M.R.O. 1—77,006—8-6-57.

(1) Number of pages 8

(2) Date of repair 30. 5. 60

(3) Initials of the Referencer

MADRAS RECORD OFFICE.

Government of Madras.

Financial DEPARTMENT.

G.O. No. 812	Press / ~~Mis.~~
106-107.	
Dated 11—5—	1874.

9/10

Not to be folded or roughly handled

Proceedings of the Madras Government, Financial Department,
11th May 1874.

No. 106. Read the following Proceedings of Government in the Public Works Department, dated 4th March 1874, No. 561 :—

ABSTRACT.—Communicating to the Financial Department a letter from Lieutenant-Colonel W. T. F. Farewell, Inspecting Engineer for Ports and Communications, dated 3rd February 1874, No. 353-49, reporting on the design for the Cortelliar bridge.

No. 107. ORDER THEREON, 11th May 1874, No. 812.

The Government are satisfied that an iron bridge will be the more satisfactory under the circumstances though the more expensive.

2. With reference to Colonel Farewell's concluding suggestions, the District Engineer will be directed in the Public Works Department to furnish the President of the Local Fund Board with a draft form of advertisement for tenders to take up the work on contract, for insertion in the local papers, and with a specification of the articles regarding which it is proposed to ascertain the terms on which they could be supplied by the Store Department at Home.

3. An application for an increased loan can be submitted when the estimated cost of the bridge has been finally determined.

(True Extract.)

D. F. CARMICHAEL,
Acting Chief Secretary.

To the Board of Revenue, with No. 561.
,, Public Works Department.

Exd. J. H. Burns.

Proceedings of the Madras Government, Public Works Department, 4th March 1874.

No. 85. Read the following letter from Lieutenant-Colonel W. FAREWELL, Inspecting Engineer for Ports and Communications, to Colonel G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Camp at Coimbatore, 3rd February 1874, No. 535-49 :—

WITH reference to G. O. in the Public Works Department, No. 2,125, dated the 25th of August 1873, having inspected the site, and the work already completed, of the Cortelliar bridge, situated at the 17th mile from Madras on the Great Northern Road in the Chingleput District, I have the honour to report that I cannot approve of the design submitted for constructing this bridge of masonry elliptical arches of 50 feet span, the piers at the springings of the arches being below the minimum safe width practically fixed, and the arches too slight; thus if masonry elliptical arches of the correct thickness, etc., etc., are to be constructed, it will be necessary to demolish the present piers, which have been built with a batter of one inch to a foot, and rebuild them straight up with a width of 8 feet at the springing lines of the arches, the estimate for this bridge would then amount to Rupees 1,89,552, including special superintendence, *i.e.*, an Assistant Engineer and his establishment for two years, and after deducting the value of work already executed, the balance required to complete the structure amounts to Rupees 1,21,475.

1 Statement marked A.
2 Original Estimates.
2 Revised Estimates.
2 Comparative Statements.
3 Original Plans.
2 Revised Plans.

2. Should it be determined that the present piers remain as they are, and a masonry bridge still be constructed, the only safe form the arches could, I think, take is that of semi-circular ones; the cost of such a bridge, including superintendence, etc., etc., as above would amount to Rupees 1,93,816, or deducting work done, the balance required would be Rupees 1,25,739.

3. In my opinion the chief objection to completing this bridge with masonry arches of any description of the span designed is, that I consider the foundations as constructed to be insufficiently reliable to bear the superincumbent weight of such a structure, which would be somewhere about 27,000 tons; the wells below the foundations, as estimated for, have been built of brick and mud, and are said to be sunk 8 feet, till they reached blue clay; though in former days wells of brick and mud sunk to about 12 feet were extensively used for foundations, in the present day none but wells built with the best hydraulic mortar and filled with hydraulic concrete are thought suitable for foundations of bridge piers, etc., etc.; and it would not be deemed satisfactory merely to sink even such wells till they reached blue clay but necessary to continue sinking them until a good stiff substratum in the clay is met with, while the thickness of the layer, of which in the case under notice there appears to be no record, would be carefully ascertained, etc., etc.,; thus as the conditions of the existing foundations are such as to render the permanency of masonry arches constructed thereon very problematical, I can but recommend their abandonment, and that the Cortelliar river be spanned with an iron superstructure, the weight of which, masonry and all, will not amount to half of that of the masonry arches.

