M.R.O. 1—77,006—8-6-31.

(1) Number of pages 2

(2) Date of repair

(3) Initials of the Referencer

MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No. 227 Press ~~Mis.~~

458-460

Dated 26-1- 1871.

Not to be folded or roughly handled

Proceedings of the Madras Government, Public Works Department, 26th January 1871.

Read the following papers:—

No. 458. From the Consulting Engineer for Irrigation and Canal Company, to the Secretary to Government, Public Works Department, dated Madras, 8th December 1870, No. 101.

REFERRING to Government Order, No. 2,376, 1st October last, directing that the breaches in the Madras Irrigation and Canal Company's Main Canal, which were caused by the floods of August, should be closed in anticipation of the sanction of the estimates, I have now the honour to forward letters from the Agent and from the Chief Engineer as per margin, transmitting estimates for repairing the breaches in the 2nd Section, and accompanied by explanatory drawings of the principal works. The total amount of the estimates, as corrected in this office, is Rupees 47,600, of which the chief items are as follow:—

From Agent, No. 505, 1st December 1870.
,, Chief Engineer, 23rd November ,,

		RS.	P.	A.
1.	Repair to Hindry aqueduct and addition of a water-cushion to receive the overflow as the canal fills and for the better protection of the work—Drawing No. 490.	4,515	1	1
2.	17 miles 48 chains.—Repair to breach of August 1870—Drawing Nos. 489 and 496.	7,240	3	7
3.	17 miles 63 chains.—Repairs to slip in the masonry revetment caused by the storm of August 1870.	5,696	4	8
4.	18 miles.—Raising old revetment to 3½ feet above water-level and the backing to 6 feet	2,590	2	5
5.	22 miles 70 chains.—Repairs to Kadrabagh aqueduct—Drawing No. 497, Rupees 83-8-0 +1,287-4-0 = ...	1,370	12	0
6.	23 miles 27 chains.—Repair to breach of August 1870—Drawings Nos. 491, 492, and 493...	16,748	1	7
7.	27 miles 67 chains.—Repair to breach of August 1870—Drawing No. 494.	3,124	6	8
8.	Sundry repairs of slips and other damage	1,982	3	8
		43,267	3	8
	Contingencies, 10 per cent....	4,314	12	4
		47,582	0	0
	Distribution—			
	Repairs to sluices	18	0	0
	Total	47,600	0	0

2. The Chief Engineer in his letter remarks that these estimates, together with one for some small repairs, aggregating Rupees 93, which are to be

executed by the Conservancy or Maintenance Establishment, and some other works estimated to cost Rupees 5,860, and which are to be charged to the Capital Account, comprise the whole of the work that is necessary to put the 2nd Section of the Main Canal into working order, and it will be observed that some of the work which he calls repair is really additions and improvements, as, for instance, the greater part of the first item and the whole of the fourth item. Moreover, on what principle he is acting in raising the old revetment wall at the 18th mile to 3½ feet above the water-level, while the other walls are not raised, does not appear; and I cannot endorse his statement that these estimates provide all that is otherwise necessary for putting that portion of the canal into a safe condition and in working order until the promised proposal for enlarging all calingulahs has been received.

3. The Chief Engineer remarks "that on the occurrence of the breaches the "conservancy staff of course became virtually inapplicable. In order not to mix "conservancy with repairs almost beyond such as might be called conservation, "and to avoid confusion, the course taken so far as I know was the following:— "All the permanent staff, including those previously on the 'conservancy staff' "and such additional engineers and officers as *were* borne on the 'permanent "staff,' were brought as rapidly as forms admitted into the permanent staff." Supposing the meaning of the above remarks to be, that when the canal breached from the floods in August last, the Chief Engineer amalgamated the Conservancy Establishment, which was sanctioned for the first 72 miles of the canal, with the permanent establishment that is paid from Capital, I have informed him that as the Conservancy Establishment was sanctioned for a specific purpose, all salaries and wages that are paid must continue to be debited directly to Revenue, and that any such amalgamation of establishments is inadmissible.

