

- (1) Number of pages _____
- (2) Date of repair _____
- (3) Initials of the Referencer _____

MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No.	1200	Press
B.P. No.		Mis.
447-448		
Dated	25. 4.	1843.

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
25th April 1873.*

No. 447. Read the following Endorsement of Lieutenant-Colonel J. MULLINS, R.E., Chief Engineer for Irrigation, dated Fort St. George, 18th March 1873, No. 89:—

From C. A. BADHAM, Esq., Acting Manager of the Madras Irrigation and Canal Company, to Lieutenant-Colonel J. MULLINS, R. E., Chief Engineer for Irrigation, dated Madras, 10th February 1873.

I HAVE the honour to hand you, by desire of the Chief Engineer, an estimate for the repairs of the lower section of the canal, amounting to Rupees 34,700, (chargeable to Revenue) as under:—

- 1 Detail estimate of cost of maintenance of canal for season 1873, etc.
- 1 Abstract do. do. do.
- 1 Statement showing cost of maintenance do.
- 1 Plan road bridge over Nulla Wunka.

Also a proposal for a modification of the staff of the same section involving a net increase upon the former sanction of Rupees 41.

A copy of the Chief Engineer's covering letter (No. 49 of 3rd instant) is enclosed.

From J. H. LATHAM, Esq., Chief Engineer, to C. A. BADHAM, Esq., Acting Manager, Madras Irrigation and Canal Company, dated Kurnool, 3rd February 1873, No. 49.

Lower Section—Maintenance.

I HAVE the honour to enclose estimates for maintenance of the lower sections of canal similar to those already forwarded* for submission to the Government for sanction.

* My No. 693 of 20th December 1872.

Staff.—This calls for no remark in addition to those already submitted for the upper sections, except that the amount and wide extent of ordinary irrigation in the lower sections seems to justify the increase of the allowance for Overseers to an equality with the upper sections.

I may here remark that it appears from the advertisements in the *Fort St. George Gazette* that the Government have difficulty in obtaining Overseers at Rupees 60 in Cuddapah District. Certainly I have; in fact, I only can get one, as the pay sheets show; I hope I may not lose him.

It is probable that I may shortly ask for sanction for a larger expenditure in office contingencies for conservancy, say, Rupees 400 a year, instead of Rupees 250, which proves insufficient. But I have not yet all the data necessary to decide me on this.

Works.—Rather heavy sums are included for flooring Peechepaud and another aqueduct. This shall be avoided if possible. The estimates have been somewhat delayed in order to get the sections of banks complete. It is satisfactory to find that nearly the whole are still above the sanctioned full height.

From the same Officer, dated Kurnool, 5th March 1873, No. 91.

Lower Section's Estimate of Repairs—Nulla Wunka, Kommaloor.

Your No. 114 of 28th ultimo. Chief Engineer for Irrigation, No. 124 of 18th ultimo.

I have the honour to note in the margin the correspondence about the Nulla Wunka, by Deputy Collector of Cuddapah, No. 147 of 24th November. which it appears that the Wunka is a stream draining nine square miles, dammed across by the canal bank. Up to last year the result was that the water of the stream was dammed up in the rains so as to flood the waste portion of its bed as no more. Last year arable land also was swamped.

2. Mr. Knorpp calculates that to make a drain sufficient to carry off all the water in an extraordinary flood of 100,000 N³ cubic yards an hour over N square miles of land, would cost Rupees 16,940* for the drain alone, and require

* See Extract appended.

100 yards breadth of good land; but that a flood of half this amount which we call "an ordinary flood," though really very unusual, might be disposed of in the manner proposed in the estimates submitted, by a 5-foot chain which would be crossed by a bridge, without swamping more than 50 acres of arable land, and that only for a short time. The land swamped is in hollow down which the Wunka used to flow, and which is a byewash of the Pennair in high floods; so that any attempt to drain it in extraordinary floods would prove illusory. The 5-foot chain seems therefore best; but I do not propose to follow Mr. Knorpp's suggestion and apply for the 500 acres which will be liable to be swamped, even with the 5-foot chain in action, because so heavy a flood would be required to swamp them as would probably have brought the river over them before the canal was made, and the revenue officers have strongly objected to the Company's possessing land merely because it is liable to be flooded once or twice in a century.

