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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

Public Works DEPARTMENT

G.O. No. 2922 W
B.P. No:

Press. / Mis.

Dated 7/12/1881 198

P.C.

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2922/1

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

READ—the following letter from F. N. THOROWGOOD, Esq., M. INST., C.E., Superintendent, Madras Harbour Works, to the Secretary to Government, Public Works Department, dated Madras, 3rd December 1885, No. 44 W.:—

I have the honor to report the progress on these works during the past month of November. It will be borne in mind that from the latter part of October until the end of December work in the sea is very uncertain, and all out-door work is liable to sudden stoppage by rain.

2. *North pier rubble base.*—Work was very much interrupted during November by the sea being just too rough for working the boats. From the 13th to the 19th the sea was at times high and broke very heavily through the ruins of the outer portion of the north pier, overturning the beacons which mark the new centre line. During the month we only succeeded in depositing 6,322 tons of rubble base, or nearly 2,000 tons less than in October, but there has not yet been a satisfactory month's work done in November and it is advisable to adopt a cautious policy.

3. *South pier rubble base.*—At the south pier, the state of the sea has put a stop to all work, both of depositing rubble and blasting away submerged block. The diving boats have been hauled up for cleaning and repair.

4. *Block-making.*—The manufacture of concrete blocks for the new section of piers was carried on throughout the month except when stopped by the heavy rain which fell after the 12th November. A total of 171 concrete blocks were made in November, representing about 2,736 tons of concrete. There are now 980 blocks ready for the new section of work, and they will be most thoroughly indurated by the time they are required, which I hope and expect will be next month.

5. The cement used for block-making during November was entirely of English manufacture, the local factory not then having any which met with my approval.

6. *Pallávaram quarries.*—The rain did much damage at the Pallávaram quarry lines, and for four days the traffic up to the end of the quarry had to be stopped. Only 8,968 tons were supplied during November, as compared with 12,553 tons quarried in October.

7. Trains had frequently to be cancelled by telegraphic orders from this office, and the stone traffic was entirely and unavoidably at the mercy of the weather. I should like to record that the traffic department of the South Indian Railway carried out all the many and sudden changes in the running of trains most courteously and satisfactorily.

8. The outturn of stone from the quarries is now increased (weather permitting) from 576 tons to 840 tons a-day. This is owing to the increased power of the locomotive engines now used, which draw a train of 35 wagons instead of 24 wagons. With three more trains running daily, the supply will be sufficient to keep work going at full speed.

9. The police guard (see G.O., No. 2144 W., 14th September 1885, paragraph 8 of report) attached to the quarry under the contractor's arrangement is undoubtedly of great use. Defaulting coolies have been caught and brought back to work by the constables from places as far away as Nellore.

10. *Cranes and plant.*—I reported last month that the north pier Titan was ready for work on 31st October. I have also reported separately (letter, No. 38 W., dated 4th November, and G.O., No. 2643 W., dated 7th November 1885) that on 4th November the Titan was capsized through the rash treatment of Mr. G. Gunther, Foreman Engineer, who had done himself infinite credit by the way in which he had worked at erecting the crane. It was placed back in its proper position and repaired by the 9th November, no serious damage having occurred either to crane or to work-people. The rain and rough sea since delayed my ordering the Titan be advanced out, but on the 30th November it was travelled along its rails for a distance of 400 feet and is now standing on the north breakwater waiting for an opportunity to deposit blocks in the "wave-breaker." It is not my intention to travel it out to the end of the breakwater for setting the blocks in the new pier till January, as the weather is never to be trusted till about the middle of that month.

11. Three days were spent, after the most unfortunate upset of 4th November, in thoroughly testing the stability of this crane, as the upset had caused something like a panic amongst those who were working at the time. These experiments of testing proved most satisfactory as a load of 31 tons was run out 2 feet further than will ever be required, and not the slightest suspicion of tilting up apppeared.

12. I have since had a very close investigation into the accident of 4th November, and I can blame no one but Mr. G. Gunther, to whom I have given in writing a most severe and serious reprimand, reviewing the whole position from beginning to end. In my own opinion this, to a man of great ability and of most excellent character, is punishment enough, especially as it clearly points out that it is only his previous and present character and energy which saves him from more severe treatment.

13. The Titan crane for the south pier is approaching completion. I withdrew all hands from other work to the north Titan from 4th November to 10th, so some delay has occurred in consequence.

14. The wave-breaker crane is progressing slowly. It is a gigantic machine to erect, the two main girders being each 107 feet long, and its weight without any load being 137 tons. I think it will be ready for work by the time it is wanted, which will be when the Titan is setting the blocks in the new section of pier.

15. *Stores.*—No stores from England have been received in November.

ORDER—dated 7th December 1885, No. 2922 W., Public Works.

Recorded.

2. Paragraphs 7 and 8 will be communicated to the Consulting Engineer for Railways.

3. In G.O., No. 2741 W., dated 16th November 1885, the Government expressed their pleasure at the result of the endeavours made to re-establish the Titan crane in its proper position; and they now learn with satisfaction that it has successfully stood the various experimental tests made to determine its stability. It is observed that Mr. Gunther, to whose want of judgment the accident to the crane was solely due, has been severely reprimanded.

(True Extract.)

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

To the Superintendent, Madras Harbour Works.
„ Consulting Engineer for Railways.
„ Marine Department.

