M.R.O.—1—77,006—8-6-37.

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MADRAS RECORD OFFICE.

Government of Madras.

Public (Confidential) DEPARTMENT.

G.O. No. 687-86 Press Mis.

Dated 3 2 18/6.

Not to be folded or roughly handled

Read the following :—

No. 58. From Major J. F. FISCHER, R. E., Acting Superintending Engineer, 1st Division, to the Secretary to Government, Public Works Department, dated Dowlaishweram, 8th January 1870, No. 3,539 :—

I HAVE the honour to submit, for the orders of Government, the accompanying plans, estimates, specifications, etc., together with copy of a letter from the Executive Engineer No. 1 Range, Godavery, for widening the Main Canal and remodelling the Cocanada Canal.

2. It appears to me advisable to send up this scheme separately, as the Cocanada Canal sadly requires being put in efficient working order as a line of navigation communicating direct with the only good port on the east coast of India. As an irrigating channel it now does nearly as much as can be expected from it, supplying 36,735 acres out of an available area of 41,612 acres, and the expected increase in cultivation is under 5,000 acres ; but as a line of navigation it carries on an average 17,374 tons a month for about nine months in the year, but in its present state during the months of April, May, and June, just at the time when the heavy cotton traffic arrives, the canal is useless, owing entirely to the defective arrangements in the Lockage.

Cocanada Canal.

1 Sketch Map.
1 Sheet of Longitudinal Sections of Canal.
1 Book of Cross Sections of Canal.
2 Plans of Locks of Canal on Tracing Cloth.
1 Plan of Calingulah of Canal on do.
*1 Do. of Lock Gates.
1 Do. of Shutters for the Lock Gates.
1 Do. of Anchor, Iron, of do. do.
1 Abstract Estimate with detail of Earthwork, Locks, Calingulah, etc.
1 Statement of Water Current of the Canal.
1 Specification of Locks, Calingulahs, and Head-sluice.

Main Duct.

2 Plans of Dowlaishweram Head-sluice.
1 Plan of Wooden Shutter on Tracing Cloth.
*1 Abstract Estimate with detail.
Specification of Head-sluice included in that of Locks and Calingulahs.
1 Statement of Water Current.

1 Copy of a letter, No. 430, dated 2nd December 1869.

18

*17 Plans, etc., by Banghy.

3. The total of the estimate now submitted amounts to Rupees 2,32,750 ; but this may be divided under three heads, as follows :—

I.—Double shutters for Head-sluice.

II.—Completing the Main Duct as far as the 7th mile to supply the entire system of canals in the Eastern Delta.

III.—The Cocanada Canal itself.

Of these items I would beg to recommend the first be entirely omitted as noted by the Executive Engineer. The proposal to remove the parapet cannot be carried out without necessitating the removal of the face-wall above the head-sluice vents, and, to knock this down after it has been up so many years and is firmly set, would be a work of no little trouble and expense ; but the stability of the whole structure would be compromised in its execution, and in a river like the Godavery, which has an immense basin above the anicut, and in which the most rapid rise of the heaviest freshes is only an inch per hour, double shutters are not actually required ; and, moreover, we can now always get telegraphic notice of an expected fresh from Doomagooden or Sirvancha, so it is perfectly easy to work the shutters as they now exist.

4. The second item properly belongs to the entire Eastern Delta scheme, and has been only included in this estimate for convenience, and based entirely on Captain Ryves' figures; the longitudinal section shows the serious defect now existing in it on the second mile, and I am quite at a loss to find out why this has remained so so long, interfering, as it must have done, with the supply of water to all the canals in this delta, except the Coringa branch, for so many years. The transverse sections show the work required to be done in this duct to enable it to carry the full supply of water; and the accompanying tables exhibit the details of the same together with the levels of the several masonry works and the velocities which will prevail in the canal in its different sections. These are taken from Neville's hydraulic tables, which are calculated at ten per cent. lower than the velocities obtained from Eytelwein's formulæ. As this latter is far better for large canals, I have directed it to be used all over the delta for all other estimates. If the Government please, this item of the estimate can be omitted for the present.

5. There remains, then, only the Cocanada Canal; and, as large quantities of material have already been collected for the locks, I am most anxious to put the work in hand as soon as possible. These have been designed according to the instructions conveyed to this office from time to time, and will, of course, be similar all over the delta for first-class navigable canals. I consider they are too large and expensive for the nature of the traffic we have to provide for; but, as ordered, they have been so designed.