3. This drain will prevent the cutting up of the flood bank to a great extent, for that bank will probably be well turfed before the next extraordinary flood again swamps 500 acres. It will be executed by bankers. It and the bridge over it form a work partly intended to economize future maintenance, and partly to prevent land being flooded.

The flooring of the Peechapaud aqueduct in the 170th mile, entered at Rupees 4,596, if necessary—for Mr. Knorpp expresses a doubt—would be to replace the natural floor which had been considered hard enough to stand unprotected; for Mr. Dodson will examine the rock carefully before incurring any expense in flooring.

The entry "Yalloor bungalow channel" is a mistake; it should be omitted and the amount for Yalloor increased to Rupees 244-5-4. It refers to a channel of the Yalloor distribution which is led off near the bungalow.

The allowance for repairs and renewals of subsidiary channels includes all work to be done beyond the sanctioned channels of 1871. It must include the extension of field channels necessary to meet next year's demands, the masonry and other works necessary for channels made hastily for last year's field irrigation, and, in fact, it is proposed to spend all that is available of it in gradually perfecting a complete system of field irrigation. I am sure such an expenditure will very much promote demand, and hope that it will not much anticipate it; while, if a season of extraordinary demands should occur, extraordinary measures may of course be required beyond what this estimate can cover.

Extract of Mr. Knorpp's letter No. 430 of 10th December 1872.

The only way to get rid of the water of the Vajoo, etc., would be to deepen and widen the drain in the side pits west of stop bank; this will have to be about 65 chains long with an average cutting of 3' 6" deep. The earth being light alluvial soil would not stand more than a velocity of 3,670 yards per hour, or a velocity corresponding to a fall of 2 feet per mile an hydraulic mean depth of 3 feet $v = 1,500$ vly. g. p. h.

The width of this channel would have to be over 100 yards mean width to discharge 432,800 cubic yards per hour, the maximum drainage of nine square miles ($2 \times 50,000$ N³).

This would require 169,400 cubic yards of excavation, and cost Rupees 16,940 at 10 cubic yards per rupee. In addition to this an expensive bridge over the channel would have to be made for the road from Tail lock to Kommaloor, and the foundations would have to be taken deep into the ground. Under these circumstances, I would recommend that the ground swamped this year should be handed over to the Company as Class A land, and only a small drain be cut, say 5 feet average width and 18 inches deep which would be sufficient to drain off all the water above last year's level in two or three days. A small bridge of 10 feet span would still be required for the Kommaloor road.

From C. A. BADHAM, Esq., Acting Manager of the Madras Irrigation and Canal Company, to Lieutenant-Colonel J. MULLINS, R. E., Chief Engineer for Irrigation, dated Madras, 13th March 1873, No. 55.

In continuation of my letter No. 38 of the 24th ultimo, and with further reference to your letter No. 124 of 18th February 1873, requesting explanation of certain items on the estimate for the maintenance of the lower section of the canal, I have the honour to annex copy of letter from the Chief Engineer affording the necessary information.

1 Plan.
3 Estimates.
1 List of Staff.

SUBMITTED to Government.

2. The estimates include emergent expenditure incurred in 1872 and the anticipated outlay in 1873-74.

3. A great many of the items both of the emergent and intended expenditure are not properly chargeable to Revenue, they being entirely for New Works.

11th page.

Turning to the detailed estimate it will be seen that—

	RS.	A.	P.
126 Cubic yards of subsidiary channel at Noonapillay	...	9	0 0
15 " of kunkur	...	7	8 0
293 " sub-channel, Bolaram	...	20	14 0
176 " Canala channel	...	12	9 2
513 " Bundy Atmakur	...	36	10 3

are all for new work, while many other items in the total of 385-10-4 are apparently not repairs or renewals. Similarly, on page 13, Rupees 100 are entered for a new hut for lock lascars; on page 14 Rupees 131-4-0 for Govindapully channel, and Rupees 75-6-8 for Sirwell channel, and further on numerous similar items properly chargeable to Capital, under the head of Distribution works, are entered in this estimate. With few exceptions the items from page 11 to page 19 are all new works.

