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MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No.	1477	Press
		Mis.
529-530		
Dated	31-5-	1871.

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
31st May 1871.*

No. 529. Read the following letter from the Chief Engineer for Irrigation, to the Secretary to Government, Public Works Department, dated Madras, 9th May 1871, No. 21 :—

I HAVE the honour to submit the plans and estimates noted in the margin for

From Agent, No. 188, 26th April 1871.

13 Sheets Cross Sections.

2 General Plans.

1 Sketch Map, 3rd and 4th Ranges.

1 General Abstract Estimate.

2 Tabular Statements.

1 Abstract Estimate.

1 Detailed do.

1 Do. do. of quantities of earthwork.

the distribution works of the 3rd and 4th Ranges of the 8th Section of the Madras Irrigation and Canal Company's project, received with the Agent and Manager's letter No. 188, dated 26th ultimo.

2. The tract of country to be irrigated by these channels lies on both sides of the Main Canal at its 115th to 120th mile. The total area to be watered being 20,000 acres, of which 8,000 are on the west of the canal in the neighbourhood of the village of Sirwell, and 12,000 on the east, between the canal and the drainage which runs past the villages of Gospad and Ramadoor.

3. The proposed works consist of three principal branches with an aggregate length of $13\frac{1}{2}$ miles, and ten minor branches about $19\frac{1}{2}$ miles long. The masonry works are—

3 Head sluices.

29 Culverts.

54 Drop calingulahs or falls.

2 Aqueducts.

2 Waste weirs.

4. Two of the principal branches, together 6 miles long, and two of the minor branches are carried along a sloping contour across the general fall of the country with a moderate declivity, but greater part of the water will, according to the plan submitted, be carried along the spines between the minor drainages. I think it would have been better, with a view to economy of water and to the convenience of the cultivators, to have laid out the channels, as far as possible, on contour lines sloping back from the Main Canal. The cost of the surplus weirs, which in the plan recommended would be required where drainages are crossed, would, I think, not exceed the cost of the drops and embanking required in the other plans, so that probably the first cost of the works would be the same for either plan.)

5. For about two-thirds of their aggregate length the channels are designed with a fall of upwards of 6 feet per mile, and the quantities of water entered in the statements will flow through these parts of the channels with a velocity of from 4,000 to 6,000 yards per hour.

If, as I believe is the fact, the ground through which these channels are to be taken is composed of black cotton soil, this velocity is far too high, and it will be necessary to build more drops or falls than the estimates provide for, and make the channels much more capacious.

6. At many points, and for considerable lengths, the water is to be carried above ground, at some places as much as $1\frac{1}{2}$ and even 2 feet, between banks only 2 to 3 feet thick at top, raised only 9 to 15 inches above the water surface. I am of

*Proceedings of the Madras Government, Public Works Department,
31st May 1871.*

opinion that these banks should not be less than 6 feet thick at top and at least 2 feet above the water level.

7. The drop calingulabs or falls, as designed, would be very slight and weak; the foundations of the front wings should be carried down deeper; the drop wall should be thicker, and stone apron and pitching to bed and sides of channel below should be provided.

8. These drops are designed with their crests flush with bed of channel and with a length of overfall equal to the mean width of channel, the stream would, therefore, arrive at a drop with greatly accelerated velocity and pass over in a shoot. The crest of the drop wall should be raised above the level of channel bed to such a height that the velocity of the approaching stream should be kept at its normal rate.

9. The ends of channels are left *en l'air* and without any provision for the disposal of the surplus water, so that it would flow at will over the country; each channel should close upon a drainage by a surplus weir and cut.

10. The estimated cost of the masonry works, especially of drops and aqueducts, appears to me to be altogether inadequate for the construction of substantial works of suitable design.

11. The amount of the estimates submitted is Rupees 22,300, besides 6 Annas per acre for minor village channels. I have above stated in what respect I consider the estimates inadequate, and I do not think the cost of the works of suitable design and substantially constructed can be estimated at less than 32,000 Rupees, besides the village channels.

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, 26th April 1871, No. 188.

I HAVE the honour to forward herewith copy of Mr. Browning's letter, No. 194, dated 25th March 1871, together with the Acting Chief Engineer's endorsement, No. 511, of 18th instant, and to solicit the sanction of Government for an expenditure of Rupees 29,800 for the 3rd and 4th Ranges of distribution.

2. The following plans and estimates accompany this letter, namely:—

Drawings.

- 13 Sheets Cross Sections.
- 2 Do. General Plan.
- 1 Sketch Map, 3rd and 4th Ranges.

Estimates.

- 1 General Abstract Estimate.
- 2 Tabular Statements.
- 1 Abstract Estimate.
- 1 Detailed do.
- 1 Do. do. of quantities of earthwork.

From the Executive Engineer, to the Chief Engineer, Irrigation and Canal Company, Kurnool, dated Nundial, 25th March 1871, No. 194.

