(1) பக்கங்களின் எண்ணிக்கை 18 + 3 Statement (-

(2) புதுக்கித் திருப்பிய நாள் 9/89

(3) ஆதாரங்குறிப்பவர் சுருக்கொப்பம்

தமிழ்நாடு ஆவணக் காப்பகம்.

(2)

தமிழ்நாடு அரசு

PWD துறை

அரசாணை எண்.
மு. கோப்புத் தாள் எண். 1245 அச்சகம் பலவகை

நாள் : 11. 5. 1989 198 .

மடிக்கவோ கண்டபடி கையாளவோ கூடாது

16 sheets
3 13 (19 chiffon.)

Sheet no 16 Small
" 1+2 Big Statement

ஆவண. கா-1—18,000—15-6-87.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

1245

Buildings and Roads.
Civil Works.

READ—the following paper :—

From R. W. BARLOW, Esq., C.S., Chairman, Harbour Trust Board, to the Secretary to Government, Public Works Department, dated Madras, 29th April 1889, No. 1543.

I have the honor to submit, for the information of Government, copy of a letter from the Engineer, Harbour Trust Board, No. 89, dated 20th April 1889, reporting upon the progress made upon the Madras Harbour Works during the month of February 1889, with a tracing and comparison statement of expenditure for February 1889, in duplicate.

ENCLOSURE.

From A. L. POGSON, Esq., Engineer, Harbour Trust Board, to the Chairman, Harbour Trust Board, dated Madras, 20th April 1889, No. 89.

I have the honor to forward my report on the progress made on these works during the month of February 1889, with a lithographed plan of the harbour (submitted in triplicate) showing the work done during the month in *red*.

2. *Surveys.*—A survey of the high-water mark both north and south of the harbour was made and several cross sections of the rubble base of both piers were taken.

3. *North Pier Works Superstructure.*—The north pier titan crane was taken out to the extreme end of the pier and turned into position for forward work on the 2nd February, and by the 4th all was ready for block-setting; but some delay was caused through a few of the wavebreaker blocks having rolled down upon the base and in the lines of the new pier; these obstacles were all removed and a fair start at block-setting made on the 8th, and up to the 28th 200 superstructure blocks had been set and the pier advanced by 122 feet, which must be considered very good progress, when working on the curves, on account of the difficulty of keeping to the true centre line.

4. *South Pier Works Rubble Base.*—At the south pier 722⅝ tons of rubble was deposited along the centre line of the new pier which was afterwards levelled up by divers.

5. *Superstructure.*—At the south pier excellent progress was made notwithstanding occasional seas washing over the ruined walls and, by the 28th of February, as many as 230 blocks had been placed in position by divers, which extended this arm by 146½ feet on the outer straight portion.

6. *Wavebreaker.*—The erection of the wavebreaker crane on the south pier was completed and travelled out to about the centre of the south pier curve, which point it reached without any difficulty owing to the satisfactory alterations made in the travelling wheels. Nineteen wavebreaker blocks of 30 tons each were deposited along the curve when this crane was taken on the straight portion to protect the new pier built.

7. *Concrete Block-making.*—Twenty-four wavebreaker blocks=432 cubic yards of concrete were made on the 1st and 2nd, and then this work had to be stopped to carry out several repairs to the engines and elevators, &c. This opportunity was taken to thoroughly scale and examine the four 40 horse-power Cornish boilers when, as I expected, two of them were found to be so fitted as to be beyond repairs; the other two will run safely for another 18 months.

8. *Pallávaram Quarries.*—Fifteen trains ran between the quarries and Madras, which brought down a total of 3,185¾ tons of stone, of which 2,463¼ tons were chips, which was all that was required owing to the necessary repairs to the crushing machinery.

9. *Pontoon.*—The pontoon was launched and was in working order by the 4th February, from which date some of the old blocks were removed from the old ruined south pier head.

10. *Stores from England.*—The following stores were received from England during the month :—

By the S.S. "Purnea."—With 1,044 casks containing 186-8-2 tons of Portland cement.

1 3

By the S.S. "Manora."—With 1,039 casks containing 185-11-0 tons of Portland cement, also one case of link motion and reversing gear for locomotive engines.

11. *Stores—Local supply.*—Eighty-two hardwood broad gauge sleepers and 164 hardwood narrow gauge sleepers were delivered by the contractor.

12. *Harbour Trust Board—Iron Pier repairs.*—All timber work was renewed on the iron pier decking for a length of 100 running feet for a half width of the pier. Several cranes and trucks were overhauled and all the railway lines kept in good working order.

Return of Work for February 1889.

Railway Lines.—One thousand running feet permanent titan road was taken up and relaid and 157 running feet temporary titan road was laid; also 183 running feet temporary broad gauge line was laid on the south pier; 483 running feet temporary broad gauge line was laid on the north pier.

Quarries.—Fifteen trains worked during the month bringing stone from Pallávaram.

Rubble.

	Tons.
Quantity received up to 28th February 1889	351,716¼
Do. do. 30th November 1888	350,993¾
Received in February 1888 ...	722½

Chips.

Quantity received up to 28th February 1889	129,582¾
Do. do. 31st January 1889	127,119½
Received in February 1889 ...	2,463¼

Ballast.—None received.

North Pier surf bank.—Nothing done since 30th November 1888.

Do. rubble base.— Do. 30th April 1887.

North Pier Superstructure.

	No.	Contents. C. yds.
Blocks set up to 28th February 1889	890	14,334⅝
Do. 30th April 1887 ...	690	11,122$\frac{1}{27}$
Set in February ...	200	3,212$\frac{14}{27}$
Running feet of new wall built up to 28th February 1889 ...		598
Do. do. 30th April 1887 ...		476
Built in February ...		122
Total length of wall completed from B ...		2,648
Do. do. F ...		598

North Pier supplementary works.—Nothing done since 31st January 1889.

Do. capping.— Do. 30th November 1888.

Do. cramps.— Do. 31st May 1887.

South Pier surf bank.— Do. 30th April 1888.

South Pier Rubble Base.

—	Foreshore. Large rubble under wavebreaker.	Foreshore. Widening foreshore.	Base.
Total quantity deposited up to 28th February 1889	10,102½	38,389¾	120,085
Total quantity deposited up to 31st October 1888	9,380	38,389¾	120,085
Deposited in February ...	722½	...	...

1245

South Pier Superstructure.