4. Pages 24 and 25 contain the following items of flooring to culverts and an aqueduct, which are additions chargeable to Capital:—

	RS.	A.	P.
163rd mile, culvert	...	598	2 8
166th " "	...	1,586	4 0
170th " aqueduct	...	4,596	0 0

Writing of the latter the Chief Engineer says that if necessary (that is after the water has been got rid of) it would be

No. 91, 5th March.

"to replace the natural floor which had been considered hard enough to stand unprotected." In other words there was no flooring originally, and one is supposed now to be necessary. It is an addition, therefore, to the original cost of the aqueduct.

5. In the last reach of the 9th Section, main channel, a drainage, the Nulla Wunka, was stopped by the canal, and it is found necessary to provide means

Page 36.

for getting rid of the water which accumulates and submerges cultivated lands. A channel is to be cut parallel to the west bank of the canal, and this will be carried out by the bankers; over this channel a bridge is required to carry the road crossing the canal at the Tail lock. The bridge is estimated to cost Rupees 610, and it is clearly a Capital charge.

*Proceedings of the Madras Government, Public Works Department,
25th April 1873.*

6. The last work item in the estimate is entered as repairs and renewal of subsidiary channels for 80,589 acres at 2 Annas, Rupees 10,073-10-0. The Chief Engineer explains that this item "includes all work to be done beyond the sanctioned channels of 1871. It must include the extension of field channels necessary to meet next year's demands, the masonry and other works necessary for channels made hastily to meet last year's field irrigation." All no doubt very necessary, but not a Revenue charge.

7. Subjoined is an abstract of the charges debitable to Capital and Revenue respectively, and it is recommended that sanction be given accordingly.

Capital.	RS.	A.	P.	RS.
Main supply	7,520	6	8	
Distribution	15,869	13	7	
5 per cent. contingencies ...	1,169	7	4	
Revenue	9,657	7	5	24,559 11 7 say 24,560
5 per cent. contingencies ...	482	13	0	
	10,140	4	5	10,140
Total ...	34,700	0	0	34,700

A memorandum showing the details of the above abstract will be furnished to the Acting Manager.

8. The estimate, Rupees 3,113, for conservancy staff differs but slightly from that already sanctioned and may be passed.

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

No. 448.

ORDER THEREON, 25th April 1873, No. 1,200.

IRRIGATION, No. 25.

THE Right Honourable the Governor in Council sanctions the estimates for expenditure upon the lower sections of the Madras Irrigation and Canal Company's Canal as revised under the heads of Capital and Revenue by the Chief Engineer for Irrigation; and the Government hope that, for the future, estimates will be prepared with due regard to the proper heads of charge. The estimate Rupees 3,113 for conservancy staff is also sanctioned.

(True Extract.)

(Signed) J. MULLINS, Lieut.-Colonel, R. E.,
Joint Secretary to Government.

To the Chief Engineer for Irrigation.

Manager of the Madras Irrigation and Canal Company.

Erd. E. C. Shunker.

M. I. & C. A.
Marra 10th Feb 1873.

From.

The Acting Manager.

To.

The Chief Engineer for Irrigation
and Joint Secy to Government
Madras.

Sir,

I have the honor to have you by
desire of the Chief Engineer an estimate for the
repairs of the lower section of the Canal amounting to Rs. 34,700 (chargeable to Revenue) under
1 Detail Estimate of cost of maintenance of canal
for season 1873-74.
1 Abstract Estimate of cost
1 Statement showing cost of maintenance
1 Plan Road Bridge over Nalla Wanka.

Also a proposal for a modification of the
Staff of the same section involving a net increase
upon the former sanction of Rs. 41.

A copy of the Chief Engineer's covering
letter (dated 9th instant) is enclosed.

I have the honor to be
Your most Obedt. Servant.

[Signature]

Sdg. Manager.

H. J. & Co.
 Chief Supt. Office
 Amnool 3rd Feb 1873
 C. R. Padham Esq.
 Acting Manager

Sir

Lower Section Maintenance

I have the honor to enclose estimates for maintenance of the Lower section of Canal similar to those already forwarded for submission to the Government for sanction.