6. I have not put any inverts to the calingulah aprons for water-cushions; it requires no demonstration to prove that materials could not be worse arranged to resist the impact of falling water, for such a place can only hold together as long as the adhesive power of the cement lasts. Should this fail, whatever material is used must inevitably be washed out.

7. In conclusion, I beg to report the levels of the crest of the anicut have been checked and found to agree with Sir A. Cotton's original levels.

From the Officer in charge No. 1 or Eastern Delta Range, Godavery District, to the Acting Superintending Engineer, 1st Division, dated Dowlaishweram, 2nd December 1869, No. 430.

I HAVE the honour to forward herewith thirty plans, estimates, etc., etc, as per margin, forming part of the Delta Project for my Range, and, in so doing, to submit the following remarks:—

1 Longitudinal Section.
1 Book of Cross Sections.
8 Plans of Locks.
8 do. of Calingulahs.
1 do. of Head-sluice.
1 Section of do.
1 Tracing of Shutter do.
1 do. of Gate Plans.
1 do. of Shutters.
1 do. of Anchor, Iron, etc.
1 Statement of Canal Data.
1 Detailed Estimate.
1 Abstract do.
1 Specification.
8 Estimates for Gates.
1 do. for Calingulah Shutter.
1 do. for Iron Shutter of Head-sluice.
1 do. for Wooden do. do.
1 do. for Anchor, Iron, etc.
1 do. for Culvert Shutter.
1 do. for Outlet do.
1 do. for Shutter of small vent of Lock.
1 do. for hand-rail of Head-sluice.
1 Sketch Map showing system of Canals and quantities of water to be conveyed.

30

1st.—I have not sent the statement required by the Chief Engineer for Irrigation showing distribution of water as it requires to be prepared by myself carefully, and can only be properly done as the plans for each canal are carried out. I shall not be able to send it in till all are done.

2nd.—I have enclosed a sketch map showing the general system of main canals and the quantities of water required for each portion of each canal.

3rd.—I have furnished the tabulated statement showing all data for each cross section of canal.

4th.—With reference to the cross sections, the portion from Chintapilly to Covoor Lock is already too large for the quantity of water required to be conveyed. I have only allowed for embanking where necessary and for deepening the centre portion to the necessary depth for a breadth of ten yards.

5th.—I have allowed in the estimate for twenty miles of small channels: this is to meet requirements for a few irrigation channels still required, and for making side channels where necessary. I have also allowed for thirty head-sluices and dividing dams to irrigation channels, of which many are required.

6th.—I have not allowed anything in the estimate for a Rest-house and store as proposed by Colonel Anderson. I think one ought to be built at Thossipoody near new lock and centre of canal; if you agree, I will send you plan and estimate to be added to those now forwarded.

7th.—The calculations for the discharge of this canal were made previous to receipt of your order regarding adding ten per cent. to the tables.

8th.—The irrigation under each canal, etc., is shown on sketch map by dividing the quantities of water shown by two, which will give acres.

No. 59.

No. 20.

NOTE *by the Acting Chief Engineer for Irrigation.*

THE Acting Superintending Engineer of the 1st Division has submitted estimates for the following works connected with the improvement of the Eastern Delta of the Godavery:—

	Rs.
1*st.*—Altering the Head-sluice	17,890
2*nd.*—Clearing and widening Main Canal	28,060
3*rd.*—Improving the Cocanada Canal	1,86,800

2. Captain Ryves, before leaving for England in July 1869, forwarded to me estimates for the improvement of all the canals in the Eastern Delta, and the arrangements proposed by him were generally approved; but as that officer had made considerable alterations in the details of the scheme as worked out in part by the Executive Engineer, and as some of the plans and estimates were incomplete and some details wanting, I thought it advisable that the whole should be carefully examined into and made complete, as also that, where Captain Ryves had made only an approximate estimate of the cost of works, an opportunity should be afforded the present Acting Superintending Engineer of preparing detailed estimates.

3. The revision of the estimates for this delta has not yet been completed; but as the Cocanada Canal is at present in a very unsatisfactory state, and as the navigation on this, one of the most important lines of the whole delta of the Godavery, is very much obstructed by the excessive fall, Major Fischer has transmitted these estimates for sanction in anticipation of the rest of the project being ready for submission to Government.