I HAVE the honour to forward herewith plans, sections, estimates, etc., (according to the sub-joined list,) for the 3rd and 4th Ranges of distribution.

2. One is described as the Yalloor scheme and commands 12,000 acres of land on the west side of the Main Canal, opposite Lock No. 1.

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31st May 1871.*

3. The other is described as the Sirwell scheme and commands 8,000 in the east side of canal.

4. They are both in the Yalloor sub-division, and together will require 40,000 cubic yards of water to be taken off from the Main Canal just above Lock No. 1.

5. What is now submitted completes the schemes for distribution from Jootoor to Rajolly.

6. The accompanying sketch map shows the general position of the irrigation, which, for convenience, I have divided into five ranges, together they dispose of the whole available supply of water to be admitted into the canal at Jootoor as follows:—

	Acres commanded.
1st. Range—Sanctioned in G. O., No. 2,939, of 5th December 1870 ...	9,300
2nd. do. Forwarded with my letter No. 180, of 15th instant...	10,000
3rd do. Now submitted ...	12,000
4th do. Now submitted ...	8,000
5th do. Sanctioned in G. O., No. 2,981, of 8th December 1870 ...	11,737
Total...	51,737

or 1,000 acres beyond what the water to be admitted, namely, 100,000 cubic yards per hour, will irrigate.

7. The average cost per acre of the works in the 3rd Range, including contingencies, and 6 Annas per acre for subsidiary channels, is Rupees 1-6-8 per acre commanded.

8. On the 4th Range the cost is Rupees 1-9-7 per acre commanded.

9. All of the road, drains, culverts, etc., are estimated as masonry-in-chunam in accordance with G. O., No. 2,981, of 8th December last.

10. The designs adopted throughout are the same as those proposed for the 2nd Range, and the works are designed capable of discharging the quantity of water required by G. O., No. 2,256, of 19th September 1870.

11. The table of discharges forwarded with Range No. 2 has been followed.

List of Enclosures.

- 1 Sketch Map.
- 1 General Plan, Sirwell scheme.
- 1 Do. do. Yalloor. do.

Sections of the following channels.

Govindupully	} Sirwell.
Cotapaud	
Sirwell	
Yerragoontla	
Wonkindinny	} Yalloor.
Jillala channel	
Gospad	
Pessarpaud	
Ramadoor	
Yalloor	
Wentyvillagalu	
Kistapoor	
Goondapapal	
2 Tabular Statements.	
2 Estimates.	
1 Detail of the Earthwork Estimate.	

No. 511.

Copy forwarded to the Agent and Manager with a request that sanction may be obtained.

KURNOOL,
18th April 1871.

(Signed) G. GORDON,
Acting Chief Engineer.

Proceedings of the Madras Government, Public Works Department,
31st May 1871.

No. 530.

ORDER THEREON, 31st May 1871, No. 1,477.

IRRIGATION, No. 31.

THE Government sanction the estimates submitted with this letter, amounting to Rupees 29,800, for the distribution

works of the 3rd and 4th Ranges of the 8th Section of the Madras Irrigation and Canal Company's Canal.

2. The attention of the Company's officers will be directed to paragraphs 5, 7, and 8 of the letter from the Chief Engineer for Irrigation in whose opinion as therein expressed the Government concur, and direct that the dimensions of the channels shall be re-arranged so as to reduce the velocity (which as the channels are now arranged would vary from 4,000 to 6,000 yards an hour) to from 1,760 to 2,000 yards an hour. The masonry falls or drop calingulahs should be more massive and have their crests raised as proposed by Major Ryves, the rough-stone apron and protective covering to the sides of the channels adjoining the masonry falls being added. Similar improvements as regards the falls, aprons, and pitching, should be made in the other distribution projects where they may appear necessary, and supplemental estimates for any additional expenditure that will be entailed should be submitted for sanction.

3. The Chief Engineer for Irrigation will communicate with the Company's officers on the point brought to notice in the 9th paragraph of his letter, and if no satisfactory explanation regarding the disposal of the surplus water is forthcoming, the arrangement proposed by Major Ryves should be adopted.

(True Extract.)

Colonel, R.E.,

Secretary to Government.

To the Acting Chief Engineer for Irrigation.

.. Agent and Manager of the Madras Irrigation and Canal Company.

Erd. S. T. Augustin.

Office of Chief Engineer for Irrigation
Madras, 9th May 1871.

No. 21.
The Chief Engineer for Irrigation
The Secretary to Government
Public Works Department

Have the honor to submit the plans
from G. E. M. N. 1882 dated 26th ult. and estimates noted in the margin for the distribution
works of the 3rd and 4th Ranges of the
8th Section of the Madras Irrigation and Canal
Company's Project received with the Agent and
Manager's letter N. 188 dated 26th ult. and
quantities of earthwork.

2. The tract of country to be irrigated by
these channels lies on both sides of the Main Canal
at its 115th to 120th mile. The total area to be
watered being 20,000 acres of which 8,000 are on
the west of the Canal in the neighbourhood of the
village of Sivwill and 12,000 on the east between
the Canal and the drainage which runs past the
villages of Coprad and Ramadoor.