	No.	Contents. C. yds.
Blocks set up to 28th February 1889	1,683	27,416⅔
Do. 31st January 1889	1,453	23,624⅔
Set in February ...	230	3,792½
Running feet of new wall built up to 28th February 1889		1,107
Do. do. 31st January 1889		960½
Built in January ...		146½
Total length of wall completed from E		3,494
Do. do. G		1,107

South Pier supplementary works.—

Blocks deposited in wavebreaker.

—	Number of blocks.	Contents, cubic yards.	Distance on pier.	Average breadth from face of pier.
Up to 28th February 1889	1,249	21,484$\frac{97}{216}$	...	...
Do. 31st October 1888	1,230	21,142$\frac{97}{216}$	...	...
In February ...	*19	342	2,577—2,597 3,179—3,189	40 feet.

* Wavebreaker blocks.

South Pier capping.—Nothing done since 31st December 1888.

Do. cramps — Do. 31st October 1888.

Protective works.—Nothing done.

Concrete Blocks.

Description of blocks.	Made up to 31st January 1889.	Made in February.	Made up to 28th February 1889.	Placed in work: Up to 31st January 1889.	Placed in work: Up to 28th February 1889.	In hand.
Old blocks	806	..	806	806	806	..
Wavebreaker blocks	3,068	24	3,092	2,342	2,361	731
Superstructure.						
North pier bottom blocks	227	..	227	114	152	75
Do. middle do.	750	..	750	417	537	213
Do. top do.	248	..	248	135	175	73
South pier bottom do.	387	..	387	284	330	57
Do. middle do.	1,093	..	1,093	783	922	171
Do. top do.	387	..	387	282	327	60
Special blocks	71	..	71	71	71	..
Counterbalance	1	..	1	..	..	1

Four hundred and thirty-two cubic yards concrete blocks were made in the month on the 1st and 2nd, after which block-making was stopped to allow of the stationary engine-boilers being examined and cleaned.

One thousand one hundred and eighty-seven and a quarter tons cement was the balance on the 28th.

Ninety-six superstructure and thirty-nine wavebreaker blocks were taken from north to south pier block ground and stacked.

Miscellaneous.—The wavebreaker crane was taken out to 2,575 feet on the south pier on the 1st.

The north pier titan was turned in position for setting blocks on the 2nd.

The pontoon was launched and taken into the harbour on the 2nd and was fitted together on the 3rd.

A beacon was fixed at north pier on the 26th.

Tools and Plant—Stationary Engine.—A new collar was made and fitted to governor and lubricator cocks were ground.

Two new waste water cocks and pipes were made and all oil-cans and dishes were repaired.

Stationary Engine and Boilers—Superbeater.—Three new plates were fitted to the top with angle irons and a brass gland and new valve spindle fitted to the exhaust valve. A new overflow tank was made with two new lengths of piping. Three lengths of new suction pipe was supplied to the donkey pumps and the superbeater was thoroughly cleaned and painted.

No. 2 *Boiler.*—Disconnected and removed from seating.

No. 3 *and* 4 *Boilers.*—Flues were cleaned and inside of boilers were thoroughly examined and cleaned. All cocks, safety valves and clack box valves were ground and all joints remade. Two packing nuts were made for the spindle. The boilers were tested to 90 lb. per square inch. The safety valves correspond.

Steam pipes and domes were painted and covered with coir rope and mud composition.

The boilers were covered with mud composition and tarred. The water tank was also repaired, cleaned and tarred.

Main Shafting.—Four new brass bearings were made and fitted and two couplings faced up.

Stonecrushers—No. 2.—Two jaws and side wedges were fitted and the shoot repaired.

No. 3.—Two jaws with side wedges, two $1\frac{1}{4}$″ bolts for back wedge and two new white metal bearings for the eccentric shaft were made and fitted.

No. 5.—Two new white metal bearings, a brass bearing, two new $1\frac{1}{4}$″ studs for back wedge and a new key for the keeps were made and fitted. New set plates were fixed and the shoot repaired.

Elevators—No. 1.—A new timber upright with all iron fitted up was fixed in position. Two new brackets for the brake gear, a new key for driving pulley and a brass washer for level pinions were made and fitted. The iron work of the platform was repaired.

No. 2.—The shafting was straightened and a new pinion and brass washer for level pinion made and fitted and the iron work of the platform was repaired.

No. 3.—A new key for the pinion, a new brass washer for level pinion, and two new steel set screws for collars were made and fitted and the iron work of platform repaired.

No. 4.—Two new steel set screws for collars were made and fitted and the iron work of platform repaired.

No. 5.—The iron work of platform and four of the iron boxes were repaired.

Concrete Mixers—Main Shafting.—Four new brass bearings were fitted, 10 brass bearings closed, three plummer blocks levelled and two couplings faced up.

No. 2 *Pump.*—Two new buckets were made and fitted to plungers.

Water Tank.—Cleaned and tarred.

Concrete Skip Boxes.—Seven were repaired.

Goliath Crane—No. 1.—Brass bearings of large and small engines were closed; left-hand slide valves of large engine were faced up; two steel studs and eight leather washers were made and fitted; a new hydraulic piston leather was fixed and the lift of pump valves regulated.

No. 3.—A new chimney was made and fitted, the pump lift regulated, and eight leather washers were made; the left-hand slide bars and brass bearings of connecting rods of large engines were closed.

North Pier Titan.—A $\frac{5}{8}$″ shunting chain, 8 timber dogs, and a new brake rope was supplied; a new travelling wheel was fitted to the crab and the face of one old travelling wheel of crab was chipped.

South Pier Titan.—The faces of two travelling wheels of crab girder and the faces of two travelling wheels of crab were chipped; one length of waste water pipe was renewed; a travelling wheel and key to crab and a new stud to blow-off cock was fitted and three brake ropes repaired.

100 *Tons Hydraulic Jack No.* 1.—A new piston leather was made and fitted; the guide of the safety valve lever was repaired; valves were ground and the jack cleaned and painted.

Pontoon.—The gearing was eased and a 1″ chain repaired.

Miscellaneous.—Two shunting ropes were made for *No.* 1 locomotive engine and one for *No.* 2 locomotive engine; a band was made for a barrel buoy for divers; ten staples with rings were made for the divers' boots; two links for $\frac{1}{2}$″ chains, links and hooks for stone excavators and seven 1″ sling chains were made for divers; the excavating box for north pier was repaired; two iron buoys were repaired and rings fixed in six $\frac{3}{8}$″ chains for Marine Survey. A beacon was repaired; 72 pickaxes and 8 crowbars were repaired and 24 new pick-axes were made.

