RAILWAY.

Gobt. of {1890} Madras.

PUBLIC WORKS.

*Dated May, 22nd.*

*Recd.* *Encl.*

**G.O., 22nd May 1890, No. 708 R.**

MAY.

**Vallur Station, Madras Railway**

Estimate of Rs. 5,520 for constructing a platform and lay-bye at —, sanctioned.

---

4618.

Gobt. of {18 } Madras.

PUBLIC WORKS.

*Dated* 2/5

*Recd.* *Encl.*

G.O., 22d May 1890 No. 709R.

Bridge

Sanction of the Govt to the est of Rs 38,145, for reconstg the damaged portions of — No 316 at mile 258 on the N. W line of the Madras Railway. Commd to the C E for Rlys.

1/3

H.C
Sectt:

Please submit this G.O. for Press for D.R's approval.

J.K.L.
22/5

Appd. [illegible]
28/5

To D.R. Submitted

K.P.
28/5/90

A

No. 709 R.

PUBLIC WORKS DEPARTMENT,
RAILWAY BRANCH.

# PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 22nd May/90.

READ again the following

Progs: of the Madras Govt: P.W. Deptt:— } H.E. No. 403-4 R of 21st March 90

Read also the following:-

Letter from the Govt: of India P.W. Deptt:— } H.E. No. 408 R.C. of 8th May 1890

Hd 21 May.

315 P.

Communicated to the Consulting Engineer for Railways with reference to his Endorsement No: 182 dated 12th March 1890.-

2. This sanction has been registered as No 6 R of 1890-91

Ameon
19.5.90
W for R

To The Consg: Engr for Rys
,, Exr Gl Ry Accts:

---

OWC No 4618

of India for State Railways pointing out the objection to the proposed adoption of wells for shallow foundations and the doubtful efficiency of the proposed flooring unless a drop wall is built on the down stream side.

3. The sanction herein accorded has been registered as No 1 R. Madras Railway of 1890.

R 16.5.90
E. 1

I have the honour to be,
Sir,
Your most Obedient Servant.
M Beachcroft Major R.E.
Under Secretary

Documents Accompanying

Copy of a note by the Consulting Engineer for State Railways dd 20th April 1890

No 403/4R. 21.3.90

0/17/5 H.S. 19/5 R 21.5.90

Read also the following papers

No. 408 R.C

All communications
should be addressed
to the Secretary.

GOVERNMENT OF INDIA.
PUBLIC WORKS DEPARTMENT.
RAILWAY Construction

130

To
The Joint Secretary to the Government of Madras,
(Railway Branch) Public Works Department.

$\frac{\text{Ld}}{16.5.90}$ 2. E. R

Simla the 8th May 1890

Sir,

Sent to Ooty on 10.5.90

I am directed to acknowledge the receipt of your No 404 R dated 21st March 1890, and in reply to communicate the sanction of the Government of India to the Estimate received therewith amounting to Rs 38145/- of the cost of re-constructing the damaged portions of Bridge No 316 at Mile 258 on the North Western Line of the Madras Railway, chargeable against Revenue.

2. In conveying this sanction I am to forward for consideration and such action as may appear desirable, a copy of a note by the Consulting Engineer to the Government of

E.1

PW4618/90

Print

Encl

1420.

Note by the Consulting Engineer to the Government of India for State Railways dated 20th April 1890 on the estimate for reconstructing the damaged portions of Bridge No 316 at mile 258 in the North West Line Madras Railway.

If Moorum existed within 8 feet of the surface at the old abutment it would seem to be easy to found the new abutment dry instead of using wells which I think are objectionable for shallow foundation from the difficulty of evenly bedding them on rock. I much doubt the efficiency of the flooring unless a drop wall is built on the down stream side and I fail to see the good of flooring behind the abutment. If the bank is washed away the flooring will to a certainty scour.

---

Form No. 3.

No. 403 R of 21st March /90.

Nos 10 mar

L.S. 17.3.90

1218

Ordered that the

stimate provisionally sanctioned

e forwarded for the con-

ras, irmation of the Govt. of India,

t. H. E. No. 404 R of 21st March 1890.