G. O., No. 1,391, 4th June 1870.

4. In regard to the estimates referred to above, and which amount to Rupees 47,600, the Agent proposed that the amount should be debited to Revenue in accordance as he said with the Government rules, and which, in reply to my inquiry as to what rules he referred to, he explains * to be the practice that has hitherto been persued in regard to repairs, in support of which he quotes the orders noted in the margin. He has also furnished me with copy of a telegram from the Board of Directors in London as follows:—

* His No. 508, 5th December 1870, enclosed.

G.O., No. 1,429, 1st May 1869.
" " 2,517, 21st Oct. 1870.
" " 2,230, 16th Sep. "

"Board regret accidents, and desire you to submit to Government immediately "estimates of repairs, the amount to be debited to Revenue."

The two first-mentioned Government orders relate to repairs to the Soonkasala Anicut, which having been completed all repairs would properly be debited to Revenue. The third Government order sanctioned an expenditure of Rupees 58 to be charged to Revenue, being the amount of a bill of cost for stopping a leak in the Main Canal near the Hindry aqueduct. I never considered that any length of the Main Canal had been completed, for it had never been tested

Proceedings of the Madras Government, Public Works Department,
26th January 1871.

or even had the full depth of water passed down it, nor am I aware that any length was ever considered completed by the Company, and so reported in view to its being formally passed; and, if the large amount now asked for under the head of Repairs is debitable to Revenue, the very important question arises of whence are the necessary funds to be obtained.

5. The Chief Engineer asks in his 3rd paragraph that the amount may be advanced from the district treasury as an advance on Revenue Account, but on the subject of the provision of funds for repairs, I find that the Contract and the Supplementary Agreement are silent. The Contract of 3rd June 1863, paragraph 21, provides that when any portion of the canal shall be completed and opened, the Company shall keep it in a state of good repair and in good working condition; and if they do not do so for six calendar months, the Government shall have power to make the repairs, the expenses to be charged against the Company by setting off the amount of such expense against any moneys then payable, or which shall thereafter become payable by the Secretary of State to the Company; and, if such expenses shall not be so satisfied, the difference shall be forthwith paid by the Company to the Secretary of State in Council; and the 23rd paragraph of the Contract provides for the disposal of the net receipts, that is, of the Revenue after deducting the cost of the repairs and maintenance; but it nowhere appears how those expenses are to be met, when, as is now the case, the current revenue is inadequate to meet the cost of repairs and maintenance.

Clauses 8 and 9 of the Supplementary Agreement, dated 2nd October 1866, similarly provide that the Revenue Account shall be debited with the expenses of management and of repairs, restoration, and maintenance of works, other than such payments as may properly belong to the Capital Account.

From the Agent and Manager of the Madras Irrigation and Canal Company, to the Consulting Engineer for the Madras Irrigation and Canal Company, dated Madras, 1st December 1870, No. 505.

I HAVE the honour to forward copy of the Chief Engineer's letter, dated 23rd November 1870, with plans and estimates, for the repair of breaches in the 2nd Section, debitable to Revenue and of work chargeable to Construction as per list thereto appended, and request you will be good enough to obtain the early sanction of Government for the proposed expenditure.

From the Chief Engineer of the Madras Irrigation and Canal Company, to the Agent and Manager of the Madras Irrigation and Canal Company, dated Cuddapah, 23rd November 1870.

2nd Section, Breaches.

I HAVE now the honour to submit for sanction plans and estimates of the whole of the work necessary to put the 2nd Section of Main Canal into working order.

2. It is well to mention that I intend very shortly to submit a proposal for enlarging the calingulahs, that are is included in the present plans.

I.—On the occurrence of the breaches the Conservancy staff of course became virtually inapplicable. In order not to mix Conservancy with Repairs almost beyond such as might be called conservation, and to avoid confusion, the course taken, so far as I know, was the following:—All

the permanent staff, including those previously on the "Conservancy staff" and such additional engineers and officers as *were* borne on the "Permanent staff" were brought, as rapidly as forms admitted into the permanent staff. This staff is paid as a charge on Engineering Capital Account without confusion. It is afterwards charged in your office to any account on which it is really employed. Thus there was no difficulty when engineers on the "Permanent staff" have been employed in your office or in workshops, or to other heads of charge; and, if I am right, there will be none in this case.