4. The Superintending Engineer does not advise the alteration of the head sluice either in the way shown in the plans and estimate or in the manner suggested by me, and which is shown in pencil on the transverse section of the sluice. If, as stated, the sluice in its present state can be worked without difficulty, no

modification need be carried out; but as Captain Ryves appears to have thought it requisite to propose double instead of single shutters at a very considerable cost, and as probably the grounds on which the proposition was based are either on record or known to the Executive Engineer, they should be stated, so that the advisability or otherwise of making any alteration may be determined.

5. It seems to be very necessary to carry out as early as possible the improvement of the Main Duct or that portion of the Cocanada Canal above the 8th mile, for the Samulcottah Canal—the high level, northern branch—has recently been enlarged and improved, and it will probably remain without an adequate supply of water until the main channel is rendered capable of carrying the full quantity required.

6. The estimates have not, however, been submitted with that complete information which is necessary for their disposal. It is proposed to carry out all the improvements required in the delta from Loan Funds, and it must be shown, therefore, what the capital outlay on the works of each distinct section of the delta has been, what have been the results consequent upon that expenditure, what further outlay is proposed, and what effect this may be expected to produce. The longitudinal and cross sections of the Cocanada Canal show distinctly enough how greatly improvements are needed; but it is requisite that the Government should be informed, either for each individual canal or for the eastern part of the delta taken as a whole—

(1.) Whether past and proposed expenditure taken together will be sufficiently profitable to warrant a considerable further outlay.

(2.) Whether the benefits to be derived from the further proposed outlay are in proportion to the expenditure contemplated.

7. It will be the more simple plan to give this information for the eastern section of the delta as a whole, for probably the records will not furnish the details of expenditure on each separate sub-division of the irrigation. It should then be shown—

1*st*.—What the expenditure on the works in the Eastern Delta has been up to date.

2*ndly*.—What its share of the cost of the anicut and other works common to the whole delta is.

3*rdly*.—What further expenditure is necessary to place the whole of the works of the eastern section in a state of efficiency.

4*thly*.—The acreage and wet revenue before the construction of the anicut; the average area of cultivation and the revenue since that time; and the expected total area of irrigated land with the assessment corresponding thereto should be compared.

5*thly*.—As a considerable part of past and proposed outlay is connected with navigation, the traffic on each canal and the receipts therefrom for the whole should be stated; for, although a direct return on the outlay on this account may not be looked for, it is requisite that the clearest idea possible should be formed of the value of this navigation to the district and to trade.

Proceedings of the Madras Government, Public Works Department, 3rd March 1870.

8. In the absence of information on these points it is not probable that Loan Funds would be granted, nor, indeed, is it desirable that definite information should be dispensed with in such a case as this. The Government of India have, however, expressed* their willingness to consider the propriety of granting Loan Funds for the construction of the new locks which are so much required, and perhaps, therefore, in order to save a considerable part of one working season and to utilize the materials already collected, so much may be sanctioned at once. At present there is no lock between that at Madapad in the 10th mile and the Chintapilly Lock in the 21st mile, and the fall of the canal in that distance is 26·10 — 10·51, or 15·59 feet, and consequently the velocity in the canal is very high, and much more water than is necessary for irrigation is required to keep open the navigation. The Madapad, Chintapilly, and Covoor Locks were built many years ago in a way unsuited to the permanent requirements of the canal, and it is now proposed to re-build the Madapad Lock of the full size, 150 × 20, which has been fixed for first-class canals, to construct a new lock at the 16th mile near Thossapudi, and to re-build the Chintapilly and Covoor Locks.

* G. O., No. 285, dated 24th January 1870.

9. As the levels have to be adjusted, it will be requisite to build also the new weirs in connection with the locks, and the estimated cost of the works is:—

	Rs.
Lock at 9½ miles	28,050
Weir	7,360
Lock at 16 miles	23,820
Weir	5,060
Lock in 21st mile	26,160
Weir	3,070
Lock in 30th mile	26,160
Total...	1,19,680

10. A considerable amount of earthwork will be needed in the 13th to 16th miles in connection with the change of levels, the present banks being generally about on a level with the altered water line. As, however, the Eastern Delta estimates ought shortly to be sent in complete, and, if so, will be disposed of before the masonry works will be far advanced, no present sanction will be necessary on this account.

11. There is no provision of Loan Funds in the current year's Budget for the Cocanada Canal or for any works in the Eastern Delta except the Samulcottah Canal; but the Superintending Engineer will probably have a surplus in other parts of the delta, and this may be supplemented by transfers from the Kistna, in which district funds have recently been reported to be available.