Forwarded.

C. L. S.
14. 3. 90

TR.

Desptd with 5 enclosures 21/3/90.

P.W. C No 2597.

From

THE CONSULTING ENGINEER
FOR RAILWAYS,
MADRAS,

No. 182

Dated 12th
Received 13 } March 1890.

No. OF ENCLOSURES. 9 (+ one plan)

*Subject.*

Estimate amounting to Rs 38,145 for the reconstruction of the damaged portions of the bridge No. 316 at 258th mile N. W. Line Madras Railway.

B.

No. 403-4 R of 21st March/90

L 6/10

R

LRC 2073.

J 26/3

Hm 15-3-90 R 17-3-90.

110

was accorded for the work to be proceeded with, at the Official meeting held on 23rd January 1890, in order that full advantage of the working season might be obtained; and the estimate is now forwarded for confirmation of the sanction thus given.

Sidney Smith
Major R.E.
for Cons. Engr. for Ry

H.S.

o 10 feet behind the outh abutment is lso provided for. This dditional safe-guard ppears essential for the protection of this butment."

6. The estimate is ecommended for the sanction of the Govern-ment of India, but as it was ~~of the~~ in-dispensable that the work should be put in hand as soon as the water fell low nough to admit of it, provisional sanction

was

"the new piers be C.I. cylinders 6 feet diameter which are available, and to rebuild the abutment of masonry founded on brick wells. It is further proposed to insert an intermediate span of 35 feet, so that the new piers may be located clear of all obstructions and built in the centre of the existing spans. A substantial dry stone flooring throughout the 1st span of the bridge and extending

1

the cost of the temporary diversion, chargeable to Revenue.

5. The Chief Engineer states "the removal of the débris and foundations of the fallen pier and abutment, and their reconstruction on the same sites, would involve extensive and costly coffer-dams, and heavy pumping; and in order to obviate the expenditure and delay which these operations would entail, it is proposed to utilize for

the

s within one foot of irder bed level, broke hrough the embankment nd created a scour ehind the south abutment causing it to fall over. The unsupported end of the girder, which was a continuous one over two openings, then dropped, and brought down with it and overturned pier No: 1, and severely shook pier No: 2.

3. On examination, when the river had gone down, it was

found

found that the cause of the failure was due to defective foundations, the pier and abutment having been founded on so called "moorum" at a depth of 8 feet only instead of on rock which was 21¼ feet below the surface.

4. The Agent and Manager, Madras Railway, now submits an estimate (with plan) amounting to Rs 38,145 for the reconstruction of the damaged portions of the bridge, which also includes

the

From No 120.

FORM No. 1.

PUBLIC WORKS DEPARTMENT.

OFFICE OF CONSULTING ENGINEER FOR RAILWAYS,

*Madras*, 12th March 1890.

Letter from the Agent and Manager, Madras Railway, No: $\frac{E.63}{69}$ dated 21st January 1890, with enclosure.

Do — No: $\frac{E.63}{264}$ dated 8th March 1890, with enclosure.

No. 182

SUBMITTED for transmission to the Government of India.

2. On 16th October 1889 very heavy floods occurred in the Gooty district by which the bridge of four 64 feet openings at $\frac{258}{10}$ North West Line, Madras Railway, was seriously injured. The flood, after having washed away a training bund rose to

---

REGISTER
No 325
FILE
No

En / Est

MADRAS RAILWAY.

*From*

The Agent and Manager.

*To*

The Consulting Engineer for Railways.

return to me

*Dated* 8th March 1890

*Recd.* 9th do No. $\frac{E.63}{264}$

Returning the Estimate for restoring bridge No. 38 of 258th Mile

PW Incl 1597/90

1 Encls

(No. H.)
No. E63.
264

**MADRAS RAILWAY.**

AGENT AND MANAGER'S OFFICE,

Madras, 8th March 1890.

720

*From*

The Ag: *Agent and Manager,* M. R. Coy.

*To*

The *Consulting Engineer for Railways.*

SIR,

Estimate for restoring Bridge No. 316 at 258th mile N. W. Line

Your No. 157 dated 18th Febry: ulto.

