Archives I -10,006—16-8 77.

(1) Number of pages 24

(2) Date of repair Sep 86.

(3) Initials of the Referencer

TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

Public Works DEPARTMENT

G.O. No. 3901 (W)
~~B.P. No.~~
Press.
~~Mis.~~

Dated 5. 10. 1878 197

G.P

Not to be folded or roughly handled

39d/1

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

5th October 1878, No. 3,901 W.

Buildings and Roads.

Military Works.

Read the following papers :—

No. 82. From Major J. L. L. MORANT, R.E., District Engineer, Nilgiris, to the Chief Engineer, Public Works Department, dated Ootacamund, 23rd May 1878, No. 154.

IN Public Works G.O. No. 2,264, dated 26th August 1876, "a modified plan and estimate under preparation on suggestions of the Chief Engineer" (Major-General G. W. Walker, R.E.,) relating to the Waterloo Bridge at Wellington were called for. These were subsequently sanctioned in Public Works G.O. No. 140 W, dated 3rd May 1877.

2. The above-referred to suggestions of the late Chief Engineer were made after a visit by him to the site of the bridge. I ventured at the time to point out to that officer the probability of their not proving entirely satisfactory, owing to the absence of wing walls to retain the earth where it joined the abutments : and consequently I drew up two designs, one for a 60 feet, and another for a 40 feet, span bridge with return and wing walls. These I enclose marked A and B. The late Chief Engineer disapproved of them on the score of expense. I then suggested adherence to the design sanctioned in Public Works G.O. No. 3,010, dated the 18th December 1872. But the late Chief Engineer directed me to draw out a design according to his suggestions, which design was subsequently sanctioned as stated in paragraph 1.

3. This sanctioned design I have done my best to carry out satisfactorily. I have all along had my misgivings as to the success of the design, but these I have endeavored to quell and to loyally do what I was ordered. All the work is very good of its kind ; but through faultiness in the design the work has resulted, I deeply regret to say, in failure. In order to overcome the defect arising from the absence of wing walls, I built up walls of turf sods, 6 feet thick, with through courses 10 feet wide at certain intervals : the turf sods were carefully laid breaking joint, and the earth filling behind them was carried up *pari passu* in layers of 6 inches well watered and rammed : every third layer of turf was also pegged down with long wooden spikes. These walls have stood for several weeks ; but the recent heavy rains have thrown down one of the walls, and I fear there is every probability of two of the remaining three also subsiding. The absence of wing walls has also affected the abutments which about two months ago cracked horizontally from the pressure of the earth filling behind them. These cracks which are all quite horizontal have been very slight.

4. To avoid further immediate loss to the bridge, I have placed struts as shown in plan marked "C." I have removed the earth at the back of the abutments and propose completing the bridge as shown in the same plan. The single water-way of 40 feet is sufficient for the drainage area. The two additional spans will do away with the necessity of lofty wing walls, which I have ascertained will be more expensive than the proposed arrangement.

5. I submit a supplemental estimate, amounting to Rupees 9,400, for sanction and provision of funds.

No. 82-A *Note by Chief Engineer, Public Works Department.*

THE design originally sanctioned for the Waterloo bridge at Wellington was for a bridge of three arches, and this was undoubtedly the proper design for the site. This bridge, owing to bad workmanship, failed before it was completed, and since that time the traffic on the road has been interrupted.

See G.O., No. 864, dated 12th April 1859.

2. The reconstruction of the bridge with timber superstructure in three spans was proposed in 1868, and the estimate amounted to Rupees 16,280, but for want of funds the work was not undertaken.

3. The estimate of Rupees 9,350 sanctioned in 1877 was for a wooden truss bridge of one span. The plan was prepared in accordance with the directions of General Walker, late Chief Engineer. One span is sufficient for the water likely to pass under the bridge, and as the object was to reduce the cost as much as possible, the approach on either side had only steep turfed slopes instead of masonry wing walls. Although great care was taken in forming the approaches, they have been so much damaged by the heavy rain of this year that communication is again interrupted.

