

(1) Number of pages _____

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(3) Initials of the Referencer _____

MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No.	2437	Press
B.P. No.		Mis. —
Dated	28-8-	1874 —195—

Not to be folded or roughly handled

Read the following papers:—

No. 686. From W. S. HARRINGTON, Esq., District Engineer, Malabar, to Colonel G. W. WALKER, R.E., Chief Engineer, Public Works Department, dated Calicut, 31st July 1874, No. 98.

I HAVE the honor to forward copy of letter, No. 130, dated 29th instant, from the Executive Engineer in charge of the Cochin and West Coast Canal Range, and of the documents marginally noted, and to request your sanction for the execution of the works named and estimated for by Mr. Harris, should you approve of them. The estimates are, I think, carefully drawn out and do him credit, and, as you will observe, the rates are much reduced from those hitherto ruling, and this can only have been done after zealous personal inquiry and observation; but I am of opinion that both prices and maintenance allotments are now reduced as low as is consistent with the proper execution and up-keep of the works. I have of course, as in duty bound, examined and inspected the different works and their localities in company with Mr. Harris, arguing out the desirability of each, *viva voce*, in the field and the office, as already partially stated in my No. 75, dated 8th instant.

2. I have, as you will observe, separated the estimate for the maintenance of the Cruz Milagre Dam, etc., from that for erecting a sort of sea wall between Groyne L² and L¹, the works being distinct. The estimates have been framed with regard to the expression of your opinion and instructions as laid down in your memorandum in manuscript, No. 462, dated 23rd ultimo.

No. 687. From the same Officer, dated Calicut, 5th August 1874, No. 100.
I HAVE the honor to forward plan, estimate,* and specification prepared by Mr. Executive Engineer Harris by my instructions after a recent and very

* Rupees 3,215.
careful inspection of the harbour and coast of Cochin. Although the work is not one of urgent necessity, I deem it very desirable, when funds will admit, of its being carried out; it will be a sort of continuation of the sea wall advocated in my No. 98, dated 31st ultimo, and will tend much, I think, to the protection of the beach, houses and cultivation in shore.

MEMORANDUM.

Of the new works proposed to be executed to the coast groynes at Cochin, the following appear to the Chief Engineer the most necessary:—

1st.—Restoring the landward end of Groyne A, (the southernmost on the Cochin or south side of the harbour.)

25 x 4 x 1½ = 150 cubic yards rough stone at Rupees 3½	=	Rs. 525
Sundries and Superintendence	...	75
Total...		600

*Proceedings of the Madras Government, Public Works Department,
28th August 1874.*

2nd.—Connecting the inner ends of Groynes G, H, J, K, on the Vypeen side of the harbour mouth by a continuous lining of rough stone.
360 × 2 × 1 = 720 cubic yards rough stone, at Rupees 3½ — Rs. 2,520
Sundries and Superintendence 280

Total... 2,800

3rd.— Similarly connecting the inner ends of Groynes G and L, and continuing such protection 75 yards further north at an average of 2 cubic yards of stone per yard in length.

220 × 2 × 1 = 440 cubic yards rough stone, at Rupees 3½ — Rs. 1,540
Sundries and Superintendence 160

Total... 1,700

In the opinion of the Chief Engineer the point at which Groyne G is placed is that which in the interests of the harbour it is most necessary to keep fixed. From it will eventually start the northern of the two piers recommended by Mr. Robertson, and all work done and material deposited here is so much to the good. As the stone can be deposited by boats exactly where it is wanted timber tramways may be dispensed with. An extra allowance of 10 per cent. has been made for contingencies.

2. The Cruz Milagre Dam may now be considered safe for the season; and the Rupees 1,000 already granted in G. O., No. 1,714, of 25th June 1874, should suffice to pay for what has already been done, and gradually to secure its flanks. The continuous line of sand beach which has now formed in front must effectually protect it.

