

(1) Number of pages 26(2) Date of repair 15-5-77

(3) Initials of the Referencer _____

MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No. <u>824</u>	Press
<u>476-78</u>	Mis.
Dated <u>20-3</u> - 1871.	

Not to be folded or roughly handled

Read the following papers:—

No. 52.

No. 476. *Note by the Chief Engineer for Irrigation.*

It would have been better had all the modifications, which the Madras Water Works require, been included in one estimate, but as it is of importance that the waste weir, for which an estimate of Rupees 7,150 has been submitted should be carried out before the canal from the Cortilliar is re-opened, it will be advisable to sanction its construction at once.

2. In paragraph 7 of his letter Captain Scott states, as one reason why he has designed the weir with a crest of 150 feet, that Cortilliar floods occasionally find their way into the supply channel between the head-sluice and the Katenkal. This is altogether improper, and such water should be effectually excluded. In

paragraph 5 of a memorandum which I addressed to the Superintending Engineer after an inspection of the works, it was noticed that the left or river side spoil banks required to be made not less than 3 feet above extraordinary flood level in the Cortilliar, and that this level should be plotted on the longitudinal section so that it might be seen exactly what work is required. I am indeed not quite sure that flood water might not enter the canal at the waste weir now intended to be built, and, if so, it would be necessary to provide posts and shutters for its exclusion.

3. The same memorandum referred to other modifications which appeared necessary to the efficiency of the works; one of these is alluded to in paragraph 8 of Captain Scott's letter, and no time should be lost in determining what alterations are needed.

4. The additions and modifications will altogether amount to but a very small per-centage on the estimates for the project generally, and they will not therefore require the special sanction of the Government of India. At the same time it is advisable that one estimate for all should be made out, and while, therefore, the construction of the additional weir may be allowed to be gone on with, specific sanction may be deferred until one estimate for all new work not included in the revised general estimate shall have been submitted. The work for stopping leakage, the additions to the head-works, etc., will be among the items.

5. As regards the details of the design for the weir, I would retain the length of 150 feet of crest, although all Cortilliar flood water will be shut out; there seems, however, to be no necessity for placing the foundations of the main or front wall of the weir lower than those of the wings, which latter appear to be quite deep enough; it is no advantage, but rather the reverse, to have the width of the crest so great as 12 feet, and as 6 feet will be ample for the earthen bund to be placed on the crest, the width should be reduced one-half; again, if the masonry apron at the bottom of the fall be made 10 feet wide instead of 24 feet, it will with the outer rough stone apron be quite wide enough. These alterations will reduce the width of the weir from front to rear by 20 feet, and make the work considerably less costly, without in any way interfering with its efficiency; the slopes in continuation of the rear wings should be revetted up to the end of the rough stone apron.

FORT SAINT GEORGE,
27th February 1871.

(Signed) J. MULLINS, Major, R.E.,
Chief Engineer for Irrigation.

No. 477. From the Superintending Engineer, 4th Division, to the Chief Engineer for Irrigation, dated Madras, 21st February 1871, No. 4,709:—

I HAVE the honour, with reference to G. O., No. 2,774, of the 18th November 1870, to send in an estimate, amounting to Rupees 7,145-8-6, for the construction of a surplus weir to convey off the water of the Katenkal stream which crosses the channel from the Cortilliar anicut to the Cholaveram lake, and request the sanction of Government to the same.

1 Estimate.
3 Plans.
1 Copy of letter from Executive Engineer,
Madras Water Works.

2. In paragraph 7 of the memorandum by the Chief Engineer, No. 214, of the 31st October, the necessity of this extra work is shown, and an estimate ordered. In such works, getting rid of local drainage is always a difficulty with the country so very level, and more so when the water is required to escape in high floods, but in general freshes the water from the Katenkal will be a welcome addition to the supply channel. The present plan will no doubt be an inconvenience in the way that after every flood the channel will be, in a greater or less degree, closed up by the deposits brought down by the Katenkal, and I would have proposed to have put sluices in the weir, but it would have added enormously to the cost, and the effect could hardly have been commensurate with this cost, as the fall is so very small into the Cortilliar.

3. In his covering letter Captain Scott enters into a full explanation of the weir and the advantages to be gained by it; but in paragraph 7 he shows that the banks of the channel require raising and some alteration which shall be attended to.

4. If this plan is approved of, an early sanction for the commencement of the work is requested, as it must be finished before May or June next. I have already given orders for the preparation of materials.