*
My No 698 of
20th Dec/72

Staff. This calls for no remark in addition to those already submitted for the upper sections, except that the amount & wide extent of ordinary irrigation in the Lower section seems to justify the increase of the allowance for overseers to an equality with the upper section.

I may here remark that it appears from the advertisements in the Fort St George Gazette that the Govt. have difficulty in obtaining overseers at Rs 60 in Cuddapah District. Certainly I have, in fact, only one as the pay sheets show. I hope I may not lose him.

It is probable that I may shortly ask for sanction for a larger expenditure in Office Contingencies for Conservancy. Say Rs 400 a year instead of Rs 250. which proves insufficient. But I have not yet all the data necessary to decide me on this.

W. R. K.

No 26
 C. R. Padham
 The Chief Engineer
 to the Acting Manager

To the Manager 21st Dec 1872

Dated 11th Dec 1872
 Received 11th Dec 1872

Rs 19 1/8
 Rs 25 1/2
 5th Dec 1872

Forwarded Estimate for the Upper
 & Lower section together with
 a proposal for irrigation
 to the Chief.

Works. Rather heavy rains are much desired for flooring
Pachepand and another Aqueduct. This shall be avoided
if possible. The Estimates have been somewhat delayed in
order to get the sections of banks complete. It is satisfactory
to find that nearly the whole are still above the sanctioned
full height.

I have the honor to
Sign of J. H. Latham
Chief Engineer

2. 24. 1978/48
14. 25. April 1973
44

Madras Eng. Canal Co.
Madras 13 March 1873.

No 55

From

The Acting Manager
M. J. & C. Co.

To

The Chief Engineer
In Irrigation and
Smt Secty to Govt.

Sir

In continuation of my letter No 38 of the 24 ulto
and with further reference to your letter No 124 of
18 February 1873, requesting explanation of certain
items in the Estimate for the maintenance of the lower
section of the Canal. I have the honor to annex
copy of letter from the Chief Engineer affording
the necessary information.

5. Enclosures

1. Plan
3. Estimates
1. List of Staff

I have the honor to be
Sir
Yours respectfully,
J. H. Latham

J. H. Latham
Acting Manager

Madras Eng. and Canal Co
 Chief Engineer's Office
 Kumbur 5 March/73

1891

C. F. Barham Esq
 Acting Manager
 Madras

Sir
 Lower Section's Estimate of Repairs
 Kulla Winka, Kottam
 Item No 114 of 28' altimo
 Chief Eng. for Engr. No 124 of 18 ulto.

I have the honor to note in the margin the correspondence about the Kulla Winka by which it appears that the Winka is a stream draining 9 square miles, dammed across by the Canal Bank. Up to last year the stream was dammed up in the rains so as to flood the waste portion of its bed as no more. Last year arable land also was swamped. Mr. Knapp calculates that to make a drain sufficient to carry off all the water in an extraordinary flood of 100,000 ft^3 cubic yards an hour over 2 square miles of land, would cost Rs 16940 for the dam alone & require 100 yards breadth of good land but that a flood of half this amount which we call "an ordinary flood" tho' really very unusual, might be disposed of in the manner proposed in the estimates submitted, by a 5 foot chain which would be crossed by a bridge, without swamping more than 50 acres of arable land, and that only for a short time. The land swamped is in hollow down which the Winka used to flow, and which is a bye wash of the Pennar in high floods, so that any attempt to drain it in extraordinary floods would prove illusory. The 5 foot chain

By Collect. of
 Cuddalore No 147
 of 24 Nov.
 Mr. Knapp's No 432
 of 10 Dec.
 by letter of 16 idem.
 Mr. Knapp's No 445
 of 17 idem

See Extract
 appended.

It must also be
 charged with the
 facilities in the
 water reference to
 the canal in the
 estimate for the
 the canal.

to the Chief Engr
 for Engr
 S. M. 19/8/93
 dated 13 March
 second 14 March
 Rs. 25 April 1893
 6 months 447

seems therefore best: but I do not propose to follow Mr. Knopp's suggestion and apply for the 500 acres which will be liable to be swamped, even with the 5 foot drain in action, because so heavy a flood would be required to swamp them as would probably have brought the piers over them before the Canal was made; and the Revenue officers have strongly objected to the Company's possessing land merely because it is liable to be flooded once or twice in a century.