2. I now enclose a list of a few repairs, estimated at Rupees 98, which may be conveniently executed by part of the "Conservancy staff" amounting to three months' work for a gang of six men, for it will be necessary to have some of this staff to trim the banks for next season; and a gang may conveniently be kept together and trained on the 26th and 27th miles, besides the others provided with work on the 1st Section. This requires no sanction.

II. I also enclose a statement of expenses still required on Capital Account, or which I recommend for the greater security of the works. They amount to Rupees 5,860, and include a foreshore to the high wall in the 26th mile. The divisional engineer has not applied for any sanction for additional expenditure on this work, but the plan requires the approval of the Consulting Engineer (Plan No. 487). The need for the foreshore and puddle is to stop the excessive leakage which, judging from the similar wall exposed by the breach in the 24th mile, probably runs through the joints towards the bottom of the inner face of the wall. The puddle must be thrown in up to low water-level of tank, and then can be raised in the ordinary way.

III. Lastly, I enclose for sanction plans and estimates for an expenditure of Rupees 47,400 to be charged as an advance on Revenue Account with a proportionate share of expenses of management and to be drawn from the district treasury, for repairing the damage due to the extraordinary flood of the 7th of August.

List of Estimates and Drawings.

ESTIMATE.

1. Abstract of expenditure on Capital Account.
2. Detail with Plan No. 487.
3. Banker's work.
4. Breach Repairs, Abstract.
5. ,, ,, Detail, with Plans Nos. 489 to 494, 496, and 497.

From the Agent and Manager of the Madras Irrigation and Canal Company, to the Consulting Engineer for Madras Irrigation and Canal Company, dated Madras, 5th December 1870, No. 508.

IN reply to your letter of the 2nd instant, No. 263, I have the honour to state that in the 3rd paragraph of my No. 465, I referred to the various orders of the Government who have from time to time directed *repairs* to be charged to Revenue. I assume also that the Board of Directors were desirous of meeting the views of the Government when they directed me to debit to Revenue the repairs now under consideration.

2. I allude more especially to G. O., No. 1,429, of 1st May 1869, directing that the charge of Rupees 2,970 for repairs to the Soonkasala anicut should be debited to Revenue; to G. O. No. 2,230 of 16th September 1870, for repairing a leak in the upper bank of the 18th mile, a hundred yards below the Hindry aqueduct; to G. O., No. 2,517, of 21st October 1870, respecting repairs to the Soonkasala anicut.

Proceedings of the Madras Government, Public Works Department, 26th January 1871.

No. 459. From the Consulting Engineer for Irrigation and Canal Company, to the Secretary to Government, Public Works Department, dated Madras, 15th December 1870, No. 104.

REFERRING to Government Order, No. 2,376, 1st October 1870, which sanctioned the repair of the breaches caused by the floods of August last in anticipation of the completion of the estimates,

2 Letters from Agent in original.
6 Plans.
2 Estimates.

I have now the honour to submit two estimates for the repair of the 1st Section of the Main Canal, or from Soonkasala to the Hindry aqueduct at Kurnool, together with the Agent's letters as per margin, and explanatory drawings.

From Agent, No. 454, 27th October 1870.
,, ,, ,, 514, 13th December ,,

One estimate amounts to Rupees 7,140, and is for general repairs including special damage done by the flood; the second is a supplementary estimate amounting to Rupees 2,750, and is for repairing the breach at 9 miles 51 chains, which was omitted in the general estimate; total Rupees 9,890.

2. This amount the Company's officers propose shall be debited to Revenue similraly to the repair estimates for the 2nd Section which accompanied my letter to Government as per margin, and in which I fully reported on the proposal to debit these charges to Revenue.

No. 101, 8th December 1870.