Exd. E Fernandez.
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BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of [1885] Madras.

PUBLIC WORKS.

Dated December, 7th.

Read. *Encl.*

G.O., 7th Dec. 1885, No. 2922 W.

DECEMBER.

Madras Harbour Works

Orders on the progress report of the —, for the month of November 1885.

2922/3

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

18th March 1882, No. 716 W.

General. Account.

Read the following paper : —

No. 137. Proceedings of the Government of Madras in the Financial Department, dated 15th March 1882, No. 329 (Mis).

No. 137-A. Proceedings of the Government of India in the Department of Finance and Commerce, (Stores,) dated Calcutta, 2nd March 1882, No. 1280.

Read again the under-mentioned papers regarding the substitution of goods of *bonâ fide* Indian manufacture for European stores :—

Financial Resolution No. 2777, dated 1st September 1881.
" " 806, dated 10th February 1882.

Read also—

Letter No. 2551 P., dated 18th February 1882, from Messrs. Burn & Co., Managing Agents of the Indian Portland Cement Company, Limited.

RESOLUTION.—In the Resolution read above, the Governor-General in Council directed that whenever Portland cement was required for the public service in India, it should be obtained of Indian manufacture. The Managing Agents of the Indian Portland Cement Company, Limited, now say that the Company has determined to erect, at a cost of Rs. 4,50,000, new works to enable them to meet the increasing Government demand. They represent that they "would like to have their hands strengthened by contracts from Local Governments as authorised by the Supreme Government," and they request that the attention of the various Departments and local authorities interested may be called to the establishment of the additional works at Raniganj, "with the view of entering into contracts for a supply of the cement for a period of five years." His Excellency the Governor-General in Council has no objection to making known the information communicated by Messrs. Burn and Co., in order that Local Governments and Administrations or Public Departments may contract for a term of years not exceeding five if they find that they can rely on obtaining cement of good quality and at prices not higher than the market prices ruling at the time of delivery for imported cement of equal quality.

ORDERED, that the foregoing Resolution be communicated to all Local Governments and Administrations and to the Public Works Department for consideration, and to Messrs. Burn & Co. for information.

Also, that it be published in the *Gazette of India* for general information.

(Signed) J. E. O'CONOR,
Asst. Secy. to the Govt. of India.

COPY to the Public Works Department.

2. There are, it is observed, cement works in this Presidency.

(Signed) C. D. MACLEAN,
Under Secretary.

No. 138. ORDER THEREON, 18th March 1882, No. 716 W.

COMMUNICATED to the officers of the Public Works Department, for information, also to the Superintendent of the Harbour Works.

(True Extract.)

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

To the Chief Engineer for Irrigation.
" Consulting Engineer for Railways.
To Superintending Engineers.
To the Consulting Architect to Government.
" General Superintendent, Public Works Workshops.
" Superintendent, Madras Harbour Works.

Exd. S. T. Au[illegible]
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GENERAL.
ACCOUNT.

Govt. of 1882 Madras.

PUBLIC WORKS.

To

THE CHIEF ENGINEER FOR
IRRIGATION,
&c., &c., &c.

Dated March, 18*th*.

Issued

Recd. *Encl.*

G.O., 18*th March* 1882, *No.* 716 *W.*

MARCH.

Nos. 137-138.

Portland Cement of Indian manufacture.—Resolution of the Government of India on the subject of obtaining — from Messrs. Burn & Co., Managing Agents of the Indian Portland Cement Co., Limited, communicated to the officers of the Public Works Department for information, also to the Superintendent, Madras Harbour Works.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

General.
Establishment.

No. 64.

READ—the following letter from Major L. CONWAY-GORDON, R.E., Under Secretary to the Government of India, Public Works Department (Account—General), to the Secretary to the Government of Madras, Public Works Department, dated Simla, 26th April 1882, No. 190 A.G.:—

In continuation of Public Works Department Circular No. 20 of 1880, and with reference to this office docket No. 164 A.G., dated 17th March 1882, I am directed to forward, herewith, copy of a letter* received from the Government of Bengal pointing out the existing agreement with Messrs. Macallister and Company, under which Government is liable to purchase 5,000 barrels of cement annually for five years from the Indian Portland Cement Company.

* No. 1071 E., dated 29th March 1882.

2. I am to invite attention to the agreement alluded to therein and to request that all applications for all Portland Cement needed or likely to be needed from the Indian Portland Cement Company may be made through the Government of Bengal.

ENCLOSURE.

From H. C. LEVINGE, Esq., Secretary to the Government of Bengal, Public Works Department, to the Secretary to the Government of India, Public Works Department, dated 29th March 1882, No. 1071 E.

I am directed to acknowledge the receipt of your endorsement, No. 164 A.G., of the 17th instant, forwarding a Resolution of the Government of India in the Department of Finance and Commerce, with regard to the supply of Portland Cement to Local Governments by the Indian Portland Cement Company.

In the letter No. 4421 I., of the 9th November 1880, from the Joint Secretary to the Government of Bengal, Public Works Department, Irrigation Branch, the agreement with Messrs. Macallister and Company, under which Government was put under an obligation to purchase 5,000 barrels of cement annually for five years from the Indian Portland Cement Company, was fully reported to the Government of India. This agreement is still in force, and 3,311 barrels have been purchased under it from the Indian Portland Cement Company during the year ending 30th September 1881, being 1,689 barrels short of that which Government was bound under the agreement to purchase during the year.