G. O., No. 267, dated 21st January 1870.

12. I may remark that the book of cross sections of the Cocanada Canal does not show, as should be the case, the tow-paths and the intended arrangement of the embankments or spoil banks. It is essential that the tow-paths should be placed at about 2½ to 3 feet above full supply-level, and that the rough irregular spoil banks should be so trimmed that they may not be washed down into the channel, and the drainage from them should be brought under regulation.

13. In sending up the delta estimates the Superintending Engineer should take care that the observations made in returning the estimates of both the western and eastern sections are attended to, and that full and complete information is furnished, otherwise much delay will be caused, which may be avoided by a little care and forethought now.

26*th January* 1870. (Signed) J. MULLINS, Major, R. E.,
Acting Chief Engineer for Irrigation.

No. 60. ORDER THEREON, 3rd March 1870, No. 687.

IRRIGATION, No. 5.

HIS Excellency the Governor in Council regrets to find from the papers recorded in these Proceedings that the estimates for the completion and improvement of the canals in the eastern section of the Godavery Delta are not yet ready for submission, but he hopes that every effort will be made to bring them forward for sanction at an early date.

2. The Acting Superintending Engineer has, however, transmitted for sanction the following estimates, which are for a part of the work required to be done in the Eastern Delta :—

	RS.
Altering the Head-sluice of the Main Canal	17,890
Clearing and widening Main Canal	28,060
Improving the Cocanada Canal	1,86,800
Total...	2,32,750

The Acting Chief Engineer for Irrigation points out that the estimates have not been sent in with that complete information which is desirable, and which is necessary to enable the Government to dispose of them ; and Major Fischer's attention will be specially called to the remarks on this point in the Chief Engineer's note. Looking, however, to the importance of the Cocanada Canal as a line of navigation, and to the recent expression by the Government of India of their willingness to consider the propriety of allowing the construction of the locks shown to be necessary for its improvement to be undertaken from Loan Funds in anticipation of the sanction of the complete estimates for the delta, His Excellency in Council resolves to transmit these Proceedings to the Government of India, and to request authority for the immediate execution of the following works :—

	RS.
Lock at 9½ miles. Estimate	28,050
Weir	7,360
Lock at 16 miles	23,820
Weir	5,060
Lock in 21st mile	26,160
Weir	3,070
Lock in 30th mile	26,160
Total of Estimates...	1,19,680

Proceedings of the Madras Government, Public Works Department, 3rd March 1870.

Sanction will also be requested for the provision of funds for such portion of the work as may be commenced in the current Official year in the manner suggested in paragraph 11 of the note of the Chief Engineer for Irrigation.

(Here enter No. 688, dated 3rd March 1870.)

(True Extract.)

Colonel, R. E.,
Secretary to Government.

To the Superintending Engineer, 1st Division.
,, Controller of Public Works Accounts.
,, Accountant-General.
,, Chief Engineer for Irrigation.
,, Revenue Department.

PUBLIC WORKS DEPARTMENT,
FORT ST. GEORGE, 3*rd March* 1870.

No. 61.

No. 688.

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,
PUBLIC WORKS DEPARTMENT.

IRRIGATION, No. 6.

SIR,—I am directed, with reference to paragraph 2 of the letter, No. 92-A-B, dated 14th December 1869, from the Government of India, to transmit, for the consideration of His Excellency the Governor-General in Council, a copy of the Proceedings of the Madras Government, No. 687, dated 3rd March 1870, and to request sanction for the immediate commencement from Loan Funds of the re-construction of three locks, and the construction of one new lock on the Cocanada Canal in the eastern section of the Godavery Delta.

2. I am to state that His Excellency the Governor in Council much regrets the delay which has occurred in preparing the complete estimates for the delta, but all that is possible is being done to get them ready as early as practicable. The importance of the Cocanada Canal to the trade of the district and its inefficiency with the present great surface fall of the water make it, I am to say, very advisable that the re-arrangement of the artificial falls should be carried out at once, and it is with the view of making the most of the present working season that this Government now solicit authority to proceed with the locks and with the weirs connected with them. It is anticipated that the whole of the estimates will be before the Government of India early in 1870-71.

3. There is no provision of Loan Funds in the Budget of the current year for any works in the eastern section except the Samulcottah Canal; but there will probably be a surplus from other works in the delta, and this may be supplemented from the Kistna, in which district funds have recently been reported to be available. I am accordingly to request permission to make the necessary transfers, the particulars of which will be reported in due course.