Four pairs of sand wagon wheels were wedged.

No. 2 *Locomotive Engine.*—A new draw hook was fitted.

Block Truck—No. 13.—Brass bearings were eased and the truck was painted.

No. 14.—Was rebuilt and painted.

Harbour Trust—Iron Pier.—100 running feet, half width, timber work was renewed.

1245

Order—dated 11th May 1889, No. 1245 W., Public Works.

Recorded.

2. Very good progress was made during the month of February.

(True Extract.)

Captain, R.E.,
Under-Secy. to Govt., P.W.D.

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

Exd. J. Henricus.
Spare Copies

3

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1889} Madras.

PUBLIC WORKS.

Dated May, 11th.

Read. *Encl.*

G.O., 11th May 1889, No. 1245 W.

MAY.

Madras Harbour Works

Progress report of the — for February 1889, recorded with remarks.

2 fathoms

1 fathom

High Water 31st July 1869

H.W. 20th Feby 69

TITAN LINE

IRON SCREW

LATRINE

INTERCEPTING SEWER

GOODS SHED

SHOP

GOODS SHED

GOODS SHED

GOODS SHED

PLATFORM

HARBOUR OFFICE

BEACH POLICE STATION

EMIGRATION YARD

CLIVES BATTERY

BOAT SHED

DIVERS DRUM

MADRAS HARBOUR WORKS OFFICE

RICE GODOWN

RICE GODOWNS

RICE GODOWNS

DYMES & CO

H.T. BOARS OFFICE

MESSRS GORDON WOODROFFE & CO.

LIQUOR SHOP

LIGHTHOUSE LANE

MESSAGERIES MARITIMES OFFICE

JAFFERSEY RANG LANE

CUSTOM HOUSE

BOUNDAGE LANE

CONDAPPA CHETTY LANE

VURDARAJAH MOODELLY LANE

GOPAUL CHETTY LANE

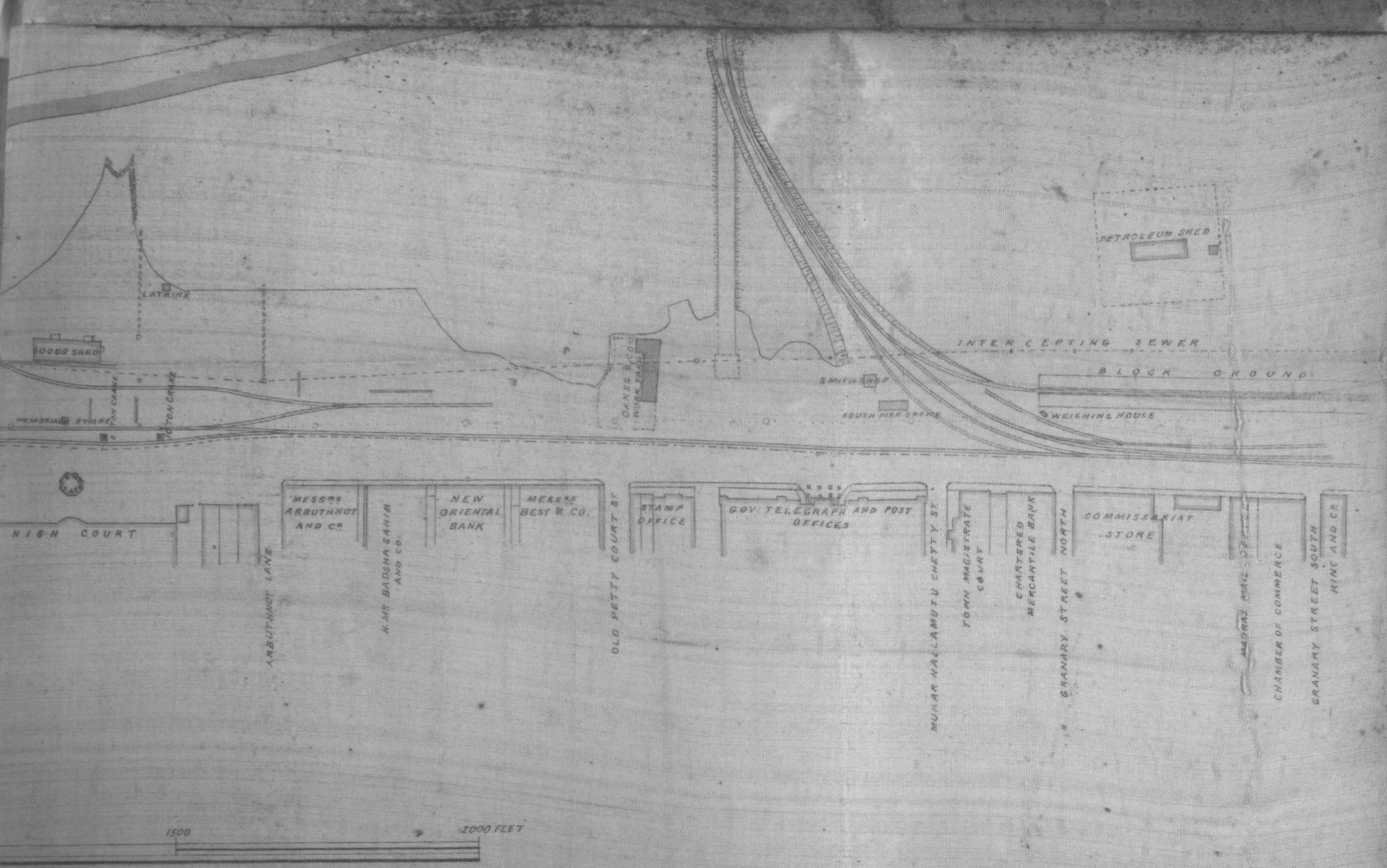
MARIAMMAN NAICK ST

Scale, - 200 feet = 1 inch

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

NOTE - The Contour lines shew the depths below De Havilland's

LITHOGRAPHED BY THE LAWRENCE ASYLUM



n Sea Level in September 1886.

S, MADRAS, 1889.

Engineer
Harbour Trust Board.

20.4.89

M.H.W.

Plan accompanying Progress Report for February 1889.

9 Fathoms

9

9 fathoms

8½

8½

8

8

7½

7½

7

7

6½

6½

6

South Pier Tidal
28th Feby 89
31st Jany 89

Wave-breaker Crane
28th Feby 89

31st Feby 89

MADRAS HARBOUR WORKS.