From the Executive Engineer of the Madras Water Works, to the Superintending Engineer, 4th Division, dated Red Hills, 16th February 1871, No. 52.

I HAVE the honour to forward herewith plans and estimate, amounting to Rupees 7,145-8-6, for the weir proposed to be constructed in the upper supply channel where it intercepts the stream called Katenkal, $1\frac{1}{2}$ miles from the head-sluice, and referred to in the report of the Chief Engineer for Irrigation, No. 214, of the 31st October 1870, and in G. O. thereon, No. 2,774, of the 18th November 1870.

1 Estimate.
3 Plans.

2. The situation of the weir, with reference to the Katenkal, is shown on the general plan No. 1; Plan No. 2 is a section showing the line of outfall as far as the Katenkal. The site selected is the most favourable in the neighbourhood of the point of junction of the supply channel and river.

3. The following are the considerations which have determined the length of the crest wall of the weir as shown on the plan.

4. The estimated maximum discharge of the channel during the flood of October last, before the water from the Cortilliar river entered it through the breach near the head-sluice, was 1,539 cubic feet per second. As this flood was not an extreme one, an addition has been made to the above of a quantity corresponding to a further rise of 1 foot of water in the channel, and the total, amounting to a discharge of 2,082 feet per second, has been assumed as the greatest quantity likely to enter from the Katenkal.

5. The soil through which the upper portion of the channel passes is extremely bad, and a depth of 7 feet is the greatest which can be allowed to flow in it without considerable damage and danger of breaching. A depth of 7 feet in a channel of the normal section (30 feet width at sole side slopes $1\frac{1}{2}$ to 1 fall, 2 feet to a mile) gives a discharge of 1,177 cubic feet per second, and this quantity deducted from 2,082, the flood discharge of the Katenkal, leave 905 cubic feet per second as the quantity to be provided for by the weir.

6. A low co-efficient of discharge (.450) has been assumed as proper to the form of the work designed in computing the length of crest necessary. The discharge by calculation is 7.17 cubic feet per second per foot lineal of wall, and the resulting total length required is therefore 126 feet. In round numbers therefore a weir 130 feet in length would suffice for the surplus from the Katenkal.

7. There is evidence, however, that occasionally during extreme floods water from the Cortilliar river below the anicut finds its way into the supply channel above its junction with the Katenkal, and for that reason to meet such a contingency it is proposed to give the weir a length on the crest of 150 feet.

8. The question as to the best mode of dealing with the flood water of the Cortilliar which passes over the banks of that river near the head-sluice will shortly be reported on. A contoured plan of the ground in course of preparation will furnish reliable data for arriving at a decision.

No. 478. ORDER THEREON, 20th March 1871, No. 824.

IRRIGATION, No. 42.

THE Government approve of the immediate construction of the weir on the supply channel from the Cortilliar intended to discharge flood water of the Katenkal. The Superintending Engineer's attention will be called to the remarks of the Chief Engineer for Irrigation, and Colonel Wilkieson will submit, as soon as possible, a general estimate for all the additional works, or modifications of existing works, which have been found necessary since the revised estimate of Rupees 10,39,175 for the Madras Water Supply Project was submitted to Government for sanction, or which are not provided for therein.

(True Extract.)

(Signed) CHARLES A. ORR, Colonel, R.E.,
Secretary to Government.

To the Superintending Engineer, 4th Division.

Chief Engineer for Irrigation.

W. B. Shunker

Erd. E. C. Shunker.

A. 52.

Madras Water Works Office
Red Hills 16th February 1871.

From

Captain A. H. Scott R.E.

Executive Engineer

Madras Water Works.

To

The Superintending Engineer

4th Division

Sir

I have the honor to forward
herewith Plans and Estimate
amounting to Rs 7145^{as P.} 8^{as P.} 6 for
the weir proposed to be constructed
in the upper supply channel
where it intercepts the stream
called Katungal 1 1/2 miles from
the Head sluice and referred
to in the report of the Chief Eng^r
Irrigation A. 214 of the 31st Oct
October 1870 and in G. O. thereon
A. 2774 of the 18th November 1870.

2. The situation of the weir
with reference to the Katungal
is shown on the general plan

C. P.

Enclosures.

1. Estimate

3. Plans.

Pl. 1. Pl. 2 is a section showing the line of outfall as far as the Katengab. The site selected is the most favorable in the neighbourhood of the point of junction of the supply channel and river.

3. The following are the considerations which have determined the length of the crest wall of the weir as shown on the Plan:-

4. The estimated maximum discharge of the channel during the flood of October last before the water from the Fortelliar river entered is through the breach near the head sluice was 1539 cubic feet per second.