The reports that have been received from Local Governments and Administrations with reference to their probable requirements during the current year indicate that the full quantity of 5,000 barrels will hardly be consumed; and the probability is that the Indian Portland Cement Company will claim compensation for the difference between the actual purchases of Government and the quantity which Government bound itself to purchase during the period the agreement is in force.

Under these circumstances, I am to suggest that Local Governments may be fully informed of the terms of agreement already existing between the Secretary of State and the Indian Portland Cement Company, with a view to preventing their entering into further agreements with that Company under which Government may be bound to purchase further quantities of cement than what they are already liable for under the existing agreement with that Company.

No. 65.

ORDER—dated 10th May 1882, No. 1182 W., Public Works.

Communicated to officers of the Public Works Department and the Superintendent, Madras Harbour Works, for information, in continuation of G.O., No. 716 W., dated 18th March 1882.

(True Extract.)

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

To the Chief Engineer for Irrigation.
" the Consulting Engineer for Railways.
" Superintending Engineers.
" the Consulting Architect to Government.
" the General Superintendent, Public Works Stores.
" the Superintendent, Madras Harbour Works.

Exd. A. F. Goodall.
Spare Copies

2922/6

GENERAL.
ESTABLISHMENT.

Govt. of {1882} Madras.

PUBLIC WORKS.

Dated May, 10th.

Recd. *Encl.*

G.O., 10th May 1882, No. 1182 W.

MAY.

Nos. 64-65.

3577 W

Portland Cement.

Letter from the Government of India relative to the purchase from the Indian Portland Cement Company of —, communicated to the officers of the Public Works Department.

2922
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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

General.
Establishment.

READ—the following letter from H. C. LEVINGE, Esq., Secretary to the Government of Bengal, Public Works Department (Establishments), to the Secretary to the Government of Madras, Public Works Department, dated Calcutta, 1st December 1883, No. 4142 E. :—

With reference to the orders of the Government of India, Public Works Department, marginally noted, I am directed to forward copy of a letter, dated the 21st ultimo, from Messrs. Finlay, Muir and Co., Agents, Indian Portland Cement Company, Limited, reporting that no cement is being manufactured at the works of the Indian Portland Cement Company at present, and to suggest that, until the manufacture of cement is resumed by the Company, arrangements for your supply of that article may be made in the open market.

Circular No. 20 P.W., dated 22nd December 1880.
Letter No. 190 A.G., dated 26th April 1882.

ENCLOSURE.

From Messrs. FINLAY, MUIR AND Co., for Agents, Indian Portland Cement Company, Limited, to the Under Secretary to the Government of Bengal, Public Works Department, dated Calcutta, 21st November 1883.

In reply to your letter, No. 4022 E., of yesterday's date, there is no cement being made at present at the Raneegunge or Sealdah works of the Indian Portland Cement Company, Limited.

ORDER—dated 14th December 1883, No. 3577 W., Public Works.

Communicated to officers of the Public Works Department for information, in continuation of G.O., No. 1182 W., dated 10th May 1882.

(True Extract.)

(Signed) J. SHAW-STEWART, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
„ Consulting Engineer for Railways.
To Superintending Engineers.
To the Consulting Architect to Government.
„ General Superintendent, Public Works Stores.
„ Superintendent, Madras Harbour Works.

Fxd. A. Aubert.
Spare Copies

GENERAL.
ESTABLISHMENT.

Govt. of {1883} Madras

PUBLIC WORKS.

Dated December, 14th.

Recd. *Encl.*

G.O., 14th Dec. 1883, No. 3577 W.

DECEMBER.

Cement

Letter from the Government of Bengal suggesting the purchase of — in the open market until the manufacture of that article is resumed by the Indian Portland Cement Company, communicated to the officers of the Public Works Department.

[For Heads of Departments.]

Circular No. VII P. W.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

GENERAL.

Simla, July 17, 1885.

The Governments of Madras, Bombay, Bengal, North-Western Provinces and Oudh, and the Punjab, in the Public Works Department.
The Chief Commissioners, Central Provinces, British Burma, Assam, and Coorg.
The Resident, Hyderabad.
The Agents to the Governor General for Central India, Rajputana, and Beluchistan.
The Inspector General of Military Works.
The Director General of Railways.
The Director General of Telegraphs in India.

The following is forwarded to the Local Governments, Administrations, and Officers marginally noted, for information and guidance.

By order,

A. B. SAMPSON,
Under Secy. to the Govt. of India.

Extract, paragraphs 2 and 3, of a letter No. 132 M., dated 14th March 1885, from the Secretary to the Government of India, Public Works Department, to the Directors of the New Indian Portland Cement Company.

2. There are two points on which your Company is desirous of obtaining the orders of Government. These may be briefly summarised thus:—

I. That the Government of India should guarantee to purchase a definite quantity of cement within a given time and make an immediate advance of payment to be recovered by instalments.

* * * *

3. With reference to the first of these, I am to say that the Government of India will be prepared to encourage the industry which your Company has inaugurated in India, by instructing its officers to use, as far as possible, the cement made by your Company in all works for which it is proved to be suitable and economical; but that it cannot advance money in anticipation of delivery, nor guarantee any definite consumption.

