(1) பக்கங்களின் எண்ணிக்கை 64

(2) புதுக்கித் திருப்பிய நாள் ஏப்ரல் 1991

(3) ஆதாரங்குறிப்பவர் சுருக்கொப்பம்

தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

PWD துறை

(139)

அரசாணை எண்.
மு. கோப்புத் தாள் எண். 718-19

அச்சகம்
பலவகை

நாள் : 13-3-1891 198 .

மடிக்கவோ கண்டபடி கையாளவோ கூடாது

No 4 Map, 5 G10 Shats
Same sets no 163 and 11 & 18
Total 195 sets no. 11

1/8 Shats

20

(11)

இவண : கா-1—18,006—15-6-87.

718-19
1

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

READ—the following paper:—

From W. P. AUSTIN, Esq., C.S., Chairman, Harbour Trust Board, to the Chief Secretary to Government, dated Madras, 14th February 1891, No. 1690.

I have the honor to submit, herewith, for the information and orders of His Excellency the Right Honorable the Governor in Council, an amended estimate for the completion of the Madras Harbour, with an eastern entrance, in accordance with the sanctioned design, as modified after the inspection lately made by Sir Alexander Rendel.

2. In 1884, the late Mr. Parkes framed an estimate of Rs. 45,90,051 for the restoration and completion of the harbour with an eastern entrance. The estimate was sanctioned in G.O., No. 2251 W. of 8th September 1886, and has formed the authority for the advances made from time to time to the Harbour Trust Board for the harbour works.

3. From the comparative statement of work done up to 15th October 1890, it will be seen that the above sanction has been nearly exhausted and that further funds are necessary to complete the harbour. It must now be explained why more money is required and how much, and reference is invited to the accompanying estimate of Rs. 56,73,434 and comparative statement showing the saving and loss upon each item of Mr. Parkes' estimate, the quantities in each case being actuals up to the date given in the statement.

4. Early in 1887 doubts were expressed regarding Mr. Parkes' design and from April in that year until February 1889 the works could only be carried on very slowly, as the details of the design were under discussion in England and in India.

5. This serious delay has by itself very largely increased the cost of the works, but there are additional reasons for the insufficiency of Mr. Parkes' estimate—

(*a*) The rise in the price of cement delivered on the works and the increased quantity in each block.

(*b*) The cost of the protective works to the north of the harbour.

The excess due to (*a*) is estimated at Rs. 3,18,337 and to (*b*) Rs. 59,949. With regard to (*a*) it may be observed that, although Mr. Parkes increased the proportion of cement in his blocks, after preparing his estimate in 1884, Sir Alexander Rendel, when he inspected the works in February 1890, expressed an opinion that a further increase in the proportion of cement was necessary in the south pier head. The cost of protective works was omitted by Mr. Parkes, because he considered that the value of the land formed by the accretion to the south should be taken as a set-off against the cost of any work required to protect the foreshore on the north; but this view has never been definitely accepted by Government, and, for the purposes of the present estimate, it is necessary to include the cost of such work up to date; probably a yearly charge will have to be incurred for the upkeep of these works, but this question is one that may be left until the harbour has been completed and the construction accounts closed.

The increased expenditure due to the delay above mentioned is estimated at Rs. 1,44,761 and represents the value of skilled labor and supervision which had to be retained on the works, but could not be fully utilized while the works were stopped so far as the superstructure was concerned.

6. In addition to these items, the extra work ordered by Sir Alexander Rendel for the pier heads and the new machinery required have increased the cost of the harbour as estimated in 1884.

7. In August 1888 Mr. Pogson prepared five plans and estimates for completing the harbour, and, among these, was an approximate estimate of Rs. 49,72,596, which provided for completing the harbour on the lines sanctioned by the Secretary of State by telegram in December 1888 and by despatch, No. 2 (Public Works) of 24th January 1889, printed with G.O., No. 622 W. of 2nd March 1889. This estimate being based on better information as regards rates than was available in 1884 may with advantage be taken as a basis for comparison with the present estimate of Rs. 56,73,434.

8. The difference between these estimates amounts to Rs. 7,00,838, but 6 lakhs of this is due to the extra work and machinery ordered by Sir Alexander Rendel, the rise in price of cement and the stoppage of the works after August 1888. In order to make this clear a statement is attached, giving the details of the above sum of 6 lakhs.

9. Briefly it may be said that the approximate estimate of August 1888 after allowing for causes of excess, which could not have been foreseen, is insufficient by Rs. 96,944, or not quite 2 per cent.

10. It is believed that the estimate of Rs. 56,73,434 provides fully for the completion of the harbour in accordance with the instructions of the Secretary of State, and, although the difference between this amount and Mr. Parkes' estimate of 1884 is the large sum of 10·83 lakhs, the Trustees are unanimously of opinion that the reasons given for the excesses are satisfactory and that there has been no delay at any time which might have been avoided by the executive staff; but, on the contrary, most satisfactory progress has been made whenever such was possible.

11. The Trustees, therefore, request that a further advance of Rs. 15,00,000 (fifteen lakhs of rupees) may be sanctioned. This includes Rs. 1,55,462 for the extension of the revetment north of the harbour, regarding which a separate estimate is being submitted, and Rs. 2,33,460, estimated proceeds of the sale of plant and machinery, which, however, cannot be disposed of till after the completion of the works.

ENCLOSURES.

	Rs.
Present estimate	56,73,434
Estimate of August 1888	49,72,596
Difference ...	7,00,838
Extra work ordered by Sir Alexander Rendel (*vide* item 50 of explanations in comparative statement)	2,60,000
Extra protective works, &c. (*vide* item 49 of explanations in comparative statement)	64,920
Extra machinery (*vide* item 48 of explanations in comparative statement)	1,60,097
Due to rise in price of cement since August 1888 (*vide* item 8 of explanations in comparative statement)	58,512
Abutment question. An abutment was ordered by the Secretary of State in view of the possibility of a change of entrance, which would necessitate a break in the wall. Special blocks requiring special moulds were made and wave-breaker blocks were set in orderly rows and afterwards taken up again (*vide* item 10 of comparative statement)	8,665
Stoppage of works pending settlement of N.E. question since August 1888 (*vide* item 10 of comparative statement) ...	51,700
	6,03,894
Difference ...	96,944

MADRAS,
29th January 1891.

A. LEE POGSON.

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EXTRACT of Proceedings of the Trustees of the Harbour of Madras at a meeting held at the offices of the Sea Customs on Friday, the 5th day of December 1890.

* * * * *

19. Examined statement by the Board's Engineer, dated 21st November 1890, submitting details of expenditure upon the Madras Harbour Works to 15th October and estimate for completing the eastern entrance to the harbour as approved by Sir Alexander Rendel.

Resolved that this estimate be submitted to Government with a report as to the necessity of the additional expenditure.

* * * * *

EXTRACT of Proceedings of the Trustees of the Harbour of Madras at a meeting held at the offices of the Sea Customs on Friday, the 9th day of January 1891.

* * * * *

2. The Board's Engineer was in attendance and submitted a tabulated statement of details in connection with the revised estimate for the completion of the eastern entrance to the harbour and explained generally the causes of the additional outlay needed.

Resolved that this statement be printed and annexed to the revised estimate and that, on receipt of further explanatory details necessitated by the particulars now laid before the Board, the revised estimate be submitted to Government with the report called for in the Board's resolution No. 19, dated 5th December 1890.

* * * * *

EXTRACT of Proceedings of the Trustees of the Harbour of Madras at a meeting held at the offices of the Sea Customs on Friday, the 23rd day of January 1891.

* * * * *

12. The Trustees then resumed the consideration of the amended estimate for the completion of the eastern entrance to the harbour on the sanctioned design with modifications approved by Sir Alexander Rendel. Mr. Lee Pogson was in attendance and submitted a tabulated statement showing the savings and extra expenditure upon Mr. Parkes' original estimate up to 15th October 1890 and gave explanations of, and reasons for, the additional outlay under various sub-heads.

Resolved that the information given by the Board's Engineer be tabulated and printed with the three statements now before the Board and that the estimates as then completed be circulated and reconsidered at the next meeting, or at a special meeting if practicable to hold one sooner.

EXTRACT of Proceedings of the Trustees of the Harbour of Madras at a meeting held at the offices of the Sea Customs on Friday, the 13th day of February 1891.

* * * * *

14. The amended estimate for the completion of the harbour, as finally revised, having been printed and circulated to each Trustee together with a forecast of the financial position of the Trust prepared by the Board's Secretary showing the position under various contingencies, was then discussed at length, Mr. Lee Pogson being in attendance and giving the Trustees further information as to the details of the estimate.

Read letter from the Board's Engineer, No. 1335, dated 9th February 1891, submitting an estimate for the extension of the revetment at Cassimode amounting to Rs. 1,55,462 for the protection of the foreshore.

Read minute by Major W. L. C. Baddeley, R.E., and draft letter to Government submitting, for the information and orders of His Excellency the Right Honorable the Governor in Council, the amended estimate for the completion of the harbour with an eastern entrance in accordance with the sanctioned design as modified after the inspection lately made by Sir Alexander Rendel.

Resolved that this estimate and draft letter for the completion of the harbour be approved and that Government be requested to make a further advance of Rs. 15,00,000 to complete the eastern entrance and for the extension of the revetment to protect the foreshore to the north.

Resolved, further, that the estimate for the extension of the revetment be approved and that Government be urgently addressed requesting immediate permission to make arrangements for the necessary preliminary outlay to the extent of about Rs. 18,000 (eighteen thousand)

in anticipation of the sanction of His Excellency the Right Honorable the Governor in Council under section 64, Act II of 1886, to the total outlay of Rs. 1,55,462 required for the protection of the coast line north of the harbour.

(True Extracts.)

(Signed) C. PINSENT,
Secretary, Harbour Trust Board.

Transferred to the Public Works Department and a copy furnished to the Financial Department for information with reference to para. 11.

27th February 1891. (Signed) J. F. PRICE,
Chief Secretary.

ORDER—dated 13th March 1891, No. 718 W., Public Works.

With the letter recorded above, the Chairman, Harbour Trust Board, submits an amended estimate for the completion of the Madras Harbour. In February 1890 the works were inspected by Sir Alexander Rendel, Consulting Engineer to the Secretary of State, who then recommended to the Trustees certain modifications of the sanctioned design with the view to give greater stability to the works and proposed that the eastern entrance should be made 500 feet wide instead of 450 feet, to which it was intended to reduce it from the 550 feet originally allowed by Mr. Parkes. The modifications were accepted by the Trustees and approved by Government and the amended estimate now submitted includes the cost of these works.

The original estimate for the harbour amounted to Rs. 57,45,165 against which the recorded outlay was Rs. 65,54,490.

	Rs.
After the disaster of November 1881, a revised estimate became necessary for the restoration and completion of the works and this amounted to	45,90,051
The expenditure against this estimate up to 15th October 1890 has been	42,67,899
Leaving an unexpended balance of	3,22,152
The new works now proposed are estimated to cost	10,83,382
Making a total of	14,05,535

for which details are given on page 2 of the statement submitted by the Harbour Trust Board.

