M.R.O. 1—77,050—8-6-32.

(1) Number of pages _____

(2) Date of repair _____

(3) Initials of the Referencer _____

MADRAS RECORD OFFICE.

Government of Madras.

Public Work DEPARTMENT.

G.O. No. 2957 Press ~~Mis.~~

562-563

Dated 23. 8. 1867.

Not to be folded or roughly handled

No. 562. Read the following letter from the Superintending Engineer, 6th Division, to the Secretary to Government, Public Works Department, dated Shealli, 7th September 1867, No. 863 :—

1 Plan of ground.
1 Estimate, Rupees 300.

No. 1,801 of 15th June.
No. 2,091 of 12th July.

1. I have the honor to inform you with reference to the G. Os., noted in the margin, that I have made a most careful examination of the Jetty at Negapatam and of the plateau of sand to its north, where a lake is formed by the inland drainage when heavy local rain falls.

2. At high tide water passes over the debris at *a* and if the gap is not filled before the north-east monsoon sets in a breach below low-water must occur, and the facing riverwards will probably be destroyed ; that there is no small quantity of debris on the river face may be judged from the fact that I have myself measured a depth of 16 feet of water along the face of the Jetty ; this rough facing consists entirely of cubes, &c., from the old fort at Negapatam, which by this time have become more or less consolidated, but with a facing of this nature settlement must be expected during or after the occurrence of high inland freshes. On a basement formed in this rough way, the Jetty, 7 feet high by from 8⅓ feet to 9 feet broad, was raised, the Jetty itself consisted of a facing about 2 feet thick in front and rear, of brick-in-chunam, or of rough cubes taken from the old fort, with the interstices and the space between the facings filled up with broken brick and chunam : while the front of this work stood on the rough facing already described, the rear stood on sand, and in some parts the superstructure consisted of two face walls built of cubes with only sand between them, and this covered with a 9-inch flooring of brick-in-chunam.

3. To carry off the inland drainage which collects in the hollow between Nagore and Negapatam, an area of about 2 square miles, and which often contains from 1½ to 2 millions of cubic yards of water, groynes such as that proposed by Colonel O'Connell were frequently constructed previous to 1856, in order to divert the water into the sea above the Jetty, and so to prevent any scour along its rear face those groynes which were tried for years one and all failed, though they were placed at intervals so as to divide the plateau into a series of tanks as it were ; no unprotected bank formed of sand (no earth or clay is to be procured in the neighbourhood) can stand, it may be destroyed in 24 hours by the along-shore wind, or by the strong westerly winds in July, just before the rivers are freshed by the south-west monsoon; while, even if a channel is formed through the sand bank thrown up by the sea to limit its own approaches, as soon as the inland drainage falls to the level of low-water, the first high tide reforms the bank and closes the mouth.

$4 \times \frac{1}{6} M = 2.$

4. These cross banks having failed, a sluice was constructed in 1855 at X, in the Plan, to carry the inland drainage into the river through a sluice formed in the north arm of the landing place at Y. The sluice at X was destroyed in 1859, and it has been usual since to cut through the natural sand bank, which separates the plateau from the sea, when the inland drainage rises above high-water mark. On the night of the 12th of May, it would appear that a large body of water accu-

2 Vents about 3 feet × 4½ feet each.

mulated in rear of the Jetty and undermined it, and found an exit into the river before the sand bank could be cut.

5. Were large quantities of stone available, nothing would be easier than to protect the Jetty in rear by throwing in stone till the effects of the scour of the inland drainage allowed the stone to settle and to form a rough stone revetment, somewhat similar to that which protects the foundation in front; in the absence of stone I, in January, proposed the formation of a small wall, built in rear of the groyne on the sand in blocks, and I hoped that the action of the water on these blocks would cause them to sink, and as they sank, I proposed building over them until the foundations of the blocks sank below the level of the sand subject to the influence of the scour of the inland drainage; this work had been only just completed in May, when the inland drainage breached the Jetty before the sand bank could be cut and the water be discharged into the sea; two of these blocks were then destroyed, while the rest were not subjected to the scour of the inland drainage; it is probable, however, that they will be tried during the north-east monsoon, and we shall shortly be able to judge of their effect; if they succeed, the experiment may be continued. In the meantime the present breach must be closed by means of sand bags, protected in front by cubes from the debris of the work, and in rear by a groyne formed of palmyras to prevent the inland drainage from setting on this point of the Jetty.