3. The establishments which are applied for consisting of—

1 Maistry	...	...	...	...	...	...	...	Rs.
1 Storekeeper	...	...	...	...	...	...	...	25
1 Peon	...	...	...	...	...	...	...	7
2 Watchmen	...	...	...	...	...	...	...	7
1 Boat watchman	...	...	...	...	...	...	...	14
Boat hire	...	...	...	...	...	...	...	4
Sundries	...	...	...	...	...	...	...	1
	...	...	...	...	...	...	...	3

Total... 61

per mensem are excessive and unnecessary. The works do not now require constant supervision by watchmen, and one maistry and lascar should do all that is required. Rupees 35 a month, including boat hire, should cover everything, and that amount may be a separate charge on Petty Establishment.

OOTACAMUND,
—August 1874.

(Signed) G. W. WALKER, Colonel, R.E.,
Chief Engineer, D.P.W.

No. 638.

ORDER THEREON, 28th August 1874, No. 2,437.

CIVIL WORKS, No. 39.

His Excellency the Governor in Council adopts the Chief Engineer's suggestions, and sanctions the sums mentioned by him for each work. The first will be at once carried out, in anticipation

*Proceedings of the Madras Government, Public Works Department,
28th August 1874.*

of early provision of its amount. It will be time enough to carry out the second and third between Christmas and the following monsoon, and application will be made in January for such amount as can be spent within the official year, the remainder being provided in the Budget of 1875-76.

(True Extract.)

Colonel, R.E.,

Secretary to Government.

To the District Engineer, Malabar.

„ Chief Engineer, Department Public Works.

„ Officiating Controller of Public Works Accounts.

Exd. S. T. Austin.

Spare Copies

N. 130.

Cochin & W. C. Canab Range
Office
Cochin 29 July 174.

From

The Executive Engineer
Cochin Range.

To

The District Engineer
Malabar

Sir,

In conformity with your instructions I beg to forward herewith a maintenance estimate for the upkeep of the Cruz Milagre Dam and Cochin Harbour works amounting to Rs. 5810. This estimate includes everything that is required. It may appear high, but I respectfully beg to point out to you that it is something more than a maintenance estimate it provides for the complete restoration of Groyne A. on the extreme south of the Harbour.

2. Also for the complete restoration of the rough sea wall along the Vypren Coast for a distance of 435 feet and for its extension to the point where the embankment remains intact. A further distance of 223 feet the wall will be raised to a height of 3' + High water springs a total distance from Groyne or training wall of 658 feet. This is the only portion that the sea washes over & requires protection, all other groynes

groynes may be left to themselves and in my opinion will never require any further repair or extension, nothing could be gained by extending or raising them, but the sea wall I strongly recommend at the same time I may point out that if the training wall by was extended as proposed it would neutralize the action of the rollers and swell upon the point and would beach the sand in shore so as to reform the coast in keeping with what is now going on from the Cruz Milagro Gap down the North Bank of shore, but as it will take sometime before this can or will be done I strongly recommend the construction of the sea wall which I can have speedily executed.

3. The estimate also provides for planting the whole of the embankment around the Lagoon at Cruz Milagro & around the border of backwaters with (*Pandanus odoratissimus*) screw pine and (*Delonix regia*) Indian Holly, these thrive well and are extensively used by the ryots in protecting their land along the backwaters & from experience I can state that the screw-pine is very effective as a protective agent in such localities.

I have seen the screw-pine planted on the E. Coast raise a bank of sand 15 ft high during the along shore wind on the coast, it may

may be desirable even to plant the Coast on the sea side of Lagoon but I am not prepared to recommend this for the present. The estimate provides for planting both sides of the embankment from the Gap to Vyseem with the screw-pine.

4. The item 100 Cyds: of Stone is to be kept in deposit only, and may never be required I don't think it will but it is well to be prepared, the stone is already in deposit but not paid for & never will unless it is required for use, there is also 500 gunny bags in store which may or may not be required, but it is necessary to be well prepared.

5. As regards the Brushwood Groynes on backwaters I have provided nothing for them the ryots are quite willing to keep them up and protect them as directed.

6. In conclusion I beg to inform you that the exact high and low water cannot be accurately fixed on the plans, I have gone as near it as I could, so that it remains subject to future observations of tides till I have fixed a true mean sea along the whole line of coast which I shall do as speedily as possible. I believe the increments and decrements rise & fall of tides here is greater than has hitherto been noted. trusting you will kindly excuse the delay that

W. Harrington
1st Engineer Mulahed

Dear letter from
 the District Surgeon
 Malabar, to the
 Chief Engineer of
 M. S. Department, 17th
 Feb. dated 31st July
 1874.