I have the honour to be,
Sir,
Your most obedient servant,

Colonel, R. E.,
Secretary to Government.

Exd. A. S. Rodgers.

SUPERINTENDING ENGINEER'S OFFICE, 1ST DIVISION
DOWLAISHWARUM, 12 January 1870

No. 353

From,

Major A. T. Fischer R.E.
Superintending Engineer
1st Division

To

Colonel C.E. Ouvry R.E.
Secretary to Government D. P. W.
Madras

Predecessor 18

SIR,

I have the honor to submit for the orders of Government the accompanying plans, Estimates, Specifications &c. together with copy of a letter from the Executive Engineer Godavery, for widening the Main Canal and remodelling the Coconada Canal.

2 It appears to me advisable to send up these Schemes separately, as the Coconada Canal Scheme requires being put in efficient working order as a line of Navigation, communicating direct with the only good port on the Coast of India, as an irrigating Channel, it does nearly as much as can be expected from it supplying 35,735 acres out of an available area of 46,612 acres, and the special increase in cultivation is under 5,000 acres - but as a line of Navigation, it carries on an average 17,374 tons a

17 Plans & Estimates

a month, for about 9 months in the year, but in the present state, during the months of April, May and June, just at the time when the heaviest Cotton traffic arrives, the Canal is useless, owing entirely to the defective arrangements in the Lockage -

3 The total of the Estimate now submitted amounts to Rupees 2,32,750 but this may be divided under 3 heads, as follows -

1 Double shutters for Head sluice

2 Completing the Main Embankment as the 7th Spur, to enclose the entire system of Canals in the Eastern Delta -

3 The Coomaree Canal closed -

Of these items, I would beg to recommend, the first be omitted, as stated by the Executive Engineer the proposal to remove the parapet cannot be carried out without necessitating the removal of the face walls above the Lock-sluice vents and to renew this down after it has been at so many years and is firmly set, would be a work of the utmost trouble and expense, but the stability of the whole structure would be compromised in its execution; and in a river like the Cauvery which has an immense basin above the Anicut

Anicut, and in which the most rapid rise of the heaviest freshes is only one inch per hour, double shutters are not actually required, and moreover, we can now always get telegraphic notice of an approaching fresh from Doomagroodem or Sivaneha, so it is perfectly easy to work the shutters as they now exist.

4 The second item properly belongs to the entire Eastern Delta Scheme, and has been only included in this Estimate for convenience and based entirely on Captain Ryves' figures, the Longitudinal section shews the serious deficit now existing in it on the 2nd Mile, and I am quite at a loss to find out, why this has remained so long, interfering as it must have done with the supply of water to all the Canals in this Delta, except the Cauvery branch, for so many years - the transverse sections shew the work required to be done in this District to enable it to carry the full supply of water and the accompanying tables exhibit the details of the same together with the levels of the several masonry works and the velocities which will prevail in the canal in its different sections, these are

taken

taken from Neville's hydraulic tables, which are calculated at 10 per Cent lower than the Velocities obtained from Eytelwein's formula as this latter is far better for large Canals I have directed it to be used all over the Delta for all other Estimates. If the Government please, this item of the Estimate can be omitted for the present.

5 There remains then only the Ocanada Canal, and as large quantities of material have already been collected for the Locks I am most anxious to put the work in hand as soon as possible, these have been designed according to the instructions conveyed to this Office from time to time. And will procure a similar all over the Delta for 1st class Navigable Canals: In Cawnpore they are too large and expensive for the station & the traffic we have to provide for, but as ordered, they have been designed.

6 I have not put any Culverts to the Eslingulah Aprons for water-Cushions &c requires no demonstration to prove that materials could not be worse arranged to resist the impact of falling water for such a

a place can only hold together as long as the adhesive power of the Cement lasts should this fail whatever material is used must inevitably be washed out.

7 In conclusion I beg to report the levels of the crest of the Anicut have been checked and found to agree with Sir A. Cotton's original levels.

I have the honor to be
Sir
Your most Obt. Servant
Alex. Mc Leod Major R.E.
Asst. to Chief Engineer 1st Division

Channels

No 33

Abstract of Estimate
Canal de Lachine Section
2d Reconstruction 1870.

Mr. Officer in charge
Mr. Mc. Kay
Contract Section

Sir,

I have the honor to forward herewith
30 Plans, Estimates &c. &c. as per accompanying
memorandum of the Public Works Projects for which
Report and in do doubt is submitted the following
remarks.