Comparison of Expenditure to date with Sanctioned Estimate for the month of February 1889.

Sub-head of Work.	As per Estimate. Quantity.	Rate.	Per	Cost.	As executed. Quantity.	Rate.	Cost. Total up to 31st December 1888.	During the month	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
		Rs. A. P.		Rs.		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
As per Old Estimate.												
ks	....	..	..	49,15,752	....	.. ....	5509324 8 10	- - -	5509324 8 10	- - -	5509324 8 10	✓
blishment	....	..	..	3,57,612	....	.. ....	529904 - -	- - -	529904 - -	- - -	529904 - -	✓
s and Plant	....	..	..	4,71,891	....	.. ....	515262 6 -	- - -	515262 6 -	- - -	515262 6 -	✓
Total ..	....	..	..	57,45,165			6554490 14 10	- - -	6554490 14 10	- - -	6554490 14 10	✓
New Estimate.												
ration and extension of block ground .. Prely...	....	..	..	8,000	....	.. ....	- - -	- - -	5892 3 5	9 13 6	5892 - -	✓
North Pier.												
Rubble Stone in Foreshore and Base.												
nary deposited from break-water .. .. Tons	5,532	1 8 0	Ton	8,297	2780	1 12 -	- - -	- - -	4865 - -	- - -	4865 - -	✓
Do. from boats .. .. „	1,82,260	2 0 0	„	3,64,520	187563	1 15 6	- - -	176 7 7	364428 13 3	457 12 2	368999 9 5	✓
ge ordinary deposited under wave breaker from break-water .. .. „	14,750	1 12 0	„	25,812	11493/4	1 12 -	- - -	- - -	19572 9 -	- - -	19572 9 -	✓
erete blocks for building .. .. .. C. yds.	58,116	9 0 0	C. yd.	5,23,044	14570 67	10 2 1	- - -	35605 8 7	148626 - 11	- - -	148626 - 11	✓
ng blocks at commencement of new work .. „	2,062	2 0 0	„	4,124	2457	2 1 1	- - -	- - -	5414 11 2	- - -	5414 11 2	✓
Do. from 2,200 to 3,600 feet .. „	35,245	2 8 0	„	88,112	17427/8	2 9 8	- - -	3524 2 2	27903 14 7	2679 9 4	30583 7 11	✓
Do. at Pier head .. .. .. „	20,809	3 0 0	„	62,427	-	- - -	- - -	- - -	- - -	- - -	- - -	
erete in mass for filling .. .. .. „	500	10 0 0	„	5,000	263	4 8 3	- - -	- - -	1188 - 7	- - -	1188 - 7	✓
Wave Breaker.												
t blocks .. .. C. yds.	288	10 0 0	C. yd.	2,880	288	9 5 7	- - -	- - -	2692 - -	- - -	2692 - -	✓
nary concrete blocks .. .. .. „	70,849	9 0 0	„	6,37,641	33920 32	10 2 11	- - -	- - -	345286 14 8	- - -	345286 14 8	✓
siting do. .. .. .. „	70,849	1 0 0	„	70,849	3445832	- 13 2	- - -	809 9 -	28453 1 1	9 7 8	28462 8 9	✓
n blocks .. .. „	1,667	9 0 0	„	15,003	-	- - -	- - -	- - -	- - -	- - -	- - -	
ng do. .. .. „	1,667	4 0 0	„	6,668	-	- - -	- - -	- - -	- - -	- - -	- - -	
erete in bags .. .. „	742	12 0 0	„	8,904	-	- - -	- - -	- - -	- - -	- - -	- - -	
aps .. .. No.	330	10 0 0	Each	3,300	27	2 6 2	- - -	- - -	207 6 -	- - -	207 6 -	✓
erete capping .. .. C. yds.	22,400	10 0 0	C. yd.	2,24,000	2815	16 10 6	- - -	95 10 -	4680 2 7	- - -	4680 2 7	✓
Total for North Pier ..	....	..	..	20,50,581			- - -	40091 3 4	950358 9 10	7257 13 2	957618 7 -	✓
South Pier.												
Rubble Stone in Foreshore and Base.												
nary deposited from break-water .. .. Tons	675	1 8 0	Ton	1,013	-	- - -	- - -	- - -	- - -	- - -	- - -	
Do. from boats .. .. „	1,69,517	2 0 0	„	3,39,034	15757	2 8 11	- - -	1224 14 11	40163 4 10	661 8 10	40825 13 8	✓
ge deposited from break-water .. .. „	13,998	1 12 0	„	26,997	1274	1 9 6	- - -	4203 2 10	29648 8 8	- - -	29648 8 8	✓
erete blocks for building .. .. .. C. yds.	52,153	9 0 0	C. yd.	4,69,377	2700	3 1 6	- - -	- - -	7911 13 3	- - -	7911 13 3	✓
ng blocks at commencement .. .. „	2,062	2 0 0	„	4,124	-	- - -	- - -	- - -	- - -	- - -	- - -	
Do. from 2,550 to 3,700 feet .. „	29,282	2 8 0	„	73,205	3498	3 - 6	- - -	5335 1 11	71299 12 10	3075 3 7	75175 - 5	✓
Do. at Pier head .. .. .. „	20,809	3 0 0	„	62,427	-	- - -	- - -	- - -	- - -	- - -	- - -	
erete in mass for filling .. .. .. „	500	10 0 0	„	5,000	604	7 9 1	- - -	- - -	4554 4 4	- - -	4554 4 4	✓
Wave Breaker.												
erete blocks .. .. C. yds.	57,066	9 0 0	C. yd.	5,13,594	2185 37	10 9 11	- - -	3790 8 -	227129 - 3	- - -	227129 - 3	✓
siting blocks .. .. .. „	57,066	1 0 0	„	57,066	3167 78	1 7 8	- - -	1285 1 8	31700 7 11	152 - 6	31852 8 5	✓
n do. .. .. .. „	1,667	9 0 0	„	15,003	-	- - -	- - -	- - -	- - -	- - -	- - -	
ng do. .. .. .. „	1,667	4 0 0	„	6,668	-	- - -	- - -	- - -	- - -	- - -	- - -	
erete in bags .. .. „	742	12 0 0	„	8,904	-	- - -	- - -	- - -	- - -	- - -	- - -	
aps .. .. No.	275	10 0 0	Each	2,750	69	6 8	- - -	6 11 2	303 10 2	- - -	303 10 2	✓
erete capping .. .. .. C. yds.	19,200	10 0 0	C. yd.	1,92,000	3992/3	19 5 1	- - -	63 12 -	7757 13 4	- - -	7757 13 4	✓
Total for South Pier ..	....	..	..	17,76,482			- - -	53744 5 6	1057848 8 3	10845 13 11	1068494 6 2	✓
s and Plant	....	..	..	3,19,529			- - -	1438 3 7	382518 - 10	5214 4 11	387732 5 9	✓
				3,19,529							387732 5 9	✓
ngencies at 2½ per cent.	....	..	..	1,03,885			- - -	228 15 2	51928 11 4	7216 - 6	59144 8 10	✓
				1,03,885							59144 11 10	✓
ting entrance	....	..	..	20,000			- - -	- - -	- - -	- - -	- - -	
blishment	....	..	..	3,11,594			- - -	4171 8 4	299701 9 8	110 10 5	299872 4 1	✓
				3,11,594							299872 4 1	✓
erials at site (concrete blocks in yards) .. C. yds.	....	..	..	....	22581 25 27	11 8 9	- - -	5512 - -	244011 13 3	16539 10 4	260551 7 7	✓
ances to work-people	....	..	..	....	-	- - -	- - -	1 - -	4970 14 5	- - -	4970 14 5	✓
r stores	....	..	..	....	-	- - -	- - -	- - -	68207 - 2	56977 5 7	125184 5 9	✓
Total of Estimate and value of work done ..	....	..	..	45,90,051			- - -	43757 4 8	3066567 7 2	103873 8 4	3169440 15 6	✓
ict Probable recoveries due to sales of Tools and Plant.	....	..	..	....			- - -	- - -	- - -	- - -	- - -	
Total ..	....	..	..	45,90,051			- - -	38460 1 8	3032472 12 9	103873 8 4	3136346 5 1	✓
ct Arrears due	....	..	..	....	....	.. ....	....	....	....	....	103873 8 4	✓
Outlay to date by books	....	..	..	....	....	.. ....	....	....	....	....	3032472 12 9	✓
ct Total Outlay to end of last year	....	..	..	....	....	.. ....	....	....	....	....	2424994 - -	✓
Total ..	....	..	..	....	....	.. ....	....	....	....	....	607478 12 9	✓
ct Value of Stock	....	..	..	....	....	.. ....	....	....	....	....	68207 - 2	✓
Total ..	....	..	..	....	....	.. ....	....	....	....	....	539191 12 7	✓
Net Debits to Suspense Heads during the year ..	....	..	..	....	....	.. ....	....	....	....	....	15932 - 6	✓
Debits of the year	....	..	..	....	....	.. ....	....	....	....	....	555123 12 1	✓
for 1888-89, Rupees 12,00,000/ 7,00,000/ ..	....	..	..	....	....	.. ....	....	....	....	....		