2922
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P. W. D.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

GENERAL.

No 1886. Dated 14 August 85.

To

Communicated to officers of the P. W. Dept. for information in continuation of G. O. No 3577 W dated 14th December 1883.

(Signed)

No 1886 Dated 14 August 85

6th Supr: for Circle
Surveyor Supr: for Rys.
Asstt: Engineers
C. A. to Govt.
Supt. Harbour Works.

The use of Portland Cement manufactured by the Portland Cement Company.

Govt. C. P. Press, Simla.—No. 239 P.W.D.—19-7-85.—907.

With Ord

2922/9

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

READ—the following letter from F. N. THOROWGOOD, Esq., M. INST. C.E., Superintendent, Madras Harbour Works, to the Secretary to Government, Public Works Department, dated Madras, 3rd September 1885, No. 28 W.:—

I have the honor to submit the following report of the progress on these works during the past month of August.

2. *North pier rubble base.*—During several days in August the ground swell stopped all work in the sea, and the trains of rubble stone for the base of the north pier had to be cancelled. Throughout the whole of the month the work of tipping rubble was much retarded by the broken and confused seas, caused by the blocks in the damaged piers, in close proximity to which the tipping boats have to work. This, however, is a contingency that has always been foreseen in carrying out the reconstruction. On the whole, more work has been done at the new rubble base during August than in July, a total of 7,217 tons of stone having been deposited, making a grand total of 67,937 tons deposited in the north pier since the work of reconstruction commenced.

3. *Recovering old blocks.*—The task of recovering or attempting to recover the old concrete blocks in the fallen walls is one that necessitates a smooth sea; and, although all the gearing is in readiness for the work, hitherto I have been unable to get any satisfactory result. An attempt was made at the north pier on the 31st, but after lying over the spot for some time the diving boats had to be removed, as occasionally a breaking wave rendered the position highly dangerous.

4. The apparatus prepared for this work consists of two very excellent new cargo boats purchased by me at Karikal, each capable of sustaining 20 tons. These are fastened together by four large teakwood beams which lie athwart the boats' gunwales and are secured by heavy iron straps and bolts passing down the outside of the sides to the keel. The boats have a space of 6 feet clear between them, and over this space is fixed a powerful crab winch with treble purchase gear and treble purchase blocks attached to the chain from the crab. The gear for laying hold of a block below water consists of a pair of wrought iron claws weighing 33 cwts., having a grip of 12′ 6″ wide; these are so arranged that they can be made to descend wide open over a block, and having reached the block, a diver frees four small catches, when on heaving up with the winch the block is caught hold of and carried up by the claws. All this works admirably in experiment, but the actual test of raising a block out of the ruins, I have not yet been able to apply.

5. *South pier rubble base.*—Work of tipping rubble at the south pier has been suspended during August, as the length of work set out for the purpose is much encumbered by old blocks from the damaged wall. These have to be blasted to pieces by divers before rubble can be thrown in, and diving work at this particular spot has been most seriously interrupted by the swell which has persistently rushed through the gap in the damaged work, sweeping divers off their legs. For the last few days the swell has abated and divers have been able to work.

6. *Block-making.*—The important work of making blocks went on satisfactorily throughout August up to the 29th, when it had to be stopped for want of room on the block-making platform. The second platform is being prepared as rapidly as possible, and when this is built block-making can be renewed. Of this second platform a length of 332 feet out of a total of 1,140 feet has been completed.

The number of blocks made during August has been 203, making the total of new blocks for the restored works now 688, representing a weight of about 20,000 tons of concrete.

7. *Pallávaram quarries.*—The quarries at Pallávaram have not yet been taxed very severely, and as yet not more than four trains daily have been received. During August, 11,859 tons of stone were sent down to Madras, of which 4,642 tons were used for block-making. The railway lines at the quarry have been extended and considerable blasting operations carried on.

8. The Mussulman contractor Kázim Alí Nakavy Sáhib has succeeded in obtaining for himself what I endeavoured to obtain for him, viz., two police constables to be on duty about the quarry, and a slight extension of magisterial power to the sarishtadar of the district. This is a great help in working the quarry, and tends materially to maintaining punctuality in loading the trains, by making the coolies more afraid to run away, as is their custom after having received an advance of pay.

9. *Titan crane for north pier.*—On the 7th August the S.S. *Harrogate* arrived with the first titan crane. It was originally hoped that this machine would have been ready in March last; but numerous causes have joined to delay its completion, and now it will not be possible to do much work with it before the storm season of the north-east monsoon.

10. This massive machine arrived in 325 different pieces and packages, and weighs 105 tons. The work of erection was commenced on 17th August, and cannot be wholly completed much under two months from that date. Owing to delay in shipping the second crane for depositing the wave-breaker blocks, I have had to build this titan with its overhanging girders pointing to the north, in which position it will advance, and begin work by depositing blocks on the foreshore of the existing north pier. The titan cranes for this work of reconstruction are capable of a greater number of movements than those now lying at the bottom of the sea, which were used for the first work.