1st I have not deemed the Statements required
by Office Engineers for Irrigation Reports, &c.
Victoria as it requires to be prepared
by myself carefully and can only be prepared
= ly done as the Plans for each Canal are
completed. I shall not be able to send
it in till all are done.

2d I have enclosed a Detail Map showing
general System of main canals and the
quantities of water required for each Section
= tion of Canal.

3d I have furnished the Calculated
Statements showing also data from which Engr
Section from Obstructions by Crown Work
is already to large for the quantity of water
required of the enlarged. I have only
allowed for enlargement where necessary
and for deepening this enlargement
the necessary depth for a depth of 10 yards

5th I have allowed in Estimate for
2 Suits of canals, this is
such requirements for a few migration

Chevalier

Mr 1870 Dept
No 3539.
From No 188.
Re C.S. Lachine Canal
1st Division
No
The Secretary
to Government
Ottawa
Dated 8 January 1870
Rec'd 15

Forwards for Order of
Government Sanction
Estimates for Proposed
Rs: 232750 for Widening
the Main Canal and Repair-
-ding the Cascades Canal

Mr. Supt 10/1/70

No 687 - 658 - 3 Transmitted

58.

C. 3rd Feb R. 19

Channels still required & for making side chan-
nels where necessary. I have also allowed for
30 Head Sluices and Dividing Dams to Irrigation
Channels of which many are required.
6th. I have not allowed any thing in Estimate
for a Rest House and Store as proposed by Colo-
nel Anderson. I think one ought to be built at
Nossiporay near new Lock and Centre of Canal,
if you agree, I will send you Plan & Estimate
to be added to those now forwarded.
7th. The Calculations for the discharge of this
Canal were made previous to receipt of your order
regarding adding 10 per cent to the tables.
8th. The Irrigation under each Canal is shown
on sketch Map by dividing the quantities of
water shown by 2 which will give Acres

I have &c.
(Sd) W. Cotton
Executive Engineer

(True Copy)

Lieut. F. Hutton Major R.E.
Asst. Engineer 1st Division.

No. 4/0
P.W. 10/70
From Secy. Madras to Govt. No. 259.

Enclosure in a letter No. 3539
dated 8th January 1870. from the
Acting Superintending Engineer
1st Div. to the Secretary to Govern-
ment P.W. Department
Madras.

No. 20

Note by the Acting Chief Engineer for Irrigation

The Acting Superintending Engineer of the 1st Division has submitted estimates for the following works connected with the improvement of the Eastern Delta of the Godavery

Enclosures 19.

1st Altering the Head sluice Rupees 17890

2nd Clearing & widening Main Canal — 28060

3rd Improving the Cocanada Canal — 18600

Captain Ryves, before leaving for England in July 1869, forwarded to me estimates for the improvement of all the Canals in the Eastern Delta, and the arrangements proposed by him were generally approved, but as that officer had made considerable alterations in the details of the scheme as worked out in part by the Executive Engineer, and as some of the plans and estimates were incomplete, and some details wanting, I thought it advisable that the whole should be carefully examined into & made complete, as also that

where

where Captain Rypes had made only an ap-
-proximate estimate of the cost of works, an op-
-portunity should be afforded the present Acting
Superintending Engineer of preparing detailed esti-
-mates.

3. The revision of the estimates for this
Delta has not yet been completed, but as the
Cocanada Canal is at present in a very unsa-
-tisfactory state, and as the navigation on
this, one of the most important lines of the
whole Delta of the Godavery, is very much
obstructed by the excessive fall, Major Fischer
has transmitted three estimates for sanction in
anticipation of the rest of the project being
ready for submission to Government.

4. The Superintending Engineer does not
advise the alteration of the Head sluice, either
in the way shown in the plans & estimate, or
in the manner suggested by me, & which is
shown in pencil on the transmitted section of
the sluice. If as stated, the sluice in its present
state

state can be worked without difficulty, no modi-
-fication need be carried out, but as Captain
Rypes appears to have thought it requisite to
propose double instead of single shutters at an
very considerable cost, and as probably the ground
on which the proposition was based are either
on record, or known to the Executive Engineer, they
should be stated, so that the advisability or other-
-wise of making any alteration may be deter-
-mined.

5. It seems to be very necessary to carry
out as early as possible the improvement of the
Main Duct or that portion of the Cocanada Canal
above the 8th mile, for the Samulcotta Canal &
the high level, Northern, branch has recently been
enlarged & improved, & it will probably remain
without an adequate supply of water until the
Main Channel is rendered capable of carrying
the full quantity required.