* Outlay on Works up to 31st March 1888 ... Rs 2424994-2-
— do — during the Current year (from 1st April to 28th February 1889.) ... 539191-12-7
Total Net Outlay up to 28th February 1889. ... Rs 2964186-15-7

Madras,
23rd April 1889.

Thos Chatterton
Accountant
M.H. Works Office.

A. de Rozario
Superintendent,
Madras Harbour Works.

MADRAS HARBOUR WORKS.

Comparison of Expenditure to date with Sanctioned Estimate for the month of February 1889

Sub-head of Work.	As per Estimate. Quantity.	Rate.	Per	Cost.	As executed. Quantity.	Rate.	Cost. Total up to 31st December 1888.	During the month	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
		Rs. A. P.		Rs.		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	
As per Old Estimate.												
rks	....	..	..	49,15,752	....	.. .. ..	5509324 8 10	- - -	5509324 8 10	- - -	5509324 8 10	
ablishment	....	..	..	3,57,612	....	.. .. ..	529904 - -	- - -	529904 - -	- - -	529904 - -	
s and Plant	....	..	..	4,71,801	....	.. .. ..	515262 6 -	- - -	515262 6 -	- - -	515262 6 -	
Total ..	....	..	..	57,45,165			6554490 14 10	- - -	6554490 14 10	- - -	6554490 14 10	
New Estimate.												
ration and extension of block ground .. Prely...	....	..	..	8,000	....	.. .. ..	- - -	- - -	5892 3 5	9 13 6	5892 - 11	
North Pier.												
Rubble Stone in Foreshore and Base.												
inary deposited from break-water .. .. Tons	5,532	1 8 0	Ton	8,297	2780	1 12 -	- - -	4 - -	4865 - -	- - -	4865 - -	
Do. from boats .. .. „	1,82,260	2 0 0	„	3,64,520	197553	1 13 6	- - -	176 7 7	364428 13 3	4570 12 2	368999 9 5	
ge ordinary deposited under wave breaker from break-water .. .. .. „	14,750	1 12 0	„	25,812	1114 9/16	1 12 -	- - -	- - -	19512 9 -	- - -	19512 9 -	
crete blocks for building .. .. .. C. yds.	58,116	9 0 0	C. yd.	5,23,044	14370 6/16	10 2 1	- - -	35605 6 7	145626 - 11	- - -	145626 - 11	
ing blocks at commencement of new work .. „	2,062	2 0 0	„	4,124	2414 6/16	2 1 1	- - -	- - -	5414 6 2	- - -	5414 6 2	
Do. from 2,200 to 3,600 feet .. „	35,245	2 8 0	„	88,112	11744 12/16	2 9 8	- - -	3524 2 2	27903 14 7	2679 7 4	30583 7 11	
Do. at Pier head .. .. .. „	20,809	3 0 0	„	62,427	7	- - -	- - -	- - -	- - -	- - -	- - -	
crete in mass for filling .. .. .. „	500	10 0 0	„	5,000	263	4 9 3	- - -	- - -	1189 - 7	- - -	1189 - 7	
Wave Breaker.												
t blocks .. .. C. yds.	288	10 0 0	C. yd.	2,880	288	9 5 7	- - -	- - -	2692 - -	- - -	2692 - -	
inary concrete blocks .. .. .. „	70,849	9 0 0	„	6,37,641	63220 23/32	10 2 11	- - -	- - -	345386 14 8	- - -	345386 14 8	
ositing do. .. .. .. „	70,849	1 0 0	„	70,849	3241 25/32	1 13 2	- - -	689 9 1	28463 1 1	9 7 8	28462 8 9	
on blocks .. .. „	1,667	9 0 0	„	15,003	7	- - -	- - -	- - -	- - -	- - -	- - -	
ing do. .. .. „	1,667	4 0 0	„	6,668	-	- - -	- - -	- - -	- - -	- - -	- - -	
crete in bags .. .. „	742	12 0 0	„	8,904	-	- - -	- - -	- - -	- - -	- - -	- - -	
nps .. .. No.	330	10 0 0	Each	3,300	87	2 6 2	- - -	- - -	227 6 -	- - -	227 5 -	
crete capping .. .. .. C. yds.	22,400	10 0 0	C. yd.	2,24,000	28 1/3	16 16 6	- - -	95 10 -	4680 2 7	- - -	4680 2 7	
Total for North Pier ...	....	..	..	20,50,581			- - -	40091 3 4	950368 9 10	7259 13 2	957618 7 -	
South Pier.												
Rubble Stone in Foreshore and Base.												
inary deposited from break-water .. .. Tons	675	1 8 0	Ton	1,013								
Do. from boats .. .. „	1,69,517	2 0 0	„	3,39,034	169566/32	2 8 11	- - -	1229 14 11	401634 10 6	6618 9 10	408253 4 4	
ge, deposited from break-water .. .. „	15,038	1 12 0	„	26,317	16048/32	1 12 -	- - -	- - -	15075 13 -	- - -	15075 13 -	
crete blocks for building .. .. C. yds.	52,153	9 0 0	C. yd.	4,69,377	27414 8/32	10 9 6	- - -	42032 14 10	290480 8 8	- - -	290480 8 8	