The amended estimate, for which sanction is now asked, amounts to Rs. 56,73,434 and is made up as follows:—

	Rs.
Revised estimate sanctioned in 1886 (G.O., No. 2251 W., dated 8th September 1886)	45,90,051
New work now proposed	10,83,385
Total ...	56,73,434
The expenditure to 15th October 1890 has been	42,67,899
Leaving an unexpended balance of	14,05,535
To this must be added a sum of	1,55,462
For protecting the foreshore north of the harbour, for which a separate estimate has been submitted, making a total of ...	15,60,997

The amount, for which advances remain to be made for completion of the works, will thus stand at Rs. 15,00,000 in round numbers. In addition to this, the Board calculate on realizing ultimately a sum of Rs. 2,33,460 by the sale of plant and machinery, and, as this receipt is shown as a deduction on page 2 of the statement,

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from which the above figures are taken, the sale-proceeds must be left at the disposal of the Board and will go towards meeting the charges under the amended estimate.

The excesses, as compared with the sanctioned revised estimate, are fully explained in the Chairman's letter and in the statement which accompanies it. His Excellency the Governor in Council accepts the amended estimate, as now presented, and resolves to recommend it for the formal sanction of the Right Honorable the Secretary of State for India.

(Here enter No. 719 W., dated 13th March 1891.)

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chairman, Harbour Trust Board.
" Marine Department.

Exd. A. D. Xavier.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1891} Madras.

PUBLIC WORKS.

Dated March, 13th.

Recd. *Encl.*

G.O., 13th Mar. 1891, No. 718 W.

MARCH.

Madras Harbour Works

Orders reviewing the amended estimate for the — and recommending it for the formal sanction of the Right Honorable the Secretary of State for India.

718-19

M.H.W.

Plan accompanying estimate for work to be done after the 15th October 1890, to complete the Harbour.

9 Fathoms

9 Fathoms

9

8½

8½

8

8

500 0

8

7½

7½

7

7

7

6½

6½

6

5½

5

5

4½

4½

4

4

3½

3½

3

3

2½

2½

2

2

1½

1 Fathom

3497 8. 15TH OCTOBER 1890

3749 8. 15TH OCTOBER 1890

Magnetic Var 1° 30' E increasing 3' annually

TRUE NORTH

High Water 30th September 1890

High Water 30th September 1890

B

E

F

G

1000 FT

Scale 400 feet = 1 inch

100 50 0 100 200 300 400 500 600 700 800 900 1000

CLIVE BATTERY

RICE GODOWN

RICE GODOWNS

DYKES

CUSTOM HOUSE

HIGH COURT

CENOTAPH

ARBUTHNOT LANE

MESSRS ARBUTHNOT & CO

H. JAFFAR SAIB & CO

NEW ORIENTAL BANK

MESSRS BEST AND CO

OLD PETTY COURT STREET

STAMP OFFICE

GOVT TELEGRAPH AND POST OFFICES

MYLAI MALLAMPU CHETTY ST

TOWN MAGISTRATES COURT

CHARTERED MERCANTILE BANK

GRANARY STREET NORTH

COMMISSARIAT STORES

MADRAS MAIL OFFICE

CHAMBER OF COMMERCE

GRANARY STREET SOUTH

MESSRS KING & CO

CROPPA CHETTY LANE

ARMENIAN MESSELLY LANE

GOPAL CHETTY LANE

R T BOARD OFFICE

MESSRS GORDON WOODROFFE & CO

MESSRS MATHEWS, JEFFERSHAND & CO

SMITH SHOP

SOUTH PIER OFFICE

PETROLEUM SHED

INTERCEPTING SEWER

BLOCK GROUND

LIGHT HOUSE

LATRINE

Note.—The Contour lines show the depths below Dr Ha… …nds Mean Sea Level in September 1889.

Neutral tint shows completed work.

Pink shows work to be done.

(Signed) A Lee Pigson.

Engineer, Harbour Trust Board 26/9/90.

Photo-Zinco S. O. Madras. 169

7/18-9
5

MADRAS HARBOUR WORKS.

Estimate for work required to be done after the 15th October 1890 to complete the Harbour with an eastern entrance.

MADRAS HARBOUR WORKS.

COMPARISON of expenditure with sanctioned estimate up to 15th October 1890.

Number of item.	Sub-head of work.	As per estimate.				As executed.					Arrears not paid.	Grand total as compared with estimate.	Remarks.
								Cost.					
		Quantity.	Rate.	Per	Cost.	Quantity.	Rate.	Total up to 30th June 1890.	Probable during the months of July, Aug., Sept. and up to 15th Oct. 1890.	Up to date.			
	1	2	3	4	5	6	7	8	9	10	11	12	13
	AS PER OLD ESTIMATE.		RS. A. P.		RS.		RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	
1	Works	..	..	..	49,15,752	..	..	55,09,324 8 10	..	55,09,324 8 10	..	55,09,324 8 10	Old estimate.
2	Establishment	..	..	..	3,57,612	..	..	5,29,904 0 0	..	5,29,904 0 0	..	5,29,904 0 0	Total outlay up to 31st December 1884.
3	Tools and plant	..	..	..	4,71,801	..	..	5,15,262 6 0	..	5,15,262 6 0	..	5,15,262 6 0	
	Total ..	..	..	..	57,45,165	..	..	65,54,490 14 10	..	65,54,490 14 10	..	65,54,490 14 10	
	NEW ESTIMATE.												
4	Alteration and extension of block ground .. Prely.	..	..	..	8,000	..	..	5,882 3 5	..	5,882 3 5	9 13 6	5,892 0 11	
	NORTH PIER.												
	Rubble stone in foreshore and base.												
5	Ordinary deposited from break-water .. Tons.	5,532	1 8 0	Ton.	8,297	2,780	1 12 0	4,865 0 0	..	4,865 0 0	..	4,865 0 0	
6	Do. from boats .. ,,	182,260	2 0 0	,,	3,64,520	204,605½	2 0 5	3,95,753 4 7	8,572 6 11	4,04,325 11 6	10,312 12 1	4,14,638 7 7	
7	Large ordinary deposited under wave-breaker from break-water .. .. ,,	14,750	1 12 0	,,	25,812	11,149¾	1 12 0	19,512 9 0	..	19,512 9 0	..	19,512 9 0	
8	Concrete blocks for building .. .. .. C. yds.	58,116	9 0 0	C. yd.	5,23,044	36,930$\frac{5}{27}$	11 5 4	3,46,229 0 5	72,359 6 2	4,18,588 6 7	..	4,18,588 6 7	
9	Setting blocks at commencement of new work. ,,	2,062	2 0 0	,,	4,124	2,615⅛	2 1 1	5,414 11 2	..	5,414 11 2	..	5,414 11 2	
10	Do. from 2,200 to 3,600 feet .. .. ,,	35,245	2 8 0	,,	88,112	34,314$\frac{29}{32}$	2 13 3	77,154 0 1	17,726 3 0	94,880 3 1	2,180 12 6	97,060 15 7	
11	Do. at pier head .. ,,	20,809	3 0 0	,,	62,427	..	..	..	..	..	..	..	
12	Concrete in mass for filling ,,	500	10 0 0	,,	5,000	263	4 8 3	1,188 0 7	..	1,188 0 7	..	1,188 0 7	
	Wave-breaker.												
13	Built blocks .. .. ,,	288	10 0 0	,,	2,880	288	9 5 7	2,692 0 0	..	2,692 0 0	..	2,692 0 0	
14	Ordinary concrete blocks. ,,	70,849	9 0 0	,,	6,37,641	55,232$\frac{23}{32}$	10 14 6	5,50,368 6 2	51,880 8 0	6,02,248 14 2	..	6,02,248 14 2	
15	Depositing do. .. ,,	70,849	1 0 0	,,	70,849	55,809$\frac{29}{32}$	0 12 7	41,768 3 9	1,293 11 1	43,061 14 10	915 4 11	43,977 3 9	

Comparison of expenditure with sanctioned estimate up to 15th October 1890—*cont.*