21 feet in all.

6. The estimate for the groyne and for cutting a small channel to the sea amounts to Rupees 220, of which Rupees 140 may be met from the balance on the estimate of Rupees 1,080, sanctioned in February last, and the difference, Rupees 80, must be provided from Port or Local Funds.

7. The portion of the Jetty which has been destroyed must be restored as soon as the season will admit of the work being undertaken, as provided in the estimate of Rupees 1,040 which accompanied letter No. 355 of 5th June from this Office.

G. O. No. 1,801, 15th June.

8. *In lieu of the estimate of* Rupees 2,600, returned with G. O. No. 2,091, I would propose to adopt the plan of forming a bank, which has proved so successful on the sand spit which divides the sea and the river, viz., by putting up a series of palmyra fences to catch the drifting sand, and by planting up the sand with marine creepers, &c., as the sand accumulates.

12th July.

9. A channel will have to be dug across the sand spit, and the sand taken from it will form the nucleus of the bank, and on it the back bone, as it were, of the fences will be placed. This fence will be constructed just beyond the limit shown in the enclosed plan, and if it succeeds, the drainage of only $\frac{1}{20}$th of a square-mile will have to be discharged at or near the Jetty, the rest of the drainage being arrested by the bank to be formed and diverted into the sea to the north of the bank.

Paragraph 6,	Rupees	80
,, 7,	,,	1,040
		*300
	Rupees	† 1,420

10. An estimate of Rupees 300* provides for this work, the total sum requiring immediate sanction and allotment is Rupees 1,420†, if this sum

cannot be provided from other sources, it might be borrowed from Local Funds for the present.

11. If these works are not carried out, it is probable that at no distant date the Jetty will become such a wreck that it must either be abandoned altogether or be restored at a very large outlay.

12. If it is found that the formation of a sand heap is impracticable, and that the inland drainage cannot be diverted into the sea above or north of the Jetty, and if the buttress walls * built this year will not answer the purpose for which they were provided, it will be necessary to procure stone from Tanjore, and to throw it along the north face of the Jetty, and to permit the inland drainage to act upon it and on the sand on which it stands, till the stone settles and forms a facing to the foot of the Jetty below the level at which the current formed by the inland drainage acts.

	Rupees	1,080
	,,	190
	*	1,270

13. The front and rear of the Jetty will then be similarly protected, and there will be comparatively little prospect of a recurrence of a breach in the Jetty; but the face walls will always be subject to injury from the waves until the Jetty is built solid, and both faces are lined with cut-stone.

No. 563. ORDER THEREON, 23rd September 1867, No. 2,954.

CIVIL WORKS, No. 61.

1. In June last, the Superintending Engineer of the 6th Division reported that a portion of the Jetty at Negapatam had been destroyed by the local rain which fell near the coast in the previous month, and that an estimate of Rupees 1,040 for the restoration of the work had been submitted to the Superintendent of Marine, to whom also, he purposed to forward an estimate for a defensive work which he hoped would save the Jetty from a recurrence of similar accidents.

2. The latter estimate, amounting to Rupees 2,600, was subsequently transmitted to Government by the Superintendent of Marine, who suggested that, as the entire balance of the Port Fund in hand was likely to be required for other purposes, the cost of the actual repairs to the Jetty should alone be met from that source.

3. Believing that the object in view of protecting the Negapatam Jetty from land floods could be effected in a less costly manner than had been proposed, the Government returned the estimate to the Superintending Engineer for reconsideration, and with a view to his adopting such defensive measures, as, in his opinion, appeared to be immediately necessary.

