

(1) Number of pages _____

(2) Date of repair _____

(3) Initials of the Referencer _____

MADRAS RECORD OFFICE.**Government of Madras.***Public Works* **DEPARTMENT.**

G.O. No. 211	(W)	Press Mis.
Dated 9-8-	1877.	

Not to be folded or roughly handled

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

9th June 1877, No. 211 W.

Buildings and Roads.

Civil Works.

Read the following paper:—

No. 68. From F. N. THOROWGOOD, Esq., C.E., Superintendent, Madras Harbour Works, to the Secretary to Government, Public Works Department, Buildings and Roads, dated Madras, 31st May 1877, No. 18 W.

I HAVE the honor to submit the following report of progress on these works during the month of May.

2. *North Pier.*—In the progress report for the month of April (paragraph 4) I stated that a caisson would be tried at the pier end, with a view to overcoming the difficulty of setting blocks in the sand. On May 14th, this caisson was completed and successfully lowered by the Titan in advance of the block work. I put on two sets of divers to work in the caisson, and on the evening of the 14th the sand was cleared away to such an extent that the bed for one block could be prepared. On the morning of the 15th the divers again worked in the caisson to level the rubble stone bed ready for the block, but before this work was completed a ground swell had come on which obliged me with reluctance to order the diving boat to come away, as the work was quickly becoming dangerous. Consequently the north pier has not advanced at all during the month of May.

3. On the 16th, 17th, and 18th a heavy gale was blowing from the north east and north north east accompanied by very heavy seas which attacked the work with tremendous force and did some slight damage, the details of which are as follow.

4. *Sea Damage.*—The course of blocks at the extreme end of the pier (307 feet from point B) got so severely shaken by the repeated blows of the waves that the northernmost tier was canted over to the northward to such an extent that it will have to be reset entirely and the bed of the foundation course will have to be levelled again. The work of resetting the blocks has been commenced, but is stopped for the present by stress of weather.

5. The block work between the distance of 92 feet from point B and 225 feet from the same point was undermined considerably by the constant run of the waves along the north side. The consequence is that a length of 131 feet has been tilted over towards the north, leaving a gap along the centre joint of the pier. This gap has been filled up with concrete, and a good foreshore of 7 ton blocks is being placed to the north of the pier at this point to prevent further damage. To complete this foreshore, I shall require a large quantity of laterite boulders, and I am now in communication with the Madras Railway Company with a view towards getting laterite sent down from Ambatoor quarry.

6. The position of the gap above referred to is shown by a thick black line on the accompanying plan.

7. On the morning of the 17th May, I feared that the Titan crane was in imminent danger, and therefore ordered men out to try and lay the road down to bring

the crane back. I have already reported (letter No. 14 W, dated 21st May,) that a most unhappy accident occurred in trying to effect this by which five men were seriously injured. On inquiring at the Monegar Choultry on the 30th instant, I was distressed to learn that one man was in danger of losing his life. The others are doing well at this date.

8. The conclusion to be drawn from the effect of the late heavy sea on the pier is this. That where the work is properly built with a foundation prepared truly by divers the sea has had no damaging effect. The length of pier from 223 feet from point B to the end was so built, and this length (84 feet) has only settled down vertically about one inch. The base of the pier is the same throughout, and the reason why some of the blocks have settled so much and others so little is, partly because in one case the blocks were set very roughly and in the other the foundation was carefully levelled, and partly because the portion of the pier that has stood so well is founded in deeper water. As a matter of fact the only portion of the work that can be looked upon as made really in accordance with Mr. Parkes' design has not been hurt at all by the late heavy seas, but remains as firm and regular as before.

9. *Prospect of progress on North Pier.*—As the attempt made with the caisson at excavating the fine sand which accumulates in advance of and all around the work proved completely successful as far as it went, I have made another and a stronger caisson (the first has been destroyed by the sea) with which I believe it will be possible to set at least one course of blocks per week when the weather permits of diving.

10. *Concrete Blocks.*—The making of concrete blocks has been carried on slowly this month. I stopped the machinery for a week in order to lift all the shafting and examine the engines, as many of the bearings were getting into bad order. The delay caused by this stoppage was of no importance, as it is evident for the present the supply of concrete blocks greatly exceeds the demand. During the month on the north block ground 28 blocks have been made which once more fills the ground quite full, and on the south block ground 42 blocks have been made. The total number of blocks that have been made is now 863, of which 155 are on the south block ground.

