

- (1) பக்கங்களின் எண்ணிக்கை 38.
 (2) புதுக்கித் திருப்பிய நாள் June 89.
 (3) ஆதாரங்குறிப்பவர் கருக்கொப்பம் by

தமிழ்நாடு ஆவணக் காப்பகம்.

(57)

தமிழ்நாடு அரசு

p.w.d. துறை

அரசாணை எண். மு. கோப்புத் தாள் எண்.	1520	அச்சகம் பலவகை
தாள் :	7-6-1889	198 .

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4TH SEPTEMBER 1889, No. 2448 W., PUBLIC WORKS.

GOVERNMENT OF MADRAS.
PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

READ—the following paper:—

From Sir RICHARD BARLOW, *Bart.*, C.S., Chairman, Harbour Trust Board, to the Acting Joint Secretary to Government, Public Works Department, dated Madras, 24th August 1889, No. 2998.

I have the honor to submit, for the information of Government, a letter from the Engineer, Harbour Trust Board, No. 563½, dated 7th instant, reporting upon the progress made upon the Madras Harbour Works during the month of May 1889, with a comparative statement of expenditure for the same month in duplicate.

ENCLOSURE.

From A. LEE POGSON, Esq., Engineer, Harbour Trust Board, to the Chairman, Harbour Trust Board, dated Madras, 7th August 1889, No. 563½.

I have the honor to forward a report on the work done on these works during the past month of May, from which it will be seen that no progress was made at sea on either piers, but the staff were kept fully occupied at alterations and repairs to the machinery ready for an early start again in June.

2. I have not prepared a plan with this report on account of there being no progress to show, but the quarterly plan under preparation will embody everything.

3. *North and South Pier works.*—The state of the sea during the month of May this year was unusually calm and passed without any heavy seas washing over the piers. During this time several cross sections were taken of the piers and wavebreaker screens, which completes a series of sections throughout the new bonded work.

4. All the railway lines on shore were put in good order, and a connection between the beach railway and the south pier, forming a curve identical with the north pier arrangement of lines, was commenced, which will enable certain ground being handed over to the South Indian Railway authorities for their proposed new beach station.

5. *Pallavaram quarries.*—During May 12 trains were despatched from the quarries, which conveyed 2,541 tons of chips to the stone crushers for blockmaking. All railway lines were kept in good order and all drains were repaired and cleaned of silt for the usual rains.

6. *Concrete blockmaking.*—Blockmaking had to be stopped from the 5th to 27th of May, partly for want of chips, and repairs to the machinery, but during the nine working days 99 blocks were made, 40 of which were the large wavebreaker blocks. The total outturn of concrete was 1,702 cubic yards.

7. *Stores from England.*—The S.S. *Duke of Devonshire* arrived from England during the month of May with 430 casks containing 76 tons 15 cwt. 2 qrs. and 24 lbs. of Portland cement for these works.

RETURN OF WORK FOR MAY 1889.

Surveys.—Several cross sections were taken of the wavebreaker at both piers.

Railway lines.—The lines at the beach and the quarries were kept in repair during the month. One of the sidings, broad gauge, was taken up at the south pier, to supply materials for the new curve connecting the beach line with the south pier, which was commenced.

Quarries.—Twelve trains worked in the month bringing chips from Pallavaram.

Rubble.—None received since 30th April 1889.

Chips.—

				TONS.
Total quantity received up to 31st May 1889	...	...	...	138,038½
Do. do. up to 30th April "	...	...	...	135,497½
Received in May	...	...	...	2,541

Ballast.—None received.

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

Do. Rubble base.—Do. 30th April 1889.
Do. Superstructure.—Do. 31st March "
Do. Supplementary works.—Do. 30th April "
Do. Capping.—Do. 30th Nov. 1888.
Do. Cramps.—Do. 30th April 1889.
South Pier Surf bank.—Do. 30th " 1888.
Do. Rubble base.—Do. 30th " 1889.
Do. Superstructure.—Do. do.
Do. Supplementary works.—Do. do.
Do. Capping.—Do. 31st December 1888.
Do. Cramps.—Do. 30th April 1889.