G. O., Public Works Department, No. 2,091, dated 12th July 1867.

4. The Superintending Engineer's reply to these proceedings is contained in the letter above read, in which, after giving a full account of the present condition of the Jetty, and of the measures which have from time to time been adopted for its protection, that Officer recommends that the breach which occurred in May last should be at once closed, and the destroyed portion restored at an outlay of Rupees 220 and 1,040 respectively. In lieu of the defensive works provided for in the

estimate of Rupees 2,600, Captain Oakes suggests that others estimated to cost Rupees 300 should, as an experiment, be carried out.

5. The Government sanction the three estimates submitted by the Superintending Engineer amounting in the aggregate to Rupees 1,560, and they grant authority for the works of restoration and defence being proceeded with in anticipation of an allotment of funds later in the year.

Closing breach	Rupees	220
Restoring destroyed portions	,,	1,040
Defensive works	,,	300
	Rupees...	1,560

6. Of the sum of Rupees 220 which is required for closing the breach, the Government note that Rupees 140 are available upon the estimate of Rupees 1,080 sanctioned in February last for repairs to the Jetty, and the Superintendent of Marine will now be requested to place the balance of Rupees 80 at the disposal of the Superintending Engineer from Port Funds.

Vide G. O. in the Marine Department, No. 42, of the 21st February, and No. 225 of the 3rd September 1867.

(True Extract.)

(Signed) J. H. M. SHAW STEWART, Major, R. E.,
Under Secretary to Government.

To the Superintending Engineer, 6th Division.
,, Marine Department.
,, Superintendent of Marine.
,, Controller of Public Works Accounts.
,, Accountant General.

Exd. S. T. Augustin.

No 863

Supdg Engineer's Office &c &c
Shalli 7th September 1867

From
Captain P. T. Oakes Esq
Supdg Engineer &c &c

To
Colonel C. H. A. Orr &c &c
Secy to Government P.W.D.

Sir

I have the honor to inform you with reference to the M. G. noted in the margin that I have inspected a portion of the Jetty and Esplanade and the Platform of Sand to its north, where a Chasm is formed by the inland drainage water having been kept back by the high tide water passing over the debris at a and if the gap is not filled before the N.E. Monsoon sets in a breach below L. W. must occur and the facing guards will

will probably be destroyed — that there is no small quantity of debris on the pier face may be judged from the fact that I have myself measured a depth of 16' of water along the face of the jetty — this pong facing consists entirely of Cubes of the old Fort at Negapatam, which at this time have become more or less consolidated, but with a facing of this nature, settlement & breach is expected during or after the erection of high in Cased Frames of Elm a Cadrement formed in this rough way, the jetty 7' high by from 3½ to 4' broad was raised, the jetty itself consisted of facing about 2' thick in front and rear, of brick in Chunam and the rough Cubes taken from the old Fort, with the interstices and the space between the facings filled up with the low brick spall Chunamed: while the front of this work stood on the pong facing already described, the rear

stood on sand and in some parts the superstructure consisted of two faces walls built of Cubes with only sand between them, and these Covered with a 9" facing of brick in Chunam.

3. To carry off the inland drainage which collects in the hollow between Nagore and Negapatam an area of about 2 square miles and which often contains some 1/2 to 2 millions of Cubic yards of water, I propose such as that proposed by Colonel O'Connell were frequently constructed previous to 1856, in order to divert the water into the sea above the jetty, and so to prevent any water acting in rear of them — three proposed which were tried for years one and all failed, though they were placed at intervals so as to divide the plateau into a series of tanks as it were, — no unprotected can be formed

formed of sand & mud & earth or clay &
to be procured in the neighbourhood)
can stand, it may be destroyed in
24 hours by the along shore drift
or by the along coast tide drift in
July just before the Piers are
breached by the N. W. Storms
which, were it a channel deepened
thro' the sand bar by the sea to limit it no more approached
& closer as the inland drainage packs
to the low W. the first high
tide removes the bar & sand
closes the mouth