11. The materials used are the same as before. General Morgan's cement has been used whenever there has been a sufficient quantity on the works. Small supplies of this are received from time to time, and the concrete made with it appears quite satisfactory.

12. *Concrete Block Platform.*—The block platform for the south pier has been extended, as shown in red, on the accompanying plan. The length extended is 130 feet, which brings the ground close up to the Peninsular and Oriental godowns.

13. *Buildings, Railways, &c.*—Since receiving the sanction of Government for the purpose, I have commenced to pull down the above-mentioned godowns, and the materials of the roofs are being utilized for finishing the Carpenters' and Smiths' shops and for covering in a stable which has to be built in place of the present stables which will have to be pulled down.

14. *The beach railway is being extended as quickly as possible, and the amount completed during the month is shown in red on the plan.

15. *Harbour Committee and Contracts.*—The Harbour Committee met three times at this office during the month. On the 7th and 21st at ordinary meetings, and on the 29th a special meeting was held to consider the case of the Engineers of the Hopper Barges. On the 7th the subject of unloading stone at the south surf bank was discussed, for which work four tenders had been received. After some discussion, the tender of Mr. Richard Woolley was eventually accepted, and he now has the work of unloading at 1 Anna per ton.

16. Another matter in which I asked for the advice of the Committee was the desirability of advancing money to the boat builder at Coringa who is building two boats for these works. The Commander of the Steam Ship *Hobart* is looking after the building of the boats for me, and he advanced Rupees 650 to the builder, having

previously satisfied himself that such was the custom. Before refunding the Rupees 650 to the Master of the *Hobart*, I referred the whole matter to the Harbour Committee.

17. *Screw Hopper Barges.*—On the 26th May I received a telegram from Mr. Parkes saying that, as Engineers for the Hoppers were difficult to get, I must try and arrange with the present men to stay on longer. This matter was freely discussed by the Harbour Committee, and it was agreed that I should offer the first Engineers Rupees 25 per mensem more, and the second Engineer Rupees 15 more, to stay. This offer has not been favorably received. Considering that some time must elapse before there is deep enough water to load the barges, I am not sure that the most economical plan would not be to reduce the hands on board. This has been suggested to me by the Master Attendant. The total working expenses of each Hopper Barge comes to nearly Rupees 970 per mensem, and this is now mounting up to a serious sum with no work to show in return for it. I regret to state that I cannot now form a guess as to when the Hoppers will be worked regularly.

18. *Stores.*—During the month the Steam Ship *Duke of Buccleugh* and *Duke of Devonshire* have brought various stores from England. Amongst other things four spare diving dresses. The Steam Ship *Hydaspes* has brought out some cases of bolts and nuts. The sailing Ships *Her Majesty* and *Mofussilite* are unloading Portland cement from England.

19. *South Pier Works.*—The storm of the 15th, 16th and 17th May did very little harm to the south surf bank. The slope at the end was flattened down considerably, thereby shortening the bank 14 feet. The south side of the bank was attacked rather heavily and some of the stone was washed out. On the whole the bank stood the battering of the sea better than I expected.

20. During the month the progress has not been quite so quick as is desirable, great delay having occurred from damage done to the South Indian Railway by the rain of the 15th, 16th, and 17th May. On the 21st an engine got off the line near the Penitentiary, owing to the subsidence of the embankment and this caused some delay in bringing down stone.

21. The total amount of stone tipped into the surf bank is now 8,457 tons, of which about 3,000 tons have been tipped during May. The total length of the surf bank from point D on plan is now 200 feet, and the length advanced during May is 60 feet. If it is borne in mind that the heavy seas flattened the end back 14 feet, and that for ten days no stone could be got down, this advance of only 60 feet will appear less unsatisfactory.

22. The whole of the south surf bank will require to be made wider eventually, but I think it is not desirable to widen it much yet, but to advance as quickly as possible, so as to intercept the sand thrown up by the waves.

23. As a matter of fact the sand is being caught in large quantities by the bank, and a precisely similar state of things is occurring with this groyne as occurred with the north groyne last year. This was expected by Mr. Parkes.