Protective works.—Nothing done.

Concrete Blocks.

Description of blocks.	Made up to 30th April 1889.	Made in May 1889.	Made up to 31st May 1889.	PLACED IN WORK		In hand.
				Up to 30th April 1889.	Up to 31st May 1889.	
Old blocks	806		806			
Wavebreaker blocks	3,109	40	3,149	806	806	
Superstructure—				3,064	3,064	\$5
North pier bottom blocks ..	227		227	212	212	15
Do. middle do. ..	750		750	713	713	37
Do. top do. ..	248		248	233	233	15
South pier bottom do. ..	459	9	468	340	340	128
Do. middle do. ..	1,292	38	1,330	948	948	382
Do. top do. ..	610	12	622	335	335	187
Special blocks	71		71	71	71	
Counterbalance blocks ..	1		1			1
Special abutment blocks ..	46		46			46

1,702 cubic yards of concrete was made in the month.

Blockmaking was stopped on the 5th and resumed on the 27th.

748 tons cement was the balance at the end of the month.

212 superstructure and 16 wavebreaker blocks were transferred from north to south block ground.

TOOLS AND PLANT.

Elevators.—Two boxes were repaired.

No. 3 Crane on mixing platform was supplied with a new chain.

Concrete mixture No. 5.—The door catch was repaired.

Concrete mixture No. 6.—A new door catch was fitted.

Concrete skips.—Three were repaired.

Goliath Crane No. 3.—Two new valve seatings, four new valves to two pumps and sixteen new studs and nuts to hydraulic piston were made and fitted. A new hydraulic piston leather and two spanners were supplied.

Light Traveller No. 2.—A new travelling wheel and a new key to crab pinion were fitted.

Pontoon.—The manhole covers were removed and the buoys painted inside. Thirty-six 3/4-inch bolts were made and fitted to manhole covers and the joints remade. New plates were supplied to the suspending chains.

North Pier Titan.—The face of a crab travelling wheel was chipped and a new key fitted to the pinion. The "east and west" travelling shaft was straightened. Two wrought-iron fire bars were made. A new key was fitted to the pinion of hand-power travelling gear. The sheaves and chains of the chain blocks were examined and the blocks repaired. The titan stood at its usual standing ground at the end of the month.

South Pier Titan.—A portion of the plank flooring was repaired and the cabin roof renewed. The crane stood at its home station at the end of the month.

Wavebreaker Crane.—The wavebreaker crane stood at the shore end of the south pier as usual during the monsoon.

Miscellaneous.—Two new block frames were made. Fifty cotters and fifty washers were also made for the repairs of some of the old ones.

The fitting shop was supplied with a 1-inch die. A diver's boat and jolly boat were repaired, two spanners and five union nuts were made for the diver's air-pump, and a ladder repaired. Six lewis bars were straightened. No. 2 Locomotive engine was supplied with a

shunting rope. Twelve bolts, six fiddle drills and a hand bellows were made for Pallavaram quarries. Four pick-axes were repaired. A survey boat and a riding trolley were also repaired.

Locomotive Engine No. 1.—A new cotter for coupling rod, a new blower pipe, a new nut for brake gear, new sand pipe and a new lead plug were supplied. The tyres of the wheels were chipped, the bearings of connecting and coupling rods were closed and cotters lined up. The eccentric straps were closed. The injectors were repaired and their steam valves faced. The boiler cocks and the safety and clack box valves were ground. The regulator valve and fire box roof stays were examined and copper stays of the fire box recaulked. The waste-water cock gear was set and the spark-catcher and ashpan were repaired.