4. The supplemental estimate of Rupees 9,400 now forwarded is for completing the bridge somewhat according to the plan prepared in 1868, that is, for adding a span on each side partially removing present approaches, the roadway to be carried by wooden trusses as over the centre span. This estimate added to the one sanctioned last year brings the cost of the bridge to Rupees ~~18,750~~ against Rupees 16,280, the amount estimated in 1868.

5. An attempt has been made to build the bridge at a greatly reduced cost, but it has not succeeded.

17th July 1878.

(Signed) E. A. FOORD, Colonel, R.E.,
Chief Engineer, P.W.D.

No. 83. ORDER THEREON, 5th October 1878, No. 3,901 W.

THE supplemental estimate, amounting to Rupees 9,400, for completing the Waterloo Bridge at Wellington is sanctioned, and funds are appropriated from the Military Reserve.

2. This sanction has been registered as Imperial No. 91 B of 1878-79.

(True Extract.)

(Signed) E. A. FOORD, Colonel, R.E.,
Secretary to Govt., P.W.D.

(True Copy.)

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

To the District Engineer, Nilgiris, with three plans.
,, Examiner of Public Works Accounts.
,, Military Department.

Exd. E. C. Shunker.
Spare Copies

BUILDINGS AND ROADS.
MILITARY WORKS.

Govt. of [1878] Madras.

PUBLIC WORKS.

To

THE DISTRICT ENGINEER,
NILGIRIS,
&c., &c., &c.

Dated October 5th.

Issued

Recd.

Encl.

G. O., 5th October 1878, No. 3,901 W.

OCTOBER.
Nos. 32-33.

Waterloo Bridge, Wellington, Nilgiris.—The supplemental estimate, amounting to Rupees 9,400, for completing the — sanctioned.

3901/3

Letter from the District Engineer Nilgiris No 154 dated 23rd May 1878.

Notes by Chief Engineer P.W.D.

~~FOR ORDERS~~

The design originally sanctioned for the Waterloo bridge at Wellington was for a bridge of three arches and this was undoubtedly the proper design for the site. This Bridge owing to bad workmanship failed before it was completed, and since that time the traffic on the road has been interrupted. The reconstruction of

e G. O. No 864 of 12th April/59.

The thing has been a muddle from first to last. Now we are landed in increased Expend. & sad loss of money on a patch work project. I fear there is no alternative the bridge with timber superstructure in three spans was proposed in 1868, and the estimate amounted to Rupees 16280, but for want of funds the work was not undertaken.

The estimate of Rupees 9350 sanctioned in 1877 was for a wooden truss bridge of one span. The plan was prepared in accordance with the directions of General Walker, late Chief Engineer. One span is sufficient for the water likely to pass under the bridge, and as the object was to reduce the cost as much as possible,

but to spend Rs. 9400 more in order to prevent Rs. 9350 from being utterly wasted. Where the money is to come from I do not know.

It is a pity that Major Moran did not bring his doubts to the notice of Govt. somewhat sooner.

9.7.78

I am unable to pass this unsatisfactory estimate — the abutments cracked horizontally 2 months ago (before therefore weather pressure occurred) but the Chief Engineer's note

A fails to convey the assurance that those cracks are immaterial or that the plans which he, I conceive, endorses will prove satisfactory. Was he aware of the Executive engineer's views giving already too much realized? Was he aware that cracks had shown themselves 2 mos. ago in the abutment? Has he carefully exam.d the work?

24/7

Government has evidently been misled, & ought, I think, to be furnished with a full explanation as to the cause of failure — It would, I think, be worth while to spend the additional Rupees 9400 if there was a guarantee that a lasting bridge would be the result — but I must say I see nothing in these papers to secure anything

the approach on either side had only steep turfed slopes instead of masonry wing walls. Although great care was taken in forming the approaches, they have been so much damaged by the heavy rain of this year that communication is again interrupted.

The supplemental estimate of Rupees 9400 now forwarded is for completing the bridge somewhat according to the plan prepared in 1868, that is, for adding a span on each side partially removing present approaches, the roadway to be carried by wooden trusses at over the centre span. This estimate added to the one sanctioned last year brings the cost of the bridge to Rupees 18,750 against Rupees 16,280, the amount estimated in 1868.

