disp. 7. 4. 77

3276

Govt. of Madras.

PUBLIC WORKS.

To

The N. C. Buddapah

Dated

Issued

Recd.

Encl.

G. O. *20th* Feb 1877, No. *1160*

Nos. 119-120

Chegar-Enhankin
Note by the Chief
Engineer for irrigation
on the estimate for
in the Buddapah
District intimating
that the work may
be undertaken as a
famine relief work
if necessary, come
to the Rev. Dept.

For info