I have the honour to return herewith the estimate for restoring the bridge named above, with provision, which has been made by the Chief Engineer, for Permanent Way material &c. required for the diversion.

I have the honour to be,
Sir,
Your most obedt. Servant.

W. Read
for Ag: Agent & Manager.

E.

En 73
1

Pw Enc:
2597/90

626

the submission of the plan and estimate, it is of the utmost importance that the work should be put in hand forthwith. It is therefore hoped that immediate provisional sanction may be accorded to proceed with the temporary diversion of the line, and the collection of plant and materials for the main portion of the scheme -

Yours faithfully
(Signed) H. R. P. Carter
Chief Engineer

(True Copy)

Mead
Actg: Agent & Manager.

5260

and in order to obviate the expenditure and delay which these operations would entail, it is proposed to utilize for the new piers C. I. cylinders 6 feet diameter which are available, and to rebuild the abutment of masonry founded on brick wells. It is further proposed to insert an intermediate span of 35 feet, so that the new piers may be located clear of all obstructions and built in the centre of the existing spans. A substantial dry stone flooring throughout the 1st span of the bridge and extending to 10 feet behind the south abutment is also provided for. This additional safe-guard appears essential for the protection of this abutment.

5. The estimated cost of the work, including the temporary diversion of the line during the progress of re-construction is Rs 39,763, and it is requested that the sanction of Government may be obtained as early as practicable, for the expenditure, which is wholly chargeable to Revenue.

6. A copy of the estimate has been forwarded to the Chief Auditor for the purpose of being checked and allocated and Mr. Camp has been requested to send on the allocation sheet to you at an early date.

In conclusion I desire to specially to point out that, as unavoidable delay has already been incurred in were erected on the sites of the ruined structures, the gap of 100 feet in the bank was rapidly filled up, and traffic was resumed over the bridge at restricted speed on the 20th October, or four days afterwards.

3. Owing to the flooded condition of the river a thorough examination of the cause of the failure was not practicable until the end of November, when it was found that this was due to defective foundations. Aided by a series of borings, it was discovered that the stratum of rock which crops up at the surface at the North bank slopes away to a depth of 21¼ feet. At the South bank, whereas the depths of foundations of the fallen abutment and pier were recorded at 8 feet only on "morumboo". Pier No 2 appears to be founded partly on rock and partly on soft morumboo, and its shaken and cracked condition renders its re-construction from its very base imperative. Pier No 3 and the North abutment are sound, but are not bedded uniformly on the rock; these however can be made secure by encasing the foundations below river bed with 3 feet of concrete as shown on the plan.

4. "The removal of the débris and foundations of the fallen pier and abutment, and their reconstruction on the same sites, would involve extensive and costly coffer-dams, and heavy pumping;

were erected on the sites of the ruined structures, the gap of 100 feet in the bank was rapidly filled up, and traffic was resumed over the bridge at restricted speed on the 20th October, or four days afterwards.

3. Owing to the flooded condition of the river a thorough examination of the cause of the failure was not practicable until the end of November, when it was found that this was due to defective foundations. Aided by a series of borings, it was discovered that the stratum of rock which crops up at the surface at the North bank slopes away to a depth of 21¼ feet. At the South bank, whereas the depths of foundations of the fallen abutment and pier were recorded at 8 feet only on "morumboo". Pier No 2 appears to be founded partly on rock and partly on soft morumboo, and its shaken and cracked condition renders its re-construction from its very base imperative. Pier No 3 and the North abutment are sound, but are not bedded uniformly on the rock; these however can be made secure by encasing the foundations below river bed with 3 feet of concrete as shown on the plan.

4. "The removal of the débris and foundations of the fallen pier and abutment, and their reconstruction on the same sites, would involve extensive and costly coffer-dams, and heavy pumping;

2

420

Enclos 320

Madras Railway Company,
Chief Engineer's Office,
Madras, 14th January 1890.

No. 4140/39

The Ag. Agent & Manager.

Dear Sir,

Reconstruction of Bridge at $\frac{258}{10}$ miles N. W. Line.