24. *General observations on the Sea, &c.*—The sea has been so rough since the storm of the 16th, that I have not been able to take any satisfactory soundings or observations. I enclose herewith one cross section taken by the Assistant Superintendent at 300 feet from point B, in which the state of the bottom after the storm is shown in brown color. Other cross sections were taken, but this one is the best to select as being the most accurate. It will be observed that there has been a great deal of scouring out to the north and filling up to the south of the pier. Further surveys will be made when the weather permits.

25. On May 9th I visited the crate in $7\frac{1}{4}$ fathoms which I could not get at on the last occasion of my going out to it, as mentioned in the Progress Report for April. The bottom of the sea was hard and firm as before, and no current could be felt by the diver. The south side of the crate was buried for a depth of 1 foot and the

4 PUBLIC WORKS DEPARTMENT, 9TH JUNE 1877, No. 211 W.

north side was buried 4 inches. I think that the crate must have sunk thus much, as the sand on the bottom had no appearance of having moved. I have not been able to visit the other crates since the late storm.

26. I made occasional trials of the rate of the current at the end of the iron pier, and have not found a greater speed than one mile per hour. This was on a day when the wind was light and the water charged heavily with sand.

27. In reporting on the sea damage I have omitted to state that the excellent diving boat purchased from Negapatam dragged her moorings during the gale and has become a wreck. I hope, however, that she may be repaired.

No. 69.

ORDER THEREON, 9th June 1877, No. 211 W.

ORDERED to be recorded.

2. The Government are satisfied that all that could be done during the past trying month of storm and high seas has been done by the Harbour authorities.

3. The earliest possible examination should be made of the crates not yet visited. The Superintendent is requested to report whether the crate which he examined on the 9th of the month was found upright.

4. The proposed reduction of the crews of the Hopper Barges is approved.

(True Extract.)

Colonel, R.E.,
Secretary to Government, P.W.D.

Read the following.

Progress report of the Madras
Harbour Works during May 1877.

FOR ORDERS.

Edmond Leach
Secretary to Govt

The damage which I took
by the storm was the expected
but was unavoidable.
I approve the reduction of
the Hopper Barges crew.
L.A.

Tryin' enough, has been
done - The pier shore is
a good deal
S.D.

Does not
report the drift in front
of the Pier some pre-
sent day -
The enclosure
in I of oblong has the
port are satisfactory
has all that could be
done during the storm

1857
F. A. Thurgood, Esq. C.E.
Superintendent
Madras Harbour Works
Colonel G. A. Ford, C.E.
Secretary to Government P. W. D.
Roads & Buildings Branch
Fort St. George
Madras 21st May 1877

Sir
I have the honor to submit the following report of progress on these works during the month of May.
2. In the progress report for the month of April para 1st, I stated that a caisson would be tried at the pier end, with a view to, overcoming the difficulty of setting blocks in the sand. On May 14th this caisson was completed and successfully lowered by the Trawler in advance of the block work. I put on two sets of divers to work in the caisson and on the evening

North Pier

evening of the 14th the sand was cleared away to such an extent that the bed for one block could be prepared. On the morning of the 15th the divers again worked in the caisson to level the rubble stone bed ready for the block, but before this work was completed a ground swell had come on which obliged me with reluctance to order the diving boat to come away, as the work was quickly becoming dangerous. Consequently the North Pier has not advanced at all during the month of May.

3. On the 16th, 17th and 18th a heavy gale was blowing from the North East and North. North East accompanied by very heavy seas which attacked the work with tremendous force and did some slight damage, the details of which are as follows:

4. The course of blocks at the extreme end of the Pier (307 feet from point B) got so severely shaken by the repeated blows of the waves that the Northernmost tier was carried over to the Northward to such an extent that it will have to be reset entirely, and the bed of the foundation course will have to be levelled again. This work

Sea Damage

of resetting the blocks has been commenced but is stopped for the present by stress of weather. —

5. The blockwork between the distance of 92 feet from point B and 222 feet from the same point was undermined considerably by the constant run of the waves along the North side. The consequence is that a length of 131 feet has been tilted over towards the North, leaving a gap along the centre joint of the pier. This gap has been filled up with concrete, and a good foreshore of 7 ton blocks is being placed to the north of the pier at this point to prevent further damage. To complete this foreshore, I shall require a large quantity of laterite boulders and shall endeavour in communication with the Madras Railway Company with a view towards getting laterite sent down from their bazar quarry. —

The position of the gap above referred to is shown by a thick black line on the accompanying plan. —

7. On the morning of the 17th May, I found that the Titan crane was in imminent danger and therefore ordered men out to try and lay the road down to bring the crane back.