An attempt has been made to build the bridge at a greatly reduced cost but it has not succeeded.

E A Wood Col: R.E.
Chief Engineer P.W.D.
~~& Secy to Govt~~

17th July 1878.

Ent 17-7-78. Rptd 13-8-78.
[illegible] Sheet 08 May

FOR ORDERS.

3901 W

the Minute —
Most certainly I should have been helped towards the spending of Rs 9350 on the result now attained, had there been more of misgivings on the part of the Engineer —
The questions asked by Sir William Robinson might be answered —
[illegible] 26/7.

Yes
Not a rupee to be spent until the fullest information respecting this [illegible] District Engineer still is before Govt.
[illegible] 31/7

District Engineer's Office
Ootacamund 23rd May 1878

No 154

39d
1/5

From
The District Engineer
Nilgiris

To
The Chief Engineer
Public Works Department
Madras.

Sir

In Public Works G.O. No 2264 dated 26th August 1876 "A modified plan and Estimate under preparation on suggestions of the "Chief Engineer" (Major General G. W. Walker R.E.) relating to the Waterloo Bridge at Wellington were called for. These were subsequently sanctioned in Public Works G.O. No 140 W dated 3rd May 1877.

2. The above referred to suggestions

of the late Chief Engineer were made after a visit by him to the site of the Bridge. I ventured at the time to point out to that Officer the probability of their not proving entirely satisfactory, owing to the absence of wing walls to retain the earth where it joined the abutments: and consequently I drew up two designs – one for a 60 feet and another for a 40 feet span bridge – with return and wing walls. These I enclose marked A and B. The late Chief Engineer disapproved of them on the score of expense. I then suggested adherence to the design sanctioned in P. W. G. O. No 3010 dated the 18th December 1872. But the late Chief Engineer directed me to draw out a design according to his suggestions, which design was subsequently sanctioned as stated in para one. 390/6

3. This sanctioned design I have done my best to carry out satisfactorily. I have all along had my misgivings as to the success of the design but these I have endeavoured to quell and to loyally do what I was ordered. All the work is very good of its kind. But through faultiness in the design the work has resulted, I deeply regret to say, in failure. In order to overcome the defect arising from the absence of wing walls, I built up walls of turf sods 6 feet thick

with through courses 10 feet wide at certain intervals: the turf or sods were carefully laid breaking joint, and the earth filling behind them was carried up pari passu in layers of 6 inches well watered and rammed: every 3rd layer of turf was also pegged down with long wooden spikes. These walls have stood for several weeks. But the recent heavy rains have thrown down one of the walls, and I fear there is every probability of two of the remaining 3 also subsiding. The absence of wing walls has also affected the abutments which about two months ago cracked horizontally from the pressure of the earth-filling behind them.

These cracks which are all quite horizontal have been very slight.

4. To avoid further immediate loss to the bridge I have placed struts as shown in plan marked "C". I have removed the earth at the back of the abutments and propose completing the bridge as shown in the same plan . The single water way of 40 feet is sufficient for the drainage area. The two additional spans will do away with the necessity of lofty wing-walls, which I have ascertained will be more expensive than the proposed arrangement.

5. I submit a supplemental estimate amounting to Rs 9400

for sanction and provision of funds.

I have the honor to be
Sir
Your most obedient Servt

J. L. Morant Major R.E.
District Engineer

G.O. No 1161 of 20th May/77
" — 2264 " 26 augt/76
" — 94 — " 12 Septr/74
" — 232 — " 24 Jany/72
" — 1596 — " 19 May/68
" — 641 " 28 Feb — "
" 864 — 12 April 1869
" 407 — " 18 Feb — "
C.E. 146 - 11-10-72.
G.O. 2010 - 18-12-72.
— 2792 - 23-12-58.

P. G. 1878 Dec

Roads and Buildings

No. 5971 -

From

The District Engineer
Nilgiris

To

The Chief Engineer
P. W. Departt
Madras

No 134

Dated 23rd May 1878

No. of Enclosures 2 + 3 Plans

Waterloo bridge at Wellington – Submits a supplemental Estimate with plans, the former amounting to Rs 9400 – for additions to.