1. I beg to forward a plan and estimate[+] (Rs 37,763) for the reconstruction of the bridge at $\frac{258}{10}$ miles N. W. Line, which was seriously injured by the heavy floods in October last. The particulars of the damages which were reported in full to you in my letter No. 1212 of 22d. October 1889 may be briefly summarised as follows:—

2. The bridge consists of four 64 feet openings, spanned by girders continuous over 2 openings, and supported on abutments and piers of masonry, with a provision for headway of 12 feet. On the 16th October 1889 the flood rose to the unprecedented height of within one foot of girder level, and above the revetment on the slope of the approaches; it broke through the bank—chiefly pure sand—and created a scour behind the South abutment which fell over. The unsupported end of the girder then dropped bringing down with it and overturning pier No. 1 and severely shaking pier No. 2. A temporary abutment and pier, formed of timber stagings,

[+] in duplicate.

---

REGISTER No.

FILE No.

(No. 12.) 3,000—1-1-78.

MADRAS RAILWAY.

*From*

The Agent and Manager

*To*

The Consulting Engineer.
for Railways.

Ex 3 including plan & est

P.W. Lues 3
2597/90

Return straps with papers

*Dated* 21 January 1890
*Recd.* 22. 1-90
ADGS
No. 69

Forwarding plan and estimate for restoring bridge No 318 at 258th mile N. W. L.

D.C. to prepare note & put up for meeting
ADGG
22.1.90

Sanctioned as an extraordinary repair on emergency Rs 37,763

Sd C.E.S.
23-1-90

Vide Rough Minutes of 23-1-90 - page 10.

Vide letter to A M No 187 of 18/2/90

A Copy of letter No. 6140/39 of the 14th instant, from the Chief Engineer, giving the particulars of the damage which it is proposed to repair, is enclosed for your information.

I have the honor to be,
Sir,
Your most Obedt. Servt.

W Mead

for Ag. Agent and Manager

---

MADRAS RAILWAY.

*From*
The Agent and Manager.

*To*
The Consulting Engineer
for Railways.

*Dated* 188

*Recd.* No.

G.O. dated 21st March/90 No. 403/404

(No. II.)

No. E.63/69

Encl: 3

## MADRAS RAILWAY.

AGENT AND MANAGER'S OFFICE,

Madras, 21st January 1890

218

*From*

The Actg Agent and Manager.
M. R. C

*To*

The Consulting Engineer for Railways.

Sir,

With reference to the penultimate paragraph of this Office letter No. 37 dated the 16th January instant, I have the honor to forward herewith an estimate, with plan No. 298, for restoring Bridge No. 316 at 258th mile North West Line and to request that you will be so good as to give it your attention prior to the next Official meeting at which it will be brought forward for discussion

A

---

RAILWAY.

## Govt. of {1890} Madras.

## PUBLIC WORKS.

*Dated May, 22nd.*

*Recd.* *Encl.*

**G.O., 22nd May 1890, No. 709 R.**

**MAY.**

### Bridge

Sanction of the Government of India to the estimate of Rs. 38,145 for reconstructing the damaged portions of — No. 316 at mile 258 on the North-West Line of the Madras Railway, communicated to the Consulting Engineer for Railways.

(No. II.)

No. E. 63/69

Encl: 3

G.O. dated 21st March/90 No. 403/404

## MADRAS RAILWAY.

AGENT AND MANAGER'S OFFICE,

Madras, 21st January 1890

208

*From*

The Actg *Agent and Manager.*
M. R. C.

*To*

The *Consulting Engineer for Railways.*

SIR,

With reference to the penultimate paragraph of this office letter No. 37 dated the 16th January instant, I have the honor to forward herewith an estimate, with plan No. 298, for restoring Bridge No. 316 at 258th mile North West Line and to request that you will be so good as to give it your attention prior to the next Official Meeting at which it will be brought forward for discussion

A

---

22ND MAY 1890, No. 709 R., PUBLIC WORKS.

## GOVERNMENT OF MADRAS.

## PUBLIC WORKS DEPARTMENT.

### Railway.

Read again the following paper :—

G.O., dated 21st March 1890, No. 403 R., Public Works.