3. The proposed works consist of three principal
branches with an aggregate length of 132 miles
and 14 minor branches about 145 miles long.

The masonry works are:

- 3 Headlances
- 29 Culverts
- 54 Drop culverts or falls
- 2 Aqueducts
- 2 Waste weirs.

4. Two of the principal branches & other 6 miles long and two of the minor branches are carried along a sloping contour across the general fall of the country with a moderate declivity but greater part of the water will according to the plan submitted be carried along the spines between the minor drains. I think it would have been better with a view to economy of water and to the convenience of the cultivators to have laid out the channels as far as possible on contour lines sloping back from the Main Canal. The cost of the surplus weirs which in the plan recommended would be required where drains are crossed would I think not exceed the cost of the drops and embankment required in the other plans so that probably the first cost of the works would be the same for either plan.

5. For about two thirds of their aggregate length the channels are designed with a fall of upwards of 6 feet per mile, and the quantities of water indicated in the statements will flow through these parts of the channels with a velocity of from 4,000 to 6,000 yards per hour. — As I believe is the fact the ground through which these channels are to be taken is composed of black cotton soil & this velocity is far too high and

and it will be necessary to build more drops or falls than the estimates provide for and make the channels much more capacious.

6. At many points and for considerable lengths the water is to be carried above ground, at some places as much as $1\frac{1}{2}$ and even 2 feet, between banks only 2 to 3 feet thick at top raised only 9 to 15 inches above the water surface. I am of opinion that these banks should not be less than 6 feet thick at top and at least 2 feet above the water level.

7. The drop culverts or falls as designed would be very slight and weak. The foundations of the front wings should be carried down deeper, the drop wall should be thicker, and stone apron and pitching to bed and sides of channel below should be provided.

8. These drops are designed with their crest flush with bed of channel and with a length of overfall equal to the mean width of channel, the stream would therefore arrive at a drop with greatly accelerated velocity and pass over in a chaut. The crest of the drop wall should be raised above the level of channel bed to such a height that the velocity of the approaching stream should be kept at its normal rate.

9. The ends of channels are left unbar and without any provision for the disposal of the surplus water.

water, so that it would flow at will over the country - such channel should close upon a drainage by a surplus over and out.

10. The estimates cost of the masonry works especially of drops and aqueducts appears to me & be altogether inadequate for the construction of substantial works of suitable design.

11. The amount of the estimates submitted is Rupees 22300 besides Gamias per acre for minor village channels. I have above stated in what respect I consider the estimates inadequate, and I do not think the cost of the works of suitable design and substantially constructed can be estimated at less than 32000 Rupees besides the village channels.

Have the honor to be,
 Sir
 Your most obedient servant
 J. R. R. Esq. C. E.
 Chief Engineer for Irrigation

C. M. B.

No 1477 P. O. D.

7

Proceedings of the Madras Government
Read the following

From

The Chief Engineer for Irrigation } (H. E. Dec. 21 & 9 May/71)

The Government

sanction the estimates submitted with this letter amounting to Rs 29,800 for the distribution works of the 3rd and 4th Ranges of the 8th section of the Madras Irrigation and Canal Company's Canal.

The attention of the Company's officers will be directed to paras 5, 7 and 8, of the letter from the Chief Engineer for Irrigation in

104/1871 Dept
of Irrigation
From

The Chief Engineer for Irrigation
To
The Secretary to Government
M.O.

Dated 9 May 1871.
No. 12

Enc. 23.

Submits with these plans & estimates from the Agent for the distribution works of the 3rd & 4th Range of the 8th section of the Madras Canal.

No 1477-31 May/71.

C/529

618 May/71 O. 222

C. M. B.

in whose opinion ^{as} therein
expressed the Government
concur and direct that
the dimensions of the
channels shall be re-arranged
so as to reduce the velocity (which as the channels are now
arranged ^{would vary from 4000 to 6000 yards an hour}
of discharge to from 1760
to 2000 yards an hour - in
the masonry falls or drops
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more massive and have
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proposed by Major Pyres,
the rough stone apron and
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should be made in the
other Distribution projects
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-mental estimates for
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-diture that will be
entailed should be
submitted for sanction.

The Chief Engineer
for Irrigation will com-
-municate with the
Company's officers on
the point brought to
notice in the 9th para of
his letter and if no satis-
-factory explanation
regarding the disposal
of the surplus water is
forthcoming, the arrange-
-ment proposed by Major
Pyres should be adopted.

L.
The Chief Engr. for Irr. with 23 encls.
Asst. Manager D. & Co.
Recd 1/6/71

17 May

1871
Govt of (1871) Madras.

PUBLIC WORKS.

To The Assty Engr for
Irrigation

Dated

Recd.

Encl.

G. O. 31st May 1871, No. 1477-

Nos. 529430

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