

(1) Number of pages _____

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(3) Initials of the Referencer _____

MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No.	3088	Press
B.P. No.		Mis.
Dated	20 - 11 -	1876 195 -

Not to be folded or roughly handled

Read the following letters :—

No. 313. From F. N. THOROWGOOD, Esq., Superintendent, Madras Harbour Works, to Major-General G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Madras, 31st October 1876, No. 82 W.

I HAVE the honor to report the following amount of progress on these works since September 30th, the date of my last report.

2. *North Surf Bank.*—I continued tipping laterite at the end of the north surf bank until the 6th October, at which date the edge of the bank was 1,098 feet from the point marked A on plan. On the 30th September the distance from the same point was 1,048 feet, which shows that a length of 50 feet had been added in five days, giving 10 feet per diem for the rate of advance. This is accounted for by the fact that on those five days the weather was smooth, and there was no spreading out from action of the surf.

3. The total quantity of laterite tipped into the north surf bank is 98,932 tons, and the amount tipped during October is 2,412 tons. In addition to this amount 502 tons have been tipped out of boats in advance of the bank, to form a base for the concrete blocks.

4. On the 6th October I ceased to tip laterite, and took up the rails, and at the same time commenced to cut down the surf bank to its proper level for the Titan crane to work upon, as mentioned in paragraph 12 of my last report. The top of the bank was lowered 3 feet at the end, and was cut away at an incline up to the point where the Titan road comes in.

5. On the 7th October a heavy sea got up and at 6 A.M. had cut away more than 50 feet of the surf bank, spreading the laterite out on each side as usual.

6. On the 13th the Titan crane was safely moved across the road and travelled along to the surf bank, where it commenced to load up on wagons the blocks that were built as a protective measure for the north side of the groyne. This was a work that took much time owing to the want of proper sling, chains, &c. On the 22nd October eight of these blocks had been deposited over the end of the bank, and as each block had previously been split into two or three pieces, there were about twenty good sized blocks deposited at the end to form a protection. The Titan has since been travelled back again to pick up the remaining eight blocks which could not at first be reached.

7. On the 28th, 29th, 30th and 31st October, a very heavy sea was raging, and this has attacked the end of the surf bank severely, so that at the present date the top edge of the bank is only a few feet further forward than on the 31st August; but there is this difference between the bank now and at that time: at the end of August there was simply the exposed end of the laterite bank which had not been properly flattened by the waves, and at present there is a long washed slope and foreshore made of the laterite

that has been carried from the end, and in the midst of this, viz., at the foot of the slope, there are the large blocks which have been dropped over. These form a capital break-water to destroy the force of the wave before it reaches the top of the bank.

The next step to be taken is to set some of the regular concrete blocks in such a way as to allow the Titan to advance preparatory to setting the actual abutment of the pier.

8. *Concrete Blocks.*—The making of concrete blocks has been carried on as quickly as circumstances will allow, but I think that the number made per diem may be doubled by employing another gang of workers as soon as the block ground and cranes will admit of such an arrangement. The total number of blocks made to this date is 121, and the number made during this month is fifty-two. They are made of the same materials and in the same proportion as before.

9. *Engine-house and Machinery.*—The brickwork of the engine-house and concrete mixing station is now finished. The engine-house chimney is complete, the scaffolding removed, and the lightning conductor is fitted up. The boilers are fitted up with safety valves, pumps, &c., but the flues are not yet finished. A delay was caused here by want of fire-bricks, which have since been obtained.

The engines are completed and ready for steam, and the roof of the engine-house is being erected. The frames for three elevators for raising the materials for making concrete are erected, and the masonry of the stone-crushing machinery is about half finished.

All the concrete mixers are fixed in position, and the shafting for driving them is nearly finished.

10. *Concrete Block Platform.*—The concrete blocks platform on the north side of the yard was completed at its west end last month (*vide* paragraph 10 of my last report), but a piece still remained to be done at the east end which could not be touched till the Titan was moved to the surf bank. This piece, 150 feet in length, is now nearly finished.

11. *Titan and Cranes.*—The Titan is at work on the surf bank as I have already stated.

Another light traveller for making concrete blocks has been commenced, and is about half finished. An alteration is being made in the framing of the steam traveller, to enable it to lift the concrete blocks on to their trucks more easily.