From the Consulting Engineer for Railways, dated Madras, 12th March 1890, No. 182.

From the Agent and Manager, Madras Railway Company, dated Madras, 21st January 1890, No. E. 63/69.

### ENCLOSURE.

From the Chief Engineer, Madras Railway Company, to the Agent and Manager, Madras Railway Company, dated Madras, 14th January 1890, No. 4140/39.

*Reconstruction of Bridge at 258-10 miles, North-West Line.*

I beg to forward a plan and estimate (in duplicate) (Rs. 37,763) for the reconstruction of the bridge at 258-10 miles, north-west line, which was seriously injured by the heavy floods in October last. The particulars of the damage which were reported in full to you in my letter No. 1212 of 22nd October 1889 may be briefly summarised as follows.

2. The bridge consists of four 64-feet openings, spanned by girders continuous over two openings, and supported on abutments and piers of masonry, with a provision for headway of 12 feet. On the 16th October 1889 the flood rose to the unprecedented height of within one foot of girder level, and above the revetment on the slope of the approaches; it broke through the bank, chiefly pure sand, and created a scour behind the south abutment which fell over. The unsupported end of the girder then dropped bringing down with it and overturning pier No. 1 and severely shaking pier No. 2. A temporary abutment and pier, formed of timber stagings, were erected on the sites of the ruined structures, the gap of 100 feet in the bank was rapidly filled up, and traffic was resumed over the bridge at restricted speed on the 20th October, or four days afterwards.

3. Owing to the flooded condition of the river a thorough examination of the cause of the failure was not practicable until the end of November, when it was found that this was due to defective foundations. Aided by a series of borings, it was discovered that the stratum of rock which crops up at the surface at the north bank slopes away to a depth of 21¼ feet. At the south bank, whereas the depths of foundations of the fallen abutment and pier were recorded at 8 feet only on "Morumboo." Pier No. 2 appears to be founded partly on rock and partly on soft morumboo, and its shaken and cracked condition renders its reconstruction from its very base imperative. Pier No. 3 and the north abutment are sound, but are not bedded uniformly on the rock; these, however, can be made secure by encasing the foundations below river bed with 3 feet of concrete as shown on the plan.

4. The removal of the débris and foundations of the fallen pier and abutment, and their reconstruction on the same sites, would involve extensive and costly coffer dams and heavy pumping; and in order to obviate the expenditure and delay which these operations would entail, it is proposed to utilize for the new piers C.I. cylinders 6 feet diameter which are available, and to rebuild the abutment of masonry founded on brick wells. It is further proposed to insert an intermediate span of 35 feet, so that the new piers may be located clear of all obstructions and built in the centre of the existing spans. A substantial dry stone flooring throughout the first span of the bridge and extending to 10 feet behind the south abutment is also provided for. This additional safeguard appears essential for the protection of this abutment.

5. The estimated cost of the work, including the temporary diversion of the line during the progress of reconstruction is Rs. 37,763, and it is requested that the sanction of Government may be obtained, as early as practicable, for the expenditure, which is wholly chargeable to Revenue.

6. A copy of the estimate has been forwarded to the Chief Auditor for the purpose of being checked and allocated, and Mr. Cramp has been requested to send on the allocation sheet to you at an early date.

7. In conclusion I desire specially to point out that, as unavoidable delay has already been incurred in the submission of the plan and estimate, it is of the utmost importance that the work should be put in hand forthwith. It is therefore hoped that immediate provisional sanction may be accorded to proceed with the temporary diversion of the line, and the collection of plant and materials for the main portion of the scheme.

---

From the Agent and Manager, Madras Railway Company, dated Madras, 8th March 1890, No. E. 63/264.

Submitted for transmission to the Government of India.

2. On 16th October 1889 very heavy floods occurred in the Gooty district by which the bridge of four 64-feet openings at 258-10, North-west line, Madras Railway, was seriously injured. The flood, after having washed away a training bund, rose to within one foot of girder bed level, broke through the embankment and created a scour behind the south abutment causing it to fall over. The unsupported end of the girder, which was a continuous one over two openings, then dropped, and brought down with it and overturned pier No. 1 and severely shook pier No. 2.