3. It is only necessary for me to mention further that the breaches are being closed by substantial and well-formed banks with a layer of puddle on the inner slope which is protected by a covering of shingle as shown in the cross sections for each breach which are enclosed, and that the estimate may be divided as follows:—

	RS.	A.	P.
For the examination of the Soonkasala anicut	450	0	0
Repairs to head sluice apron noticed in paragraph 3 of my Inspection Report, G. O., No. 2,963, of 7th December 1870, drawings enclosed	1,100	0	0
Repair of breach at 5 miles 45 chains	1,594	13	4
Do. do. at 5 do. 53 do.	450	2	8
Do. to No. 10 culvert at 8 miles 51 chains	1,154	8	0
Do. breach at 9 do. 1 do.	880	9	2
Do. do. 9 do. 51 do.	2,497	2	0
Do. to stop sundry leaks and to various masonry works	867	1	4
Contingencies ... ... {642 13 6 / 252 14 0}	895	11	6
Total...	9,890	0	0

4. Regarding the proposed repair to the apron of the head sluice, the Chief Engineer remarks that the destruction of the old work is caused by the water passing through fissures in the rock under the head sluice when the river is high by which the concrete apron is blown up, and the remedy proposed is to form a

kind of water-cushion below the head sluice by running a wall two feet high across the canal between the masonry side walls, which it is hoped will have the further beneficial effect of preventing the rush of water from one or two open sluices setting against the side walls of the canal and undermining them.

5. I recommend the estimates for sanction.

From the Agent and Manager of the Madras Irrigation and Canal Company, to the Consulting Engineer for the Madras Irrigation and Canal Company, dated Madras, 27th October 1870, No. 454.

I HAVE the honour to forward for sanction the under-mentioned drawings and estimates for the repair of breaches in the 1st Section, with copy of the Chief Engineer's letter, No. 1,513, dated 20th October 1870 :—

Accompaniments.

1 Plan of apron below head sluices, Soonkasala.
1 Sheet cross sections of do., do.
1 Sheet plan and cross sections of breach in 1st Section.
1 Do. do. 5 miles 45 chains.
1 Do. do. 5 do. 53 do.
1 Do. do. 9 do. 1 do.
1 Estimate for repairs.
2 Lists of work remaining to be executed.

From the Chief Engineer, to the Agent and Manager of the Madras Irrigation and Canal Company, dated Kurnool, 20th October 1870, No. 1,513.

Repairs of 1st Section.

I HAVE the honour, in continuation of my previous application, No. 1,293, of 25th August last, to apply for Government sanction for Rupees 7,140 for repairing the 1st Section, including all damage done thereon by the floods of 7th August. The whole is now given in detail after a close scrutiny of the divisional engineers. I have the honour to refer to the sections of breaches previously sent, and to enclose other tracings of the proposed repairs. This supersedes the former estimate for 2nd Section.

2. In connection with the above I add a list of such ordinary repairs as I think the sanctioned gangs of bankers may complete, and which I have therefore *omitted* from the former list. This requires no sanction.

3. Also I append a list of work properly chargeable to capital, including the clearing of tow path, removal of some boulders, and other work recently pointed out by the Consulting Engineer during his inspection. I also include the proposed repairs of the apron to the head sluice, with two drawings for the Consulting Engineer's assent.

4. The apron seems to be destroyed by water which passes through cracks in the rocks or otherwise *under* the head sluice when the river is high, and blows up any concrete apron placed below the sluice so far that the rush of water catches the cracks and destroys the apron. The ground under the apron is not all rock. The rock is very discontinuous as will be remembered. Thus it was found that there was none to be reached on the site originally proposed for the head sluice itself. Under these circumstances, it seems to me that the best remedy will be to cushion the water slightly by running a low wall across the canal between the masonry side walls two feet high. The effect of this on the surface will hardly be visible when the water is three feet deep in the canal, and the increased height of the anicut given by the coping would more than

compensate for loss of head at lower levels. The present irregularities in the surface of the hard ground may be filled with concrete. The effect of this wall will be beneficial for another reason. When one sluice of a pair in the head sluices is open alone, the re-action of the side of the opening causes the stream to issue at a considerable angle with the normal to the sluices, and to play against the side walls of the canal; and when a pair is equally open, the same effect may be produced in slighter degree by the side set of the current above the head sluices. This will be rendered harmless, I hope, by a toe-wall.