Sir, I have the honor to forward copy of letter No 130 dated 29th Instant from the Executive Engineer in charge, of the Kochin and West Coast Canal

1. Plan of the Beach at Vypren showing the proposed sea wall between Ghaynes L^d and L^d.
2. One Estimate and Specification for - do - - - - - R^s 3783 - - - - -
3. One Abstract Estimate for - do - - - - - marginally notes.
4. Plan of the Cruz Milagria and to request your sanction
5. One Estimate and Specification for the maintenance of the Cruz Milagria for the execution
6. One Abstract Estimate of the works named and estimated for by

Mr. Harris, should you approve
of them. The Estimates, are I think
carefully drawn out, and do him
credit, and, as you will, observe
the

the rates are much reduced from those hitherto ruling, and this can only have been done after zealous personal inquiry and observation, but I am of opinion that both prices and maintenance allotments are now reduced as low as is consistent with the proper execution and upkeep of the works. I have, of course, as in duty bound, examined and inspected the different works and their localities in company with Mr. Harris, arguing out the desirability of each, viva voce, in the field and the Office, as already partially stated in my No. 75 dated 8th Instant.

2. I have, as you will observe, separated the Estimate for the maintenance of the Cruz Milagre Dam from that for erecting a sort of sea wall between Graynes L² and L¹, the works being distinct. The Estimates have been framed with regard to the execution of

of your opinion and your instructions, as laid down in your Memo. in Manuscript No. 462, dated 23rd Ultimo.

I have the honor to be,

Sir,

Your most O^bdt. Servant,

W. M. M. M. M.

District Engineer,
Malabar.

10.11.50

2. 10. 11. 50

10.

Abstract Estimate of the Maintenance of the Cochin Harbour.

Items		Rate	Amount		
<u>Harbour works</u>					
6510 3/4	Rough stone Cyds	cyd	8	5	2242 5 4
870	Cft planks wrought & put up	cft	10	12	548 12 "
220	Upright piles for planking	each	12	"	165 " "
8910	Cft Earthwork	cyd	5	103	2 " "
66	Sleepers for bogies & L.	each	12	49	8 " "
15	Do A	"	8	7	8 " "
7000	Screw piles	100	1	70	" " "
1700	Pyds of repairing bund	pyd	"	1	108 4 "
2	Establishment	month	14	"	168 " "
Removing and fixing cranes, and preparing landing stage at Tycoon			100 " "		
			3555 7 4		
Sundries & Superintendence			5	177	8 8

Total Rupees 3433 " "

Malabar Distt. Engg's Office
Calicut 31st July 1874

W. Stevenson
District Engineer,
Malabar.

No 688
Subd. of Cochin Harbour

Estimate No. 2437 2887.

of maintaining, repairing and fortifying the harbour of the Cochin Harbour, and Cochin Harbour.

E. 10.

Estimated 31st July 1874
Week 31 August

1874

Q. M. 1874

of the Cochin Harbour

No. 2437

of the Cochin Harbour

1287 11/14/14
 1288 11/28 Aug 17/14
 1289 11/11 Aug 18/14
 1290 11/11 Aug 18/14
 1291 11/11 Aug 18/14
 1292 11/11 Aug 18/14
 1293 11/11 Aug 18/14
 1294 11/11 Aug 18/14
 1295 11/11 Aug 18/14
 1296 11/11 Aug 18/14
 1297 11/11 Aug 18/14
 1298 11/11 Aug 18/14
 1299 11/11 Aug 18/14
 1300 11/11 Aug 18/14

Estimate of the probable cost of protecting and maintaining the
 Gochin Harbor, Gochin River East Canal Range, Malabar District