Locomotive Engine No. 2.—The bearings of connecting and coupling rods and eccentric studs were supplied and the steam valves faced of the injectors. The boiler cocks and safety and clack box valves were ground. The waste-water cock gearing was set. The roof stays of fire box and brake nut and lead plug were examined. The spark-catcher was repaired.

Block Truck Nos. 2, 3, 5, 6, 7, 10, 11, 12, 15, 16, 18 and 19.—The brass bearings were eased, the keeps filled with waste and oil and the trucks painted. Nos. 14 and 18 were supplied with coupling chains.

Send wagon No. 9 was supplied with a coupling chain.

HARBOUR TRUST.

Iron Pier.—Fifty-eight running feet, half with timber, was renewed. Two lamp-posts were fixed. A new gangway was fitted and the old one removed and fixed at the shore end of the pier.

Portable Crane No. 6 B was thoroughly repaired.

Trucks Nos. 29 and 32 were thoroughly repaired.

C. Class Cranes.—Extra balance box patterns were made.

Harbour Trust Office.—Twelve writing desks and six benches were made and supplied.

ORDER—dated 4th September 1889, No. 2448 W., Public Works.

Recorded.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Lt.-Col., R.E.,
Ag. Joint Secy. to Govt., P.W.D.

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

Exd. P. L. Pereira.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1889} Madras.

PUBLIC WORKS.

Dated September, 4th.

Recd.

Encl.

G.O., 4th Sept. 1889, No. 2448 W.

SEPTEMBER.

Madras Harbour Works

Progress report of the — for May 1889,
recorded.

19TH MARCH 1889, No. 831 W., PUBLIC WORKS.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

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, 13th March 1889, No. 973.

I have the honor to submit, for the information of Government, copy of a letter from the Engineer, Harbour Trust Board, No. 1565, dated 5th March 1889, reporting upon the progress made upon the Madras Harbour Works during the month of January 1889, with a tracing in duplicate.

ENCLOSURE.

From A. LEE POGSON, Esq., Engineer, Harbour Trust Board, to the Chairman, Harbour Trust Board, dated Madras, 5th March 1889, No. 1565.

Accompaniment—Tracing (in triplicate).—I have the honor to submit my report on the progress made on these works during the past month of January. Accompanying this report is a return of work and a plan of the harbour (submitted in triplicate) showing the progress made during the month, in red.

2. *Surveys.*—Several cross sections were taken of the rubble base during the month, and a work iron beacon was fixed in position at sea, marking the true centre line.

3. *North Pier works—Wavebreaker.*—At the north pier 76 30-ton wavebreaker blocks were dropped into position along the inner straight of the pier by the Titan crane, completing the wavebreaker to the required width as it worked its way towards the end of the pier, where I could have made good progress at blocksetting had the telegram received from the Secretary of State on the 24th December 1888 been communicated to me earlier than 31st January.

4. *Concrete block-making.*—The work of concrete block-making was carried on briskly throughout the month when 282 large blocks were made, of which 142 were wavebreakers; the total outturn of concrete, from which these blocks were made, was 4,864½ cubic yards. All the machinery used in the making of blocks will have to undergo heavy repairs during the ensuing month.

5. *South Pier works—Superstructure.*—At the south pier the progress was as rapid as could be wished for; during the 24 working days 23 rows, containing 220 large blocks, were set in position by divers, which added a length of 137·6 to the pier during January.

6. *Wavebreaker.*—The wavebreaker crane was completed and tested on the 17th January. To thoroughly satisfy myself and all who have the handling of this ponderous crane, I tested it with a full load out to the greatest overhang, viz., 40 feet; and tested also several other movements about which there was some doubt, and I am happy to report that I found the crane quite equal to the extra strains. The alterations I suggested to make in this crane, to enable it to travel round the different curves, have been completed and a serious error in its original design has been overcome.

7. *Pallavaram quarries.*—Twenty trains were despatched from the Pallavaram quarries in January, conveying to the crushing station 4,322½ tons of chips for block-making.