I have already reported (letter No 14, xv, dated 21st May), that a most unhappy accident occurred in trying to effect this, by which 5 men were seriously injured. On enquiring at the attorney's Chancery, on the 30th instant, I was distressed to learn that one man was in danger of losing his life. The others are doing well at this date.

The conclusion to be drawn from the effect of the late heavy sea on the pier is this. That where the work is properly built with a foundation prepared truly, by divers, the sea has had no damaging effect. The length of pier from 223 feet from point B to the end was so built, and this length (84 feet) has only settled down vertically about one inch. The bedding of the pier is the same throughout and the reason why some of the blocks have settled so much and others so little is partly because in one case the blocks were set very roughly and in the other the foundation was carefully levelled and partly because the portion of the pier that has stood so well is founded in deeper water. As a matter of fact, the only portion of the work that can be

looked

looked upon as made really in accordance with Mr. Parker's design has not been hurt at all by the late heavy sea, but remains as firm and regular as before.

of progress
the pier.

9. The attempt made with the caisson at excavating the fine sand which accumulates in advance of and all around the work proved completely successful as far as it went. There is now another and a stronger caisson (the first has been destroyed by the sea) with which I believe it will be possible to set at least one course of blocks per week when the weather permits of diving.

Blocks 10. The making of concrete blocks has been carried on steadily this month. I stopped the machinery for a week in order to lift all the shafting and examine the engines, as many of the bearings were getting into bad order. The delay caused by this stoppage was of no importance as it is evident for the present the supply of concrete blocks greatly exceeds the demand. During the month over the north block ground 28 blocks have been made which once more fills the ground quite full, and

on the South block ground 42 blocks have been made. The total number of blocks that have been made is now 863 of which 165 are on the South block ground.

11. The materials used are the same as before. General Morgan's cement has been used whenever there has been a sufficient quantity on the works. Small supplies of this are received from time to time and the concrete made with it appears quite satisfactory.

12. The block platform for the South Pier has been extended as shown in red on the accompanying plan. The length extended is 130 feet which brings the ground close up to the P. & O. godowns.

Concrete Block Platform

13. Since receiving the sanction of Government for the purpose I have commenced to pull down the above mentioned godowns and the

Buildings, Railways &c.

materials of the roofs are being utilized for finishing the roofed sheds and smith's shops and for covering in a stable which has to be built in place of the present stable which will have to be pulled down.

14. The Beach Railway is being extended as quickly as possible and the amount completed during the month is shown in red on the plan.

The

Harbour Committee
Contracts

15. The Harbour Committee met three times at this Office during the month. On the 7th and 21st at ordinary meetings and on the 29th a special meeting was held to consider the case of the Engineers of the Hopper Barges. On the 7th the subject of unloading stone at the South Pier Bank was discussed for which work four tenders had been received. After some discussion the tender of Mr. Richard Woolley was eventually accepted and he undertakes the work of unloading at 8 annas per ton.

16. Another matter in which I asked for the advice of the Committee was the desirability of advancing money to the boat builder at Coimbatore who is building two boats for these works. The Commander of the S. S. "Hobart" is looking after the building of the boats for me and he advanced £650 to the builder having previously satisfied himself that such was the case. Before repaying the £650 to the builder of the "Hobart" I referred the whole matter to the Harbour Committee.

Crew Hopper Barges

17. On the 26th May I received a telegram from Mr. Parkis saying that as engineers for the Hoppers were difficult to get I must try and arrange

arrange with the present men to stay on longer. This matter was freely discussed by the Harbour Committee and it was agreed that I should offer the 1st Engineer £25 per mensem more and the 2nd Engineer £15 more to stay. This offer has not been favourably received. Considering that some time must elapse before there is deep enough water to load the barges, I am not sure that the most economical plan would not be to reduce the hands on board. This has been suggested to me by the Master Attendant. The total working expenses of each Hopper Barge comes to nearly £970 per mensem, and this is now mounting up to a serious sum with no work to show in return for it. I regret to state that I cannot now form a guess as to when the Hoppers will be worked regularly.

