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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

PUBLIC WORKS DEPARTMENT

G.O. No.	2851 W	Press.
B.P. No.		Mis.
Dated	9. 12. 1880	197.

Not to be folded or roughly handled

[Signature]

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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

9th December 1880, No. 2,851 W.

Buildings and Roads.
Civil Works.

Read the following paper:—

No. 41. From F. N. THOROWGOOD, Esq., M. INST. C.E., Superintendent, Madras Harbour Works, to the Secretary to Government, Public Works Department, dated Madras, 4th December 1880, No. 62 W.

I HAVE the honor to submit the following report of the progress on these works during the past month of November, and I regret to have to state that the advance of the work has been very small, while the casualties have been great.

2. *North Pier Superstructure.*—On the 1st of the month the sea was sufficiently heavy from the north-east to carry away 50 feet of the line of rails on the north pier, and it was not until the 10th that the damage was repaired. There then occurred a few days of fair weather and smooth sea, during which 32 blocks were set, and the pier advanced by a length of 19 lineal feet. The total length of the pier is now 3,606½ feet from the commencement.

3. *Sea Damage.*—During the remainder of November the sea has prevented all work, and between the 19th and 22nd was so heavy as to cause damage to the following extent:—From the middle of the curve outwards nearly the whole of the rails and sleepers were torn off and thrown into the harbour, but these are all recovered again. The portion of the pier that has been constructed since January 1880, and over which no heavy seas had previously broken, settled down evenly to its correct height above mean sea level, as was expected, and the centre joint between the two rows of blocks closed up to such an extent that the blocks ground into one another at their top edges. The result of this has been to break off some of the inner top corners, which gives an unsightly appearance until repaired; but the general effect on the work is to consolidate it by closing the joints. At the extreme end of the pier the action of the waves was greatly increased by the local eddy round the corners of the blocks, and this eddy reached down to the rubble base to such an extent as to disturb the stone exactly at the foot of the last row of blocks, especially at the inner corner, where the blocks have settled 36 inches. This action was strictly confined to the last row, no disturbance whatever having taken place in the blocks immediately preceding this row, nor in any other blocks throughout the pier. As I was fully prepared for this action, and had secured the end row by iron clamps, the damage is confined to the excessive settling down almost vertically of the last row of blocks, the clamps (which have not given way in any place) serving to keep any blocks from falling over. This is all the damage that the actual pier has sustained, and it can be put right in six hours. I should remark that I have had the end of the pier thoroughly examined by the Foreman Diver, on whose information I report. Numerous sections are now being taken, the weather being favorable.

4. *North Pier Rubble Base.*—The uncertain weather has naturally interfered with the deposit of rubble base, but I have carried on this branch of the work whenever it was possible. During November 10,919 tons of laterite were deposited, of which the two steamers carried 8,188 tons. It is satisfactory to note that whereas in October and November 1879 these two vessels were idle at Cocanada, they have in the corresponding months of this year deposited over 20,000 tons of material in the rubble bases of the two piers.

5. The North Pier Base is now approaching completion, but each lineal foot of advance requires a great deal more material than formerly. This is partly on

account of the great amount of fine small laterite which it is impossible to avoid bringing with the larger boulders from the quarry, but which makes hardly any increase in the submerged base; and partly because of the thick coating of mud which overlies the hard sand about the 7 and 8 fathom depths of the harbour. This layer of mud was first noticed in 1876 when we were taking observations at the bottom with a diver. It is sufficiently soft to be easily displaced by the super-imposed rubble, which finds its way through to the sand below.

6. *Concrete Blockmaking.*—The heavy and persistent rains in November have interrupted the making of concrete blocks considerably. At the north block ground the machinery was chiefly employed in making special blocks for the pier head. At the south pier block ground I suspended work on the 19th November in order to reduce the expenditure during the current year. The total number of blocks made in November has been 328, but many of these are small ones, of from 7 to 12 tons weight only, for the north pier head.