4th Three cross bar jetties keeping
pailed & Sluices roads constructed
in 1855 at X, in the plan, to carry
the inland drainage into the River
through a Sluice formed in the
North Arm of the landing place at X
The Sluices at X were destroyed
in 1859 and it has been usual
since to cut through the natural
sand bar which separates the
pl Calais

pl Calais from the sea when the
inland drainage piles above
H. W. mar ft — On the night of the
12th of May, it would appear, that a
large body of water accumulated
in rear of the Jetty and undermined
it and formed an exit into the
River before the sand bar
could be cut-
5 More large quantities of
stone available nothing would
be easier than to protect the
Jetty in rear by throwing in stone
till the effects of the scour of
the inland drainage allowed the
stone to settle and to form a
rough stone protection somewhat
similar to that which protects the
foundation in front; in the advanced
of stone, I, in January, proposed
the formation of a small road
built in rear of the groyne on the
sand in blocks, and I hoped that
the action of the water on these
blocks

these piers would cause them to die off
and as they damage I propose
building over them until the foundations
of the piers damaged by the cause the
cause of the sand subject to the ebb
& flow of the scour of the inland
drainage; this work had been
only just completed in May
when the inland drainage breached
the jetty before the sand could
be cut and the water let discharged
into the sea — two of these piers
were then destroyed while the rest
were not subjected to the scour of
the inland drainage, it is probable,
however, that they will be tried
during the N.E. monsoon and
we shall shortly be able to judge
of their effect; if they succeed,
the experiment may be continued —
In the mean time, the present
breach must be closed by means
of sand bags supported in front
by Cubes from the debris of
the

the work if, and in place of a groyne
formed of palmyra to prevent
the inland drainage from scouring
on this point of the jetty —
6. The Estimate for the groyne
and for cutting a small channel
to the sea amounts to Rs 220
of which Rs 140 may be met
from the balance on the Estimate
of Rs 1080 sanctioned in February
last, and the difference Rs 80
much be provided from Boat &
Local Funds —
7 The portion of the jetty
which have been destroyed
must be restored as soon as
the season will admit of the
work being undertaken as provi-
ded in the Estimate of Rs 1040
which accompanied letter No 355
of 5th June from this Office —
8 In lieu of the Estimate
of Rs 2,600 returned with G. O.
No 2091, I would propose to
adopt

adopt the Plan of forming a Bank which has appeared to succeed on the sand spit which divides the Sea and the River, viz by putting up a series of palisadoes to catch the drifting sand and by planting up the sand with Marine Grasses as the sand accumulates—

7 A Channel for Vessels to use in access the sand spit and the sand to be kept from it and from the Mouth of the Harbour being, as it were, off the Jetty will be placed— This Jetty will be constructed just beyond the limit shown in the enclosed Plan, and if it succeeds, the drainage of only $\frac{1}{20}$ of a square mile will have to be discharged at or near the Jetty, the rest of the drainage being arrested by the Bank to be formed and diverted into the Sea to the North of the Bank—

An

10 An Estimate of £1,300 provides for this Work, the total sum requiring immediate sanction and Allotment is £1,020, if this sum cannot be appropriated from other sources it might be borrowed from Local Funds for the present—

11 If Waves over top are not carried out, it is probable that a two distant Gale the Jetty will become such a Barrier that it must either be abandoned altogether or be restored at a very large outlay—

12 If it is found that the formation of a Sand heap is impracticable and that the inland drainage cannot be diverted into the Sea above or North of the Jetty, and if the Sluices of the Bank this year will not answer the purpose for which they were provided, it will be necessary to

to procure Stone from Sanjore
and to throw it along the North
face of the Jetty and to permit
the inland drainage to act upon
it and on the Sand on which it
stands & the Stone settles
and forms a facing to the foot
of the Jetty below the Level at
which the Current formed by the
inland drainage acts -

13 The front and rear of the
Jetty will then be similarly
protected, and there will be Com-
paratively little progress of
a recurrence of a breach in
the Jetty: but the face will
always be subject to injury
from the Waves until the Jetty
is built solid and both faces
are lined with Cut Stone -

I have the honor to be
Sir
Your most obedient Servant
W. Yates Captain R.E.
Asst Engineer

Port and Harbour

Sanjore Pier

Sanjore Pier
Portuguese Estimate
Estimate No 4 of 1866/68

Sheet

Forming a Mole by means of Rubble
Stone ——————

Quantity	Rate	Description of Work	Cost	Amount of Cost
21 ft.	50 ft.	Stone 12 Yds long on each side at 10 Yds in Depth		
	200	Base Course of Stone		
	700	Running Yards	at ...	176 ...
100 ft.	1000	Cutting Channel	...	1 ... 12 8
		Cutting through Sandstone		
		Sand to be taken on occasion		
		Carriage required	...	30 ...
		Steel for sandstone	...	15 ...
20 Yds	1000	Planting Granite Breakwater	...	26 8

Total Estimate Rupees ---- 300 ...