8. *Stores from England.*—The following vessels arrived during the month of January with stores for the Madras Harbour Works as follows:—

By the S.S. "Navarino."—Six cases containing miscellaneous stores such as spanners, rules, steel jack planes, twine and spun yarn, leather belting, paint brushes, taps, stocks and dies.

By the S.S. "Goorkha."—2,093 casks containing 373½ tons of Portland cement, also 14 Lewis bolts, six Messent's concrete mixers and two cases of fittings.

By the S.S. "Duke of Argyle."—732 casks containing 130½ tons of Portland cement.

By the S.S. "Asia."—One case of brass screws overcarried by the S.S. *Pandua*.

9. *Stores—Local supply.*—The contractor, M. O. Ragava Charry, delivered 483 hard wood sleepers, of which 44 were for the quarries.

RETURN OF WORK FOR JANUARY 1889.

Railway lines.—On the south pier 157 rg. ft. broad gauge temporary lines and 967 rg. ft. single rail for South Indian Railway wagons were laid; 604 rg. ft. wavebreaker crane lines and 572 rg. ft. broad gauge lines were laid to take out the crane. On the sand road, 110 rg. ft. broad gauge lines were laid, 2,500 rg. ft. new rails were laid in renewing and extending lines.

Quarries.—Twenty trains worked during the month bringing stone from Pallavaram.

Rubble.—None received since 30th November 1888.

Chips.—

Total quantity received up to 31st January 1889	...	...	127,119½
Do. do. 31st December 1888	...	...	122,796½

Received in January ... 4,322½

Ballast.—None received.

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

Do. rubble base.—Nothing done since 30th April 1887.

Do. superstructure.—

Do. supplementary works.—

Blocks deposited in wavebreaker.

	Number of blocks.	Concrete, cubic yards.	Distance on pier.	Average breadth on base of pier.
Up to 31st January 1889	1,928	35,019½	...	...
Do. 29th February 1888	1,852	33,651½	...	...
In January	76	1,368	487—2,222	9' to 28'

* All wavebreaker blocks.

North Pier, capping.—Nothing done since 30th November 1888.

Do. cramps.—Do. 31st May 1887.

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

Do. rubble base.—Do. 31st October 1888.

Do. superstructure.—

Blocks set up to 31st January 1889	...	...	1,453	23,624½
Do. 31st December 1888	...	...	1,233	20,016½
In January	...	...	220	3,607½

Rg. ft. of new wall built up to 31st January 1889	...	...	960½
Do. do. 31st December 1888	...	...	823
In January	...	...	137½

Total length of wall completed from E	...	...	3,347½
Do. do. G	...	...	960½

South Pier, supplementary works.—Nothing done since 31st October 1888.

Do. 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 December 1888.	Made in January 1889.	Made up to 31st January 1889.	PLACED IN WORKS		In hand.
				Up to 31st December 1888.	Up to 31st January 1889.	
Old blocks	806	...	806	806	806	...
Wavebreaker blocks	2,926	142	3,068	2,266	2,342	726
<i>Superstructure.</i>						
North pier, bottom blocks	227	...	227	168	114	113
Do. middle do.	750	...	750	466	417	333
Do. top do.	248	...	248	131	125	113
South pier, bottom do.	359	28	387	246	284	103
Do. middle do.	1,009	84	1,093	663	783	310
Do. top do.	359	28	387	242	282	105
Special blocks	71	...	71	71	71	...
Counterbalance	1	...	1	...	...	1

4,864½ cubic yards concrete blocks were made in the month.

943 tons cement was the balance in store.

127 superstructure and 87 wavebreaker blocks were transferred from north to south pier stacking ground.

TOOLS AND PLANT.

Stationary engines.—Brass bearings of boiler donkey pumps were closed.

Stone crushers, No. 1.—Two side wedges were refitted.