7. *Quarries.*—The outturn from the quarries has not been large, owing to the heavy rains which prevented all work on several occasions. From Ambatūr 13,065 tons of laterite were received, and from Pallāvaram 11,234 tons of hard rock, giving a total for the month of 24,299 tons. During the corresponding month of last year only 16,324 tons of stone were received on the works. From November 23rd to 29th all traffic from the Pallāvaram quarries to the beach was suspended for carrying out the raising of the wooden bridge over the canal near the General Hospital.

8. *South Pier Superstructure.*—The progress at the south pier has been better than at the north, but still very small. Between the 6th and the 20th November 64 blocks were set, advancing the pier by a length of $37\frac{1}{2}$ feet, and making the total length from the commencement 3,112 $\frac{1}{2}$ feet. Since the 20th November no work has been done, and the heavy sea of the 21st has done much damage to the rails, &c., although the pier itself is uninjured.

9. *Sea Damage.*—At the south pier I had not taken the precaution to unfasten the fish-plates of the rails on the outer lengths of the line, as is always done at the north pier in bad weather. My reason for ordering that this should not be done was because I felt confident (wrongly, as it turned out,) that any sea which would attack the south pier would surely come from the north-east, and would therefore strike the work nearly end on. The seas of the 21st came from south-east and east-by-south with great force and striking the outside rails on the newer and more unconsolidated portion of the pier, tore them up from the extreme end to beyond the commencement of the curve (a distance of nearly 900 feet) and as the fish-plates were for the most part bolted fast, the rails were twisted and broken in a way that renders many of them useless. At the extreme end the last row of blocks settled down rather unevenly, but throughout the work the centre joint has closed up tight, and in no spot has the settlement been more than was allowed for in construction. The last row of blocks in the south pier has not been disturbed by the eddy of the waves round the exposed end, as was the case at the north pier. The reason of this is because the foundation course of the next row of blocks in advance was set in position as a protection to the foot of the work against this eddy. I should remark that my orders are that this protective course should always be set in position before the Titan is withdrawn for the night, and that the reason of its absence at the north pier was that the divers were prematurely driven out by the rising sea on the 13th.

10. The south pier Titan had a narrow escape of being displaced, but fortunately the sea retired before the damage to it was serious. It was secured in the usual manner, and was in a good position for safety as regards the angle at which the waves struck it. The two timbers carrying the steel rails on which the Titan stands were tied together by four wrought-iron tie-rods with nuts and washers. The object of these ties is to keep the gauge of the road right. The heavy blows of the sea from the south-east struck the timbers on the outer side of the Titan, so heavily that the rail was driven against the flange of one of the wheels, which it broke up. At the same time the inner timber carrying the other rail was so severely attacked, that the nuts and washers of the tie-bolts were drawn into the wood and the gauge of the Titan

thrown out 8 inches too wide. The shock of this movement in so heavy a machine as the Titan, coupled with the settling of the blocks to their permanent level, broke the corners off two blocks immediately under the inner hind wheels, and under these conditions we found the Titan on the 22nd, when it was possible to visit the spot.

11. I wish that the above represented the whole of the mishaps during this storm, but Government is aware that in an attempt to get out to the end of the south pier on the morning of the 21st, seven persons were drowned, including Mr. James Duffy and Mr. H. Patching, two valuable men. The loss of Mr. Duffy is to be particularly deplored, as he was indefatigable in his exertions, and universally esteemed. This accident has been reported on separately, and I only refer to it here as a record in the month's proceedings.

12. *South Pier Rubble Base.*—Very little work was done at the Rubble Base, only 7,175 tons having been deposited in November. The storm of the 21st drove all the cargo boats used on this work ashore, but most of them are not badly injured.

13. *Protective Works to the Beach.*—Since October 31st the sea has ceased to encroach to the north of the harbour, and there has been a perceptible recovery of shore. The revetment extending towards the Police Tannah has been lengthened and made up, for this purpose 1,662 tons of boulders have been used. The groynes are kept up and repaired whenever such a course seems necessary towards retaining the sand which has lately come in from the north. On the 22nd November these protective works were thoroughly inspected by Colonel R. H. Sankey, Chief Engineer, Public Works Department, in company with myself.

14. The only stores received from England during November have been two consignments of Portland cement:—

By the ship *Vimiera*, 1,120 casks.
S.S. *Gannet*, 500 casks.