12. *Ambatoor Quarries.*—I visited these quarries in company with Mr. Parkes, the Chief Engineer, on 25th October, and we examined the present state of the quarries with a view to seeing what arrangement would be best for letting the work to a regular contractor. We came to the conclusion that it would be advisable to let the present quarryman work out the ground he has already attached, and to let the untouched portion of the quarry be tendered for as a separate contract.

On this subject I am still in communication with the Committee formed in compliance with G.O., No. 2,261, dated 25th August 1876.

At the present time I am not requiring much laterite, being only in want of occasional supplies.

13. *Other sources of Stone-supply.*—The other sources of supply are the same as reported last month. I have prepared to advertise for stone from Chinnamapett

immediately, but at present the small supplies from Palaveram are sufficient for block-making. The stone from Chinnamapett that is already on the ground is used, however, for the blocks to form the item known as "quarry lumps."

14. *Contracts.*—The contract referred to in my last report for converting a godown into a store-office has been satisfactorily carried out, and I have given the same contractor the masonry work of the stone crushers to carry out. This man does his work very well, and generally cheaper than others who have sent in tenders.

15. *Cement and Stores.*—Two vessels have arrived at Madras with stores for the Harbour Works, viz., the *Kingdom of Italy* and the P. and O. Steamer *Teheran*. The *Kingdom of Italy* brought 1,378 casks of Portland cement, which are being delivered in fair order. The *Teheran* brought various small stores, such as canvas, sheet-brass, guage-glasses for engines, &c., &c.

16. *General Morgan's Cement.*—I have made out a list of experiments on General Morgan's cement, which I send herewith. Since Mr. Parkes' arrival I have discussed with him the matter of framing a specification for the supply of this cement, and he agrees with me that something quite different from the ordinary specification for supply of English cement is required.

I will submit a form of specification or advertisement for tenders for the approval of Government as soon as possible.

I sent away a bag of the cement to Mr. Dejoux on 26th October, as directed by G.O., No. 2,486, dated 18th September 1876.

17. *Office Staff.*—The office staff remains the same as reported for last month. I shall be glad to have instructions as to whether, in the present time of scarcity of food, it is the intention of Government to increase the rate of pay of the office peons receiving Rupees 7 per mensem. I have taken no steps as yet in the matter either in the office or on the works, but the men are beginning to complain.

18. *Marine Survey.*—The marine survey has been finished for a considerable distance north and south of the proposed harbour, but it is desirable that it should be extended at some future time for a further distance north and south. This was originally intended, but the weather would not admit of its being done this year. Lieutenant Jarrad and Mr. Falle left Madras on the 25th instant.

The soundings taken by the Marine Surveyors show that the increase of depth seaward is gradual and regular, and that the 7-fathom line agrees well with what was taken as such on Mr. Parkes' original plan for the Harbour.

19. *Sand accumulation and Beach.*—The action of the sea on the beach during the north-east winds has been very marked. The accumulation to the south of the surf bank has been cut away considerably, the greatest distance cut in being about 150 feet. The beach to the north of the Harbour has been severely attached, and the roots of some of the groynes have been surrounded by the surf. I have supplied the District Engineer with laterite to make up the defects, but if a large quantity is required it will have to be procured from Ambatoor specially for this purpose, as the usual supply for the Harbour Works is suspended.

20. I have mentioned Mr. Parkes' name several times in this report. I should have stated that he arrived here on the 22nd October.

Public Works Dept.

Read the following:-

Progress Report of the Madras Harbour
Works for the month of October 1876.

For Orders

Commander Major General R. S.
Secretary to Government.

7901

Experiment on Cement
mixed with sand in different proportions.

No. of experiments	Maker's Name	Proportion of sand in brick	Age	Wet or dry	Breaking weight lbs	Remarks
1	Gillingham Co	3 sand 3 stone 1 cement	2 months	Dry	1217	Broke in centre
	Wouldham Co	do.	do.	do.	1060	Broke in centre
	Genl. Morgan	do	do.	do.	1077	Broke in centre
2.	Gillingham	do	7 days	Dry	584	Broke in centre
	Wouldham	do	do	Dry	574	"
	Genl. Morgan's	do	do	Dry	342	"
	do	do	do	Wet	203	Broke into 3 pieces
3	Gillingham	do	7 days	Wet	454	Broke in centre
	Genl. Morgan's	do	do	Wet	313	"
	do	"	"	Dry	298	"
4	Wouldham	3 sand 1 cement	7 days	Wet	685	Broke in centre
	Wouldham	do	"	Wet	715	"
	Wouldham	do	"	Wet	450	A bad specimen
	Genl. Morgan	do	"	Wet	448	"
	do	do	"	"	392	"
5	do	do	"	"	357	Broke in three pieces
						A

See Mr. M. R. C. 11

7901

A small concrete block made of 6 parts of sand and gravel to one of cement was suspended in the sea after having been left for 9 days to set. It was taken out of the sea at the end of eleven days (making 20 days for its whole age) and was still soft and easily broken, but after remaining in the air for another fortnight it became properly hardened.