As this flood was not an extreme one an addition has been made to the above of a quantity corresponding to a further rise of 1 foot of water in the channel and the total amounting to a discharge of 2082 ft per second has been assumed as the

the greatest quantity likely to enter from the Katengab.

5. The soil through which the upper portion of the channel passes is extremely hard and a depth of 7 feet is the greatest which can be allowed to flow in it without considerable damage and danger of breaching. A depth of 7 feet in a channel of the normal section (30 feet width at sole side slopes $\frac{1}{2}$ to 1 fall 2 feet to a mile) gives a discharge of 1177 cubic feet per second and this quantity deducted from 2082 the flood discharge of the Katengab leaves 905 cubic feet per second as the quantity to be provided for by the weir.

6. A low coefficient of discharge (.450) has been assumed as proper to the form of the work designed in computing the length of crest necessary. The discharge by calculation

calculation is 7.17 cubic feet
per second per foot (width) of
wall and the resulting total
length required is therefore 126
feet. In round numbers therefore
a weir 130 feet in length would
suffice for the surplus from the
Katalungat.

7. There is evidence however that
occasionally during extreme floods
water from the Fortelliar river
below the Aricut finds its way
into the supply channel above
its junction with the Katalungat
and for that reason to meet such
a contingency it is proposed to
give the weir a length on the
crest of 150 feet.

8. The question as to the best
mode of dealing with the flood
water of the Fortelliar which
paves over the banks of that
river near the head sluice
will shortly be reported on.
A contoured plan of the ground
in course of preparation will
furnish

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furnish reliable data for
arriving at a decision.

I have the honor to be Sir,

Signed A. H. Scott Esq.

Executive Engineer

Madras Water Works

(True copy)

Norman Colonel R.
Superintendent A. H. S.

This water
is not to be
used - I understand
the principle of
this is to prevent
any damage to the
19th 1870 & have
instructions which
should be carried
out.

No. 52

London, 15th Nov 1870

Noted by the Chief Engineer for Irrigation

Encl 6

It would have been better had all the modifications, which the Madras water works require, been included in one estimate, but as it is of importance that the waste weir, for which an estimate of Rspees 7150 has been submitted should be carried out before the canal from the Cortihar is reopened, it will be advisable to sanction its construction at once.

2. In para 7 of his letter Captain Settle states, as one reason why he has designed the weir with a crest of 150 feet, that Cortihar floods occasionally find their way into the supply channel between the head sluice and the Kalandah. This is altogether improper, and such water should be effectually excluded. In para 5 of a Memorandum, which I addressed to the Superintending Engineer

1135-19 July 1870

after

after an inspection of the works, it was noticed that the left or river side spoil bank required to be made not less than 3 feet above extraordinary flood level in the Colitiar, and that this level should be plotted in the longitudinal section so that it might be seen exactly what work is required. I am indeed not quite sure that flood water might not enter the Canal at the waste weir now intended to be built and, if so, it would be necessary to provide pools and shutters for its exclusion.

3. The same Memorandum referred to other modifications which appeared necessary to the efficiency of the works, one of these is alluded to in para 8 of Captain Seale's letter, & no time should be lost in determining what alterations are needed.

4. The additions and modifications will altogether amount to but a very small percentage on the estimate for the project generally, and they will

will not therefore require the special sanction of the Government of India. At the same time it is advisable that one estimate for all should be made out and while, therefore, the construction of the additional weir may be allowed to be gone in with, specific sanction may be deferred until one estimate for all new work not included in the revised general estimate shall have been submitted. The work for stopping leakage, the additions to the head works, &c. will be among the items.

5. As regards the details of the design for the weir, I would retain the length of 150 feet as proposed, although all Colitiar flood water will be shut out; there seems however to be no necessity for placing the foundations of the main or front wall of the weir lower than those of the wing, which latter appears to be quite deep enough, it is no advantage, but rather the reverse, to have the

the width of the crest is great as 12 feet, and as 6 feet will be ample for the earthen bund to be placed on the crest, the width should be reduced one half;

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Feb 5th
27th Feb 1871

Pro 18 November 1908
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From
The Chief Engineer
In Irrigation
The Secretary to
Government W. & D.

Dated 27th Feb 1871
Recd 28th Feb 1871
No 53
Note in an estimate of
Rupees 7150 for the con-
struction of a surplus weir
to carry off the water of
the Kalingal stream.
Major W. & D.