6. The estimates have not however been
submitted with that complete information

which

which is necessary for their disposal. It is proposed to carry out all the improvements required in the Delta from Loan funds, and it must be shown therefore what the Capital outlay on the works of each distinct section of the Delta has been, what have been the results consequent upon that expenditure, what further outlay is proposed, and what effects this may be expected to produce. The longitudinal & cross sections of the Cocanada Canal show distinctly enough how greatly improvements are needed, but it is requisite that the Government should be informed, either for each individual Canal or for the Eastern part of the Delta taken as a whole,

1st whether past and proposed expenditure taken together will be sufficiently profitable to warrant a considerable further outlay

2nd whether the benefits to be derived from the further proposed outlay are in proportion to the expenditure contemplated.

It will be the more simple plan to give this information for the Eastern Section of the Delta as a whole, for probably the records will not furnish the details of expenditure on each separate subdivision of the irrigation. It should then be shown

1st what the expenditure on the works in the Eastern Delta has been up to date,

2nd what its share of the cost of the Anicut & other work common to the whole Delta is,

3rd what further expenditure is necessary to place the whole of the works of the Eastern Section in a state of efficiency,

4th the acreage & net Revenue before the construction of the Anicut, the average area of cultivation & the Revenue since that time, and the expected total area of irrigated land, with the assessment corresponding thereto, should be compared

5th & a considerable part of past & proposed outlay

outlay is connected with Navigation, the traffic on each Canal and the receipts therefrom for the whole should be stated; for although a direct return on the outlay on this account may not be looked for, it is requisite that the clearest idea possible should be formed of the value of this Navigation to the District and to trade.

8. In the absence of information on these points it is not probable that Loan funds would be granted, nor, indeed, is it desirable that definite information should be dispensed with in such a case as this. The Government of India have however expressed their willingness * to consider the propriet of granting Loan funds for the Construction of these new locks which are so much required, and perhaps therefore, in order to save a considerable part of the working season, & to utilize the materials already collected, so much may be sanctioned at once. At present there is no lock between that at Madapád in the 10th mile & the Chintapilly lock in the 21½ mile, and the fall of the Canal in

* G.O. No 285 of 24th January 1870

in that distance is 26.10 - 10.51, or 15.59 feet, and consequently the velocity in the Canal is very high, and much more water than is necessary for irrigation, is required to keep open the navigation. The Madapád, Chintapilly & Coovr locks were built many years ago in a way unsuited to the permanent requirements of the Canal, and it is now proposed,

to rebuild the Madapád lock of the full size 150 x 20 which has been fixed for first class Canals,

to Construct a new lock at the 16th mile near Thotapúdi, and

to rebuild the Chintapilly & Coovr locks.

Also the levels have to be adjusted, & it will be requisite to build also the new weirs in connection with the locks and the estimated cost of the works is,

Lock at 9½ miles	Rupees	28050
Weir		7360
Lock at 16 miles		23820
Weir		5060
Lock at 21½ miles		26160
Weir		3070
Lock at 30 miles		26160
		119680

13.

10. A considerable amount of Earthwork will be needed in the 13 to 16 miles in connection with the change of levels, the present banks being generally about on a level with the altered water line. As however the Eastern Delta estimate ought shortly to be sent in complete, and if so, will be disposed of before the Masonry works will be far advanced, no present sanction will be necessary on this account.

11. There is no provision of Loan Funds in the current year budget for the Cocanada Canal or for any works in the Eastern Delta except the Saumlcotta Canal, but the Superintending Engineer will probably have a surplus in other parts of the Delta, which may be supplemented by transfers from the Kistna, in which District funds have recently been reported to be available.

G.O. No 267 dated 21st January 1870.

12. I may remark that the book of cross sections of the Cocanada Canal does not show, as should be the case, the tow paths and the intended arrangement of the embankments or spoil banks. It is essential that the tow paths should be placed at about 2½ to 3 feet above full supply level, level & that the rough irregular spoil banks should be so trimmed that they may not be washed down into the channel; and the drainage from them should be brought under regulation.

13. In sending up the Delta estimates the Superintending Engineer should take care that the observations, made in returning the estimates of both the Western & Eastern sections, are attended to, and that full & complete information is furnished, otherwise much delay will be caused, which may be avoided by a little care and forethought now.

Fort St. George
26th January 1870.