ng blocks at commencement .. .. „	2,062	2 0 0	„	4,124	2063	3 1 6	- - -	- - -	7911 13 3	- - -	7911 13 3	
Do. from 2,550 to 3,700 feet .. „	29,282	2 8 0	„	73,205	24860 3/32	3 - 5	- - -	5335 1 11	71299 12 10	3875 3 7	75175 - 5	
Do. at Pier head .. .. .. „	20,809	3 0 0	„	62,427	-	- - -	- - -	- - -	- - -	- - -	- - -	
rete in mass for filling .. .. .. „	500	10 0 0	„	5,000	602	7 7 1	- - -	- - -	4554 14 4	- - -	4554 14 4	
Wave Breaker.												
rete blocks .. .. C. yds.	57,066	9 0 0	C. yd.	5,13,594	3235 17/32	10 9 11	- - -	3790 8 -	227129 - 3	- - -	227129 - 3	
siting blocks .. .. „	57,066	1 0 0	„	57,066	323 17/32	1 7 8	- - -	1285 1 8	31700 7 11	182 - 6	31882 8 5	
m do. .. .. „	1,667	9 0 0	„	15,003	-	- - -	- - -	- - -	- - -	- - -	- - -	
ng do. .. .. „	1,667	4 0 0	„	6,668	-	- - -	- - -	- - -	- - -	- - -	- - -	
rete in bags .. .. „	742	12 0 0	„	8,904	-	- - -	- - -	- - -	- - -	- - -	- - -	
ips .. .. No.	275	10 0 0	Each	2,750	87	3 6 8	- - -	6 11 2	303 10 2	- - -	303 10 2	
rete capping .. .. C. yds.	19,200	10 0 0	C. yd.	1,92,000	362 1/2	14 14 1	- - -	63 12 -	7757 13 4	- - -	7757 13 4	
Total for South Pier ..	....	..	..	17,76,482			- - -	53744 6 6	1057648 8 3	10845 13 11	1068494 6 2	
s and Plant	....	..	..	3,19,529			- - -	1438 3 7	382518 - 10	5214 4 11	387732 5 9	
				3,19,529							387732 5 9	
ingencies at 2½ per cent.	....	..	..	1,03,865			- - -	228 15 2	51928 11 4	7216 - 6	59144 11 10	
				1,03,865							59144 11 10	
ting entrance	....	..	..	20,000			- - -	- - -	- - -	- - -	- - -	
blishment	....	..	..	3,11,594			- - -	417 8 4	299761 9 8	110 10 5	299872 4 1	
				3,11,594							299872 4 1	
erials at site (concrete blocks in yards) .. C. yds.	....	..	..	....	22561 25/32	11 8 9	- - -		244011 13 3	16539 10 4	260551 7 7	
ances to work-people	....	..	..	....			- - -		4970 14 5		4970 14 5	
er stores	....	..	..	....			- - -	- - -	68287 - 2	56877 6 7	125164 5 9	
Total of Estimate and value of work done ..	....	..	..	45,90,051			- - -	43151 4 8	3065587 7 2	103873 8 4	3169460 15 6	
uct Probable recoveries due to sales of Tools and Plant	....	..	..	....								
Total ..	....	..	..	45,90,051				38460 6 8	3032472 12 9	103873 8 4	3136346 5 1	
duct Arrears due	....	..	..	....	....	.. ....	....	....	....	....	103873 8 4	
al Outlay to date by books	....	..	..	....	....	.. ....	....	....	....	....	3032472 12 9	
duct Total Outlay to end of last year	....	..	..	....	....	.. ....	....	....	....	....	2424994 2 -	
Total ..	....	..	..	....	....	.. ....	....	....	....	....	607478 10 9	
duct Value of Stock	....	..	..	....	....	.. ....	....	....	....	....	68287 - 2	
Total ..	....	..	..	....	....	.. ....	....	....	....	....	539191 10 7	
d Net Debits to Suspense Heads during the year ..	....	..	..	....	....	.. ....	....	....	....	....	15932 - 6	
t Debits of the year	....	..	..	....	....	.. ....	....	....	....	....	555123 11 1	
ant for 1888-89, Rupees 1200000/ ied from Do. — 700000/	....	..	..	....	....	.. ....	....	....	....	....		

* Outlay on Work up to 31st March 1888 — 2,24,994-2-—
— Do. — during the current year (from 1st April to 28th February 1889) — 5,39,191-10-7
Total Net Outlay up to 28th February 1889. — 2,64,185-12-7

Madras,
21st April 1889.

Accountant
M.H. Works Office

Superintendent,
Madras Harbour Works.

Enclosure

No. 89

2 S/O

From

The Superintendent

Madras Harbour Works.

No. 1245

1245

The Chairman

Harbour Trust Board

Madras

Madras, 20th April 1889

Sir

I have the honour to forward my report on the progress made on the works during the month of February 1889, with a lithographed plan of the Harbour (submitted in triplicate) showing the work done during the month in red.