15. *Expenditure.*—The expenditure on the works has been Rs. 1,29,462 during the past month, and the total amount up to the 30th November has been Rs. 47,75,297.

16. *Plans and Sections.*—I submit herewith a lithographed plan, on a scale of 200 feet to an inch, which shows the changes in the line of high water mark since October. It will be seen that to the north there has been considerable gain of shore, and to the south the accumulation has been cut away. Within the harbour area the effect of the north-easterly waves deflected from the south pier is shown, and the result is a cutting away of the shore between the iron pier and the south pier of the harbour. This action is exactly the reverse of what has been occurring inside the north pier. The two longitudinal sections show the extent of the rubble base of each pier on November 3rd, the earliest date at which accurate soundings could be taken.

17. *Visit of His Grace the Governor.*—On the 23rd November His Grace the Governor visited the works and made special inquiries as to the extent of damage incurred, and asked after the families and relatives of those who lost their lives on the 21st at the south pier.

No. 42. ORDER THEREON, 9th December 1880, No. 2,851 W.

ORDERED to be recorded.

(True Extract.)

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

To the Superintendent, Madras Harbour Works.
.. Secretary, Harbour Works Committee.
.. Marine Department.

Exd. S. T. Austin.

Spars Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of Madras.
PUBLIC WORKS.

To

THE SUPERINTENDENT,
MADRAS HARBOUR WORKS.

&c., &c., &c.

Dated December, 9th.

Issued

Recd.

Encl.

G. O., 9th December 1880, No. 2851 W.

DECEMBER.

Nos. 41-42.

Madras Harbour Works.—Progress Report
of the — for November 1880, recorded.

No. 621v.

From

THE SUPERINTENDENT,
MADRAS HARBOUR WORKS.

To Colonel R. N. Sankey, C. B. P. C.
Secretary to Government, P. W. Dept.
Buildings & Roads,
Fort Saint George
MADRAS, 14 December 1880.

Sir,

I have the honor to submit the following
report of the progress on these works during
the past month of November, and I regret
to have to state that the advance of the work
has been very small, while the casualties
have been great. —

North Pier
Superstructure.

2. On the first of the month the sea was
sufficiently heavy from the North East to
carry away 50 feet of the line of rails on
the North Pier, and it was not until the
10th that the damage was repaired. There
then occurred a few days of fair weather
and smooth sea, during which 32 blocks were
set and the pier advanced by a length
of 19 lineal feet. The total length of the
pier is now 360 6 1/2 feet from the commencement.

During

thoroughly examined by the Foreman Diver, on whose information I report. Numerous sections are now being taken, the weather being favourable. -

4. The uncertain weather has naturally interfered with the deposit of rubble base, but I have carried on this branch of the work whenever it was possible. During November 10,919 tons of laterite were deposited of which the two steamers carried 8,188 tons. It is satisfactory to note that whereas in October and November 1879 these two vessels were idle at Leconada, they have in the corresponding months of this year deposited over 20,000 tons of material in the rubble base of the two piers. -

5. The North pier base is now approaching completion, but each lineal foot of advance requires a great deal more material than formerly. This is partly on account of the great

amount

North Pier
Rubble Base

Concrete Block
making

13 285/5
amount of fine small laterite which it is impossible to avoid bringing with the larger boulders from the quarry, but which makes hardly any increase in the submerged base; and partly, because of the thick coating of mud which overlies the hard sand about the 7 and 8 fathom depths of the Harbour. This layer of mud was first noticed in 1876 when we were taking observations at the bottom with a diver. It is sufficiently soft to be easily displaced by the super-imposed rubble, which finds its way through to the sand below. -

6. The heavy and persistent rains in November have interrupted ~~the~~ the making of concrete blocks considerably. At the North block ground the machinery was chiefly employed in making special blocks for the pier head. At the South Pier block ground I suspended work on the 19th November in order to reduce the expenditure during the current year. The total number

of

3. During the remainder of November the sea has prevented all work, and between the 19th and 22nd was so heavy as to cause damage to the following extent. From the middle of the curve outwards nearly the whole of the rails and sleepers were torn off and thrown into the Harbour, but these are all recovered again. The portion of the Pier that has been constructed since January 1880, and over which no heavy seas had previously broken, settled down evenly to its correct height above mean sea level, as was expected, and the contra joint between the two rows of blocks closed up to such an extent that the blocks ground into one another at their top edges. The result of this has been to break off some of the inner top corners, which gives an unsightly appearance until repaired, but the general effect on the work is to consolidate it by closing the joints. At the extreme end of the pier the

Sea Damage 3.