11. *Stores received on the works.*—During August, in addition to the *Harrogate* with the titan above mentioned, there arrived the S.S. *Sutlej*, *Nuddea*, *Goorkha*, and *Goa*; these brought 960 tons of Portland cement, 8 sets of points and crossings which are much needed, and 708 sâl-wood sleepers from Gopálpur, besides other stores of various kinds. I was surprised to find a charge made of Rs. 2-8-0 a ton as import duty by the Madras Municipality for the sâl-wood sleepers. These sleepers do not leave the harbour limits and never are brought into the area of jurisdiction of the municipality; so after taking the opinion of the Government Solicitor on the subject of this charge, I am at present withholding payment pending a settlement of the question.

12. I am pleased to report that Mr. A. L. Pogson arrived here 20th August and assumed charge of the post of Assistant Superintendent on the 21st August.

ORDER—dated 14th September 1885, No. 2144 W., Public Works.

Recorded.

(True Extract.)

(Signed) J. SHAW-STEWART, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent, Madras Harbour Works.
" Examiner, Public Works Accounts.
" Marine Department.
" Judicial Department for information, with advertence to paragraph 8.
" Financial (Municipal) Department for information, with advertence to paragraph 11, and with copy of note by the Honorable Member.

Exd. J. Henricus.
Spare Copies

2922/10

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1885} Madras.

PUBLIC WORKS.

Dated September, 14th.

Recd. *Encl.*

G.O., 14th Sept. 1885, No. 2144 W.

SEPTEMBER.

Madras Harbour

Progress report of — for August 1885, recorded.

2922
11

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

READ—the following papers:—

From F. N. THOROWGOOD, Esq., M. INST. C.E., Superintendent, Madras Harbour Works, to the Secretary to Government, Public Works Department, dated Madras, 2nd October 1885, No. 31 W.

I have the honor to submit the following report of the progress on these works during September. As all the constructive work has been below water, I do not forward a plan, as there would be little to show in addition to the coast line at high water on 30th September.

2. *North pier rubble base.*—Work has been going on steadily at the north pier base during September, and there were very few days on which the boats could not work. The line of new foundations is accurately marked out with iron beacons, and the divers have been employed in blowing up those blocks which lie in the line of the work so as to interfere with the superstructure hereafter. There have been 9,192 tons of rubble deposited during the month, being 2,000 tons more than was deposited in August. This portion of the work is now in a forward state, and bids fair to be executed at lower rates than shown in the estimate.

3. *Recovering old blocks.*—On the 7th and 14th September the sea was as smooth as it ever is at Madras, and a fine opportunity was offered for trying the floating craft for raising blocks. On each occasion the best and most experienced diving staff and boat lascars endeavoured without ceasing for half a day to attach the claws to a block lying apart at the bottom of the sea, but the movement of the boats even on a smooth day was such that it was absolutely impossible to manage these claws in a depth of $3\frac{1}{2}$ fathoms, and I finally put a stop to the attempts as the experiment really was unsafe for a diver in the thick water. The attempt on the 14th was more nearly successful than on the 7th, but it was nevertheless a failure. I have reported these results to Mr. Parkes, who is very anxious that old blocks should be recovered; and, in the meantime, have given up this section of the work as, in my opinion, hopeless with the plant at command—an opinion which I am bound to say I have been inclined to from the first. Mr. Parkes may have some suggestion to make which will justify a renewed attempt. If, however, he should be satisfied that it is not worth while to proceed further in the matter, there will have been but little money lost on the experiments, as the boats, crab, chains and timber-work will all be available in other directions.

4. *South pier rubble base.*—At the south pier the sea has interfered very much with all work, the site of operations being still opposite to the first large gap in the damaged wall, referred to in paragraph 5 of my last report. It is to be feared that [illegible]ing as the swell comes from the south of east there will always be trouble at this point both in diving operations and working at the superstructure. At this spot the fallen blocks lie very thick and in much confusion, so that it is delicate work inserting the cartridges for blasting. During September 17 blocks were blown to pieces, giving an equivalent to 460 tons of rubble deposited, in addition to which 2,005 tons of granite from Pallávaram were thrown in from boats. This work is now proceeding satisfactorily on the whole.

5. For the blasting of blocks at the south pier, I have tried a few charges of "blasting gelatine," which is about 50 per cent. more powerful than dynamite, and possesses the additional advantage of being water-proof, a quality of great value in sea-work. The dynamite, however, I find is the more satisfactory material for the particular work in question, as the gelatine seems to be too quick in its explosion, cutting

a block of 432 cubic feet clean in two pieces, whereas dynamite shakes the block throughout.

6. *Block-making.*—The work of making concrete blocks has been suspended during September owing to want of room in the block platforms. It will be resumed during the current month, the second platform having been completed in September, and the old blocks being stacked away.

For the commencement of the new work in the north and south piers old blocks are being altered by manual labor to suit the new design. A total number of 231 blocks have thus been modified, of which 38 were done in September.

7. *Pallávaram quarries.*—At Pallávaram for three days the quarry line was completely blocked up owing to very sudden and heavy rains, which caused a land-slip on the side of the hill. The contractor met the difficulty very well, and the result was only the cancelling of three trains on one day. During the month 13,264 tons of stone were delivered at Madras, being 1,400 tons more than was delivered in August.