Number of item.	Sub-head of work.	As per estimate. Quantity.	Rate.	Per.	Cost.	As executed. Quantity.	Rate.	Cost. Total up to 30th June 1890.	Probable during the months of July, Aug., Sept. and up to 15th Oct. 1890.	Up to date.	Arrears not paid.	Grand total as compared with estimate.	Remarks.
1		2	3	4	5	6	7	8	9	10	11	12	13
	Wave-breaker—cont.		Rs. A. P.		Rs.		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
16	Apron blocks .. .. C. yds.	1,667	9 0 0	C. yd.	15,003	242⅘	10 4 1	..	1,853 11 11	1,853 11 11	628 3 3	2,481 15 2	
17	Setting do. .. .. ,,	1,667	4 0 0	,,	6,668								
18	Concrete in bags .. ,,	742	12 0 0	,,	8,904								
19	Cramps .. .. No.	330	10 0 0	Each.	3,300	245	9 3 9	2,240 4 7	6 13 6	2,247 2 1	15 11 11	2,262 14 0	
20	Concrete capping .. C. yds.	22,400	10 0 0	C. yd.	2,24,000	444⅜	19 13 2	8,817 4 7	3 7 0	8,820 11 7	..	8,820 11 7	
	Total for North pier ..	..	..	..	20,50,581	..	..	14,56,002 12 11	1,53,696 3 7	16,09,699 0 6	14,052 12 8	16,23,751 13 2	
	South pier.												
	Rubble stone in foreshore and base.												
21	Ordinary deposited from break-water .. Tons.	675	1 8 0	Ton.	1,013	..	..	..	..	..	..	..	
22	Do. from boats .. ,,	169,517	2 0 0	,,	3,39,034	168,860¾	2 9 4½	4,27,837 10 8	3,854 11 4	4,31,692 6 0	4,925 14 8	4,36,618 4 8	
23	Large, deposited from break-water .. .. ,,	15,038	1 12 0	,,	26,317	8,614¾	1 12 0	15,075 13 0	..	15,075 13 0	..	15,075 13 0	
24	Concrete blocks for building .. .. .. C. yds.	52,153	9 0 0	C. yd.	4,69,377	34,715⅛	10 14 5	3,59,969 4 4	18,442 8 8	3,78,411 13 0	..	3,78,411 13 0	
25	Setting blocks at commencement .. ,,	2,062	2 0 0	,,	4,124	2,556	3 1 6	7,911 13 3	..	7,911 13 3	..	7,911 13 3	
26	Do. from 2,550 to 3,700 feet .. .. ,,	29,282	2 8 0	,,	73,205	30,166⅔	3 7 11	1,05,461 9 4	..	1,05,461 9 4	..	1,05,461 9 4	
27	Do. at pier head .. ,,	20,869	3 0 0	,,	62,427	1,998²⁰⁄₂₇	14 10 8	10,076 2 4	16,768 12 2	26,844 14 6	2,472 1 6	29,317 0 0	
28	Concrete in mass for filling .. .. .. ,,	500	10 0 0	,,	5,000	602	7 9 1	4,554 14 4	..	4,554 14 4	..	4,554 14 4	
	Wave-breaker.											4,12,012 10 7	
29	Concrete blocks .. .. .. ,,	57,066	9 0 0	,,	5,13,594	37,044¹⁄₂₇	11 1 11	3,99,832 4 7	12,180 6 0	4,12,012 10 7	..		
30	Depositing blocks .. ,,	57,066	1 0 0	,,	57,066	37,526⅞⅔	1 4 1	45,197 3 1	1,362 2 8	46,559 5 9	630 5 11	47,189 11 8	
31	Apron do. .. ,,	1,667	9 0 0	,,	15,003								
32	Setting do. .. ,,	1,667	4 0 0	,,	6,668	956¹⁷⁄₂₀	9 3 2	6,415 12 2	2,378 9 1	8,794 5 3	..	8,794 5 3	
33	Concrete in bags .. ,,	742	12 0 0	,,	8,904								
34	Cramps .. .. No.	275	10 0 0	Each	2,750	186	11 12 2	2,167 12 8	5 13 8	2,173 10 4	13 12 0	2,187 6 4	
35	Concrete capping .. C. yds.	19,200	10 0 0	C. yd.	1,92,000	590¹⁄₁₀	20 12 5	12,184 1 3	95 4 2	12,279 5 5	..	12,279 5 5	
	Total for South pier ..	..	..	..	17,76,482	..	..	13,96,684 5 0	55,088 3 9	14,51,772 8 9	8,042 2 1	14,59,814 10 10	
36	Tools and plant	..	..	..	3,19,529	..	..	4,30,237 11 9	41,549 15 1	4,71,787 10 10	653 3 0	4,72,440 13 10	
		..	..	..	3,19,529	..	..	..	..	..	..	4,72,440 13 10	
37	Contingencies at 2½ per cent. ..	..	..	..	1,03,865	..	..	72,625 13 3	1,450 5 1	74,076 2 4	7,158 4 11	81,234 7 3	
		..	..	..	1,03,865	..	..	..	..	..	..	81,234 7 3	
38	Lighting entrance	..	..	..	20,000	..	..	..	..	..	..	..	
39	Establishment	..	..	..	3,11,594	..	..	3,73,933 0 3	17,814 8 2	3,91,747 8 5	100 4 6*	3,91,847 12 11	
		..	..		3,11,594	..	..	..	..	..	..	3,91,847 12 11	
40	Materials at site (concrete blocks in yards) .. C. yds.	..	..	..	..	15,575⅜	13 9 8	2,18,360 12 9	—23,210 14 0	1,95,149 14 9	16,718 15 10	2,11,868 14 7	
41	Advances to work people ..	..	..	..	..	..	..	4,970 14 5	..	4,970 14 5	..	4,970 14 5	
42	Other stores	..	..	..	..	..	..	..	..	..	..	..	
43	Protective works	..	..	..	..	28,796	2 1 4	38,849 3 0	17,355 3 6	56,204 6 6	3,744 6 9	59,948 13 3	
	Total of estimate and value of work done	..	..	..	45,90,051	..	..	39,97,546 12 9	2,63,743 9 2	42,61,290 5 11	50,479 15 3	43,11,770 5 2	
	Deduct probable recoveries due to sales of tools and plant ..	..	..	..	..	..	..	—42,971 6 3	— 900 0 0	—43,871 6 3	..	—43,871 6 3	
	Total ..	..	..	..	45,90,051	..	..	39,54,575 6 6	2,62,843 9 2	42,17,418 15 8	50,479 15 3	42,67,898 14 11	
	Deduct arrears due	..	..	..	..	..	..	..	..	..	..	..	
	Total outlay to date by books ..	..	..	..	..	..	..	..	..	..	..	..	
	Deduct total outlay to end of last year	..	..	..	..	..	..	..	..	..	..	..	
	Total ..	..	..	..	..	..	..	..	..	..	..	..	
	Deduct value of stock	..	..	..	..	..	..	..	..	..	..	..	
	Total ..	..	..	..	..	..	..	..	..	..	..	..	
	Add net debits to suspense heads during the year	..	..	..	..	..	..	..	..	..	..	..	
	Net debits of the year	..	..	..	..	..	..	..	..	..	..	..	
	Grant for 188 -8 , .. Rupees.	..	..	..	..	..	..	..	..	..	..	..	

MADRAS,
21st November 1890.

(Signed) A. LEE POGSON,
Engineer, Harbour Trust Board.

		Rs.
Sanctioned estimate (G.O., No. 2251 W., dated 8th September 1886)		45,90,051
Total expenditure to 15th October 1890		42,67,899
Balance ...		3,22,152
	Ft.	Ins.
North pier—		
Total length when complete	3,848	9
Do. completed up to 15th October 1890	3,497	8
Total length of pier to be completed ...	351	1
South pier—		
Total length when complete	3,981	3
Do. completed up to 15th October 1890	3,749	8
Total length of pier to be completed ...	231	7

Estimate for work to be done after the 15th October 1890 to complete the harbour with an eastern entrance as called for in letter No. 174 E., of 9th June 1890, from Chairman, Harbour Trust Board, forwarding G.O., Financial No. 385 of 26th May 1890.

Number of item.	Quantity.	Description of work.	Rate.	Per	Amount.	Total.
		North pier.	Rs. A. P.		Rs.	Rs.
1	1,290 Tons.	Additional rubble to make up rubble base ..	2 0 0	Ton.	2,580	..
2	82 L. feet.	Blockwork in pier to be done up to pier head (setting only)	103 12 0	L. ft.	8,508	..
3	857 C. yds.	Concrete blocks—materials only	11 0 0	C. yd.	9,427	..
4	82 L. feet.	Wave-breaker (40 feet wide)	334 0 0	L. ft.	27,388	..
5	1,209 ,,	Do. (12 ,,)	100 4 0	,,	1,20,300	..
6	1,444 C. yds.	Concrete in protection to rubble base	10 4 0	C. yd.	14,801	..
7	13 No.	Cramps, iron	10 12 0	Each.	140	..
8		Add for pier head, including rubble, superstructure, wave-breaker, setting, concrete protection to base and cramps	..	Sum	3,05,436	..
		Total of north pier, less concrete, capping, and caisson at pier head	..	..	..	4,88,580
		South pier.				
9	1,523 Tons.	Additional rubble to make up rubble base ..	2 0 0	Ton.	3,046	..
10	444 C. yds.	Concrete in protection to rubble base	10 4 0	C. yd.	4,551	..
		Add for pier head complete, including rubble, superstructure, wave-breaker, concrete protection, caisson and cramps, &c.	..	Sum	3,57,878	..
11		Total of south pier complete, less concrete capping.	..	..	3,65,475	8,54,055
12		New plant and repairs to machinery, extra railway lines and sleepers	..	..	1,39,215	..
		Total of north and south piers	..	..	9,93,270	..
13		Add 10 per cent. for establishment	..	..	99,327	..
14		Do. 5 do. for contingencies	..	..	49,664	..
15		Deduct sale-proceeds of tools and plant on completion of works	..	..	11,42,261	..
		Total to complete eastern entrance from 15th October 1890 without north pier caisson and capping to both piers	..	..	2,33,460	..
16		Add outlay to 15th October 1890 (approximate) ..	..	..	9,08,801	..
		Total cost of sanctioned design complete, as above.	..	..	42,67,899	..
17		Add cost of north pier caisson and setting in position	..	..	..	51,76,700
18	15,907 C. yds.	Add capping to north pier	11 0 0	C. yd.	84,750	..
19	15,656 ,,	Do. do. south pier	11 0 0	,,	1,74,977	..
		....	..	..	1,72,216	..
				..	4,31,943	..

Estimate for work to be done after the 15th October 1890 to complete the harbour with an eastern entrance, &c.—*cont.*

Number of item.	Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
		South pier—cont.	Rs. A. P.		Rs.	Rs.
20		Add 10 per cent. for establishment	..	..	43,194	...
21		Do. 5 do. for contingencies	..	..	21,597	..
		Total of capping to both piers and north pier caisson	..	..	4,96,734	56,73,434
		Total of north and south piers completed in accordance with sanctioned design, eastern entrance	..	..	56,73,434	..
22		Deduct total of original estimate for sanctioned design	..	..	45,90,051	..
23		Balance for which sanction is required to complete eastern entrance after 15th October 1890 ..	..	..	10,83,383	10,83,383
		Abstract of estimate.				
		To complete north and south piers less the capping and the north pier caisson	..	..	..	9,08,801
		Add outlay to 15th October 1890	..	..	..	42,67,899
		Total cost of harbour completed less concrete capping and north pier caisson	..	..	..	51,76,700
		Deduct original estimated cost of sanctioned design	..	..	..	45,90,051
		Balance required to complete north and south piers without the concrete capping and the north pier caisson	..	..	..	5,86,649
		Add cost of capping to both piers and cost of setting north pier caisson	..	..	..	4,96,734
		Total balance required to complete harbour ..	..	..	..	10,83,383
		Add sanctioned estimate	..	..	..	45,90,051
		Total cost of harbour eastern entrance with capping and caisson completed	..	..	..	56,73,434

MADRAS,
21st November 1890.

(Signed) A. LEE POGSON,
Engineer, Harbour Trust Board.

Statement showing what the work done up to the 15th October 1890 would have cost had it been carried out at the rates allowed by Mr. Parkes in his estimate of 1884, submitted in compliance with the Board's memo. No. 506 E. of 5th January 1891 calling for further report in support of the estimate of 21st November 1890, amounting to Rs. 10,83,383, for completing the harbour.