J. H. Pierouford,
Superintendent,
Madras Harbour Works.

No. 82 W.

From

THE SUPERINTENDENT,
MADRAS HARBOUR WORKS.

To

Major General G. W. Walker, R.E.,
Secretary to Government,
Public Works Department,
Fort St. George, MADRAS, October 31st 1876.

Sir,

I have the honour to report the following amount of progress on these works since September 30th the date of my last report.

North Surf Bank.

I continued tipping laterite at the end of the North Surf Bank until the 6th October, at which date the edge of the bank was 1098 feet from the point marked A on plan. On the 30th September the distance from the same point was 1048 feet, which shows that a length of 50 feet had been added in five days, giving 10 feet per diem for the rate of advance. This is accounted for by the fact that on those five days the weather was smooth and there was no spreading out from action of the surf.

The total quantity of laterite tipped into the North Surf bank is 98982 tons and

The amount tipped during October is 2,412 tons. In addition to this amount 502 tons have been tipped out of boats in advance of the bank to form a base for the concrete blocks.

On the 6th October I went to tip laterite and took up the rails - and at the same time commenced to cut down the surf bank to its proper level for the Titan crane to work upon, as mentioned in paragraph 12 of my last report. The top of the bank was lowered 3 feet at the end, and was cut away at an incline up to the point where the Titan road comes in.

On the 7th October a heavy sea got up and at 6.0 am. had cut away more than 50 feet of the surf bank spreading the laterite out on each side as usual.

On the 13th the Titan Crane was safely moved across the road and travelled along to the surf bank, where it commenced to load up on wagons the blocks that were built as a protective measure for the North side of the groyne. This was a work that took much time owing to the want of

proper sling, chains &c. On the 22nd October eight of these blocks had been deposited over the end of the bank, and as each block had previously been split into two or three pieces, there were about 20 good sized blocks deposited at the end to form a protection. The Titan has since been travelled back again to pick up the remaining 8 blocks which could not at first be reached.

On the 28th, 29th, 30th & 31st October, a very heavy sea was raging, and this has attacked the end of the surf bank severely, so that at the present date the top edge of the bank is only a few feet further forward than on the 3rd August - but there is this difference between the bank now and at that time. At the end of August there was simply the exposed end of the laterite bank which had not been properly flattened by the waves, and at present there is a long washed slope and foreshore made of the laterite that has been carried from the end, and in the midst of this, namely at the foot of the slope, there are the large blocks which have been dropped over. These form a capital breakwater

to destroy the force of the wave before it reaches the top of the bank.

The next step to be taken is to set some of the regular concrete blocks in such a way as to allow the Titan to advance preparatory to setting the actual abutment of the Pier.

The making of concrete blocks has been carried on as quickly as circumstances will allow, but I think that the number made per diem may be doubled by employing another gang of workers, as soon as the block ground and cranes will admit of such an arrangement. The total number of blocks made to this date is 121 and the number made during this month is 52. They are made of the same materials and in the same proportion as before.

The brickwork of the Engine house and Concrete mixing Station is now finished. The Engine house Chimney is complete, the scaffolding removed and the lightning conductor is fitted up. The boilers are fitted up with safety valves

Concrete Blocks

Engine House & Machinery

pumps

153
pumps &c but the flues are not yet finished. A delay was caused here by want of fire bricks, which have since been obtained.

The Engines are completed and ready for steam, and the roof of the Engine house is being erected. The frames for three Elevators for raising the materials for making Concrete are erected and the masonry of the stone crushing machinery is about half finished.

All the Concrete mixers are fixed in position and the shafting for driving them is nearly finished.

Concrete Block Platform

The concrete block platform on the North side of the yard was completed at its west end last month (vide para 10 of my last report) but a piece still remained to be done at the East end which could not be touched till the Titan was moved to the Surf bank. This piece 150 feet in length, is now nearly finished.

Titan & Cranes

The Titan is at work on the Surf bank as I have already stated.