Recd 18-9-78 J.W.L. 3.10.78
Recd 23-8-78 J.W.L 17-9-78
To Acty 3-6-78 Rtd 7-10-78.
Cir 17-7-78 Rtd 13-8-78
Ol. Sheet 68 May.

P. W. D.

3901/9

X it may be put in estimates for next year – but cannot be dealt with this year

M 2/6

If the Ch: Engr. is perfectly satisfied as to the proposed expedient meeting satisfactorily & permanently the requirements of the case. I think the work had better go on if he can find funds

Provincial cannot provide any addl. grant I fear

26.8.78

J.W.L. 27/8.

X

Memo:

With reference to the remarks of the Members of Government, the Chief Engineer has the honor to state that he did not notice the crack in the abutments of the bridge in his former Memorandum because, having himself inspected the bridge, he did not consider the crack of sufficient importance, nor did he think it likely in any way to affect the stability of the bridge if completed in the manner proposed. The crack could not readily be seen even when there was the pressure of earth behind the abutments. Now that the pressure has been removed the crack has ~~now~~ ~~nearly~~ to all intents and purposes closed. It is not likely that the Chief Engineer would have recommended additions to a bridge the abutments of which were not sound.

The bridge which gave way at this site was a brick bridge of three arches. It is nearly twenty years since the failure took place, and there is not any one now in the Department who was connected with that failure. The bridge was a Contract work.

The bridge built by Major Morant during the last twelve months has not given way. The

masonry abutments and timber superstructure are sound and uninjured. But it has been found necessary to remove the earthen approaches or a portion of them. It is now proposed to have an additional opening on each side instead of the solid approaches, but the abutments (or more properly piers as there are no wing walls), and wood work already erected will without alteration, or repair, form part of the new design.

With reference to Sir W. Robinson's remark that the abutments cracked before there was any weather pressure, the Chief Engineer has only to state that on the 27th of April there was a fall of rain at Wellington of 6 inches in twelve hours.

Hon W. Hudleston
Hon Sir W. Robinson KCSI
His Grace the Governor

E A Ford Col: R.E.
Chief Engr. & Secy. to Govt.
P.W.D.

23rd Augt. 1878.

Nilgiris

G.O. No 3901 W – 5-10-78

Recd 18.9.78 Retd 3.10.78
Recd 23.8.78. Retd 18.9.78
[illegible] O.L. Shrub 28 Augt

B & R
Mily works
Public Works Department.

No 3901 W

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 5 Oct/78.

3901/11

Read the following :—

From the Dt Engr Nilgiris (H.R. No 154 d/ 23d May/78)
Note by the Ch Engr P.W.D. (— 17 July/78)

The supplemental estimate amounting to Rs 9400 for completing the Waterloo Bridge at Wellington is sanctioned and funds are appropriated from the Military Reserve

This sanction has been registered as Imperial No. 91 B of 1878.79 EAF 18/9

With reference [illegible] remarks on the [illegible] [illegible] on the [illegible] Chief Engineer [illegible] that funds are now available
EAF

D.E. Nilgiris with 3 plans.
Ex. [illegible] with 1 Estimate } in 3 despd. 5/10/78.
Mily Dept

Despd 22-10-78

~~[illegible]~~

this piece the foremen

(3)

Watkin Grandfe.

Print Sewing 3/10

[illegible] Com.

[illegible] 7-10

It is supposed that this
since the foreman has approx. c. 10
[illegible] this vote notes on
[illegible] R 3/10

[illegible] 5

desp 5/18

Cir 18/9/78 Rept 3.10.78
O.L. Sheet 68 May ~~Aug~~ 1

5771

Govt. of {1878} Madras.

PUBLIC WORKS.

To

Dated

Issued

Recd. Encl.

G. O., 5th Octr. 1878, No. 3901 W.

Nos. 82-83.

Waterloo Bridge Ketting tow, Nilgris

The supplemental estimate amounting to Rs 9400 for completing the — sanctioned.