12 95/14

the action of the waves was greatly increased by the local eddy round the corners of the blocks, and this eddy reached down to the rubble base to such an extent as to disturb the stone exactly at the foot of the last row of blocks, especially at the inner corner, where the blocks have settled 36 inches. This action was strictly confined to the last row, no disturbance whatever having taken place in the blocks immediately preceding this row, nor in any other blocks throughout the pier. As I was fully prepared for this action, and had secured the 2nd row by iron clamps, the damage is confined to the excessive settling down almost vertically of the last row of blocks, the clamps (which have not given way in any place) serving to keep any blocks from falling over. This is all the damage that the actual pier has sustained, and it can be put right in 6 hours. I should remark that I have had the end of the pier thoroughly

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Sea Damage. 3.

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12 283/4
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of blocks made in November has been 328, but many of these are small ones of from 7 to 12 tons weight only, for the North Pier Head.

7. The output from the quarries has not been large owing to the heavy rains which prevented all work on several occasions. From Ambatior 13,065 tons of laterite were received, and from Pallavaram 11,234 tons of hard rock, giving a total for the month of 24,299 tons. During the corresponding month of last year only 16,324 tons of stone were received on the works. From November 23rd to 29th all traffic from the Pallavaram quarries to the beach was suspended for carrying out the raising of the wooden bridge over the canal near the General Hospital.

8. The progress at the South Pier has been better than at the North, but still very small. Between the 6th and the 20th November 64 blocks were set advancing the pier by a length of

57½

Quarries

Sea Damage.

57½ feet, and making the total length from the commencement 3112½ feet. Since the 20th November no work has been done, and the heavy sea of the 21st has done much damage to the rails &c. although the pier itself is uninjured.

9. At the South Pier I had not taken the precaution to unfasten the fish plates of the rails on the outer lengths of the line, as is always done at the North Pier in bad weather. My reason for ordering that this should not be done was because I felt confident (wrongly, as it turned out) that any sea which would attack the South Pier would surely come from the North East, and would therefore strike the work nearly end on. The seas of the 21st came from South East and East by South with great force and striking the outside rails on the newer and more unconsolidated portion of the pier, tore them up from the extreme end to beyond the commencement of the curve,

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(a distance of nearly 900 feet) and as the fish plates were for the most part bolted fast, the rails were twisted and broken in a way that renders many of them useless. At the extreme end the last row of blocks settled down rather unevenly, but throughout the work the centre joint has closed up tight and in no spot has the settlement been more than was allowed for in construction. The last row of blocks in the South Pier has not been disturbed by the eddy of the waves round the exposed end, as was the case at the North Pier. The reason of this is because the foundation course of the next row of blocks in advance was set in position as a protection to the foot of the work against this eddy. I should remark that my orders are that this protective course should always be set in position before the Titan is withdrawn for the night, and that the reason of its absence at the North Pier was that the divers were prematurely driven out by the rising sea on the 13th.

The

10. The South Pier Titan had a narrow escape of being displaced, but fortunately the sea retired before the damage to it was serious. It was secured in the usual manner, and was in a good position for safety as regards the angle at which the waves struck it. The two timbers carrying the steel rails on which the Titan stands, were tied together by four wrought iron tie rods with nuts and washers. The object of these ties is to keep the gauge of the road right. The heavy blows of the sea from the South East struck the timbers on the outer side of the Titan so heavily, that the rail was driven against the flange of one of the wheels, which it broke up. At the same time the inner timber carrying the other rail was so severely attacked, that the nuts and washers of the tie bolts were drawn into the wood and the gauge of the Titan thrown out 8 inches too wide. The shock

of

of this movement in so heavy a machine as the Titan, coupled with the settling of the blocks to their permanent level, broke the corners off two blocks immediately under the inner hind wheels, and under these conditions we found the Titan on the 22nd when it was possible to visit the spot.