(Sic.)

5. The above expenditure on capital account requires no sanction, being already sanctioned.

6. I hope to propose a modification of No. 1 calingulah from the original design. Surveys are now being prosecuted for lengthening and modifying the calingulahs in the 6th, 24th, 36th, and 59th miles, so as to adapt them for discharging a drainage of an inch of rain an hour on the basins they drain. I hope to submit the whole shortly for the consideration of Government.

7. The removal of silt in the first six miles is not included in the above estimates.

From the Agent and Manager of the Madras Irrigation and Canal Company, to the Consulting Engineer for the Madras Irrigation and Canal Company, dated Madras, 13th December 1870, No. 514.

Breach Repairs, 1st Section.

ADVERTING to your letter of the 18th ultimo, No. 248, I have the honour to forward copy of Chief Engineer's letter, No. 1,674, dated 6th December 1870, together with a corrected detail drawing and new supplemental estimate, amounting to Rupees 2,750.

From the Chief Engineer, to the Agent and Manager for the Madras Irrigation and Canal Company, dated Kurnool, 6th December 1870, No. 1,674.

I HAVE the honour to reply to your No. 900 of the 23rd ultimo, covering No. 248 of the Consulting Engineer.

2. There was no provision made in the *estimate* of repairs to breaches on 1st Section for the breach at 9 miles 51 chains, hence the confusion.

3. I now forward the correct detail drawing* and new supplemental estimate amounting to Rupees 2,750.

* No. 449.

No. 460. ORDER THEREON, 26th January 1871, No. 227.

IRRIGATION, No. 24.

WITH these letters the Consulting Engineer for the Madras Irrigation and Canal Company submits estimates of Rupees 9,890 and 47,600 respectively for making good the damages which the 1st and 2nd Sections of the canal sustained during the heavy rains of August last. The works are now in progress under the authority conveyed in G. O., No. 2,376, dated 1st October 1870. Two other estimates of Rupees 93 and 5,860 are also forwarded; the former for small repairs which are to be executed by the Conservancy Establishment in the 2nd Section, and the latter for certain new works remaining to be executed in that section, and the outlay on which will be debited to Capital. The Chief Engineer reports that the expenditure contemplated by these several

estimates will complete the works which are required to put the two sections of the canal into working order.

2. The Agent proposes that the outlay on the estimates of Rupees 47,600 and Rupees 9,890 should be debited to Revenue in accordance with what he assumes to be the rule, but His Excellency in Council concurs with Colonel Carpendale that the cost of repairs can only form a charge against that head when the canal or any section of it has been fully completed and tested.

3. His Excellency the Governor in Council sanctions the estimates of Rupees 47,600 and Rupees 9,890, but as they provide for carrying out either restorations or additions in sections of the canal which have not been reported complete or in a safe state for the admission of a full supply of water the outlay must be regarded as a charge to Capital.

4. The Consulting Engineer's proceeding as reported in paragraph 3 of his letter of the 8th December is approved.

(True Extract.)

Colonel, R.E.,

Secretary to Government.

To the Consulting Engineer for the Madras Irrigation and Canal Company.
„ Agent and Manager for do. do.

Exd. F. R. Bantleman.

Consulting Engineer's office
Irrigation & Canal Company
Madras, 8th Dec 1870.

No. 101.

From Colonel A. Carpendale R.E.
Consulting Engr for P.W.D.

To The Secretary to Government
Department of Pub. Works.

Sir,

Referring to Government Order No. 2376 - 1st October last directing that the breaches in the Madras Irrigation and Canal Company's Main Canal, which were caused by the floods of August should be closed in anticipation of the sanction of the estimates, I have now the honor to forward letters from the Agent and from the Chief Engineer as per

From Agent No. 505-1 Dec. 70.
" Ch. Engr. 23rd Nov. 70.

margin in transmitting estimates for repairing the breaches in the 2nd Section, and accompanied by explanatory drawings of the principal work Rs. The total amount of the estimates as corrected in this office is Rupees 47,600 of which the chief items are as follow.