8. *Titan cranes and plant.*—The titan crane for the north pier is now approaching completion. The top frame, consisting of four heavy girders and an end piece, being now rivetted together was raised to its full height of 15 feet on the 26th September. The operation of raising this frame was necessarily slow, as it had to be done entirely with hydraulic and screw-jacks. On the 30th the packing or scaffolding was removed and the machine brought to rest on its own wheels. The engine and boiler, the crab and balancing tank have yet to be erected, which I think will be done during this month. All pressure has been put on this work by working overtime every day to bring it to completion as soon as possible. I regret to state that 950 important bolts and nuts appear to have been omitted from the shipment of this machine, and I fear they will have to be made on the works. I have telegraphed to Mr. Parkes to know if it is any good waiting for them. The titan crane for the south pier is being landed and placed in position for erection at the root of the pier. The foundation "compressors" (referred to in paragraph 17 of Mr. Parkes' report—G.O., No. 3127 W., of 19th December 1884) have arrived in pieces and are being put together.

9. *Stores received on works.*—During September there arrived from England the following vessels:—

	Cargo.
S.S. Cormorant	900 tons cement.
„ Rewa	40 „ „
„ Clan Mackenzie	Plates and rivets for titan roads.
„ Lamington	South pier titan.
„ Almora	Foundation compressors.

Also from Gopálpur there arrived the steamers *Secundra* and *Sirdhana* with sálwood sleepers and pieces for block-making.

10. *Expenditure.*—Until the new estimate receives sanction it is hardly possible to give an intelligible statement of expenditure, for at present all outlay has to be charged to the obsolete and unsuitable heads of the estimate for the original work. But I have extracted some of the rates at which the work is now being carried on, and they compare favorably with the estimate as here shown:—

		Estimate.			Actual.		
		RS.	A.	P.	RS.	A.	P.
Concrete blocks	per c. yard ...	9	0	0	7	12	8
Rubble deposit from breakwater ..	per ton ...	1	8	0	1	5	0
Do. from boats, north pier	„ ..	2	0	0	1	10	9
Do. do. south pier	„ ..	2	0	0	1	8	7

It is possible that these rates may be increased by delays in the work, but they are taken from the total cost of a considerable amount of work and may be considered satisfactory so far as they go.

11. *The public and the breakwaters.*—On the 24th September a lad was washed off the south breakwater and drowned. There are plain notices in English and Tamil at the commencement of each breakwater warning the public against walking on the piers as the seas are treacherous. At the inquest on the body of the lad the Coroner's jury remarked that the notices "were useless to illiterate persons," which is no doubt true; and the jury recommended that a watchman should stand at each pier to

"warn the public of the danger." This could hardly be carried out, and have therefore taken measures to exclude the public as much as is possible, and thus prevent a recurrence of such accidents. On works like these in England the public are always jealously excluded, but my attempt to do so here in 1879 was greatly resented. Now, however, that a Coroner's jury have considered the present system insufficient I trust that Government will lend its approval to the closing of the piers to the public with reasonable exceptions.

From F. N. THOROWGOOD, Esq., M. INST. C.E., Superintendent, Madras Harbour Works, to the Secretary to Government, Public Works Department, dated Madras, 14th October 1885, No. 35 W.

In reply to your memorandum of the 12th October, No. 1623 C., regarding the public and the harbour piers, I regret to state that I have no correspondence on this subject. I will relate what occurred.

2. In 1878-79 the public used to come on to the works in progress very freely, and in my opinion to their imminent risk, as well as to the serious inconvenience of those working at the pier ends. I then resolved to do, as is nearly always done on similar work, viz., erect a barrier with a notice prohibiting the public from passing. At the same time watchmen were posted at the barrier with written instructions signed by myself, explaining that it was necessary to keep the public back.

3. This move was followed by people *insisting* on passing the barrier, defying the watchmen, and by repeated letters * addressed to me complaining that, as the works were "public works," the public ought to be admitted. So far did this resentment go that some individuals had to be forcibly removed from the south pier, because they persisted in crowding round the men engaged in setting blocks.

* The letters are not preserved.

One man came to me in a perfect frenzy of rage because he was not allowed to see the works, "public works" as he reminded me that they were.

4. The Harbour Works have always been subject to the criticism of almost every cooly who has seen them, and no doubt the closing of the breakwaters was supposed to arise from a wish to keep something from meeting the public eye.

5. It became so extremely unpleasant at last to have these little battles with the public, and to receive resentful letters from natives who could hardly write, that I relaxed the watch on the piers, and put up notices in Tamil and English warning people of the danger. Since then two natives have been drowned, and at the inquest on the last case the jury recommended that a watchman should be stationed to warn illiterate persons of the danger verbally. This is a refinement that I do not feel disposed to carry out, for it is hardly to be expected that a watchman could explain to every cooly-child the danger of walking on the breakwater. I think it will be better once more to close the piers, allowing discretion to the watchman as to who shall pass, and thus try to prevent the public from being washed off.

ORDER—dated 2nd November 1885, No. 2547 W., Public Works.

The Harbour Works appear to have made satisfactory progress during September.

2. With advertence to the concluding paragraph of his letter, dated 2nd October 1885, the Superintendent will state the portion of the length of each breakwater which he considers it necessary to close, in view to the safety of the public.

(True Extract.)

(Signed) J. SHAW-STEWART, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent, Madras Harbour Works.

a Marine Department

Exd. J. Henricus.

Spare Copies

2922/12

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1885} Madras.

PUBLIC WORKS.

Dated November, 2nd.

Recd. *Encl.*

G.O., 2nd Nov. 1885, No. 2547 W.

NOVEMBER.