Number of item	Description of work.	Quantity of work done up to 15th October 1890.	As per Mr. Parkes' estimate. Rate.	Per	Cost of work done at Mr. Parkes' rates.	Actual cost of work done.	Saving upon Mr. Parkes' estimate.	Loss upon Mr. Parkes' estimate.
	New estimate.		Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
4	Alteration and extension of block-ground	..	..	..	8,000 0 0	5,892 0 11	2,107 15 1	..
	North pier.							
	Rubble stone in foreshore and base.							
5	Ordinary deposited from break-water	2,780 Tons.	1 8 0	Ton.	4,170 0 0	4,865 0 0	..	695 0 0
6	Do. from boats	204,605½ ,,	2 0 6	,,	4,09,211 0 0	4,14,638 7 7	..	5,427 7 7
7	Large ordinary deposited under wave-breaker from break-water.	11,149⅝ ,,	1 12 0	,,	19,512 1 0	19,512 9 0	..	0 8 0
8	Concrete blocks for building	36,930-5/7 C. yds.	9 0 0	C. yds	3,32,371 10 8	4,18,588 6 7	..	86,216 11 11
9	Setting blocks at commencement of new work	2,615½ ,,	2 0 0	,,	5,230 14 3	5,414 11 2	..	183 12 11
10	Do. from 2,230 to 3,600 feet	34,314 29/47 ,,	2 8 0	,,	85,786 13 8	97,060 15 7	..	11,274 1 11
11	Do. at pier head	..	8 0 0	,,	..	..	..	..
12	Concrete in mass for filling	263 ,,	10 0 0	,,	2,630 0 0	1,188 0 7	1,441 15 5	..
	Wave-breaker.							
13	Built blocks	288 ,,	10 0 0	,,	2,880 0 0	2,692 0 0	188 0 0	..
14	Ordinary concrete blocks	55,282 23/33 ,,	9 0 0	,,	4,97,093 12 0	6,02,248 14 2	..	1,05,155 2 2
15	Depositing do.	56,809 29/33 ,,	1 0 0	,,	55,809 6 10	43,977 3 9	11,832 3 1	..
16	Apron blocks	..	3 0 0	,,	..	..	..	..
17	Setting	242 29/33 ,,	4 0 0	,,	3,074 7 3	2,481 15 2	592 8 1	..
18	Concrete in bags	..	12 0 0	,,	..	..	..	..
19	Cramps	245	10 0 0	Each.	2,450 0 0	2,262 14 0	187 2 0	..
20	Concrete capping	444 8/33 ,,	10 0 0	C. yd.	4,448 5 4	8,820 11 7	..	4,372 6 3
	Total for North pier	..	..	..	14,32,668 7 0	16,29,643 14 1	16,349 11 8	2,13,325 2 9
	South side.							
	Rubble stone in foreshore and base.							
21	Ordinary deposited from break-water	..	1 8 0	Ton.	1,013 0 0	..	1,013 0 0	..
22	Do. from boats	168,860⅜ Tons.	2 0 0	,,	3,37,721 8 0	4,36,618 4 8	..	98,896 12 8
23	Large deposited from break-water	8,814¾ ,,	1 12 0	,,	15,075 13 0	15,075 13 0	..	..
24	Concrete blocks for building	34,715 29/33 C. yds.	9 0 0	C. yds.	3,12,439 5 4	3,78,411 13 0	..	65,972 7 8
25	Setting blocks at commencement	2,556 ,,	2 0 0	,,	5,112 0 0	7,911 13 3	..	2,799 13 3
26	Do. from 2,550 to 3,700 feet	39,160⅝ ,,	2 8 0	,,	75,401 4 0	1,05,461 0 4	..	30,060 5 4
27	Do. at pier head	1,998 27/47 ,,	3 0 0	,,	5,996 3 7	29,317 0 0	..	23,320 12 5
28	Concrete in mass for filling	602 ,,	10 0 0	,,	6,020 0 0	4,554 14 4	1,465 1 8	..
	Wave-breaker.							
29	Concrete blocks	37,044 1/33 C. yds.	3 0 0	C. yd.	3,33,396 0 10	4,12,012 10 7	..	78,616 0
30	Depositing blocks	37,526 1/33 ,,	1 0 0	,,	37,527 0 0	47,189 11 8	..	9,662 11 8
31	Apron do.	..	3 0 0	,,	..	..	..	..
32	Setting do.	956 17/33 ,,	4 0 0	,,	12,140 3 6	8,794 5 3	3,345 14 3	..
33	Concrete in bags	..	12 0 0	,,	..	..	..	..
34	Cramps	186 No.	10 0 0	Each.	1,860 0 0	2,187 6 4	..	327 6 4
35	Concrete capping	590 11/33 C. yds.	10 0 0	C. yd.	5,909 2 8	12,279 6 5	..	6,370 2 9
	Total for South pier	..	..	..	14,49,611 8 11	14,50,814 10 10	5,823 15 11	3,16,027 1 10
36	Tools and plant	..	..	..	3,19,520 0 0	4,72,440 13 10	..	1,52,911 13 10
37	Contingencies at 2½ per cent.	..	..	..	1,03,865 0 0	81,234 7 3	22,630 8 9	..
38	Lighting entrance	..	..	..	20,000 0 0	..	20,000 0 0	..
39	Establishment	..	..	..	3,11,594 0 0	3,91,847 12 11	..	80,253 12 11
40	Materials at site (concrete blocks in yards)	15,575½ C. yds.	9 0 0	C. yd.	1,40,179 0 0	2,11,868 14 7	..	71,689 14 7
41	Advances to work people	..	..	..	..	4,970 14 5	..	4,970 14 5
42	Other stores	..	..	..	..	..	..	..
43	Protective works—rubble stone	28,796 Tons.	2 1 4	Ton.	..	59,948 13 3	..	59,948 13 3
44	Total value of work done	..	..	..	..	43,11,770 5 2	..	..
45	Deduct probable receveries due to sales of tools and plant	..	..	..	..	43,871 6 3	43,871 6 3	..
	Total	..	..	..	..	42,67,898 14 11	1,98,675 10 7	8,99,127 9 7
46	Balance which would have been available had Mr. Parkes' rates been sufficient	..	..	..	..	..	..	1,90,451 15 0
47	Additional sum now asked for to complete the harbour as per estimate of 21st November 1890	..	..	..	..	..	..	10,83,383 0 0
48	Deduct for extra machinery not allowed for in Mr. Parkes' estimate, Rs. 1,39,215 + 15 per cent.	..	..	..	..	..	..	1,60,097 0 0
49	Deduct advances to work people, Rs. 4,970-14-5, and protective works, Rs. 59,948-13-3	..	..	..	..	..	..	9,23,286 0 0 64,920 0 0
50	Deduct extra work in pier heads as ordered by Sir Alexander Rendel, K.C.I.E.	..	..	..	..	..	..	8,58,366 0 0 2,60,000 0 0
51	Balance which would have been required to complete the harbour as per Mr. Parkes' design and rates	..	..	..	..	..	..	5,98,366 0 0
52	Balance which would have been on hand upon the completion of the work had it been carried out at Mr. Parkes' rates after deducting extra work in pier heads and tools and plant, protective works and advances to work people, all being extras upon the original estimate for reconstruction	..	..	..	..	..	..	1,92,085 15 0

Details of cost of pier heads.

Quantity.	Description of work.	Rate.	Per.	Amount.	Quantity.	Description of work.	Rate.	Per.	Amount.
	NORTH PIER HEAD (ITEM 8).	RS. A. P.		RS. A. P.		SOUTH PIER HEAD (ITEM 11).	RS. A. P.		RS. A. P.
216 L. ft.	Coursed blockwork labor	539 0 0	L. ft.	1,16,424 0 0	166 L. ft.	Coursed blockwork labor ..	..	..	1,07,528 0 0
8,452 C. yds.	Do. material	11 0 0	C. yd.	92,972 0 0	5,652 C. yds.	Do. material ..	11 0 0	C. yd.	62,172 0 0
					2,355 "	Concrete in cylindrical pier head ..	15 0 0	" ..	35,325 0 0
1,000 Tons.	Rubble stone to make up base ..	2 0 0	Ton.	2,000 0 0	184 "	Do. in filling in between coursed blockwork and caisson	15 0 0	..	2,760 0 0
					4,694 Tons.	Rubble stone to make up base ..	2 0 0	Ton.	9,388 0 0
270 L. ft.	Wave-breaker, 40 feet wide	334 0 0	L. ft.	90,180 0 0	270 L. ft.	Wave-breakers, 40 feet wide ..	334 0 0	L. ft.	90,180 0 0
					73 No.	Iron cramps	10 12 0	each.	785 0 0
73 No.	Iron cramps	10 12 0	Each.	785 0 0	300 C. yds.	Concrete protection to rubble base ..	10 4 0	C. yd.	3,075 0 0
					1 No.	Iron caisson	..	Sum.	18,000 0 0
300 C. yds.	Concrete protection to rubble base ..	10 4 0		3,075 0 0		Preparing base for and setting cylindrical pier head	..	..	28,665 0 0
		..		3,05,436 0 0			..		3,57,878 0 0

MADRAS,
9th January 1891.

(Signed) A. LEE POGSON,
Engineer, Harbour Trust Board.

Remarks on the various items in the preceding comparative statement.

Items 5, 6 & 7. Due to excess quantity required on account of base being washed down pending settlement of question of position of entrance.

Item 8. Due to increased cost of cement and to increased proportion of it used in the concrete, as ordered by Mr. Parkes subsequently to the making of his estimate. The cost of cement has increased from Rs. 37½ per ton, when the estimate for the restoration was framed, to Rs. 52 at the present time. This increase has been due to the fall in exchange, freight, additional charge of 3 per cent. made by the India Office, and in prime cost in England. The increase in expenditure under this head amounts to Rs. 2,48,837. The loss under increased consumption due to increased proportion ordered by Mr. Parkes has been Rs. 69,500. The sum of these two items is Rs. 3,18,337. The total of the losses under items 8, 14, 20, 24, 29, 31, 32, 33, 35 and 40 is Rs. 3,73,393, the balance (Rs. 55,056) is the value of block moulds and joggle boxes in the yards and includes all repairs, alterations and cost of special moulds made for the abutment, for which no provision was made in the original estimate.

" 10. Due to the necessity of maintaining the full staff of trained employés during suspension of work (from April 1887 to February 1889) pending settlement of the question of position of entrance. The actual loss due to this stoppage was Rs. 1,44,761. There was also a loss of Rs. 8,665 due to setting wave-breakers in orderly rows at north pier, which wave-breakers had to be taken up again; also to a stoppage pending settlement of abutment question. The total of these two items is Rs. 1,53,426. The total of the losses under items 10, 26, and 39 is Rs. 1,21,588. The amount, namely Rs. 31,838, to credit in this case is due to the uninterrupted rapid progress made since the questions above mentioned have been settled.

" 14. See remark under item 8.

" 20. Do. do.

" 22. Due to establishment having been maintained during the years 1882 to 1885 when but little progress was being made pending sanction for reconstruction.

" 24. See remark under item 8.

" 25. Due to difficulties in execution owing to position of work and to heavy seas already reported at recommencement of works.

" 26. See remark under item 10.

" 27. Due to unsuitability of present Titan cranes to build a wall so wide as 36 feet, entailing extra labor and delay in setting.

" 29. See remark under item 8.

" 30. Due to difficulty in depositing blocks with Titan crane as was done previous to the transfer of the wave-breaker crane from north pier in 1888.

Items 31, 32, 33. See remark under item 8.

Item 35. Do. do.

" 36. Due to the additional time taken in carrying out the work, which has involved expensive repairs to old machinery and the purchase of new. A considerable recovery will be made, however, upon the completion of the work, as most of the machinery will still be serviceable and some almost new.

" 39. See remark under item 10.

" 40. See remark under item 8.

" 48. This item includes the cost of new all round Titan crane erected and all extra plant necessary to complete the harbour.

" 49. No provision was made for protective works in the original estimate for reconstruction, therefore this item must be deducted to arrive at a comparative statement.

" 50. These works comprise two concrete cylindrical pier heads (including steel caissons), Rs. 1,94,926; extra block work for an additional 6 feet in depth, Rs. 41,156; and extra labor in lowering the rubble base by divers, the base being already made up to the level originally intended, Rs. 23,918.

Time of completion.—Assuming that fair setting weather is experienced, both north and south piers (including pier-heads) will be completed by the end of October 1892. The new work must be allowed one monsoon to settle. The capping will be commenced in February 1893 and completed in October 1893.

MADRAS [illegible] HARBOUR.

Comparison of Expenditure with Sanctioned Estimate up to 15th October 1890.