Another light traveller for making Concrete

Concrete blocks has been commenced, and is about half finished. An alteration is being made in the framing of the Steam Traveller to enable it to lift the concrete blocks on to their trucks more easily.

I visited these quarries in company with Mr. Parker, the Chief Engineer, on October 25th, and we examined the present state of the quarries with a view to seeing what arrangement would be best for letting the work to a regular contractor. We came to the conclusion that it would be advisable to let the present quarryman work out the ground he has already attached, and to let the untouched portion of the quarry be tendered for as a separate contract.

On this subject I am still in communication with the Committee formed in compliance with G.O. 12261, dated August 25, 1896.

At the present time I am not requiring much materials, being only in want of occasional supplies.

The other sources of supply are the same as reported last month. I have prepared to advertise for stone from Chinnampett.

Ambarat Quarries

The present quarryman has some 30,000 sq. yds. of ground attached to his contract. The untouched portion of the quarry is about 100,000 sq. yds. and is to be tendered for as a separate contract.

Other sources of stone supply

immediately, but at present the small supplies from Palavram are sufficient for block making. The stone from Chinnampett that is already on the ground is used, however, for the blocks to form the item known as "quarry lumps."

Contracts.

The contract referred to in my last report for converting a godown into a store office has been satisfactorily carried out - and I have given the same contractor the masonry work of the stone crushers to carry out. This man does his work very well, and generally cheaper than others who have sent in tenders.

Cement & Stores

Two vessels have arrived at Madras with stores for the Harbour Works, viz, the "Kingdom of Italy" and the P. & O. Steamer "Teheran". The "Kingdom of Italy" brought 1378 Casks of Portland Cement, which are being delivered in fair order. The "Teheran" brought various small stores, such as carrap, sheet brass, gauge glasses for engines &c. &c.

General Morgan's Cement

I have made out a list of experiments on General Morgan's Cement, which I send herewith. Since Mr. Parker's arrival I have

discussed with him the matter of framing a specification for the supply of this cement, and he agrees with me that something quite different from the ordinary specifications for supply of English cement is required.

I will submit a form of specification or advertisement for tenders for the approval of Government as soon as possible.

I sent away a bag of the cement to Mr. Dejoura on October 26, as directed by G.O. No 2186 dated 18th September 1896.

The Office Staff remains the same as reported for last month. I shall be glad to have instructions as to whether in the present time of scarcity of food it is the intention of Government to increase the rate of pay of the Office peons receiving Rs 7 per mensem. I have taken no steps as yet in the matter either in the Office or on the works, but the men are beginning to complain.

The Marine Survey has been finished for a considerable distance North and South of the proposed harbour, but it is desirable that it should be extended at some future time for a further distance North & South.

I have myself on Mr. Dejoura's recommendation for the purpose of the specification.

Office Staff

Marine Survey

This was originally intended, but the weather would not admit of its being done this year. Lieutenant Jarrad and Mr. Falle left Madras on the 25th instant.

The soundings taken by the Marine Surveyors show that the increase of depth seaward is gradual and regular and that the seven fathom line agrees well with what was taken as such on Mr. Parkes' original plan for the Harbour.

Sand accumulation and Beach

The action of the sea on the beach during the North East winds has been very marked.

The accumulation to the South of the Surf Bank has been cut away considerably, the greatest distance cut in being about 150 feet. The beach to the North of the Harbour has been severely attacked, and the roots of some of the groynes have been surrounded by the surf. I have supplied the District Engineer with laterite to make up the defects, but if a large quantity is required it will have to be procured from Ambatoor specially for this purpose, as the usual supply for the Harbour works is suspended.

Mr. Parkes has recommended for the purpose of the specification.

I

I have mentioned Mr. Parkes' name
several times in this report. I should
have stated that he arrived here on the
22^d October. -

I have the honour to be,

Sir,

Your most obedient servant,

F. N. Huxford.

Superintendent.

Madras Harbour Works

27-4-76 no 1056.
 " 12-5-76 - 1197
 " 15-6-76 - 1492
 " 18-7-76 - 1802
 " 15-8-76 - 2117
 " 26-9-76 - 2568
 " 12-10-76 - 2740.

25-8-76 no 2261.

25-8-76 no 2261
 " 18-9-76 - 2486.
 " 9-10-76 - 2705

From 2100
 No 7901
 The Superintendent
 Madras Harbour Works
 To The Secretary to Government,
 Public Works Department,
 Fort St. George.