I have &c.
Colonel Cullen Major R.E.
Acting Chief Engineer for Irrigation

To
The Secretary to Government
P.W.D.

From The Acting Chief
Engineer for Irrigation

To

The Secretary to
Government Punjab

Dated 26th
Despd 31st January 1870
Recd 3rd

No 20
Encls Nos 36

Note on the estimates of
certain works connected
with the improvement
of the Eastern Delta
of the Godavery

dated 6th 7th 8th March 70

Read 3rd Feby 1870 Pd 19

Sanction the following estimates which are for a part of the work required to be done in the Eastern Delta

Altering the Head Sluice of the main Canal.	Rs. 17,890
Clearing and widening main canal	28,060
Improving the Cocanada Canal	1,86,800
Total	Rs. 2,32,750

The Ag. Chief Engineer for Irrigation points out that the estimates have not been sent in with that complete information which is desirable, and which is necessary to enable the Govt. to dispose of them; and Major Fischer's attention will be specially called to the remarks on this point in the Chief Engineer's note. Looking, however, to the importance of the Cocanada Canal as a line of navigation, and to the recent expression by the Govt. of India of their willingness to consider the propriety of allowing the Construction of the locks shown to be necessary for the improvement, to be undertaken from Loan funds, in anticipation of the sanction of the complete estimates for the Delta, His Excellency in Council resolves to transmit these Proceedings to the Govt. of India, and to request authority for the immediate execution of the following works:

Lock at 9/2 miles. Estimate Rs.	28,160
Weir	7,360
Lock at 11 miles	23,820
Weir	5,060
Lock in 21st mile	26,160
Weir	2,170
Lock in 30th mile	26,460
Total Estimates Rs.	1,19,180

Sanction

Sanction will also be requested for the provision of funds for such portion of the work as may be commenced in the current official year, in the manner suggested in para: 11 of the note of the Chief Engineer for Irrigation.

No. 688

To

The Secretary to the Govt. of India.

Sir

I am directed with reference to para 2 of the letter No. 22 dated 4th Feby. from the Govt. of India to transmit, for the consideration of His Excellency the Governor General in Council, a copy of the proceedings of the Madras Govt. No. dated and to request sanction for the immediate commencement, from Loan Funds, of the reconstruction

To the Supt. Engr. 1st Dn. ✓
" Controller of Accts. ✓
" Accountant ✓
" Chief Engr. for Irrign. ✓
" Rev. Deptt. ✓

Dept. 15/3/70.

of three locks and the construction of one new lock on the Cocanada Canal in the Eastern Section of the Godavery Delta

2. I am to state that His Excellency the Governor in Council much regrets the delay which has occurred in preparing the complete Returns for the Delta but all that is possible is being done to get them ready as early as practicable. The importance of the Cocanada Canal to the trade of the District and its efficiency with the present great surface fall of the water makes it, I am to say, very advisable that the rearrangements of the artificial falls should be carried out at once and it is with the view of making the most of the present working season that Govt. now solicits

Authority

authority to proceed with the
locks, and with the weirs con-
nected with them. It is anti-
cipated that the whole of the
estimates will be before the
Govt of India early in 1870/71.

3. There is no provision
of Loan funds in the Budget
of the current year for any
works in the Eastern Section,
except the Samulcotta
Canal, but there will prob-
ably be a surplus from
other works in the Delta, and
this may be supplemented
from the Kistna, in which
District funds have recently
been reported to be avail-
able. I am accordingly to
request permission to
make the necessary transfer

the

the particulars of which will
be reported in due course.

W.P.

Desp 15/3/70 with Copy
of Govt 687 of 1870.

36 Copies of Govt 687 of 1870
forwarded by bandy today
Govt of India 16/3/70.

Ens 168 & 610

Govt. of India

PUBLIC WORKS.

To The Superintending Engr 1st Division and To The Secretary to the Govt of India

Dated

Rec'd 26

G. O. 3rd March 1870, Nos. 687 & 688

Nos. 58-60 & 61

Eastern Delta of the Godavery Papers orders and letters relative to certain works connected with the improvement of the Eastern Delta of the Godavery

Eastern Delta of the Godavery A Copy of Do relative to certain works connected with the improvement of the Eastern Delta of the Godavery, & forwarded to Govt of India with a request that sanction may be granted for the immediate commencement of the Anicut Lock Gates, & the reconstruction of the three Locks & the construction of one new Lock on the Cocanada Canal.

c. 3rd Feby 1870 R. 19