Madras Harbour Works

Orders on the progress report of the — for the month of September 1885.

6TH NOVEMBER 1885; No. 2636 W., PUBLIC WORKS.

2922/13

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

READ—the following letter from F. N. THOROWGOOD, Esq., M. INST. C.E., Superintendent, Madras Harbour Works, to the Secretary to Government, Public Works Department, dated Madras, 3rd November 1885, No. 37 W.:—

I have the honor to submit the following brief report of the progress on these works during October.

2. *North pier rubble Base.*—The weather has not been very favorable for working at the north pier base, and the boats latterly were turned over to the south pier. There were 8,224 tons of rubble deposited during October, or about 900 tons less than in September. This branch of the work is now well forward, nearly 750 feet of foundation being ready to receive the superstructure blocks. Levels and soundings are taken over the base as opportunity offers.

3. *South pier rubble base.*—During the latter part of October the boats for tipping base worked at the south pier. The divers also worked well at blowing up the fallen blocks in line of the new foundation, fifty-five blocks having been demolished by dynamite in the month. This gives a total of 3,947 tons of rubble deposited in October, of which 1,485 tons are due to broken pieces of concrete blocks. Since the 29th October all work at sea was stopped by bad weather.

4. *Blockmaking.*—The making of blocks was resumed on 15th October and carried on as usual till stopped by the rain. There were 121 blocks made during October, giving a total of 809 blocks now ready for the new section besides 255 old blocks altered to suit the new work and now available for use.

5. *Pallávaram quarries.*—Work has been carried on satisfactorily at the quarries, and the railway lines have been much improved by cutting back the slope so as to let the rain run off more gently. During October 12,553 tons of stone were quarried, of which 1,578 tons were used for blockmaking and the rest for the rubble work of the breakwaters. This branch of the work cannot be brought into full play until block setting commences.

6. *Titan cranes and plant.*—The north pier Titan was completed on the 31st October, and is now ready for steam. A permanent road has meanwhile been built on the breakwater on which the Titan will travel out to its work. The whole machine has been built without any serious hitch, and appears to me to be highly satisfactory. It is my intention to deposit "wave-breaker" blocks with it as soon as I have tested its stability, but it will always be withdrawn from the breakwater before night until the storm season has passed away.

7. The south pier Titan is progressing rapidly and will soon be ready for raising to its full height. Much confusion has occurred in the erection of this machine owing to mistakes in numbering the packages before shipment; many packages have duplicate numbers, and from others all traces of a number have been obliterated. I have reported this to Mr. Parkes in England. The immense "wave-breaker" crane has arrived during the past month, and is being landed slowly. This machine will, in the first instance, be erected at the north pier, and when its work there is done, it will be transferred to the south.

8. *Stores received.*—There arrived during October the following vessels with stores for the works :—

S.S. "Avocet" with 560 casks Portland cement.
S.S. "Pelican" with wave-breaker crane.
S.S. "Buteshire" with drilling machine, slotting machine, and turning lathe.

Also the steamers "Nevasa" "Chanda," "Arcot," and "Goa" with sâl wood sleepers and pieces.

9. *Madras cement.*—The local cement factory did not supply any cement in October, as I was anxious to make many tests from the sample offered before accepting it. The testing is still going on.

ORDER—dated 6th November 1885, No. 2636 W., Public Works.

Recorded.

2. The report is satisfactory.

(True Extract.)

(Signed) J. SHAW-STEWART, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent, Madras Harbour Works.
" Marine Department.

Exd. E. Fernandez.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1885} Madras.

PUBLIC WORKS.

Dated November, 6th,

Recd. *Encl.*

G.O., 6th Nov. 1885, No. 2636 W.

NOVEMBER.

Madras Harbour Works

Progress report of — for October 1885, recorded.

P. W. DEPARTMENT.

2922/15

No. 1862 C. dated 17th. November 1884.

MEMORANDUM.

Copy of the following communication from Messrs. Arbuthnot & Co. Madras is circulated to officers of the Public Works Department for information :-

" We recently directed our Manager at the Cement works "to supply cement in any quantities to Public Works Department at "a uniform rate of Rs 40 per ton. We have been in the habit "of charging a higher rate for quantities less than 10 tons, "which does not seem quite fair considering that practically "all the orders come out of one Department. We have therefore "decided to allow the reduced rate to all D.P.W. orders"

(By Order)
C. Bowen Major.R.E.
Dy Chief Engineer P. W. D.

To

The Suptg. Engineers.
Supt. M. H. Works.
Cong. Archt. to Govt.

No. 44 W.

From

The SUPERINTENDENT,

MADRAS HARBOUR WORKS,

To The Hon^ble Colonel J. H. M. Shaw Stewart, R.E.
Secretary to Government
Public Works Department

Madras, 3rd December 188

Sir,

I have the honour to report the progress in these works during the past month of November. It will be borne in mind that from the latter part of October to the end of December work in the sea is very uncertain, and all out-door work is liable to sudden stoppage by gales.

North Pier Rubble Base.

2. Work was very much interrupted during November by the sea being just too rough for working the boats. From the 13th to the 19th the sea was at times high and broke very heavily through the gaps of the outer portion of the North Pier, overturning the beacons which mark the new outer line. During the month we only succeeded in depositing 6322 tons of rubble base, or nearly 2000 tons less than in October, but there has not yet been a satisfactory month's work done in November and it is advisable to adopt a cautious policy.