Surveyed Sheet No 3
Scale 1" = 50 feet

W. Yates Captain
Asst Engineer

Public Works Dept
No 2954

Proceedings of the Madras Government
Under date the 23rd September 1867.
Read the following

From the Supg Engineer of the
6th Dist

(Nellore 7th Sept 1867. No 8631)

In June last, the Supt
Engineer of the 6th Division
reported that a portion
of the Jetty at Nejapatam
had been destroyed by
the local rain which fell
near the Coast in the
previous month, and that
an estimate of Rs 1040
for the restoration of the
work had been subm-
-itted to the Supt of
Marine, to whom also,
he proposed to forward
an estimate for re-

15th June 1867 - 1501
12th July — " — 2091

Copy of Letter from the Supt
Engineer 6th Division
dated 7th September 1867
No 8631
Forwarded to the Supt
Marine Agent

Read the 13th September 1867

No 863.
Executive Dept.

Superintending Engineer 6th
Division Cuddalore.
Nejapatam Jetty.
and Buckingham Canal Repairs.
Abstract Estimate for
Restoration of the
Jetty No 2954 - 23rd September 1867

defensive work which he hoped would save the Jetty from a recurrence of similar accidents—

The Letter estimate, amounting to ₹2,000, has subsequently transmitted to Govt by the Supt of Marine, who suggested that, as the entire balance of the Port fund in hand was likely to be required for other purposes, the cost of the actual repairs to the Jetty should alone be met from that source

Believing that the object in view of protecting the Negapatam Jetty from land floods could be effected in a less costly manner than had been proposed, the Govr returned

S.O. Pub. 8 No. 2091 of 12 July 67.

the estimate & the Supt Engr for reconsideration, and to call a view to his adopting such defensive measures as, in his opinion, appeared to be immediately necessary

The Supt Engrs reply to these proceedings is contained in the letter above read, in which, after giving a full account of the present condition of the jetty, and of the measures which have from time to time been adopted for its protection, that Officer recommends that the breach which occurred in May last should be at once closed, and the destroyed portion restored at an outlay of ₹220 and 1860 respectively. In lieu of the defensive work provided for in the estimate of ₹2,000

₶2000, Capt.ⁿ Oakes suggests that - Offices estimated to cost Rupees 300 should, as an experiment, be carried out -

The Gov.ᵗ Auditor the three estimates submitted by the Supt. Engineer amounting in the aggregate to ₶1580, and they grant sanction for the works of restoration and defence being proceeded with in anticipation of an allotment of funds later in the year - of the sum of Rupees 220 which is required for closing the breach, the Gov.ᵗ note that ₶140 are available upon the estimate of ₶1080 sanctioned in February

Closing breach ₶220
Resting Restings 1060
fortress
Defensive works 300
1580

vide Sec in the Marine Dept. N.ᵒ 42 of the 21.ˢᵗ Jan.ʸ
and N.ᵒ 225 of the 8.ᵗʰ Sept.ʳ

Sent for repairs & the Dock, and the Supt. of Marine will now be requested to place the balance of ₶80 at the disposal of the Supt. Engineer from Port funds -

Copy to Sec. Govt. 26th -
1 - " Marine Dept -
6 - " Supt. of Marine
4 - " Executive Engr.
3 - " Asst. Engr.

Dept. 26/9/65.

Enb. March 1867 Dispatch

Rec.d Sandfor. September

No 29554

Rec.d at the Inlands Govt.

Office 23rd September 1867

Directing such remarks
the Estimates amounting to
Rs. 1560 for the restoration and
defence of the Jetty at Negom-
bo to be made.

No. 562-563

8/1158/1868.16.5