No. 4.—Two new side wedges were fitted and twelve handles were fitted to set plates and two shafts repaired.

Concrete mixers, No. 3.—Two new door catches were fitted.

Elevators.—Six wheels were made for elevator boxes and four others were repaired.

Sand crane, No. 1.—On mixing platform, a tie rod was repaired.

Goliath cranes, No. 3.—A new hydraulic piston leather was fitted and a new key to the flywheel of small engine.

Light ga. try travellers, No. 1.—The foot board was repaired and crane painted.

No. 3.—Foot boards painted, and a new chain supplied to the crab.

No. 4.—A new chain supplied to the crab.

Fitting shop.—Plungers lined up, and four new valves were fitted to the hand pumps.

Diver's helmet.—A new special nut was fitted to the air valve, the old studs were drilled out of the pump barrels, and twenty-four new brass bolts made.

Miscellaneous.—Diver's ladders repaired. A new canvas water-pipe was supplied to the running shed. Twenty-eight bolts and thirty-three cotters were repaired for block frames.

Twelve ½" bolts and three eye bolts were made for joggle boxes. A coupling chain was made for No. 1 Locomotive engine. Seven pins and cotters for shackles and eight 1½" special links were

welded into 1" chain for divers. Gear of pontoon was cleaned and fitted. A 4-inch pin was made for the block dropping claws. Seven concrete skips were repaired. Twenty-nine cramps made for S. P. superstructure. Twenty-four spike nails and five brackets were made for a diver's boat. Twenty-four square washers, twelve pins and seven knee pieces were made

for Lewis wedges. Two sounding irons were also made for the divers.

Locomotive Engines, No. 1.—L.H. steam chest cover joint was made and a new stud fitted. A shaft was fitted to the driving wheel. A new key fitted to R.H. driving wheel. A new key fitted to eccentric sheave. A stud was fitted to blow off cock. The boiler cocks ground and the lead plug renewed. Brass bearings of connecting and coupling rods and eccentric straps closed and the spark-catcher repaired.

No. 2.—The R.H. cylinder cover joint was re-made.

No. 3.—Brass bearings of connecting and coupling rods were closed. The lead plug was renewed. The whistle and steam gauge cocks were ground. A buckle was fitted to the slide valve and valve spindle turned. The slide valves were reset and dummy gland and steam chest cover joints made, a waste watercock reset.

Block trucks, Nos. 4 and 9.—Brass bearings were cased and keeps were fitted with waste and grease.

Sand wagon, No. 3.—A tail board hinge, and four second-hand pedestals were fitted and the wagon painted.

Nos. 6 and 7.—A pair of new wheels and a buffer band fitted and the wagon painted.

No. 8.—Liners were fitted to pedestals and the wagon painted.

Wavebreaker crane.—This crane was completed and tested on the 17th.

North Pier Titan crane.—After depositing 76 wavebreaker blocks the crane was taken out to 2,382 feet on the new wall, where it stood at the end of the month.

South Pier Titan crane.—The south pier Titan crane stood at the end of the south pier. Three leathers were made and fitted to the brake drum, and pinion; two brass bearings were cast and a pin was made for the double gear lever. Three brake ropes were also supplied.

HARBOUR TRUST.

Iron Pier.—110 sq. ft. for the half width of the pier timber work was renewed.

B. Portable cranes, No. 11.—This 2-ton crane was thoroughly repaired.

Smiths' shop.—A ventilator was added to the smiths' shop.

ORDER—dated 19th March 1889, No. 831 W., Public Works.

The report will be forwarded to the Secretary of State for India.

(Here enter No. ¹⁰₈₃₁ W., dated 19th March 1889.)

(True Extract.)

(Signed) H. R. MEAD, Colonel, R.E.,
Ag. Secretary to Govt., P.W.D.

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

Exd. J. Henricus.
Spare Copies

1520

5

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1889} Madras.
PUBLIC WORKS.