This drain will prevent the cutting up of the flood bank to a great extent, for that bank will probably be well turfed before the next extraordinary flood again swamps 500 acres.

It will be executed by bankers. It and the bridge over it form a work partly intended to economise future maintenance and partly to prevent land being flooded.

The flooring of the Puchapad Aqueduct in the 170 will entice it No 2,596, if necessary - for Mr. Knopp expresses a doubt - would be to replace the natural floor which has been considered hard enough to stand unprotected. For Mr. Dodson will examine the rock carefully before incurring any expense in flooring.

The entry "Yaloor Bungalow Channel" is a mistake. it should be omitted and the amount for Yaloor increased to Rs 244.5.2. It refers to a Channel of the Yaloor distribution which is led off near the Bungalow.

The allowance for repairs and renewals of subsidiary channels includes all work to be done beyond the sanctioned Channels of 1871. It must include the extension of field channels necessary to meet next year's demands, the masonry and other works necessary for channels made hastily for last year's field irrigation: and in fact, it is proposed to spend all that is available of it in gradually perfecting and complete system of field irrigation. I am sure such an expenditure will

will very much promote demand, and hope that it will not much anticipate it. While if a season of extraordinary demands should occur, extraordinary measures would of course be required beyond what this estimate can cover.

I have the honor to be
Sd/- J. H. Latham
Chief Engr.

Extract of Mr. Knopp's letter No 230 of 10 Dec 1872

The only way to get rid of the water of the vajas would be to deepen and widen the drain in the side pits west of slope bank; this will have to be about 65 chains long with an average cutting of 3' 6" deep. The earth being light alluvial soil would not stand more than a velocity of 3670 yards per hour or a velocity corresponding to a fall of 2 feet per mile an hydraulic mean depth of 3 feet ($v = 1550 \text{ vly g.p.h.}$).

The width of this Channel would have to be over 100 yards mean width to discharge 432,800 Cubic Yards per hour the maximum drainage of 9 square miles is $(2 \times 50000 \text{ ft}^2)$.

This would require 169400 Cubic Yards of excavation and cost Rs 16940 @ 10 Cyp per Cyp. In addition to this an expensive bridge over the Channel would have to be made for the road from Sail Dock to Commaloor and the foundations would have to be taken deep into the ground. Under these circumstances I would recommend that the ground swamped this year should be handed over to the Company as Class A land and only a small drain be cut say 5 feet average width and 18 inches deep which would be sufficient to drain off all the water above last year's level in two or three days. A small bridge of 10 feet span would still be required for the

Sgt C. B. Prosser
Conservancy Engineer

Hands copy of Chief Engineer's letter offering information with reference to certain items in the estimate for the thinning of the lower portion of the Canal.

L. K. 1978/43
 14.25 April / 3 13 1/2
 5. Eubarna 44

Feb 13 March 1873
Received 14/11

Mr. Gust. Engman
Care of my father
11 Oct 73

The As. Magni
W. J. & C. C.

Enclosures. 9.

Submitted to Government.

2 The estimates include emergent expenditure incurred in 1872 and the anticipated outlay in 1873-74.

3. A great many of the items both of the emergent and intended expenditure are not properly chargeable to Revenue, they being entirely for new works. Turning to the Detailed Estimate it will be seen that,-

126	Cy ^{rs} of Subsidiary Channel	
	at Noonapillyay	9-0-0
15	" " Hunkur	7-8-0
293	Sub Channel Bolaram	20-14-0
176	" do: Canala Channel	12-9-2
513	" do: Bundy Atmakur	36-10-3

are all for new work, while many other items in the total of 385-10-4 are apparently not repairs or renewals. Similarly, on page 13, Rupees 100 are entered for a new hut for Lock Lixcars, on page 14 Rupees 131-4-0 for Govindapully Channel, and Rupees 75-6-8 for

[Handwritten signature]

for Sirwell Channel and further on numerous similar items properly chargeable to Capital, under the head of Distribution works, are entered in this estimate. With few exceptions the items from page 11 to page 19 are all new works.