Measurements	Contents	Particulars	Rate	Amount	Total Remarks
100	4 3	5220 Building seawall on top portion of the Sredent			
223	4 4	3568 120 in including foundation			
223	10 2	1460 Cement to seawall up to Grogue L			
75	12 1/2	4050 Addition to Grogue L out of 11/12			
		Landward			
17298		Total Cft. or 640 2/3 Cub. yards of Rough Stone	38	Cy 2425.54	
660	7 1/6	770 Framing plan for between Grogue L & L and plan for of 11/12 on near of same all			
100	4 1/6	870 Total Cft of plan for wrought and put up			
		Uphright piles for plan for of near short side of seawall	10	Cft 543.12	
100	8 220	Carried over	12	each 165	2951.4

*On extreme
 South

1860 4 2 3	8910	Back Bay Earthwork in clay in dip.	Brought over	2957 1 4
7 12 12 66		Port of sea wall	5 - Cgd 1032 -	
15		Sheep and between Georges Bay	12 - each 498 -	
1860		1290	5 - do 215 -	
1860		Scrub pines and Eucalyptus along all		
1860		along the banks, on both sides from		
1860		offshore to long village	1 - 100 70 -	
1860		Planting spade, of mowing hand		
1860		with mowing, and Eucalyptus	1 - 100 106 4 -	
2		Establishment - storekeeper, and		
		from 100 100 100 each 14 -		
		Planting and sowing, orange from		
		George Village, and to 100 100		
		and preparing, Landing Stage	100 - 3555 4 4	
		Land and Superintendence	177 8 8	
		Total Proposed	3433 -	

Malabar District, Engage Office
 Calcutt 31st July 1864

W. Harrison
 District Engineer,
 Malabar.

Specification report to accompany the Estimate for the maintenance of the Cochin Harbour.

Harbour Works

1. Roughstone 640 $\frac{2}{3}$ Cys @ 3/4 Rs per Cys @ 2242.5.4.

In the item is included the restoration of Groyne A. on the extreme South, which has been outflanked on the shore end for a distance of 75 ft. the total quantity of block stone required 150 Cys @ 3/4 per Cys. the dimension of the groyne as constructed 70 x 10 x 1 1/2.

2. The reconstruction and extension of the sea wall on the North bank of river at 1/4 per wall. this Estimate provides for the complete restoration of the sea wall and extension to join the Bund a distance of 668 x 4 x 3. with upright piles and planking on the landward side, the stones to be, all cubes of 1 1/2 to 2 ft or 3 ft. The wall will be 3 ft + the highest water mark, the portions already done 435 ft has revetment and sufficient foundation the walls only need be rectored and perfected. with a batter on both sides as per plan, and for the extension 223 ft a revetment to be carried up from 2 ft low water with a slope of 2 to 1. upon this the wall will be continued to the portion of the Bank that remains in ~~the~~ and this will complete the rough sea

Received from

the District Engineer
Malabar, to the Chief
Engineer P. M. Jett
No 98. dated 2/2/4
July 13/4.

Rs. 28 Rs. 1/74
Rs. 18 Rs. 1/86.
Rs. 4821/4.
3

Estimate and
Specification for
the maintenance
of the Cochin Har-
bour.

Rs. 3733-0-0

sea wall from the Groyne to the training wall to the point where the waves wash over, as soon as the training wall is pushed out further, the action of the sea on this portion will not be so heavy and the training wall to will beach the sand in shore and restore the coast in this place in keeping with the general restoration now going on since the closing of the Bruz Milage Gap. The sea wall will be backed by earthwork against the piles and wooden sheeting, making the roadway complete from Vypren to the Bruz Milage.

3. Planks for tramways 870 cft @ 10 as 873. 12. "
4. 220 upright piles for sea wall shore side reinforcement @ 12 annas each Rs 168. 0. 0. "
5. Backing with earthwork 280 cft @ 5 as cft Rs 103. 2. "
6. Sleepers for sea wall tramway 66 @ 12 as each - Rs 49. 8. "
7. D. for Groyne & do 15 @ 8 as Rs 7. 8. "
8. Screw-piles 7000 @ Rs 1 per 100 Rs 70. 0. 0. for bund on both sides from Vypren to Bruz Milage. The estimate also provides for planting screw-piles on both sides of the bund, and repairing and turfig the embankment fully.
9. Repairing bund with turfig 1700 Rs @ 1 anna per Rs 106. 4. "
10. Establishment for Harbour works @ Rs 14 per mensem Rs 168. 0. 0. The establishment for the Harbour is one store keeper and one person.
11. Removing and fixing crane on

staging at Vypren Rs 100. 0. 0. "
12. Sundries & Superintendence Inspect. 177. 8. 8

W. Maristow
District Engineer
Malabar.

Mal' St Engrs' Office,
Calcutt - 31st July 1874

Ms. A. 9. 2. 28 Aug 1874
San Francisco, Cal.