18. During the month the *St. Duke of Buccleugh* and *Duke of Devonshire* have brought various stores from England - (largest other things 4 spare diving dresses. The *Hydaspes* has brought out some cases of tools and nails. The sailing ships *Her Majesty* and *Alfred* are unloading Portland Cement from England.

Stores

19. The storm of the 15th, 16th, 17th May did very little harm to the South Surf Bank. The slope at the end was flattened down considerably, thereby shortening the bank 11 1/2 feet. The south side of the bank was attacked rather heavily and some of the stone was washed out. On the whole the bank stood the battering of the sea better than expected.

20. During the month the progress has not been quite so quick as is desirable, great delay having occurred from damage done to the South Indian Railway by the rain of the 15th, 16th & 17th May. On the 21st an engine got off the line near the Quaternary owing to the subsidence of the embankment and this caused some delay in bringing down stone.

21. The total amount of stone tipped into the Surf Bank is now 84,577 tons, of which about 2000 tons have been tipped during May. The total length of the Surf Bank from point D on plan is now 200 feet, and the length advanced during May is 60 feet. If it is borne in mind that the heavy seas flattened the end back 11 1/2 feet, and that for 10 days

no stone could be got down, this advance of only 60 feet will appear less satisfactory.

22. The whole of the South Surf bank will require to be made wider eventually, but I think it is not desirable to widen it much yet but to advance as quickly as possible, so as to intercept the sand thrown up by the waves.

23. As a matter of fact the sand is being caught in large quantities by the bank and a precisely similar state of things is occurring with this groyne as occurred with the North groyne last year. This was expected by Mr. Parkes.

24. The sea has been so rough since the storm of the 16th that I have not been able to take any satisfactory soundings or observations. I enclose herewith one cross section taken by the Assistant Superintendent at 300 feet from point B, in which the state of the bottom after the storm is shown in brown colour. Other cross sections were taken, but this one is the best to select as being the most accurate. It will be observed that there has been a great deal of scouring out to the North and filling up to the South of the pier. Further surveys will be made when the weather permits.

General observations on the sea

25. On May 4th I visited the crate in the fourth which I could not get at on the last occasion of my going out to it, as mentioned in the progress report for April. The bottom of the crate was hard and firm as before, and no current could be felt by the diver. The South side of the crate was buried for a depth of one foot, and the North side was buried four inches. I think that the crate must have sunk thus much, as the sand on the bottom had no appearance of having moved. I have not been able to visit the other crates since the late storm.

26. I made occasional trials of the rate of the current at the end of the iron pier, and have not found a greater speed than one mile per hour. This was on a day when the wind was light and the water charged heavily with sand.

27. In reporting on the sea damage, I have omitted to state that the excellent diving boat purchased from - Vegapetan, dragged her moorings during the gale and has become a wreck. I hope however that she may be repaired.

I have the honor to be,
Sir,
Your most obedient servant,
J. H. Morrisford.

Superintendent
Colaba Harbour Works

21-4-77 1369
23-4-77 1382
30-5-77 1704

Roads & Buildings

From Superintendent
Madras Harbour Works

12 1877
Dated 31st May 1877

Enclosure 14

Progress Report

Submit progress report
on work during May 1877

4.09.77 1382

21-6-77 1382

No. VII W P.W. 21
Proceedings of the Madras Government
Under date the 9 June 77
Read the following

From
The Supt. Madras Harbour Works } (M.C. No. 18 Wd/31st May 1877)

Ordered to be
recorded.

2. The Government
are satisfied that all
that could be done during
the past trying month of
storm and high seas has
been done by the Harbour
authorities.

3. The earliest possible
examination should be made
of the crates not yet visited.

The Superintendent is requested
to report whether the crate
which he examined on the
9th of the month was found
upright.

4. The proposed re-
duction of the crews of
the Hopper Barges is
approved.

627

Wt
9.6.77

Lt. M. A. H. K. M.
Marine Dept.
Secy. Harbor Committee
C. J. Dispa: 16.6.77

18.6.77

7.11.77

105481

RECORD OF 1877
FROM WORLD

Open for inspection

13-07-77
Madr. Harbour
4 - 4
13/8

9th June 21 W

Has by

Madr. Harbour
Passing order in report
of progress of the
during May 1877

Out in Regt

11/11