Dated 31st October 1876
 Recd

No 82 W.
 2 Plans with
 Submit Progress
 Report on the works for
 October 1876.

No 313

From
 The offg. Under Secy. to Govt.
 To The Secretary to Government
 Fort St. George November 1876.

Sir,
 I have the honor to report that
 during the month of October I visi-
 ted the Harbour Works with the
 Superintendent once weekly.

2. The Engineer in Chief, Mr. Parker
 M.I.C.E. arrived in Madras from
 England on the 22nd of October and
 immediately proceeded to view the
 works, and he accompanied the Super-
 intendent and myself over the
 works on my last inspection.

During

3. During the month the further tipping of laterite and lengthening the surf bank has been suspended. 2410 tons only having been used on the work. The Titaw way was completed and the crane has been moved out to the end of the surf bank picking up on its way. Eight of the cubes originally constructed for protection from wave action at a point where they are now found to be unnecessary, which cubes having been reduced to moveable dimensions were deposited by the Titaw in front of the surf bank as a moveable protection, they have however sunk and disappeared, and a great deal of the rubble has been spread north and south of the surf bank by the

the heavy surf action which took place at various dates during the month. The rubble spread on the north of the surf bank affording most excellent protection from the heavy surf waves now running from the north-east.

4. Since the change of wind & current to the north a considerable quantity of the sand accumulated south of the surf bank has been swept away and the accumulation is being daily reduced. The surf however as heretofore, still remains in front of the surf bank.

5. Fifty two concrete blocks have been built during the month.

These were constructed with hand mixed material at the rate of 2 per chem. The blocks so far as appearance goes are most satisfactory their edges being sharp well defined and their sides perfectly square. At the Concrete mixing shed good progress has been made, the remaining 6 of Innocenti Patent Mixers have been swung. The timber frames of four elevators have been constructed, the gearing of one of them fitted and the central shafting from the engine house fixed and completed. The Platform for the granite stone crushers is well in hand and rails to the points.

7 10
points for the discharge of the mixed concrete from the Mixers have been laid and connected with the main line through the Block platform.

6 The Engine House is being roofed in. Trusses, Ridge and purlins laid. The Engine has been completed and is ready for steam. The chimney of the Boiler house has been completed and is a very creditable bit of brick work. As soon as the five bricks required to complete the flues are received the Boilers will be built in 1894.

7 The fitting up of the Second Trinity crane has been commenced.

a good deal of the timber staging
fixed & on & on.

D. I take this opportunity of
correcting the statement made
last month in reference to the
completeness of number one set
of Block platforms. I should have
noted that its western end was
completed a little still remaining
to be done eastwards.

g. The survey of the Harbour, im-
mediately required, was completed
during the month by the Marine
Surveyors, who reported their de-
parture on the 25th of October
as the state of the weather pre-
vented further extended operations.

10. The Committee appointed in
Edho 2261, dated 25th August 1876
assembled on two occasions dur-
ing the month. The Honorable
Mr. Macfadyen has been appointed
Chairman and Lieutenant Taylor
R. N. R. Honorary Secretary.

I have the honor to be,
Sir,

Your most Obedient Servant

W. H. Hall
Deputy Chief Engineer
Offg. ~~Commander~~ ~~of the~~
S. H. C.

W. H. Hall

P.W.D.
18 NOV 76
No 3381

From
The Deputy Chief Engr
P.W.D.

Dated November 1876

Submitting report
to the Madras Harbour Works

No 313a

On 3-11-76

No 3088

Public Works Department.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Under date the 20th Nov 76
Read the following :-

From
The Supt. Madras
Harbour Works } (H.C. No 82 Wd/31st Oct 76)
From the Dy Chief Engr P.W.D. d/

Recorded.

Tenders for the
opening up of the un-
touched portions of
Ambatour quarries
should be advertised
for without delay.

G.M.H.

It would be premar-
: time to increase the
: pay of the Harbour
: Office from before
: the effect of the pre-
: sent monsoon on

Supt. Madras H. Works
Chairman C. of Comm. in
Extract Wd/18-11-76
Wd/24-11-76

Prices of food is
rental -

G.M.

8384
Govt. of 1876 Madras.

PUBLIC WORKS.

To

The Supt. Madras Harbour
Works

Date

Issued

Recd

Encl.

G. O. 20th Feb 1876, No. 288

Recd 3/3/76

Copy of the order for
the works for the
harbour 1876 -

Subscribed by the
Hon. Secy to Govt.