Plate Composita of Bonarbo

Charge	Contents	Particulars	Rate	Amount
B. D.	Sup. Cash			
10	1	2		
50	5	4		
195	3	2		
195	2	1 1/2		
3450		10000		
2	1 1/2	60		
500		500		
500		500		

The Estimate provides the following items for the

1. Rough stone investment 222 3/4 cyds. @ 1.12 per yd. — 26.14.6

2. Earthwork for raising Bond 25/5 211.1.9
3. Lill 527/9 Cysdo C. Rd per Cysdo 211.1.9

and placing in front of dam wall.
 1874. @ \$1 per 100 =

high tides of June 17.
Screw-pines and Indian Holly, 1000 ft.
all around the lagoon, bound
the plain.

Rs 100 to be planted
and along the border of backwater as per
lings 60 @ Rs each Rs 60 to be

5. B. M. Stone for Lomax and then to be
lined in position permanently and then to be
ascertained and

with reference to mean sea level. $\text{Rs } 25 \text{ per } 100 -$

6. - Gunny bags to be kept ready for emergency - 22500. 22 annas each 500 Rs.

7. Filling with sand and leveling @ 10 cu. yd. - 10.35 C yd. @

8. Plaster for paving Return No. 1. 1881
9. Pouchstone for paving Return No. 1. 1881

10. P. 100 in Deposit Cys 100 @ 1/2 per Cyn. ready for any emergency

on both sides of the Dam
Spawellia 2.8 - P. 24. 2.8

[illegible]

12 Surfing 1450 @ 90% 1300
13 Gr. with clay @ 1 1/2 as 96% 1280
Ham slope 37 1/2 Cy to at 1.10 per Cy

14 Travelling stop of 10.
Rs 50.2/9

- 15 Revetting E. side to Return No. 1 - 11 1/2 @ Rs. 3 per
Cyd. - Rs 48.5.4
16 Establishment at Rs 47 per mensem Rs 564 per annum
17 Sundries and Superintendence Rs 98-10-5

W. Harrington
District Engineer,
Malabar

Malabar Engr's Office
Calicut. 31st July 1874

Abstract Estimate for the Maintenance of the
Brug Milagui Dam.

Items		Rate		Amount	
	Cyd.	1	12	388	14 3
22 1/2 Cyds of Rough stone Revetment	"	"	1 6	26	14 6
287 do. earthwork	"	4	"	211	1 9
52 1/2 do. filling sand with gunny bag	100	1	"	100	"
10000 Screw pines & Indian Holly	each	1	"	60	"
60 B. In. Stones	100	25	"	125	"
500 Gunny bags in deposit	each	"	2	62	8
500 do. sand filling swing &c.	Ch.	"	10	61	9
98 1/2 Ch. of planking	Cyd.	3	8	36	8
10 35/81 Cyds. Rough Stone	"	1	12	175	"
100 do. do. in deposit	"	"	"	"	"
Graveling	Cyd.	"	2	24	2 8
193 1/3 Cyds. of earthwork	Sq. ft.	"	26	25	2 9
1450 or 161 1/2 Sq. turfing	"	"	1 6	9	1 6
96 7/8 do.	Cyd.	1	10	60	2 2
37 1/2 Graveling to Dam	"	3	"	48	5 4
16 1/4 Revetting E. side of Dam	mensem	47	"	564	"
Establishment	Cent	5	"	98	10 5
Sundries & Superintendence				2077	"
Total Rupees					

Malabar District Engr's
Office Calicut
31st July/74

W. Harrington
District Engineer, Malabar

[Faint, mostly illegible handwritten notes and scribbles at the top of the page.]