Surveys 2. A Survey of the High Water Mark both North and South of the Harbour was made and several cross sections of the Rubble Base of both Piers were taken.

North Pier Works Superstructure 3. The North Pier Titan Crane was taken out to the extreme end of the Pier and turned into position for forward work on the 2nd February and by the 4th all was ready for Block setting, but

some delay was caused through a few of the Wavebreaker blocks having rolled down upon the base and in the lines of the New Pier, these obstacles were all removed and a fair start at Blocksetting made on the 8th and up to the 28th 200 Superstructure blocks had been set and the Pier advanced by 122 feet, which must be considered very good progress, when working on the Curves, on account of the difficulty of keeping to the true centre line.

South Pier Wr Rubble Ba

4 At the South Pier 722½ Tons of Rubble was deposited along the centre line of the New Pier which was afterwards levelled up by Divers.

Superstructu

5. At the South Pier excellent progress was made notwithstanding occasional seas washing over the ruined walls, and by the 28th of February, as many as 230 blocks had been placed in position by Divers which extended this arm by 141½ feet on the Outerstraight portion.

Wavebreaker

6. The erection of the Wavebreaker Crane on the South Pier was completed

12½ 3 81

& out to about the centre of the Curve, which point it reached without any difficulty owing to the Satisfactory alterations made in the travelling wheels. 19 Wavebreaker blocks of 30 tons each were deposited along the Curve, when this crane was taken on the Straight portion to protect the new pier built. 12½

Concrete Blockmaking

7. Twenty four Wavebreaker blocks = 432 cubic yards of Concrete were made on the 1st & 2nd and then this work had to be stopped to carry out several repairs to the engines and elevators &c. This opportunity was taken to thoroughly scale and examine the four 40 HP Cornish boilers, when as I expected, two of them were found to be so pitted as to be beyond repairs, the other two will run safely for another 18 months. 7

Pallavaram Quarries

8. 7 Fifteen trains ran between the Quarries and Madras, which brought down a total of 3,165 3/4 tons of Stone of which 2463¼ tons were Chips which was all that was required owing to the necessa

repairs to the Crushing Machs

9. The Pontoon was ~~was~~ was in working order by the 4th Jany from which date some of the old blocks were removed from the old ruined South Pier head.

10. The following stores were received from England during the month. *Stores from England*

By the S.S "Pavonia" With 1044 Casks containing 186-8-2 Tons of Portland Cement.

By the S.S "Manora" with 1039 Casks containing 186. 11. 0. Tons of Portland Cement, also one case of Link motion and reversing gear for Locomotive Engines.

11. 82 Hardwood Broad gauge sleepers and 164 Hardwood Narrow gauge sleepers were delivered by the Contractor. *Stores Local supp*

Harbour Trust Board

12. All timber work was renewed on the Iron Pier decking for a length of 100 Running feet for a half width of the Pier. General Cranes and trucks were overhauled and all the Railway lines kept in good working order. *Iron Pier repairs*

Return

Return of Work for February 1889

y lines 1000 Rg ft. Permanent Titan road was taken up and relaid and 157 Rg ft ~~~~ temporary Titan road was laid, also 183 Rg ft. temporary broad gauge line was laid on the South Pier 483 Rg: ft temporary broad gauge line was laid on the North Pier. 1245 1245

ries Fifteen trains worked during the month bringing stone from Pallaveram.

		Tons
Rubble	Quantity received up to 28th Feby 89 -	35171 6/4
	——— do ——— 31st Novr 88 -	35093 3/4
	Received in Feby '88 -	722 1/2
Chips	Quantity received up to 28th Feby 89 -	12958 2 3/4
	——— do ——— 31st Jany 89 -	12711 9 1/2
	Received in Feby 89 -	246 3 1/4

Ballast. None received

North Pier. Surf bank. Nothing done since 30th Nov 88

——— do ——— Rubble base ——— do ——— 30th April 87

——— do ——— Superstructure

	Nos	Cubic Contents
Blocks set up to 28th Feby 89.	890 -	14334 57/98
——— do — 30th April 87.	690 -	11122 1/27
Set in February.	200 -	3212 14/27

Rg ft of new wall built up to 28th Feby 89 - 598

——— do ——— 30th April 87 - 476

Total length of wall completed from B. 2648

——— do ——————— F. 598

North Pier supplementary works. Nothing done since 31st Jany 89

——— do — Capping ——— nothing done since 30th Nov 88

——— do — Cramps ——— nothing done since 31st Aug 89

South Pier. surp bank — Nothing done since 30th April 88

——— do — rubble base

Foreshore

	Large rubble under Wave Breaker	Widening foreshore	Base
Total quantity deposited up to			
28th Feby '89 -	10102 1/2 —	38389 3/4 -	120085
Do 31st Oct 88 -	9380 —	38389 3/4 -	120085
Deposits in Feby -	722 1/2 —	" —	"

South Pier Superstructure

	Nos	Cubic Cyds
Blocks set up to 28th February 89 -	1683 -	27416 2/3
——— do ——— 31st January 89 -	1453 -	23624 2/9
Set in February	230 -	3792 4/9

Rubble new wall built up to 28th Feby 89 — 1107

——— do ——— 31st Jany 89 — 960 1/2

Built in January 146 1/2

Total length of wall completed from E — 3494

——— do ——————— A — 1107

South Pier. supplementary works

Blocks deposited in Wave Breaker

	No of blocks	Cubic Cyds			
up to 28th Feby 89.	1249. —	21484 97/216	— " —	average Breadth from paper 9/24	" —
do 31st Oct 88 -	1230 -	21142 97/216	— " —	"	" —

Wave Breaker Blocks

South Pier - Capping - Nothing done since 31st December 88

——— do ——— Cramps ——— do ——— 31st October 88

Protective Works — Nothing done

Concrete Blocks

Description of blocks	made up to 31st January	made in February	made up to 28th February	Placed in work up to 6th January	Placed in work up to 27th February	In hand
Old blocks	806	"	806	806	806	"
Wave breaker blocks	3068	24	3092	2342	2361	731
Superstructure						
North Pier Bottom blocks	227	"	227	114	152	75
do Middle do	750	"	750	417	537	213
do Top do	248	"	248	135	175	73
South Pier Bottom - do	387	"	387	284	330	57
do Middle do	1093	"	1093	783	922	171
do Top do	387	"	387	282	327	60
Special do	71	"	71	71	71	"
Counterbalance	1	"	1	"	"	1

432 Cyds Concrete blocks were made in the month on the 1st and 2nd, after which blockmaking was stopped to allow of the Stationery Engine boilers being examined and cleaned

1187 1/4 Tons Cement was the balance on the 28th

96 Superstructure and 39 wavebreaker blocks were taken from North to South Pier block a—

The Wave-breaker crane was taken out Miscellaneous
to 2575 feet on the South Pier, on the 1st

The North Pier Titan was turned in
position for setting blocks, on the 2nd

The Pontoon was launched and
taken into the Harbour on the 2nd and
was fitted together on the 3rd

A beacon was fixed at North Pier
on the 26th.