No. of Item.	Sub-Head of Work.	As per Estimate. Quantity.	Rate.	Per.	Cost.	As Executed. Quantity.	Rate.	Cost. Total up to 30th June 1890.	Cost. Probable during the months of July, Aug., Sept. and up to 15th October 1890.	Cost. Up to date.	Arrears not paid.	Grand Total as compared with Estimate.	Remarks.
	1	2	3	4	5	6	7	8	9	10	11	12	13
	As per Old Estimate.		Rs. A. P.		Rs.			Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
1	Works	...	... ...	...	49,15,752	...	... ...	55,09,324 8 10	.. ..	55,09,324 8 10	.. ..	55,09,324 8 10	Old Estimate. Total outlay up to 31st December 1884.
2	Establishment	...	... ...	...	3,57,612	...	... ...	5,29,904 0 0	.. ..	5,29,904 0 0	... ...	5,29,904 0 0	
3	Tools and Plant	...	... ...	...	4,71,801	...	... ...	5,15,262 6 0	... ...	5,15,262 6 0	... .	5,15,262 6 0	
	Total ...	...	... ...	...	57,45,165	...	... ...	65,54,490 14 10	... ...	65,54,490 14 10	... .	65,54,490 14 10	
	New Estimate.												
4	Alteration and extension of block ground ... ... Prely.	...	.. ..	...	8,000	..	.. ..	5,882 3 5	... ...	5,882 3 5	9 13 6	5,892 0 11	
	North Pier.												
	Rubble Stone in Foreshore and Base.												
5	Ordinary deposited from break-water ... ... Tons	5,532	1 8 0	Ton.	8,297	2,780	1 12 0	4,865 0 0	... ...	4,865 0 0	... .	4,865 0 0	
6	Do. from boats... „	1,82,260	2 0 0	„	3,64,520	2,04,605½	2 0 5	3,95,753 4 7	8,572 6 11	4,04,325 11 6	10,312 12 1	4,14,638 7 7	
7	Large ordinary deposited under wave-breaker from break-water „	14,750	1 12 0	„	25,812	11,149¾	1 12 0	19,512 9 0	... ...	19,512 9 0	... .	19,512 9 0	
8	Concrete blocks for building ...C. yds.	58,116	9 0 0	C. yd.	5,23,044	36,930 5/27	11 5 4	3,46,229 0 5	72,359 6 2	4,18,588 6 7	... .	4,18,588 6 7	
9	Setting blocks at commencement of new work ... ... „	2,062	2 0 0	„	4,124	2,615⅝	2 1 1	5,414 11 2	... ...	5,414 11 2	... .	5,414 11 2	
10	Do. from 2,200 to 3,600 feet ... ... „	35,245	2 8 0	„	88,112	34,314 9/17	2 13 8	77,154 0 1	17,726 8 0	94,880 3 1	2,180 12 6	97,060 15 7	
11	Do. at Pier Head... ... „	20,809	3 0 0	„	62,427	...	... .	... ...	... ...	... ...	... ...	... ...	
12	Concrete in mass for filling ... „	500	10 0 0	„	5,000	263	4 8 3	1,188 0 7	... ...	1,188 0 7	... .	1,188 0 7	
	Wave Breaker.												
13	Built blocks ... ...C. yds.	288	10 0 0	C. yd.	2,880	288	9 5 7	2,692 0 0	... ...	2,692 0 0	... ...	2,692 0 0	
14	Ordinary concrete blocks ... „	70,849	9 0 0	„	6,37,641	55,232 23/30	10 14 6	5,50,368 6 2	51,880 8 0	6,02,248 14 2	... ...	6,02,248 14 2	
15	Depositing do. ... „	70,849	1 0 0	„	70,849	55,809 23/54	0 12 7	41,768 3 9	1,293 11 1	43,061 14 10	915 4 11	43,977 3 9	
16	Apron blocks ... ... „	1,667	9 0 0	„	15,003								
17	Setting do ... ... „	1,667	4 0 0	„	6,668	242⅔	10 4 1	... .	1,853 11 11	1,853 11 11	628 3 3	2,481 15 2	
18	Concrete in bags ... ... „	742	12 0 0	„	8,904								
19	Cramps ... ... No.	330	10 0 0	Each.	3,300	245	9 3 9	2,240 4 7	6 13 6	2,247 2 1	15 11 11	2,262 14 0	
20	Concrete capping ... ...C. yds.	22,400	10 0 0	C. yd.	2,24,000	444⅝	19 13 2	8,817 4 7	3 7 0	8,820 11 7	... ...	8,820 11 7	
	Total for North Pier ...		... ...	...	20,50,581			14,56,002 12 11	1,53,696 3 7	16,09,699 0 6	14,052 12 8	16,23,751 13 2	
	South Pier.												
	Rubble Stone in Foreshore and Base.												
21	Ordinary deposited from break-water ... . Tons	675	1 8 0	Ton	1,013								
22	Do. from boats. „	1,69,517	2 0 0								25 14 8	4,36,613 4 8	
23	Large, deposited from break-water „	15,058	3								... ...	15,075 13 0	
24	Concrete blocks for building ...C. yds.	52,153	9								... ...	3,78,411 13 9	
25	Setting blocks at commencement. „	2,062	2								... ...	7,911 13 3	
26	Do. from 2,500 to 3,700 feet... „	29,282	2 8								... ...	1,05,461 9 4	
27	Do. at Pier head ... ... „	20,809	3 0 0	„	62,427	1,988 5/27	14 10 8	10,0[illegible]			72 1 6	29,317 0 0	
28	Concrete in mass for filling ... „	500	10 0 0	„	5,000	602	7 9 1	4,554 14 4	... ...	4,554 14 4	... ...	4,554 14 4	
	Wave Breaker.												
29	Concrete blocks ... ...C. yds.	57,066	9 0 0	C. yd.	5,13,594	37,044 1/168	11 1 11	3,99,832 4 7	12,180 6 0	4,12,012 10 7	... ...	4,12,012 10 7	
30	Depositing blocks ... ... „	57,066	1 0 0	„	57,066	37,526 155/756	1 4 1	45,197 3 1	1,362 2 8	46,559 5 9	630 5 11	47,189 11 8	
31	Apron do. ... ... „	1,667	9 0 0	„	15,003								
32	Setting do. ... ... „	1,667	4 0 0	„	6,668	956 17/18	9 3 2	6,415 12 2	2,378 9 1	8,794 5 3	... ...	8,794 5 3	
33	Concrete in bags ... ... „	742	12 0 0	„	8,904								
34	Cramps ... ... No.	275	10 0 0	Each.	2,750	186	11 12 2	2,167 12 8	5 13 8	2,173 10 4	13 12 0	2,187 6 4	
35	Concrete capping ... ...C. yds.	19,200	10 0 0	C. yd.	1,92,000	590 1/12	20 12 5	12,184 1 3	95 4 2	12,279 5 5	... ...	12,279 5 5	
	Total for South Pier ...		... ...	...	17,76,482			13,96,684 5 0	55,088 3 9	14,51,772 8 9	8,042 2 1	14,59,814 10 10	
36	Tools and Plant	...	... .	...	3,19,529			4,30,237 11 9	41,549 15 1	4,71,787 10 10	653 3 0	4,72,440 13 10	
					3,19,529							4,72,440 13 10	
37	Contingencies at 2½ per cent.				1,03,865			72,625 13 3	1,450 5 1	74,076 2 4	7,158 4 11	81,234 7 3	
					1,03,865							81,234 7 3	
38	Lighting entrance				20,000			... ...	... ...	... ...	... ...	... ...	
39	Establishment				3,11,594			3,73,933 0 3	17,814 8 2	3,91,747 8 5	100 4 6	3,91,847 12 11	
					3,11,594							3,91,847 12 11	
40	Materials at site (concrete blocks in yards) ... ...C. yds.	...	... ...	...	...	15,575¼	13 9 8	2,18,360 12 9	23,210 14 0	1,95,149 14 9	16,718 15 10	2,11,868 14 7	
41	Advances to work people	...	... ...	...	...			4,970 14 5	... ...	4,970 14 5	... ...	4,970 14 5	
42	Other Stores...	...	... ...	...	...			... ...	... ...	... ...	... ...	... ...	
43	Protective Works	...	... ...	...	...	28,796	2 1 4	38,849 3 0	17,355 3 6	56,204 6 6	3,744 6 9	59,948 13 3	
	Total of Estimate and value of work done		... ...	...	45,90,051			39,97,546 12 9	2,63,743 9 2	42,61,290 5 11	50,479 15 3	43,11,770 5 2	
	Deduct probable recoveries due to sales of Tools and Plant	...	... ...	...	...			—42,971 6 3	— 900 0 0	—43,871 6 3	... ...	—43,871 6 3	
	Total ...	...	... ...	...	45,90,051			39,54,575 6 6	2,62,843 9 2	42,17,418 15 8	50,479 15 3	42,67,898 14 11	
	Deduct Arrears due	...	... ...	...	...	...	... ...	...	...	...	...	...	
	Total outlay to date by books	...	... ...	...	...	...	... ...	...	...	...	...	...	
	Deduct total outlay to end of last year. ...	...	... ...	...	...	...	... ...	...	...	...	...	...	
	Total ...	...	... ...	...	...	...	... ...	...	...	...	...	...	
	Deduct Value of Stock	...	... ...	...	...	...	... ...	...	...	...	...	...	
	Total ...	...	... ...	...	...	...	... ...	...	...	...	...	...	
	Add Net Debits to Suspense Heads during the year	...	... ...	...	...	...	... ...	...	...	...	...	...	
	Net Debits of the year	...	... ...	...	...	...	... ...	...	...	...	...	...	
	Grant for 188 -8 , Rupees...	...	... ...	...	...	...	... ...	...	...	...	...	...	

Harbour Works Office,
Madras, 21st November 1890.

A. LEE POGSON,
Engineer, Harbour Trust Board.

...OUR WORKS.

Estimate for work to be done after the 15th October 1890 to complete the Harbour with an Eastern Entrance, as called for in letter No. 174E of 9th June 1890 from Chairman, Harbour Trust Board, forwarding G.O., Financial, No. 385 of 26th May 1890.