Rs. 728 1/4
 1/10 482 1/4
 1/10 482 1/4

Appendix A.

Establishment of the Hong Kong & Shanghai Bank

No.	Particulars	Per	Per
		Maintenance	
1	Monthly	25	300
2	Waterhouse & Co.	14	165
1	Boat maintenance	14	48
	Landrocks	1	12
	Boat hire for soundings of Lagoon, Backwater and Coast	3	36
Total		47	564

Mal: St. Eng's Office
 Calcutta 31st July 1874

W. J. Barrington
 Civil Engineer, Malacca

No 100 Malabar Distt. Engr's Office
Calicut 5th August 1874

From The District Engineer,
Malabar.

To The Chief Engineer,
P.W. Department,
Madras.

Sir, I have the honor to forward
Plans, Estimate and Specification
No 98 prepared by Mr Executive Engineer
at Calicut by my instructions after a
very careful inspection
of the Harbour and coast of
Calicut. Although the work is not
one of urgent necessity I deem it
very desirable, when funds will
admit of its being carried out.
It will be a sort of continuation
of the Sea wall advocated in my
No 98 dated 3rd ultimo, and will
tend much I think to the protection
of the Beach, Houses and culti-
vation in shore.

I have the honor to be,
Sir,

Your most Obedt. Servant,
W. J. Stevenson

District Engineer,
Malabar.

File No 28 August 1874
In 11 A. 686.
W. J. Stevenson
6/7/74.

Recd to Cash 8/11/1874

1874

[Faint handwritten notes, mostly illegible]

[Handwritten signature and notes]

Estimate of the probable cost required for Retaining the Southern side of the bar between Groyne, G. & H. in Cochin & M. C. Canal Range, Malabar District.

Measurement	Contents	Which	Length	No.	Rate	Amount	Total	Remarks
365	6	3	"	"	6570	Retaining between Groyne G. & H.		
370	6	3	"	"	6660	"		
357	6	3	"	"	6426	"		
100	4	1/8	"	"	19656	Total 6 ft. or 7.28 Cyds. Rough		
						Stone Retaining	38	Cyds. 2548
						8 1/2 ft. planks for tramway	10	3 ft. 458 54
						Sleepers	do	8" each 55
						Sundries & Superintendence		153 10 8
Total Estimated Expenses							3215	"

[Handwritten signature]

[Handwritten signature]

Malabar Distt. Engineer's Office
Calicut 5th August 1874
Diott: Engineer, Malabar

Abstract Estimate for a Stone Revetment between Groynes
 of H. I. and H. in Kochin & West Coast Canal Range.

Quantity	Items	Rate	Amount.
19,656	Cft. or 728 Cycles of Rough Stone	8 Cyt.	2548 . .
	Revetting	10 Cft.	458 5 4
738 1/2	Cft. of planks for framework	8 each	55 . .
110	Sleepers		153 10 8 1/2
	Standards & Superintendence		
	<u>Total Rupees</u>		<u>3215 . .</u>

Malabar Distt. Engr's Office
 Calicut 5th August 1874.

W. Harrington
 Distt. Engineer, Malabar

872 8/11
 5-8-74

20
Specification Report to accompany estimate
for a Stone Revetment between Groyne G. H. & K.

This estimate amounting to Rupees 3215. provides 728 Cys. of Stone to be laid down in revetment as per plan accompanying, the left or North bank of the river to prevent erosion by the ingress and egress of tides and floods. The stone to be of good size 1 to 2 feet cube and well packed at a slope of 4 to 1, this will complete the revetment of the whole of the Northern Bank of the river from the back-water to the training wall or Groyne G.

Malabar Distt. Eng's Office
Calicut 5th August 1874

W. Harrington
Distt. Engineer, Malabar.

In a letter from
the Distt. Engineer,
Malabar. to the
Distt. Engineer,
Calicut dated 5th
August 1874.