Tools and Plant

A new collar was made and Stationary Engines
fitted to Governor and lubricator cocks were
ground.

Two new made water cocks & pipes
were made and all oilcans and dishes
were repaired.

Superheater. Three new plates were Stationary Engines
fitted to the fire with angle irons and a & Boilers
brass gland and new valve spindle fitted
to the exhaust valve. A new overflow tank
was made with two new lengths of fitting.
Three lengths of new suction pipe were sup-
plied to the donkey pumps and the
superheater was thoroughly cleaned and
painted.

Two axle Discs jacked and removed
from seating. 1245 2575

No 3 & 4 Boilers. Flues were cleaned and
inside of boilers were throughly examined
and cleaned. All cocks, safety valves
and clack box values were ground
and all joints remade. Two packing
nuts were made for the spindle. The
boilers were tested to 90 lbs per square
inch. The safety values correspond.

Steam pipes and domes were painted
and covered with coir rope and mud
composition.

The boilers were covered with
mud composition and tarred. The water
tank was also repaired, cleaned and
tarred.

Main Shafting

Four new brass bearings were
made and fitted and two couplings re-
faced up.

10

Stone Crushers

No 2. Two jaws and side wedges
were fitted and the shoot repaired.

16

No 3 Two jaws with side wedges,
two 1¼" bolts for back wedge and two
new white metal bearings for the
eccentric shaft, were made and fitted.

11

No 6 Two new white metal bear-

a brass bearing, two new 1/4" studs for back wedge and a new key for the keeps were made and fitted. New set plates were fixed and the shoot repaired.

Elevators.

No. 1. A new timber upright with all iron fitted up was fixed in position. Two new brackets for the brake gear, a new key for driving pulley and a brass washer for bevel pinions were made and fitted. The iron work of the platform was repaired.

No. 2. The shafting was straightened and a new pinion and brass washer for bevel pinion made and fitted and the iron work of the platform was repaired.

No. 3. A new key for the pinion, a new brass washer for bevel pinion, and two new steel set screws for collars were made and fitted and the iron work of platform repaired.

No. 4. Two new steel set screws for collars were made and fitted, and the iron work of platform repaired.

No. 5. The iron work of platform and some of the iron boxes were repaired.

Concrete Mixers

Main Shafting. Four new brass bearings were fitted, 10 brass bearings closed, three plummer blocks levelled and two couplings faced up. 4 SP

No. 2 pump. Two new buckets were made and fitted to plungers.

Water tank. Cleaned and tarred.

Concrete Skip Boxes. Seven were repaired. 12 45 12 H E

Goliath Crane.

No. 1. Brass bearings of large and small engines were closed. Left hand slide valves of large engine were faced up. Two steel studs and eight leather washers were made and fitted. A new hydrolic friction leather was fixed and the lift of pump valves regulated.

No. 3. A new chimney was made and fitted. The pump lift regulated, and eight leather washers were made. The left hand slide bars and brass bearings of connecting rods of large engines were closed.

North Pier Titan.

A 5/8" shunting chain, 8 timber dogs, and a new brake rope was supplied. A new travelling wheel was fitted to the crab and the face of one old travelling wheel of crab, was chipped. 4 17

South Pier Titan.

The faces of two travelling wheels

of crab girder and the faces of the travelling wheels of crab, were chipped. One length of waste water pipe was renewed. A travelling wheel and key to crab and a new steel to blow off cock was fitted and three brake ropes repaired.

No 1. A new friction leather was made and fitted. The guide of the safety valve lever was repaired. Valves were ground, and the jack cleaned and painted. 100 Tons hydrolic jack

The gearing was eased and a 1" chain repaired. Pontoon

Two shunting ropes were made for No 1 Loco Engine and one for No 2 Loco Engine. A band was made for a barrel buoy for divers. Ten staples with rings were made for the divers boats. Two links for 1/2" chains, links and hooks for stone excavators and seven 1" sling chains were made for divers. The excavating bop for North Pier was repaired. Two iron buoys were repaired, and rings fixed in six 3/8" chains for Marine Survey & beacon was repaired. 72 pairs axles & two bars were retired and 24 new pairs axles were made. Miscellaneous 8 8/0

Four pairs of sand wagon wheels were wedged. 12 & 5

No 2 Loco Engine 12 & 5 A new draw hook was fitted

Block Truck No 13. Brass bearings were eased and the truck was painted

No 14. Was rebuilt and painted.

Harbour Trust

Iron Pier. 100 Rg. ft., half width, timber work was renewed.

I have the honor to be

Sir

Your Most obed.t Servant

(Signed) A. Lee. Pogson

Engineer, Harbour Trust Board.

True Copy

HARBOUR TRUST BOARD 24 APR. 89 MADRAS.

Chairman, Harbour Trust Board.

12 13

E.1
P438957
89

1P

Harbour Trust Board Office,

1245

MADRAS, 29th April 1889.

No. 573.

1245

From R. W. Barlow Esquire C.S.

Chairman, Harbour Trust Board,

MADRAS,

To

Colonel H. R. Mead RE

~~Chief~~ Secretary to Government,

Public ~~Marine~~ Works Department.

Sir

I have the honour to submit for the information of Government, copy of a letter from the Engineer Harbour Improvement Board No 89 dated 20th April 1889, reporting upon the Progress made upon the Madras Harbour Works during the month of February 1889, with a tracing and comparison Statement of Expenditure for February 1889, in duplicate.

I have the honour to be

Sir

Your most obedient Servant

1245 1245

15 15 16-

Govt. of (1889) Madras.

PUBLIC WORKS.

Rec'd 13/5/1889

Read.

Encl.

G.O. 11th May 1889 No. 1245

Madras Harbour Work

Progress report of th

— for February 18

— Recorded with ref

16

100

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