South Pier Rubble Base.

3. At the South Pier the state of the sea has put a stop to all work, both of depositing rubble and blasting away submerged rocks. The diving boats have been hauled up for cleaning and repairs.

Block making

4. The manufacture of concrete blocks for the

new section of piers was carried on throughout the month except when stopped by the heavy rains which fell after the 12th September. A total of 171 concrete blocks were made in November representing about 2436 tons of concrete. There are now 980 blocks ready for the new section of work and they will be most thoroughly seasoned by the time they are required, which I hope and expect will be next month.

5. The cement used for block making during November was entirely of English manufacture, the local factory not then having any which met with my approval.

6. The rains did much damage at the Pallaveram quarry lines, and for four days the traffic up to the end of the quarry had to be stopped. Only 8968 tons were supplied during November, as compared with 12,553 tons quarried in October. Pallaveram Quarries.

7. Trains had frequently to be cancelled by telegraphic orders from this office, and the stone traffic was entirely and unavoidably at the mercy of the weather. I should like to record that the Traffic Department of the South Indian Railway carried out all the many and sudden changes in the running of trains most courteously and satisfactorily.

8. The output of stone from the quarries is now increased (weather permitting) from 576 tons to 840 tons a day. This is owing to the increased power of the locomotive engines now used, which draw a train of 35 wagons instead of 24 wagons. With two more trains running daily the supply will be sufficient to keep work going at full pace.

9. The police guard (vide G.O. 2105 W September 11th 1886. para 8 of report) attached to the quarry under the Contractor's arrangement is undoubtedly of great use. Defaulting coolies have been caught and brought back to work by the constables from places as far away as Nellore.

Cranes and Plant

10. I reported last month that the 40 ton Titan was ready for work on October 31st. I have also reported separately (letter No. 38 W dated 4th November and G.O. No. 2643 W dated 17th November 1886) that on November 4th the Titan was capsized through the rash treatment of Mr. G. Gunther, Foreman Engineer, who has done himself infinite credit by the way in which he had worked at erecting the crane. It was placed back in its proper position and repaired by the 9th November, no serious damage having occurred either to Crane or to work people. The rain and rough sea since delayed my ordering the Titan be advanced out, but on the 30th November it was travelled along its rails for a distance of 400 feet and is now standing on the North breakwater waiting for an opportunity to deposit blocks in the "Wave breaker". It is not my intention to travel it out to the end of the breakwater for placing the blocks in the new pier till January, as the weather is never to be trusted till about the middle of that month. —

11. Three days were spent, after the most unfortunate upset of November 4th, in thoroughly testing the stability of this crane, as the upset had caused something like a panic amongst those who were putting up the jibs. The subsequents of testing proved most satisfactory as a load of 51 tons was run out 2 feet further than will ever be required, and not the slightest suspicion of settling up appeared.

12. I have since had a very close investigation into the upset of November 4th, and I can blame no one but Mr. G. Gunther, to whom I have given in writing a most severe and serious reprimand, reviewing the whole position from beginning to end. In my own opinion this, to a man of great ability and of most excellent character is punishment enough, especially as it clearly points out that it is only his previous and present character and energy which saves him from more severe treatment.

13. The Titan Crane for the South Pier is approaching completion, I withdrew all hands from other work to the North Titan from November 4th to 10th, so some delay has occurred in consequence.

14. The Wave breaker Crane is progressing slowly. It is a gigantic machine to erect, the two main girders being each 107 feet long, and it might without any load bring 137 tons. I think it will be ready for work by the time it is needed but I do not like to be when the Titan is setting the blocks in the new portion of pier.

Stores. 15. No stores from England have been received in November.-

I have the honour to be,
Sir,
Your most obedient Servant
F. W. Harrowood. M. Inst. C.E.
Superintendent

B42L
19

Rec^d 10.12.85

Buildings & Roads

From

The Superintendent
Madras Harbour Works.

No 444 W
Dated 3rd December 1885.

No of Enclosures Nil

Progress Report

Submits ____ for November 1885

B^t & C. Works

PUBLIC WORKS DEPARTMENT.

W^n 2922 W

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 7th Dec^r 85.

READ the following

From

The Supt^t Madras Harbour Works.

(H Letr No: 444 W dated 3rd Dec^r 1885)

Recorded.

2. Canal yard & will be communicated to the Consulting Engineer for Railways.

3. In G^t No: 2741 W dated 16th November 1885, the Government expressed their pleasure at the result of the endeavours made to re-establish the Titan Crane in its proper position; and they now learn with satisfaction ~~& satisfactory to~~ learn that it had

successfully placed the various experimental tests made to determine its stability. The Court fully recognizes the fact that the severe reprimand administered by the Superintendent to the Foreman Engineer is sufficient.

Lieut
7/12/85

It is observed that W. Gunther, to whose ~~injury~~ want of judgment the accident to the crane was solely due, has been severely reprimanded.

WL
7-12-85

Supt't M't Wells
Chief Engr.
Marine Dep't.

WW/W

10463

Govt. of Madras.

PUBLIC WORKS.

9/12/85.

Dated

Read. Encl.

G.O., 7 Dec 1885, No. 2922

Madras Harbour Works

Orders on the pro-
gress report of the —
for the month of
November 85.

65/6

Rd 9/12