Dated March, 19th.

Recd.

Encl.

G.O., 19th March 1889, No. 831W.

MARCH.

Madras Harbour Works

Ordered that the progress report of the —
for January 1889 be forwarded to the Home
Government.

19TH MARCH 1889, No. ¹⁰_{831 W.} PUBLIC WORKS.

1520

PUBLIC WORKS DEPARTMENT.

LETTER—to

THE RIGHT HONORABLE THE SECRETARY OF STATE FOR INDIA.

MY LORD,

In continuation of our despatch No. ⁹_{831 W.}, dated 5th March 1889, we have the honor to forward, for your Lordship's information, the progress report of the Proceedings of Government, dated 19th March 1889, No. 831 W. Madras Harbour Works for the month of January 1889, together with a plan showing the advance made during the month.

2. The usual statement of expenditure will follow.

We have the honor to be,

My Lord,

Your Lordship's most obedient, humble servants,

(Signed) CONNEMARA.

(") H. E. STOKES.

(") J. H. GARSTIN.

FORT ST. GEORGE,
19th March 1889.

Ed. J. Henricus.

b

GOVT. OF MADRAS.
PUBLIC WORKS DEPARTMENT.

(Copy.)

LETTER to the Right Honorable
the Secretary of State for
India.

No. ¹⁰_{831 W.} dated 19th Mar. 1889.

Forwarding progress report of the Madras
Harbour Works for January 1889.

11TH MAY 1889, No. 1245 W., PUBLIC WORKS.

GOVERNMENT OF MADRAS.
PUBLIC WORKS DEPARTMENT.

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 722½ 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. *Pallavaram Quarries.*—Fifteen trains ran between the quarries and Madras, which brought
down a total of 3,185½ tons of stone, of which 2,463½ 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.

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 Pallavaram.

		Rubble.		TONS.
Quantity received up to 28th February 1889	...	...	...	351,716½
Do. do. 30th November 1888	...	...	...	350,993½
Received in February 1888				722½

		Chips.		TONS.
Quantity received up to 28th February 1889	...	...	...	129,582½
Do. do. 31st January 1889	...	...	...	127,119½
Received in February 1889				2,463½

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	14,334½
Do. 30th April 1887	...	...	...	690	11,122½
Set in February				200	3,212½
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.		Base.
	Large rubble under wave- breaker.	Widening foreshore.	
Total quantity deposited up to 28th February 1889	10,102½	38,389½	120,085
Total quantity deposited up to 31st October 1888	9,380	38,389½	120,085
Deposited in February	722½	...	...

South Pier Superstructure.

		NO.	Contents. C. YDS.
Blocks set up to 28th February 1889	...	1,683	27,416½
Do. 31st January 1889	...	1,453	23,624½
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	21,484½	...	...
Do. 31st October 1888	...	1,230	21,142½	...	...
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 Feb- ruary 1889.	PLACED IN WORK		In hand.
				Up to 31st January 1889.	Up to 28th February 1889.	
Old blocks	806	...	806	806	806	...
Wavebreaker blocks	3,068	24	3,092	2,342	2,361	751
<i>Superstructure.</i>						
North pier bottom blocks	227	...	227	114	162	75
Do. middle do.	750	...	750	417	637	213
Do. top do.	248	...	248	135	176	73
South pier bottom do.	387	...	387	284	330	67
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—Superheater.—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 superheater 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 $1\frac{1}{2}$ " 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 $1\frac{1}{2}$ " 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 plunger 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 $\frac{3}{4}$ " 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 $\frac{3}{4}$ " 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.

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

Recorded.

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

(True Extract.)

(Signep) R. R. E. DRAKE-BROCKMAN, Lt.-Col., R.E.,
 Ag. Joint Secy. to Govt., P.W.D.

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

Exd. J. Henricus.
 Spare Copies

Harbour Trust Board Office,
Madras, 25th March 1889.