63 March 1871
The Secretary, Government
P. W. D.

Madras Water Works.

Detailed Estimate for Constructing a Calingulab in the
Upper Supply Channel below Kalingal bund.
To accompany the Executive Engineer's letter No 52. Dated 16th February 1871.

Particulars of work.	Dimensions				Cubic feet.	
	Length	Breadth	Depth	Area		
<u>Earthwork.</u>						
<u>Excavation.</u>						
Removing bank of channel	1	188	188	33	6 1/2	46,326
do portion of gravel bed	1	188	188	14	1 1/2	3,290
Excavation for foundation of body wall	1	152	152	6	9 3/4	8,892
do Retain wall below	1	168	168	2 1/2	7	29,400
do Wing wall by the side of body wall with returns	2	20	40	4 1/2	6	1,080
do do do steps	2	34	48	4 1/2	7	1,572
do do do at front with returns	2	32	44	4	7 3/4	1,984
do Counterforts to wing walls in the front	2	3 1/2	7	2 1/2	6	105
do do do rear	2	3 1/2	7	2 1/2	7 1/2	1,355 1/2
do 1st step next to the body wall	1	148	148	7 1/2	2	2,220
do 2nd, 3rd, 4th & 5th do and apron	1	159 1/2	159 1/2	28 1/2	3 3/4	17,196
Total Excavation Cubic feet						79,680 5/8
or Cubic Yards						2,951.
<u>Filling.</u>						
Filling and forming bank by the side of wing including watering and ramming	2	16 1/2	33	2 1/2	6 1/2	5,952 1/2
Total Filling Cubic feet						5,952 1/2
Cubic Yards						220 1/2
<u>Concrete.</u>						
Body wall	1	152	152	6	1 1/2	684
Wing walls by the side of body wall with returns	2	20	40	4 1/2	1 1/4	135
Carried forward						819

Particulars of work.	Dimensions					Cubic feet.
	No.	Length	Width	Height	Depth	
Brought forward						819
on wing walls by the sides of steps	2	24	48	4½	½	162
to 1st step next to body wall	2	32	64	4	½	192
2nd, 3rd, 4th and 5th do	1	151	151	9	½	679½
of counterforts below front	2	3½	7	2½	½	13½
Total concrete						3248½
Brickwork in Churn						120½

Lateral masonry in Chums.					Cube yards — 556 1/2				
2 nd structure wing wall above by the									
sides of body wall with returns	2	19 1/2	36	1 1/2	6	469 1/2			
Do do do steps	2	23 1/2	47	1 1/2	6	445 1/2			
Do do do ed from with									
returns	2	31 1/2	63	1 1/2	5	557 1/4			
Do counter for & balance front	2	2	4	1 1/2	6	42			
Do do rear	2	2	4	1 1/2	5	35			
Do 1 1/2 ft steps next to body wall	1	150	150	12	1 1/2	3000			
Carried forward						4531 1/4			

Particulars of work.	Dimensions				Cubic feet.
	Length	Breadth	Height	Volume	
Brought forward					4,531 1/2
Superstructure 2 1/2 x 3 1/2 x 15 = 112 1/2 ft. and 1 16 1/2 x 16 1/2 x 3 1/2 = 1	16 1/2	16 1/2	3 1/2	1	6,016
Total Blasted masonry in Channel					10,547 1/2
Cubic yards					390 1/2

Painting Lateral work.					
Wing walls front with returns	2	17½	35	6½	227½
Do by the sides of steps	2	17	34	6	204
Do do approx with returns	2	28	56	6	336
Top of retaining wall	1	170	170	2	340
Do steps, head approx	.	.	.	7946	7946
Total Lateral painting				Squire feet	9053½
				Squires	90½

Paul Stone work.
 Setting the main line the side of wing
 front portion — 2 36½ 43 9 1½ 985½
 Paul Stone laid down at rear — 1 170 170 15 2 5700
 Total Long balance of front & rear — 6,085½
 Cubic feet — 225½

Excavating the plus Channel from the
Proposed Calingula Side Station to the
Small Battery Channel by the wharf.