3. On examination, when the river had gone down, it was found that the cause of the failure was due to defective foundations, the pier and abutment having been founded on so called "Moorum" at a depth of 8 feet only instead of on rock which was 21¼ feet below the surface.

4. The Agent and Manager, Madras Railway, now submits an estimate (with plan), amounting to Rs. 38,145, for the reconstruction of the damaged portions of the bridge, which also includes the cost of the temporary diversion, chargeable to Revenue.

5. The Chief Engineer states "the removal of the débris and foundations of the fallen pier and abutment, and their reconstruction on the same sites, would involve extensive and costly coffer-dams, and heavy pumping; and in order to obviate the expenditure and delay which these operations would entail, it is proposed to utilise for the new piers C.I. cylinders 6 feet diameter which are available, and to rebuild the abutment of masonry founded on brick wells. It is further proposed to insert an intermediate span of 35 feet, so that the new piers may be located clear of all obstructions and built in the centre of the existing spans. A substantial dry stone flooring throughout the first span of the bridge and extending to 10 feet behind the south abutment is also provided for. This additional safeguard appears essential for the protection of this abutment."

6. The estimate is recommended for the sanction of the Government of India, but as it was indispensable that the work should be put in hand as soon as the water fell low enough to admit of it, provisional sanction was accorded for the work to be proceeded with, at the official meeting held on 23rd January 1890, in order that full advantage of the working season might be obtained, and the estimate is now forwarded for confirmation of the sanction thus given.

---

*Order*—dated 21st March 1890, No. 403 R., Public Works.

Ordered that the estimate provisionally sanctioned be forwarded for the confirmation of the Government of India.

(Here enter No. 404 R., dated 21st March 1890.)

(True Extract.)

(Signed) C. J. SMITH, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Railway Branch.

*Endorsement*—dated 21st March 1890, No. 404 R., Public Works.

Forwarded.

(By Order.)

(Signed) C. J. SMITH, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Railway Branch.

---

Read also the following paper :—

From the Under-Secretary to the Government of India, Public Works Department (Railway Construction), to the Joint Secretary to the Government of Madras, Public Works Department, Railway Branch, dated Simla, 8th May 1890, No. 408 R.C.

I am directed to acknowledge the receipt of your No. 404 R., dated 21st March 1890, and in reply to communicate the sanction of the Government of India to the estimate received therewith, amounting to Rs. 38,145, of the cost of reconstructing the damaged portions of bridge No. 316 at mile 258 on the north-western line of the Madras Railway, chargeable against Revenue.

2. In conveying this sanction I am to forward, for consideration and such action as may appear desirable, a copy of a note by the Consulting Engineer to the Government of India for State Railways pointing out the objection to the proposed adoption of wells for shallow foundations and the doubtful efficiency of the proposed flooring unless a drop wall is built on the down-stream side.

3. The sanction herein accorded has been registered as No. 1 R., Madras Railway, of 1890.

---

### Enclosure.

Note by the Consulting Engineer to the Government of India for State Railways, dated 20th April 1890, on the estimate for reconstructing the damaged portions of bridge No. 316 at mile 258 in the North-West Line, Madras Railway.

If Moorum existed within 8 feet of the surface at the old abutment it would seem to be easy to found the new abutment dry instead of using wells which I think are objectionable for shallow foundation from the difficulty of evenly bedding them on rock. I much doubt the efficiency of the flooring unless a drop wall is built on the down-stream side, and I fail to see the good of flooring *behind* the abutment. If the bank is washed away the flooring will to a certainty scour.

---

Order—dated 22nd May 1890, No. 709 R., Public Works.

Communicated to the Consulting Engineer for Railways with reference to his endorsement No. 182, dated 12th March 1890.

2. This sanction has been registered as No. 6 R. of 1890-91.

(True Extract.)

(Signed) SIDNEY SMITH, Major, R.E.,
Under-Secy. to Govt., P.W.D.,
Railway Branch.

To the Consulting Engineer for Railways.
" Examiner, Guaranteed Railway Accounts.

Exd. J. Moses.
Spare Copies