1. Repair & Hindry Aqueduct and addition of a water cushion to receive the overflow as the Canal fills and for the better protection of the work — Drawing No. 490 ——— Rs. 4515-1-1
2. 17 miles 48 chains - Repair & breach of August 1870 - Drawing No. 489 and 496 ——— 7240-3-7
3. 6 miles 63 chains - Repairs & slip in the masonry revetment caused by the storm of Aug. 70 ——— 5696-4-8

17451-9-4

17,451-9-4

4. 18 miles - Raising old revetment 3½ feet above water level and the backing 6 feet - Rs: 2,590-2-5

5. 22 miles 70 chains - Repairs to Kadabagh Aqueduct - Drawing No. 497 Rs: 83-8- + 1,287-4- = 1,370-12-

6. 23 miles 27 chains - Repairs to breach of August 1870 - Drawings No. 491-2-3 — 16,748-1-7

7. 27 miles 67 chains - Repair to breach of Aug/70 - Drawing No. 494 — 3,124-6-8

8. Sundry repairs of slips and other damage — 1,982-3-8

43,267-3-8.

Contingencies - 10 per cent — 4314-12-4

47,582-"-"

Distribution.

Repairs to sluices — 18—"—"

Total Rupees 47,600-"—"

2. The Chief Engineer in his letter remarks that these estimates, together with one for some small repairs aggregating Rupees 900 which are to be executed by the Conservancy or Maintenance Establishment, and some other works estimated to cost Rupees 5860 and which are to be charged to the Capital account, comprise the whole of the work that is necessary to put the 2nd Section of the Main Canal into working order; and it will be observed that some of the work which he calls repair is really additions and improvements, as for instance, the greater part of the first item and the whole of the fourth item; - Moreover, on what principle he is asking us to raise the old revetment wall at the 18th mile to 3½ feet above the water level, while the other walls are not raised does not appear, and I cannot endorse his statement that these estimates provide all that is otherwise necessary for putting that portion of the Canal into a safe condition and in working order until the promised proposal for enlarging all culverts has been received. -

3. The Chief Engineer remarks "that on the "occurrence of the breaches the Conservancy "Staff of course became virtually inapplicable "In order not to mix conservancy with repairs - "almost beyond such as might be called conservancy, and to avoid confusion, the course taken "so far as I know was the following: All the "permanent staff including those previously "on the "Conservancy Staff" and such additional "Engineers and officers as were borne on the "Permanent Staff" were brought as rapidly as forms "admitted into the Permanent Staff"

Supposing the meaning of the above remarks to be, that when the Canal breached from the floods in August last the Chief Engineer amalgamated the Conservancy Establishment, which was sanctioned for the first twenty two miles of the Canal, with the Permanent Establishment that is paid from Capital, I have informed him that as the Conservancy

Conservancy Establishment was sanctioned for a specific purpose, all salaries and wages that are paid must continue to be debited Directly to Revenue, and that any such amalgamation of establishments is inadmissible.— G.O.No. 1391-4th June/70

4. In regard to the estimates referred to above and which amount to Rupees 47,600, the Agent proposed that the amount should be debited to Revenue in accordance as he said with the Government rules, and which, in reply to my enquiry as to what rules he referred to, he explains to be the practice that has hitherto been pursued in regard to repairs; in support of which he quotes the orders noted in the margin.— He has also furnished me with copy of a telegram from the Board of Directors in London as follows:

"Board regret accidents and desire you to submit to Government immediately estimates of repairs "the amount to be debited to Revenue":—

The two first mentioned Government Orders relate to repairs to the Coonnavala Anicut which having been completed all repairs would properly be debited to Revenue— The third Government Order sanctioned an expenditure of Rupees 58, to be charged to Revenue, being the amount of a bill of cost for stopping a leak in the Main Canal near the Aqueduct.— No.No.508-5th Despa Enclosed.— G.O.No. 1429-1st May/69. " " 2517-21st Oct./70. " " 2230-16th Sept/70.