11. I wish that the above represented the whole of the mishaps during this storm, but Government is aware that in an attempt to get out to the end of the South Pier on the morning of the 21st seven persons were drowned, including Mr. James Duffy and Mr. J. B. Patching, two valuable men. The loss of Mr. Duffy is to be particularly deplored, as he was indefatigable in his exertions, and universally esteemed. This accident has been reported on separately, and I only refer to it here as a record in the month's proceedings.

12. Very little work was done at the Rubble Base, only 717⁵ tons having been deposited

South Pier
Rubble Base

deposited in November. The storm of the 21st drove all the cargo boats used on this work ashore, but most of them are not badly injured.

Protective works
to the Beach.

13. Since October 31st the sea has ceased to encroach to the North of the Harbour and there has been a perceptible recovery of shore. The revetment extending towards the Police Channel has been lengthened and made up; for this purpose 1662 tons of boulders have been used. The groynes are kept up and repaired whenever such a course seems necessary towards retaining the sand which has lately come in from the North. On the 22nd November these protective works were thoroughly inspected by Colonel R. H. Lankey, Chief Engineer, Public Works Department, in company with myself.

14. The only stores received from England during November have been two consignments of Portland Cement.

By

By the Ship "Vimiera" — 1120 casks
S.S. "Gannet" — 500 casks

15. The expenditure on the works has been Expenditure
Rs 129,14.62 during the past month, and
the total amount up to the 30th November
has been Rs 1,775,297. —

16. I submit herewith a lithographed Plans & Sections
plan on a scale of 200 feet to an inch which
shows the changes in the line of High Water
Mark since October. It will be seen that
to the North there has been considerable
gain of shore, and to the South the accu-
mulation has been cut away. Within the
Harbour area the effect of the north easterly
waves deflected from the North Pier is shown,
and the result is a cutting away of the shore
between the Iron Pier and the South Pier
of the Harbour. This action is exactly the
reverse of what has been occurring inside
the North Pier. The two longitudinal
sections show the extent of the rubble base
of each pier on November 3rd, the earliest
date at which accurate soundings could be
taken. —

Visit of His
Grace the
Governor.

17. On the 23rd November, His Grace the
Governor visited the works and made
special inquiries as to the extent of
damage incurred and asked after the
families and relatives of those who lost
their lives on the 21st at the South Pier. —

I have the honor to be,
Sir,

Your most Obedient Servant.

J. H. Horrocks & Co. Esq.
Superintendent,
Madras Harbour Works

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No. 2720 W. 25.11.80.
— 2735 W. 26.11.80.

P.W. C. 107735.

Buildings & Roads

From
The Superintendent
Madras Harbour Works

N. 62 W
Dated 4th December 1880
No. 6.

No. of Enclosures 3

to be placed in
the
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Progress Report

Submits — for the month of
November 1880.

Cir 7.12.80. Rd. 9.12.80.

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N. 2851 W

PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Under date the 9th Decr/80
Read the following:—

From

The Superintendent } (N. 62 W. d/4th Decr/80)
Madras Harbour Works

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Recorded

Att

6/12/80

S. H. H. L. M. V.
Secy. H. W. Committee
Maine Dept.

to be

21-12-80

✓ Cl 7708

1880
Capt. of (1879) ~~Adres.~~

PUBLIC WORKS.

To

Dated

Issued

Recd.

Encl.

11-12-
G. O. 9 Dec 1880 No. 28514

Hos. 4 Dec 1880

Madame Barber North
Progress report of the
for Nov/80, accorded.

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Am. W. Middleton
His grace the foun

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Oct 7-12.00 Phil 9

✓ Cw 7708

1880
Govt. of (1879) Indrs.

PUBLIC WORKS.

11-12

To

Dated

Issued

Recd.

Trans.

1880
O. O. 9 Recd. No. 28576

Recd. 1/15/80

Madras Harbour Board

Progress report of the —
for Nov/80, recorded.

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