Mr. 4962/74
2/1/74
Pg. 338 Aug 15/74
Copy 15. 11. 6. 87
Estimate and
Specification for
rebuilding the
northern side of
the Cochin Base
between Groyne
G and H 1874
Rs. 3215-00

of the new work proposed
 the executed by the Port Engineer
 at Fochew, the following appear
 to the Chief Engineer the most
 necessary -

1st Restoring the landward end
 of Quay No. A (the southern most
 on the Fochew or South side of
 the Harbour) -

$25 \times 4 \times 1\frac{1}{2} = 150$ cubic yards Rough Stone
 at Rs $3\frac{1}{2}$ = Rs 525

Sundries and Superintendence " 75

Total Rs 600

2nd Continuing the inner ends of
 Quay No. G. H. & K, on the Typhoon
 sides of the Harbour mouth
 by a continuous lining of
 rough stone.

$360 \times 2 \times 1 = 720$ cubic yards Rough Stone

at Rs $3\frac{1}{2}$ = Rs 2520

Sundries and Superintendence " 280

Total Rs 2800

Rs. 728 August 74

Jan 18. 18. 687.

1744962/14

Engineer

3rd Similarly connecting the inner
ends of groynes C and Ia, and
continuing such protection
45 yards further north, at an
average of 2 cubic yards of stone
per yard in length.

$220 \times 2 \times 1 = 440$ cubic yards Rough Stone

at Rs $3\frac{1}{2}$ = Rs 1540
Sundries and Superintendence 160

Total Rs 1700

In the opinion of the Chief Engineer
the point at which Groyne Ia is
placed is that which in the in-
terests of the Harbour it is ^{necessary} most
to keep fixed. From it will even-
tually start the northern of the
2 Piers recommended by Mr. Robertson,
and all work done and material
deposited here is so much to the
good. As the stone can be deposited
by boats exactly where it is wanted
timber tramways may be dispensed
with

with. An extra allowance of 10
per cent has been made for
Contingencies.

The Cruz Milagres dam may
now be considered safe for the re-
-con, and the Rs 1000 already granted
in P.O. No. 1714 of 25 June 1874
should suffice to pay for what has
already been done, and gradually
to secure its flanks. The conti-
-nuous line of sand beach
which has now formed in front,
must effectually protect it.

The establishments which
are applied for consisting of

1 Manibry	at Rs 25
1 Storekeeper	" 4
1 Peon	" 4
2 Watchmen	" 14
1 Boatwatchman	" 4
Boat hire	" 1
Sundries	" 3

Rs 61 per

per mensem are excessive, and unnecessary - The works do not now require constant supervision by Watchmen, and Infantry and Cavalry should do all that is required - Rs 35 a month, including Boat hire, should cover every thing, and that amount may be a separate charge on Petty Establishment.

Wm. A. R. E.
Chief Engineer
D.O. O.

Cataramund
August 1874.

Public Works Department
Proceedings of the Madras Government
Read the following
From
The Lt. Col. Mahan (No. 98 dated
31 July 1874)
do do (No. 100 dated 5
Aug 1874)

Memo. by Chief Engineer
P.W.D.

Dated Aug 1874

2437.

His Excellency the Governor in Council
adopts the Chief Engineer's suggestions
and sanctions the sums mentioned by
him for each work.
The 1st will be at once
carried out, in anticipation of early
provision of its amount - It will be
time enough to carry
out the 2nd and 3rd
between

between Christmas
and the following New-
-year; and applica-
-tion will be made
in January for such
amount as can be
spent within the
official year, the
remainder being pro-
-vided in the Budget
of 1875-76.

Lyons

To Mr D. C. Malabar ✓
" Chief Clerk, D. P. W.
" Controller ✓
S. Collins despatch 4/9/74.

1870-1871 686-688.

Recd. 9/8/74
G.W. 15/8/74

4902
4821
Govt. of 1874 Madras.
(PUBLIC WORKS.)

10/11/74
The Dist. Engr.
Malabar

Dated

Recd.

Incl. / 3

G. O. 28 Aug. No. 2437

No. 65,688

Coast Troops at Cochin
Malabar D^o -

The suggestions of the
Chief Engr. D^o as regards
the new works proposed to be
executed to the Coast Troops
adopted & the sums men-
tioned by him sanctioned.
The first work to be carried
out at once & the remainder
to be held in abeyance.
Application to be made
January for such amount
can be sent within the offe
for the remainder.