I never considered that any length of the Main Canal had been completed, for it had never been tested or even had the full depth of water passed down it— nor am I aware that any length was ever considered completed by the Company, and so reported in view to its being formally passed, and if the large amount now asked for under the head of repairs is debitable to Revenue, the very important question arises of whence are the necessary funds to be obtained?

5. The Chief Engineer asks in his third paragraph that the amount may be advanced from the District Treasury as an advance on Revenue account, but on the subject of the provision of funds for repairs I find that the Contract and the supplementary Agreement are silent— The Contract of 3rd June 1863 paragraph 21 provides:— that when any portion of the Canal shall be completed and opened, the Company shall keep it in a state of good repair and in good working condition, and if they do not do so for six calendar months the Government shall have power to make the repairs, the expenses to be charged against the Company by setting off the amount of such expense against any monies then payable or which shall thereafter become payable by the Secretary of State to the Company; and if such expenses shall not be so satisfied, the difference shall be forthwith paid by the Company

& the Secretary of State in Council: and the 23rd paragraph of the Contract provides for the disposal of the Net receipts, that is, of the Revenue after de=ducting the cost of the repairs and maintenance; but it nowhere appears how those expenses are to be met, when, as is now the case, the current Revenue is inadequate to meet the cost of repairs and main=tenance.—

Clauses 5 and 9 of the Supplementary Agreement dated 2nd October 1866 similarly provide that the Revenue account shall be debited with the expenses of Management, and of repairs, restoration, and Maintenance, of works, other than such payments as may properly belong to the Capital account.—

I have the honor to be,
Sir,
Your most obedient servant,
H. Fulljames Coll R.E.
Engr for Br. Company.—

Ind: Mly B:

Enclosures.
2 Letters from Agent in orig.
6 Plans
2 Estimates

Consulting Engineer's office
Irrigation & Canal Company
Madras, 15th Dec 1870.

No. 104.

Dear,
Colonel C. Carpendale R.E.
Consulting for P.C.C.

To
The Secretary to Government
Public Works Department

Sir,

Referring to Government Order No. 2376 - 1st October 1870 which sanctioned the repair of the breaches caused by the floods of August last in anticipation of the completion of the estimates, I have now the honor to submit two estimates for the repairs of the 1st Section of the Main Canal, or from Soonkasala to the Hindry Aqueduct at Tirnool, together with the Agent's letters as per from Agent No. 454 - 27 Oct/70 margin and explanatory drawings. — 514 - 13 Dec/70

One estimate amounts to Rupees — 7,140 — and is for General repairs including special damage done by the flood.—

The second is a supplementary estimate amounting to Rs. 2,750 and is for repairing the breach at 9 miles 51 chains which was omitted in the General estimate.

Total Rupees 9,890

Rec. Office No. 101 1870 Department
from P.W. Govt for Summary
The Consulting for P.C.C.
To
The Secretary to Govt. P.W.D.

2 Encs
1

Dated 8th Dec/70.
Rec. 13th Dec/70.

Encs: 16.

Submits for consideration of Govt. Plans & Estimates received from the Agent for repairing the breaches in the 2nd Section amounting to Rs. 47,600.—

No. 458

No. 227 - 26 Jany/71.

22nd Decr 1870 R. 31st

this amount the Company's officers propose shall be debited to Revenue similarly to the repair estimates for the 2nd Section which accompanied my letter to Government as per margin, and in which I fully reported on the proposal to debit these charges to Revenue.—

No. 101-8th Dec/70.