Sanctioned Estimate, G.O., No. 2251W, dated 8th September 1886	Rs.	45,90,051	
Total Expenditure to 15th October 1890	,,	42,67,899	
Balance...	,,	3,22,152	
NORTH PIER.—Total length when complete		3,848′ 9″	
Do. do. completed up to 15th October 1890		3,497′ 8″	
Total length of Pier to be completed...		351′ 1″	
SOUTH PIER.—Total length when completed		3,981′ 3″	
Do. do. completed up to 15th October 1890		3,749′ 8″	
Total length of Pier to be completed...		231′ 7″	

No. of Item.	Quantity.	Description of Work.	Rate. Rs.	A.	P.	Per	Amount. Rs.	A.	P.	Total. Rs.	A.	P.
		NORTH PIER.										
1	1,290 Tons.	Additional rubble to make up rubble base	2	0	0	ton	2,580	0	0			
2	82 L. ft.	Blockwork in Pier to be done up to Pier Head (setting only) ...	103	12	0	l. ft.	8,508	0	0			
3	857 C. yds.	Concrete Blocks—materials only	11	0	0	c. yd.	9,427	0	0			
4	82 L. ft.	Wave-breaker (40 ft. wide)	334	0	0	l.ft.	27,388	0	0			
5	1,200 ,,	Do. (12 ft. wide)	100	4	0	,,	1,20,300	0	0			
6	1,444 C. yds.	Concrete in protection to rubble base	10	4	0	c. yd.	14,801	0	0			
7	13 No.	Cramps, iron	10	12	0	each	140	0	0			
8		Add for Pier Head, including rubble, superstructure, wave-breaker, setting, concrete protection to base and cramps ...	...	...	...	sum	3,05,436	0	0			
		Total of North Pier, less concrete, capping, and caisson at Pier Head	...	...	...	...	...	...	...	4,88,580	0	0
		SOUTH PIER.										
9	1,523 Tons.	Additional rubble to make up rubble base	2	0	0	ton	3,046	0	0			
10	444 C. yds.	Concrete in protection to rubble base	10	4	0	c. yd.	4,551	0	0			
		Add for Pier Head complete, including rubble, superstructure, wave-breaker, concrete protection, caisson and cramps, &c.	...	...	...	sum	3,57,878	0	0			
11		Total of South Pier complete, less concrete capping	...	...	...	...	3,65,475	0	0	8,54,055	0	0
12		New Plant and repairs to Machinery, extra Railway lines and sleepers	...	...	...	...	1,39,215	0	0			
13		Total of										
		,, 5				...	99,327	0	0			
						...	49,664	0	0			
15		Deduct Sale proceeds of Tools and Plant on completion of Works...	...	...	...	...	11,42,261	0	0			
							2,33,460	0	0			
16		Total to complete Eastern Entrance from 15th October 1890 without North Pier caisson and capping to both Piers ...	...	...	...	...	9,08,801	0	0			
		Add outlay to 15th October 1890 (approximate)	...	...	...	...	42,67,899	0	0			
		Total cost of Sanctioned Design complete, as above.... ...	...	...	...	...	...	...	...	51,76,700	0	0
17												
18	15,907 C. yds.	Add cost of North Pier caisson and setting in position	...	...	...	...	84,750	0	0			
19	15,656 ,,	,, capping to North Pier	11	0	0	c. yd.	1,74,977	0	0			
		,, ,, South Pier	11	0	0	,,	1,72,216	0	0			
20												
21		Add 10 per cent. for Establishment	...	...	...	...	4,31,943	0	0			
		,, 5 ,, ,, Contingencies	...	...	...	...	43,194	0	0			
		Total of Capping to both Piers, and North Pier caisson	...	...	...	...	21,597	0	0			
							4,96,734	0	0	56,73,434	0	0
22		Total of North and South Piers completed in accordance with Sanctioned Design, Eastern Entrance	...	...	...	...	56,73,434	0	0			
23		Deduct Total of Original Estimate for Sanctioned Design	...	...	...	...	45,90,051	0	0			
		Balance for which sanction is required to complete Eastern Entrance after 15th October 1890	...	...	...	...	10,83,383	0	0	10,83,383	0	0

ABSTRACT OF ESTIMATE.

To complete North and South Piers less the capping and the North Pier caisson	9,08,801	0	0
Add outlay to 15th October 1890	42,67,899	0	0
Total Cost of Harbour completed less concrete capping and North Pier caisson	51,76,700	0	0
Deduct Original Estimated cost of Sanctioned Design	45,90,051	0	0
Balance required to complete North and South Piers without the concrete capping and the North Pier caisson	5,86,649	0	0
Add cost of capping to both Piers and cost of setting North Pier caisson	4,96,734	0	0
Total Balance required to complete Harbour	10,83,383	0	0
Add Sanctioned Estimate	45,90,051	0	0
Total Cost of Harbour Eastern Entrance with capping and caisson completed	56,73,434	0	0

HARBOUR WORKS OFFICE,
MADRAS, 21st November 1890.

A. LEE POGSON.
Engineer, Harbour Trust Board.

MADRAS HARBOUR WORKS.

...quired to be done after the 15th October 1890

...te for W...

to complete the Harbour with an Eastern entrance.

MADRAS HARBOUR WORKS.

Statement showing what the work done up to the 15th October 1890 would have cost had it been carried out at the rates allowed by Mr. Parkes in his Estimate of 1884.

Submitted in compliance with the Board's Memo. No. 506 E of 5th January 1891 calling for further report in support of the Estimate of 21st November 1890 amounting to Rs. 10,83,383 for completing the Harbour.

No. of Item.	Description of Work.	Quantity of Work done up to 15th October 1890.	As per Mr. Parke's Estimate. Rate.			Per	Cost of work done at Mr. Parke's Rates.			Actual cost of Work done.			Saving upon Mr. Parke's estimate.			Loss upon Mr. Parke's estimate.		
			Rs.	A.	P.		Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
	NEW ESTIMATE.																	
4	Alteration and Extension of block-ground ...	.....	...	...	...	...	8,000	0	0	5,892	0	11	2,107	15	1	...	...	...
	NORTH PIER.																	
	Rubble Stone in Foreshore and Base.																	
5	Ordinary deposited from breakwater ...	2,780 Tons	1	8	0	Ton												
6	Do. from boats ...	204,605½ ,,	2	0	0	,,	4,170	0	0	4,865	0	0	...	...	...	695	0	0
7	Large ordinary deposited under wavebreaker from breakwater	11,149¾ ,,	1	12	0	,,	4,09,211	0	0	4,14,688	7	7	...	...	...	5,427	7	7
8	Concrete blocks for building ...	36,930$\frac{5}{27}$ C. yds.	9	0	0	C. yd.	19,512	1	0	19,512	9	0	...	...	...	0	8	0
9	Setting blocks at commencement of new work	2,615¼ ,,	2	0	0	,,	3,32,371	10	8	4,18,588	6	7	...	...	...	86,216	11	11
10	Do. from 2,200 to 3,600 feet ...	34,314$\frac{20}{27}$,,	2	8	0	,,	5,230	14	3	5,414	11	2	...	...	...	183	12	11
11	Do. at Pier-head	.....	3	0	0	,,	85,786	13	8	97,060	15	7	...	...	...	11,274	1	11
12	Concrete in mass for filling	263 ,,	10	0	0	,,	...	...	...	...	...	...	...	...	...	...	...	...
	WAVE BREAKER.						2,630	0	0	1,188	0	7	1,441	15	5	...	...	...
13	Built blocks	288																
14	Ordinary concrete blocks	55,232$\frac{23}{36}$,,	10	0	0	,,	2,880	0	0	2,692	0	0	188	...	...	...	...	...
15	Depositing do	56,809$\frac{33}{54}$,,	9	0	0	,,	4,97,093	12	0	6,02,248	14	2	...	...	...	1,05,155	2	2
16	Apron blocks	.....	1	0	0	,,	55,809	6	10	43,977	3	9	11,832	3	1	...	...	...
17	Setting	242$\frac{8}{9}$,,	9	0	0	,,	...	...	...	...	...	...	...	...	...	...	...	...
18	Concrete in bags	.....	4	0	0	,,	3,074	7	3	2,481	15	2	592	8	1	...	...	...
19	Cramps	215	12	0	0	,,	...	...	...	...	...	...	...	...	...	...	...	...
20	Concrete capping	444$\frac{5}{6}$ C. yds.	10	0	0	each	2,450	0	0	2,262	14	0	187	2	0	...	...	...
	Total for North Pier ...	.....	...	...	...	C. yd.	4,448	5	4	8,820	11	7	...	...	...	4,372	6	3
	SOUTH PIER.					..	14,32,668	7	0	16,29,643	14	1	16,349	11	8	2,13,325	2	9
	Rubble Stone in Foreshore and Base.																	
21	Ordinary deposited from breakwater ...	.....	1	8	0	Ton												
22	Do. from boats	168,860¾ Tons.	2	0	0	,,	1,013	0	0	...	...	...	1,013	0	0	...	...	..
23	Large deposited from breakwater ...	8,614¾ ,,	1	12	0	,,	3,37,721	3	0	4,36,618	4	8	...	...	..	98,896	12	8
24	Concrete blocks for building ...	34,715$\frac{13}{27}$ C. yds.	9	0	0	C. yd.	15,075	13	0	15,075	13	0	...	...	...	...	...	...
25	Setting blocks at commencement ...	2,556 ,,	2	0	0	,,	3,12,439	5	4	3,78,411	13	0	...	...	...	65,972	7	8
26	Do. from 2,550 to 3,700 feet ...	30,160¼ ,,	2	8	0	,,	5,112	0	0	7,911	13	3	...	...	...	2,799	13	3
27	Do. at Pier-head	1,998$\frac{20}{27}$,,	3	0	0	,,	75,401	4	0	1,05,461	9	4	...	...	...	30,060	5	4
28	Concrete in mass for filling	602 ,,	10	0	0	,,	5,996	3	7	29,317	0	0	...	...	...	23,320	12	5
	WAVE BREAKER.						6,020	0	0	4,554	14	4	1,465	1	8	...	...	..
29	Concrete blocks	.....					,33,396	0	10	4,12,012	10	7	...	...	...	78,616	9	9
30	Depositing blocks	.....					37,527	0	0	47,189	11	8	...	...	...	9,662	11	8
31	Apron do	.....					...	...	...	...	...	...	...	...	...	...	...	...
32	Setting do	.....					...	...	...	...	...	...	...	...	...	...	...	...
33	Concrete in bags	.....					...	8		8,794	5	3	3,345	14	3	...	...	..
34	Cramps	.....					...	...	...	...	...	...	...	...	...	...	...	...
35	Concrete capping	.....					2,187	6	4	...	...	...	...	...	...	327	6	4
36	Tools and Plant	.....					...	5	5	...	...	...	...	...	...	6,370	...	...
37	Contingencies at 2½ per cent.	.....					4,72,440	13	10	...	...	...	...	...	...	1,52,911	...	...
38	Lighting entrance	.....					0	81,234	7	3	22,630	8	9	...	...	...	...	...
39	Establishment	.....					0	...	...	...	20,000	0	0	...	...	...	...	...
40	Materials at site (concrete blocks in yards) ...	15,575¾ C. yds.	9	0	0	C. yd.	1,40,179	0	0	2,11,868	14	7	...	...	...	71,689	14	7
41	Advances to work-people	.....	...	...	...	...	...	...	...	4,970	14	5	...	...	...	4,970	14	5
42	Other stores	.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
43	Protective Works—rubble stone	28,796 Tons	2	1	4	Ton.	...	...	...	...	...	...	...	...	...	...	...	...
44	Total value of work done...	.....	...	...	...	...	...	...	...	59,948	13	3	...	...	...	59,948	13	3
45	Deduct Probable Recoveries due to Sales of Tools and Plant	.....	...	...	...	...	...	...	...	43,11,770	5	2	...	...	...	...	...	...
	Total ...	.....	...	...	...	...	...	...	...	43,871	6	3	43,871	6	3	...	...	...
										42,67,898	14	11	1,08,675	10	7	8,99,127	9	7
46	Balance which would have been available had Mr. Parke's rates been sufficient															7,90,451	15	0
47	*Additional sum now asked for to complete the Harbour* as per *Estimate* of 21st November 1890															10,83,383	0	0
48	Deduct for extra machinery not allowed for in Mr. Parke's Estimate, Rs. 1,39,215 + 15 per cent.															1,60,097	0	0
																9,23,286	0	0
49	Deduct advances to work people, Rs. 4,970-14-5 and Protective Works, Rs. 59,948-13-3															64,920	0	0
																8,58,366	0	0
50	Deduct extra work in Pier-heads as ordered by Sir A. Rendel, K.C.I.E.															2,60,000	0	0
51	Balance which would have been required to complete the Harbour as per Mr Parke's design and rates															5,98,366	0	0
52	Balance which would have been on hand upon the completion of the work had it been carried out at Mr Parke's rates after deducting extra work in Pier heads and Tools and Plant, Protective Works and Advances to Work-people all being extras upon the original estimate for reconstruction															1,92,085	15	0

Details of cost of Pier-Heads.