No. 1105

From

¹⁵²⁰
R. H. Barton Esquire

CHAIRMAN, HARBOUR TRUST BOARD,

Madras,

To

Colonel R. E. Drake Brockman

~~Chief~~ SECRETARY TO GOVERNMENT,

Public Works ~~Marine~~ Department.

Sir

I have the honor to forward
herewith copy of statement showing
Expenditure upon the Madras Har-
bour Works for the month of January
1889.

I have the honor to be
Sir

Your most obedient servant

W. H. Barton
Chairman

Harbour Trust Board

P. H.

12

831 W 7 19/3/89
608 W 7 5/3/89
469 W 7 16/2/89

P.W. No. 2947
MARINE DEPARTMENT.

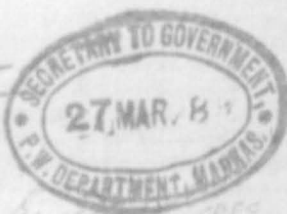
From
THE CHAIRMAN,
HARBOUR TRUST BOARD,
Madras,

To
THE ~~Chief~~ SECRETARY TO GOVERNMENT,
P. W. Marine Department.
Chennai

Dated 25 } March 1889.
Received 27 }

ENCLOSURE. /

No. 1105



Subject.

Forwarding copy of a
statement showing expen-
diture upon the Madras
Harbour Works for the
month of January 1889

PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Under date the 15th 20

Read the following

From the Chairman M. H. J. Bd. No. 1105-1725-3.89

The statement is

forwarded to the
India Office.

H.S. No. 1105 W 27th March

To the Under Secy of State
for India
India Office
London.

Sir,

With reference to
para 2 of the despatch
from this Govt. No. 10
dated 19th March 1889.
I am directed to
forward a statement
showing

Showing the expenditure on
the Madras Harbour Works
at the end of January 1889.

Worth
20.3.59

Proved
28.7.89

Despatch
to
3/4/89

1245W

Tracing Statement
given to the
1889

The 2nd 1/2 page
7/11

8/11/89

Cu
8/11/89
3/4

Harbour Trust Board Office,

MADRAS, 28th May 1889.

No. 1897 1520

FROM

Sir Richard Barton Bart C^{ts}

CHAIRMAN, HARBOUR TRUST BOARD,

MADRAS,

TO

Colonel R. E. Drake Brockman

SECRETARY TO GOVERNMENT,

Public Works Department.

Sir

I have the honor to
forward herewith statement
in duplicate showing expenditure
upon the Madras Harbour
Works for the month of March
1889.

I have the honor to be

Sr

Your most obedient servant

W. Barton

Chairman

Harbour Trust Board

15.

S.O. No 1245 Waf 11.5.89
" " 1062 Waf 18.4.89
" " 940-41 Waf 29.3.89
Despatch No 821 Waf 19.3.89
S.O. No 121 Waf 19.3.89

No 1520 Waf 19.3.89

Recorded.
Recorded.

2. The quarterly report to be submitted with reference to G.O. No 1062 Waf 18.4.89 should be accompanied by a statement of expenditure for the quarter for transmission to the India Office.

3. Separate statement of expenditure for the last month of the quarter need not be submitted in addition for the information of the Secretary of the India Office.

WOM

3.6.89

Amended 6.89

30 The Ch. Secy. to Govt.
" Marine Dept.
Oct 33/6. 2
3/6 - 7/10/16

PWC 8-4876
MARINE DEPARTMENT.

FROM (5)
THE CHAIRMAN,
HARBOUR TRUST BOARD,
MADRAS,

TO
THE CHIEF SECRETARY TO GOVERNMENT,
Marine Department.

DATED 188
RECEIVED 29.5.89
ENCLOSURE 1 (with reply)
No.

SUBJECT.

No 1520 Waf 19.3.89

(16)

with order