Cart Burrows

Excavating Channel B to carry off surface
water of the Channel _____ , 228 228 81 $\frac{1}{2}$ 3 $\frac{7}{8}$ 58.267
Grading the Service Channel at the approach
of Calingula _____ , 154 154 9 1 $\frac{1}{2}$ 2156
Total excavating & putting Cartwork C. feet 60463
Calig yards 2237 $\frac{1}{8}$

Abstract

Quantity	Description of work	Rate	Per	Amount
		Rs. Ann		Rs. Ann
Excavation for foundations				
5188 1/4	Removing bank and cutting surplus	0	13 1/2	4-05 5 4
Channel				
220 1/2	Shilling and forming bank	0	10	13 12 6
120 1/2	Concrete	3	4 0	391 10 0
556 1/2	Brickwork in chunnaw in foundation	5	0 0	2782 8 0
Latite Masonry in chunnaw in				
390 1/2	Structure	6	0 0	2343 0 0
90 1/2	Pointing Latite walls	1	8 0	135 12 0
112 1/2	Rough stone a from lower course	2	12 0	310 3 9
112 1/2	Do in upper Do	3	12 0	423 0 9
Sundries at 5 per cent				340 4 2
Total Estimate Rs.				7145 8 6

Madras Water Works Office
 Redhill 16th February 1871.

Chas. Pitt.
 Captain R.E.
 Executive Engineer
 Water Works

Wm. Wilson Chas. Pitt.
 Supg. Eng. W. Division

N^o 4709.

Supg. Eng. Office 4th Div.
 Madras 21st February 1871

From

Colonel E. V. Wilkinson R.E.
 Superintending Engineer 4th Div.

To

Major J. Mullins R.E.
 Chief Engineer
 for Irrigation.

Enclosures

1 Estimate

3 Plans

1 Copy of letter

from E. Eng.

M. W. Works

I have the honor with reference to G.O. N^o 2774 of the 18th November 1870 to send in an Estimate amounting to Rs. 7145. 8. 6 for the construction of a surplus weir to convey off the water of the Katenkal Stream which crosses the Channel from the Cortiliar Anicut to the Cholanur intake, and request the sanction of Government to the same.

2. In para: 7 of the Memo:
 by

by the Chief Engineer N° 214 of the
31st October, the necessity of this
extra work is shown and an Estimate
ordered. In such works getting
rid of local drainage is always
a difficulty with the country so
very level and more so when the
water is required to escape in high
floods, ^{but} in general freshes the water
from the Kutunkal will be a welcome
addition to the supply Channel.
The present plan will no doubt
be an inconvenience in the way that
after every flood the channel
will be in a greater or less degree
be closed up by the deposits
brought down by the Kutunkal
and I would have proposed to
have put sluices in the weir
but it would have added more
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2
21
could hardly have been commensurate with this cost as the fall is so very small into the Cortellinas.
3. In his covering letter Captain Scott enters into a full explanation of the weir and the advantages to be gained by it, but in Para. 7 it shows that the banks of the channel require raising and some alteration which shall be attended to.

4. If this plan is approved of, an early sanction for the commencement of the work is requested as it must be finished before May or June next. I have already given orders for the preparation of materials.

I have the honor to be
Sir
Your Most Obedient Servant
Wm Wilson Col R E
Sub-Eng 10th Division

Proceedings of the Madras Government

Recd the following

From
The Chief Engineer for Irrigation } (K. E. No. 529 of 27 July 1871)

The Government
approve of the immediate
construction of the weir
on the supply channel
from the Coartilar, in-
tended to discharge
flood water of the Kottar.
The Superintending
Engineer will be called to
the attention of the Chief
Engineer for Irrigation,
and Col. Wilkison
will submit, as soon
as possible, a general
estimate for all the
additional

N

Received
of the Chief Engineer
for Irrigation
the sum of Rs. 1000
on account of the
construction of the
weir on the supply
channel from the
Coartilar.

27th July 1871
J. P. S. Esq.
Secretary to Government
Madras
The Chief Engineer for
Irrigation
Madras
The Government
approve of the immediate
construction of the weir
on the supply channel
from the Coartilar, in-
tended to discharge
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the attention of the Chief
Engineer for Irrigation,
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estimate for all the
additional

1871

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additional work, or still for the same
modifications of existing
work, which have been
found necessary since
the revised estimate
of Dec 10, 39, 175 for the Indian
water supply project
was submitted to Govt.
for sanction, or which
are not provided for
therein.

12/2/71

W.B.

25
The Sup. Genl. to Govt.
Chief Engr. for the Govt.
Controller of P.W. A.
22 March 1871

22 March 1871

Esq. 906

Govt. of 1871 Madras.

PUBLIC WORKS.

The Superintending Engr.
4th Division

Q. O. 20th March. N 221

708. 176 @ 475

Mem. The immediate construction
of the weir on the right channel
from the partition intended
to discharge flood water of
the Katakai stream,
approved as the remarks.