Quantity.	Description of Work.	Rate. Rs.	A.	P.	Per	Amount. Rs.	A.	P.	Quantity.	Description of Work.	Rate. Rs.	A.	P.	Per	Amount. Rs.	A.	P.
	NORTH PIER-HEAD. *Item* 8.									SOUTH PIER-HEAD. *Item* 11.							
216 L. ft.	Coursed blockwork labour ...	533	0	0	L. ft.	1,16,424	0	0	166 L. ft.	Coursed blockwork labour ...	...	...	...	...	1,07,528	0	0
8,452 C. yds.	Do. material ...	11	0	0	C. yd.	92,972	0	0	5,052 C. yds.	Do. material ...	11	0	0	C. yd.	62,172	0	0
1,000 Tons.	Rubble stone to make up base ...	2	0	0	Ton.	2,000	0	0	2,355 ,,	Concrete in cylindrical pier-head ...	15	0	0		35,325	0	0
270 L. ft.	Wave breaker 40 feet wide ...	334	0	0	L. ft.	90,180	0	0	184 ,,	Do. in filling in between coursed blockwork and caisson ...	15	0	0		2,760	0	0
73 No.	Iron cramps	10	12	0	each	785	0	0	4,694 Tons.	Rubble stone to make up base ...	2	0	0	Ton.	9,388	0	0
300 C. yds.	Concrete protection to rubble base	10	4	0		3,075	0	0	270 L. ft.	Wave breakers 40 feet wide ...	334	0	0	L. ft.	90,180	0	0
									73 No.	Iron cramps	10	12	0	each.	785	0	0
									300 C. yds.	Concrete protection to rubble base...	10	4	0	C. yd.	3,075	0	0
									1 No.	Iron caisson	...	...	...	sum.	18,000	0	0
										Preparing base for and setting cylindrical pier-head					28,665	0	0
						3,05,436	0	0							3,57,878	0	0

HARBOUR WORKS OFFICE,
MADRAS, *9th January*, 1891.

A. LEE POGSON.
Engineer, Harbour Trust Board.

Remarks on the various items in the preceding Comparative Statement.

Items 5,6 and 7. Due to excess quantity required on account of base being washed down pending settlement of question of position of entrance.

" 8. Due to increased cost of cement and to increased proportion of it used in the concrete, as ordered by Mr. Parkes subsequently to the making of his estimate. The cost of cement has increased from Rs. 37½ per ton, when the estimate for the restoration was framed, to Rs. 52 at the present time. This increase has been due to the fall in Exchange, Freight, additional charge of 3 per cent. made by the India Office, and in prime cost in England. The increase in expenditure under this head amounts to Rs. 2,48,837. The loss under increased consumption due to increased proportion ordered by Mr. Parkes has been Rs. 69,500. The sum of these two items is Rs. 3,18,337. The total of the losses under items 8, 14, 20, 24, 29, 31, 32, 33, 35 and 40 is Rs. 3,73,393, the balance Rs. 55,056 is the value of Block moulds and Joggle boxes in the yards; and includes all repairs, alterations and cost of special moulds made for the abutment, for which no provision was made in the original estimate.

" 10. Due to the necessity of maintaining the full staff of trained employés during suspension of work (from April 1887 to February 1889) pending settlement of the question of position of entrance. The actual loss due to this stoppage was Rs. 1,44,761. There was also a loss of Rs. 8,665 due to setting Wavebreakers in orderly rows at North Pier, which Wavebreakers had to be taken up again; also to a stoppage pending settlement of abutment question. The total of these two items is Rs. 1,53,426. The total of the losses under items 10, 26, and 39 is Rs. 1,21,588. The amount, namely Rs. 31,838, to credit in this case is due to the uninterrupted rapid progress made since the questions above mentioned have been settled.

" 14. See remark under item 8.

" 20. See remark under item 8.

" 22. Due to Establishment having been maintained during the years 1882 to 1885 when but little progress was being made pending sanction for reconstruction.

" 24. See remark under item 8.

" 25. Due to difficulties in execution owing to position of work and to heavy seas already reported at recommencement of works.

" 26. See remark under item 10.

" 27. Due to unsuitability of present Titan Cranes to build a wall so wide as 38 feet, entailing extra labor and delay in setting.

" 29. See remark under item 8.

" 30. Due to difficulty in depositing blocks with Titan Crane as was done previous to the transfer of the Wavebreaker Crane from North Pier in 1888.

" 31, 32, 33. See remark under item 8.

" 35. See remark under item 8.

" 36. Due to the additional time taken in carrying out the work, which has involved expensive repairs to old machinery and the purchase of new. A considerable recovery will be made, however, upon the completion of the work, as most of the machinery will still be serviceable, and some almost new.

" 39. See remark under item 10.

" 40. See remark under item 8.

" 48. This item includes the cost of new all-ro[illegible] necessary to complete the Harl[illegible]

No provision was made for Protecti[illegible] to the re[illegible] intended [illegible] Comparative [illegible]

[illegible]e of Completion.—Ass[illegible]ng that fair setting weather is experienced, both North and South Piers (including pier-heads) will be completed by the [illegible]ctober 1892. The new work must be allowed one monsoon to settle. The capping will be commenced in February 1893, and completed in October 1893.

LAWRENCE ASYLUM PRESS

Read the following paper

Mar Gen 206

718-9/11

Harbour Trust Board Office,

MADRAS, 14th February 1891.

Despatched 23 - 91

No. 1690.

18

From

WARE AUSTIN, Esq., C.S.,

CHAIRMAN, HARBOUR TRUST BOARD,

MADRAS.

To

THE HON. J. F. PRICE, C.S.,

CHIEF SECRETARY TO GOVERNMENT, MARINE DEPARTMENT.

SIR,

I have the honour to submit herewith, for the information and orders of His Excellency the Right Honorable the Governor in Council, an amended estimate for the completion of the Madras Harbour, with an eastern entrance; in accordance with the Sanctioned design, as modified after the inspection lately made by Sir Alexander Rendel.

2. In 1884 the late Mr. Parkes framed an estimate of Rs. 45,90,051 for the restoration and completion of the Harbour with an eastern entrance. The estimate was sanctioned in G.O. 2251 W. of 8th September 1886, and has formed the authority for the advances made from time to time to the Harbour Trust Board for the Harbour Works.

3. From the comparative statement of work done up to 15th October 1890, it will be seen that the above sanction has been nearly exhausted, and that further funds are necessary to complete the Harbour. It must now be explained why more money is required, and how much; and reference is invited to the accompanying estimate of Rs. 56,73,434, and comparative statement, showing the saving and loss upon each item of Mr. Parkes' estimate; the quantities in each case being actuals up to the date given in the statement.

4. Early in 1887 doubts were expressed regarding Mr. Parkes' design; and from April in that year, until February 1889, the works could only be carried on very slowly, as the details of the design were under discussion in England and in India.

5. This serious delay has by itself very largely increased the cost of the works; but there are additional reasons for the insufficiency of Mr. Parkes' estimate.

(*a*) The rise in the price of cement delivered on the works, and the increased quantity in each block.

(*b*) The cost of the protective works to the north of the Harbour.

The excess due to (*a*) is estimated at Rs. 3,18,337 and to (*b*) Rs. 59,949. With regard to (*a*) it may be observed that although Mr. Parkes increased the proportion of cement in his blocks, after preparing his estimate in 1884, Sir A. Rendel when he inspected the works in February 1890, expressed an opinion that a further increase in the proportion of cement was necessary in the South Pier head. The cost of protective works was omitted by Mr. Parkes, because he considered that the value of the land formed by the accretion to the south should be taken as a set off against the cost of any work required to protect the foreshore on the north; but this view has never been definitely accepted by Government, and for the purposes of the present estimate it is necessary to include the cost of such work up to date; probably a yearly charge will have to be incurred for the up-keep of these works, but this question is one that may be left until the Harbour has been completed and the construction accounts closed.

The increased expenditure due to the delay above-mentioned is estimated at Rs. 1,44,761, and represents the value of skilled labor and supervision which had to be retained on the works; but could not be fully utilised while the works were stopped so far as the superstructure was concerned.

6. In addition to these items, the extra work ordered by Sir A. Rendel for the Pier-heads, and the new machinery required, have increased the cost of the Harbour, as estimated in 1884.

7. In August 1888 Mr. Pogson prepared five plans and estimates for completing the Harbour; and among these was an approximate estimate of Rs. 49,72,596 which provided for completing the Harbour on the lines sanctioned by the Secretary of State, by telegram, in December 1883, and by despatch No. 2 P. W. of 24th January 1889, printed with G.O. 622 W of 2nd March 1889. This estimate being based on better information, as regards rates, than was available in 1884, may with advantage be taken as a basis for comparison with the present estimate of Rs. 56,73,434.

8. The difference between these estimates amounts to Rs. 7,00,838, but 6 lakhs of this is due to the extra work and machinery ordered by Sir A. Rendel, the rise in price of cement, and the stoppage of the works after August 1888. In order to make this clear a statement is attached, giving the details of the above sum of 6 lakhs.

9. Briefly it may be said that the approximate estimate of August 1888, after allowing for causes of excess which could not have been foreseen, is insufficient by Rs. 96,944, or not quite 2 per cent.

10. It is believed that the estimate of Rs. 56,73,434, provides fully for the completion of the Harbour, in accordance with the instructions of the Secretary of State; and although the difference between this amount and Mr. Parkes' estimate of 1884 is the large sum of 10·83 lakhs, the Trustees are unanimously of opinion that the reasons given for the excesses are satisfactory; and that there has been no delay at any time which might have been avoided by the Executive Staff; but on the contrary most satisfactory progress has been made, whenever such was possible.

11. The Trustees therefore request that a further advance of Rs. 15,00,000 (fifteen lakhs of Rupees) may be sanctioned. This includes Rs. 1,55,462, for the extension of the revetment north of the Harbour—regarding which a separate estimate is being submitted—and Rs. 2,33,460, estimated proceeds of the sale of Plant and Machinery, which however cannot be disposed of till after the completion of the works.

I have the honor to be,
Sir,
Your Obedient Servant,

Chairman, Harbour Trust Board.