4 Pages 24 and 25 contain the following items of flooring to culverts and an Aqueduct, which are additions chargeable to Capital.

^{mile} 163 Culvert	598-2-8
166 — do	1586-4-0
170 Aqueduct	4596-—

Writing of the latter the Chief Engineer says that if necessary (that is after the water has been got rid of) it would be to replace the natural floor which had been considered hard enough to stand unprotected.

In other words there was no flooring originally, and one is supposed now to be necessary. It is an addition therefore to the original cost of the Aqueduct.

No. 91.
5th March.

Page 36.

5 In the last reach of the 9th Section main Channel, a drainage, the Nulla Wunka, was stopped by the Canal, and it is found necessary to provide means for getting rid of the water which accumulates and submerges cultivated lands. A Channel is to be cut parallel to the west bank of the Canal and this will be carried out by the Bankers: over this Channel a bridge is required to carry the road crossing the canal at the Tail Lock. The bridge is estimated to cost Rupees 640, and it is clearly a capital charge.

6 The last work item in the estimate is entered as Repairs and renewal of Subsidiary Channels for 80,589 acres at 2 Annas - Rupees 10073-10-0. The Chief Engineer explains that this item includes all work to be done beyond the sanctioned Channels of 1871. It must include the extension of field channels necessary to meet next year's demands.

demands, the masonry and other works necessary for channels made hastily to meet last year's field irrigation." All no doubt very necessary, but not a Revenue charge.

7. Subjoined is an abstract of the charges debitable to Capital and Revenue respectively, and it is recommended that sanction be given accordingly.

Capital

Main Supply ——— Rs. 7520-6-8

Distribution ——— " - 15869-13-7

5 per Cent Contingencies 1169-7-4

24,559-11-7, say 24,560

Revenue ——— Rs. 9657-7-5

5 per Cent Contingencies - 482-13-0

10,140-4-5 " 10,140

Total Rupees - 34,700- " - " 34,700

A memorandum showing the details of the above abstract will be furnished to the Acting Manager.

8. The estimate Rupees 3,113 for conservancy staff differs but slightly from

from that already sanctioned and may be passed.

Fort Saint George

18th March 1873

Colonial Engineer

Chief Engineer for Irrigation

To

The Secretary to Government
Public Works Department.

W.S.P.

62204/73 Q.8.

Sto 447

Submits for orders
certain papers from the
acting manager Messrs.
Hamil & Co. in connection
with the condensation
maintenance of the
canal for season
1893.

Dated 18th
June 24th }
Received 25th } March
1893.

Public Works 1873, No. 10
of 100th March
from
the Chief Engineer for
Irrigation
to the Secretary & Joint
Superintendent Works

Cor
P

From

The Chief Engineer
for Irrigation

N. 1200 P. H. D.

Proceedings of the Madras Govt.

Read the following:

(H. E. Dec 89 / 18th Mar 1900)

M

The Right Honble
the Governor in Council
sanctions the estimates
for expenditure upon
the Lower Sections of
the Madras Irrigation
and Canal Company
Canal as revised un-
der the heads of Capital
and Revenue by the
Chief

22/11/73

Chief Engineer for Irrigation, and the Government. I much hope that for the future, estimates will be prepared with due regard to the proper heads of charge. It is so apparent that many of the items in the maintenance estimate, as prepared by the Chief Engineer of the Company, are for entirely new work, that His Excellency in Council is at a loss to understand how they could ever have found a place in a repair estimate. The estimate Rupees 3,113 for

I do not think this is sufficiently commented on by the letter of the Chief Engineer for Irrigation.

Conservancy Staff is also sanctioned.

22/3/73

G.M.W.

To the Chief Eng^r for Irrigation, State & Indus^{try} Co. Ltd. Company

25
2nd May 1873. 3

Ch 1970

Cont. of 1873

PUBLIC WORKS.

Is the Chief Eng for
Irrigation

Is

Recd.

Encl. 4

G. O. 25 April 1873, No. 1200

Recd. 447 & 448

Mr. D. S. R. Co. Retimates
for
Expenditure upon the
lower sections of the 70's
canal and for conservancy
staff, sanctioned
with remarks.