It is only necessary for me to mention further that the breaches are being closed by substantial and well formed banks with a layer of puddle on the inner slope which is protected by a covering of shingle as shewn in the cross sections for each breach which are enclosed, and that the estimate may be divided as follows:—

For the examination of the Coonthaiala Aniout—Rupees		450-0-0
Repairs to Headsluice apron noticed in para: 3 of my inspection report G.O. No. 2963 of 7th December 1870—drawings enclosed		1,100-0-0
Repair of breach at 5 miles 45 chains		1,594-13-4
—do— do— 5— 53		450-2-8
—do— & No. 10 culvert at 8 miles 51 chains		1,154-8-0
—do— breach— 9— 1		880-9-2
—do— do— 9— 51		2,497-2-0
—do— to stop sundry leaks and to various masonry works		867-1-4
Contingencies	642-13-6 252-14-0	895-11-6
Total Rupees		9890-0-0

Regarding the proposed repair to the apron of the head sluices the Chief Engineer remarks that the destruction of the old work is caused by the water passing through fissures in the rock under the head sluices when the river is high by which the concrete apron is blown up, and the remedy proposed is to form a kind of water cushion below the head sluices by running a wall two feet high across the Canal between the masonry side walls, which it is hoped will have the further beneficial effect of preventing the rush of water from one or two open sluices setting against the side walls of the Canal and undermining them.

I recommend the estimates for sanction.—

I have the honor to be,
Sir,
Your most obedient servant,
H. Pedemore Colt R.E.
Consulting for the Company—

Ed. M. B.

No 227 Irrigation P.W.D. 16

Proceedings of the Madras Government.

Read the following

From.

The Cons. Engr. for Irrn. & C. Co. (M. E. Do. 101 of 8th Dec. 70)

Do Do (M. E. Do. 104 of 15th Dec. 70)

With these letters the Cons. Engineer for the Madras Irrigation and Canal Company submits estimates of Rs 9,890 and 47,600 respectively for making good the damages which the first and second sections of the Canal sustained during the heavy rains of August last. The works are now in progress under the authority conveyed in G. O. No. 2376 dated

P.W. Dept. Recd. 5th Jany. 1871

From The Cons. Engr. for Irrn. & C. Co. No. 514 dated 31st Dec. 1870

To The Secretary to Govt. P.W.D.

Read 5th } Jan. 1871
Desp. 19th }

Enclosure 10.

Submits for sanction plan & estimate for the repair of the breaches in the 1st Section Main Canal caused by the floods of August last with Chief Engr's letter dated 27th Dec. 1870

No. 227 dated 27th Dec. 1870

dated 1st October 1870. Two other estimates of Rs 98 and 5,860 are also for-warded; the former for small repairs which are to be executed by the Conservancy Establishment in the second section, and the latter for certain new works remaining to be executed in that section and the outlay on which will be debited to Capital. The Chief Engineer reports that the expen-diture contemplated by these several estimates will complete the works which are required to put the two sections of the Canal into working order.

The

The Agent proposed that the outlay on the estimates of Rs 47,600 and Rs 9,890 should be debited to Revenue in ac-cordance with what he assumed to be the rule but His Excellency in Council concurs with Col. Carpendale that the cost of repairs can only form a charge against that head when the Canal or any section of it has been fully completed and taked.

His Excellency the Governor in Council sanctions the estimates of Rs 47,600 and Rs 9,890 but as they provide for carrying out either resto-rations or additions in

in sections of the Canal which have not been reported complete or in a safe state for the admission of a full supply of water the outlay must be regarded as a charge to Capital.

The Consg Engineers proceeding as reported in para 3 of his letter of the 8th December is approved.

2/3

Lo.

The Consg Engr for the Rr. Dist of Cloncurry
Twenty six Enclosures
" Agent & Manager do do

Decr 30/1/71

C. 22 Wdeer 1870 R. 3125

Govt. of 1874 Madras.

PUBLIC WORKS.

To The Consulting Engineer for the Madras Irrigation & Canal Company

Dated

G. O. 26 Sept 74 No. 227.

Nos. 158-160

Cauvery Canal. The estimates of Rs: 9,890 and ~~₹7,000~~ for the repair of the damages sustained, by Rain, the heavy rains of August 1870 Feb, by the Madras Irrigation & Canal Co's Cauvery Canal, sanctioned with remarks.