Present Estimate	Rs.	56,73,434
Estimate of August 1888	,,	49,72,596
Difference ...	Rs.	7,00,838
Extra work ordered by Sir A. Rendel (vide Item 50 of explanations in Comparative Statement)	,,	2,60,000
Do. Protective Works, &c., (vide Item 49 of ditto) ...	,,	64,920
Extra machinery (vide Item 48 of ditto) ...	,,	1,60,097
Due to rise in price of Cement since August '88 (vide Item 8 of ditto) ...	,,	58,512
Abutment question. An abutment was ordered by the Secretary of State in view of the possibility of a change of entrance, which would necessitate a break in the wall. Special blocks requiring special moulds, were made: and Wave-breaker blocks were set, in orderly rows, and afterwards taken up again. Vide item 10 of Comparative Statement ...	,,	8,665
Stoppage of Works pending Settlement of N. E. question since August '88. Vide item 10 of Comparative Statement ...	,,	51,700
		6,03,894
Difference ...	Rs.	96,944

MADRAS, 29*th January*, 1891.

A. LEE POGSON.

3 8 P
718-9/13

Extract of Proceedings of the Trustees of the Harbour of Madras, at a Meeting held at the Offices of the Sea Customs, on Friday the 5th day of December 1890.

* * *

19. Examined Statement by the Board's Engineer, dated 21st November 1890, submitting details of expenditure upon the Madras Harbour Works to 15th October and Estimate for completing the Eastern Entrance to the Harbour as approved by Sir Alexander Rendel.

Resolved,—that this Estimate be submitted to Government with a report as to the necessity of the additional expenditure.

* * *

Extract of Proceedings of the Trustees of the Harbour of Madras, at a Meeting held at the Offices of the Sea Customs, on Friday the 9th day of January 1891.

* * *

2. The Board's Engineer was in attendance and submitted a tabulated Statement of details in connection with the revised Estimate for the completion of the Eastern Entrance to the Harbour, and explained generally the causes of the additional outlay needed.

Resolved,—that this Statement be printed and annexed to the revised Estimate, and that on receipt of further explanatory details necessitated by the particulars now laid before the Board, the revised Estimate be submitted to Government with the report called for in the Board's Resolution, No. 19, dated 5th December 1890.

* * *

Extract of Proceedings of the Trustees of the Harbour of Madras, at a Meeting held at the Offices of the Sea Customs, on Friday the 23rd day of January 1891.

* * *

12. The Trustees then resumed the consideration of the amended Estimate for the completion of the Eastern Entrance to the Harbour on the sanctioned design with modifications approved by Sir Alexander Rendel. Mr. Lee Pogson was in attendance and submitted a tabulated Statement showing the savings and extra expenditure upon Mr. Parkes' original Estimate up to 15th October 1890, and gave explanations of, and reasons for, the additional outlay under various Sub-heads.

Resolved,—that the information given by the Board's Engineer be tabulated and printed with the three Statements now before the Board, and that the Estimates as then completed be circulated and reconsidered at the next Meeting, or at a special Meeting if practicable to hold one sooner.

* * *

Extract of Proceedings of the Trustees of the Harbour of Madras, at a Meeting held at the Offices of the Sea Customs, on Friday the 13th day of February 1891.

* * *

14. The amended Estimate for the completion of the Harbour as finally revised having been printed and circulated to each Trustee together with a forecast of the financial position of the Trust prepared by the Board's Secretary showing the position under various contingencies, was then discussed at length. Mr. Lee Pogson being in attendance and giving the Trustees further information as to the details of the Estimate.

Read letter from the Board's Engineer, No. 1335, dated 9th February 1891, submitting an Estimate for the extension of the revetment at Cassimode amounting to Rupees 1,55,462 for the protection of the foreshore.

Read Minute by Major W. L. C. Baddeley, R. E., and draft letter to Government submitting for the information and orders of H. E. The Right Honorable the Governor in Council the amended Estimate for the completion of the Harbour with an Eastern Entrance in accordance with the sanctioned design as modified after the inspection lately made by Sir Alexander Rendel.

Resolved,—that this Estimate and draft letter for the completion of the Harbour be approved, and that Government be requested to make a further advance of Rs. 15,00,000 to complete the Eastern Entrance; and for the extension of the revetment to protect the foreshore to the North.

Resolved further,—that the Estimate for the extension of the revetment be approved and that Government be urgently addressed requesting immediate permission to make arrangements for the necessary preliminary outlay to the extent of about Rupees 18,000 eighteen thousand in anticipation of the sanction of H. E. The Right Honorable the Governor in Council under Section 64, Act II of 1886, to the total outlay of Rupees 1,55,462 required for the protection of the coast line north of the Harbour.

* * *

(True Extracts.)

Secretary, Harbour Trust Board.

PRINTED AT THE LAWRENCE ASYLUM PRESS.

Inward Ens. 2064 of 91

718-9/14

9.6.84. 1437 W
20.6.84 - 1852 W
10.11.84 - 2815 W
19.12.84 - 3128 W
13.5.85 - 1136 W
6.2.86 - 122 R
8.9.86 - 2250 W
20.12.87 - 3484 W
16.1.88 - 153 W
19.8.89 - 2277 W
28.8.89 - 2870 W
16.2.91 - 5/427 W

8.9.86 - 2252 W
1.8.88 - 2335 W
1.8.88 - 11/2335 W
17.11.88 - 3644.45 W
17.11.88 - 24/3644 W
2.3.89 - 622 W
2.3.89 - 7/622 W
1.7.89 - 1737 W
9.1.90 - 546 W
26.5.90 - 1460 W
19.9.90 - 2508 W
16.2.91 - 4284 W
16.2.91 - 4/4264 W
17.2.91 - 532 W

CURRENT No. 206

[9] Marine Department.

PWC 8: 2316

15-3-89 no. 89 - Routine
28-5-89 no. 151 — " —
2-7-89 no. 184 — " —
30-7-89 no. 223 — " —
7-10-89 no. 284 — " —
31-1-90 no. 21 — " —
29-3-90 no. 66 — " —
25-9-86 no. 522 - this -

From

The Chairman
Harbour Trust Board
Madras.

To

The Chief Secretary to Govt.
Marine Dept.

No 1690

Dated 14-2-91 - Despd 23-2-91
Received
Enclosures one + a plan + estt, and 6 do

SUBJECT.

Completion of the Madras Harbour with an Eastern Entrance

Submitting an amended Estimate and requesting that an additional advance of Rupees fifteen Lakhs may be made.

Transferred.

D 27 Jany 1891

Transferred to the Public Works Dept: and a copy furnished to the Financial Dept for information with reference to para: 11.

for Chief Secretary

JDB
26/2/91

In Fin. Dept. Sh. J.D.B. Should be called on at once to report on the financial aspect of the scheme and how they propose to provide for the charges in the adl. loan asked for. The forwarded is sent to in the first part of the next of 1346. should be submitted forthwith for information of Govt.

SHS
25/2/91

C.26/2
S.27/2

13 Mar
cw Darby

Public Works Department.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

718-9/15

Read the following

From the Chairman Madras Harbour Trust Board No 1690 dt 14 Febry 1891
Endorsement with the Marine Dept dt 27 Febry 1891

With the letter recorded above, the Chairman Harbour Trust Board submits an amended estimate for the completion of the Madras Harbour. In Febry 1890 the works were inspected by Sir Alexander Rendel, Consg. Engineer to the Secy. of State, who then recommended to the Trustees certain modifications of the sanctioned design with the view to give greater stability to the works, and proposed that the eastern entrance should be made

500

SHS
12 Mar

500 feet wide instead of 450 feet to which it was intended to reduce it from the 550 feet originally allowed by Mr. Parkes. The modifications were accepted by the Trustees and approved by Govt:, and the amended estimate now submitted includes the cost of these works.

The original estimate for the Harbour amounted to Rs. 57,45,165, against which the recorded outlay is as Rs. 65,54,490.

After the disaster of November 1881, a revised estimate became necessary for the restoration and completion of the works, and this amounted to _____ Rs. 45,90,051

The expenditure against this estimate up to 5th Octr. 1890 has been _____ 42,67,899

leaving an unexpended balance of _____ 3,22,152

The new works now proposed are estimated to cost _____ 10,83,382

making a total of _____ 14,05,535

for which details are given on page 2 of the Statement submitted by the Harbour Trust Board.

The amended estimate for which sanction is now asked amounts to Rs. 56,73,434 and is made up as follows:-

Revised estimate sanctioned in 1886 - (G.O. 2251 W dt 8th September 1886) _____	45,90,051
New work now proposed _____	10,83,385
Total	56,73,434
The expenditure to 15th Octr 1890 has been _____	42,67,899
leaving an unexpended balance of Rupees	14,05,535
To this must be added a sum of Rupees - for protecting the foreshore north of the Harbour, for which a separate estimate has been submitted, making a total of Rs.	1,55,462
	15,60,997

The amount for which advances remain to be made for completion of the works will thus stand at Rs. 1,500,000 in round numbers. In addition to this, the Board calculate on realising ultimately a sum of Rs. 233,460 by the sale of Plant and machinery, and as this receipt is shown as a deduction on page 2 of the statement from which the above figures are taken, the sale proceeds must be left at the disposal of the Board,

8.204/2

Board, and will go towards
meeting the Charges under
the amended estimate.

The excesses as compared
with the sanctioned revised
estimate are fully explained
in the Chairman's letter
and in the statement which
accompanies it. His Excellency
the Governor in Council
accepts the amended estimate
as now presented, and re-
solves to recommend it
for the formal sanction of
the Right Honble the Secy.
of State for India.

To
The Chairman
M. I. Board
" Marine dept. 4/4/91

H.E. No. [illegible]

To

The Secy. to the
Govt. of India P.W.D.

Sir,

I am directed to forward,
for transmission to the
Right Honble the Secy. of
State for India, the accompany-
ing copy of Proceedings of
this Govt. No. 718 W dated 13th March
1891

receiving

718-9/17

of

reviewing the amended estimate
for the Chadaos Harbour
works, drawn up in ac-
cordance with the recom-
mendations of Sir Alexander
Rendel made after his in-
spection of the works in
February 1890. The amended
estimate provides for all
work now considered
necessary for completion
of the Harbour with an
eastern entrance, and I
am to recommend that
it be laid before the Home
Govt. for formal sanction.

I am also to forward
a copy of Proceedings No.
720 W dated 13th March 1891 in
which an estimate amount-
ing to Rs. 1,55,462 for protect-
ing the foreshore south of
the Harbour has been
sanctioned, and in this
connection to invite at-
tention to the note of the
Chief Engineer (P.W.D.) recorded
with G.O. No. 462 W dated 16th
February 1891 which also

17/ forms

forms an accompaniment to this letter. I am to request formal confirmation of the proceedings of Govt sanctioning this additional emergent word.

Thanks.

9.3.91

4/4/91

9.iii.91

9.iii.91 R 13/-

718-9/18

2316.

Govt. of (1891) Madras.

PUBLIC WORKS.

Dated. Print 2000 13. 3. 91.

Rect. (18) 14/3/91 Encl.

G.O. 13 March 91 No 718-191

Madras Railway Workshop

Orders providing the amended establishment for the — Steam Ferry for the Annual Charges of the Rt Honourable the Secretary of State for —

Do — do — do

Fixing the amended Establishment for the — for transmission to the Right Honble the Secretary of State for India for sanction.

120
3/X
100/2
30 copies
A/P

18

18C 13/3 D/ 12/3