Govt. of Madras
FINANCIAL.
To
THE BOARD OF REVENUE,
&c., &c.,
Dated May, 11th.
Read.
G.O., 11th May 1874, No. 812.
MAY.
Nos. 106-107.
Cortelliar Bridge.—The opinion expressed t
an iron bridge will be the more satisfactory un
the circumstances, though the more expens
The District Engineer ordered to be directed
the Public Works Department to furnish
President of the Local Fund Board with a d
form of advertisement for tenders to take up
work on contract, &c., and the President informa
that an application for an increased loan can
submitted when the estimated cost of the bri
has been finally determined.

4. I have obtained from the Superintendent of the Public Works Workshops a revised abstract estimate for the requisite iron girders, etc., etc., at the rates now said to exist, including superintendence, etc.—

	Rs.
It amounts to	1,45,425
To which is to be added work done	68,077
Building piers, etc., etc., full height	25,642
	2,39,144

Taking the mean cost of the masonry arches noticed in paragraphs 1 and 2 to be Rupees 1,91,684, the iron bridge would exceed the cost of a masonry bridge by Rupees 47,460, but for the reasons given I hardly think it is fair to compare the estimated cost of a work that would in all probability be destroyed with that of one which is likely to be a useful and lasting structure.

5. I believe but little is known regarding the real durability of iron girder bridges, the fact being that they have not been in general use a sufficient time to allow of any true data being framed on the subject. There can be no doubt, however, that their durability is very materially influenced by their locality; for instance, when close to the sea, oxidation is accelerated, etc., etc., etc., ; the site of the Cortelliar bridge, however, is so far inland that I do not apprehend the iron being affected by the sea air, and from the fact that the bridge is one over which much traffic must pass it will be kept in a constant state of vibration, which, according to the best authorities, will tend greatly to preserve it from oxidation, and if well painted and cared for I see no reason to doubt its durability to such an extent at all events as to render it a paying structure.

6. Taking the Traffic Return marked A. enclosed, to be nearly correct, and the average tolls for carts laden and unladen to be 4 annas each, horses at 2 annas each, and all other cattle at 6 pie each in round numbers, the bridge would earn over 50,000 Rupees per annum, and while paying 5 per cent. on the capital sunk to build it would in addition make good that capital in six or seven years.

7. Lastly, I cannot but think that the estimate supplied by the Superintendent of the Public Works Workshops is excessive. I would therefore respectfully recommend that, should the Government decide the question in favour of an iron superstructure for the Cortelliar bridge, tenders should be sought by advertisement for the work being taken up on contract, or that steps be taken to ascertain from the Store Department at Home at what rate they would be prepared to supply the girders, etc., including freight to India; and I would further suggest that it might be more economical in the end to use Mallet's buckled iron plates for flooring in lieu of teakwood, as contemplated in the estimate submitted by the Superintendent of the Public Works Workshops.

P. S.—The enclosures noted below, received with G. O., No. 2,125, dated 25th of August 1873, are herewith returned:—

2 Original Estimates.
2 Revised Estimates.
2 Comparative Statements.
3 Original Plans.
2 Revised Plans.

Proceedings of the Madras Government, Public Works Department, 4th March 1874.

No. 86. ORDER THEREON, 4th March 1874, No. 561.

CIVIL WORKS, No. 7.

COMMUNICATED to Financial Department in continuation of G. O., No. 2,125, dated 25th August 1873.

(True Extract.)

Colonel, R.E.,
Secretary to Government.

To the Financial Department. North twelve Enclosures
,, Inspecting Engineer for Communications.

Exd. S. T. Austin.

10 Spare Copies

Rec. 30 August 1873. No. 113-14.

Fwd. 1874 Dept.

Govt. of {1874} Madras.

PUBLIC WORKS.

To

THE FINANCIAL DEPARTMENT,

&c., &c., &c.

Dated March 4th.

Recd. — 7 Encl. 12

G. O., 4th March 1874, No. 561.

10 L C.

MARCH.

Nos. 85-86

No 529

~~Cortelliar Bridge~~.—Letter from the Inspecting Engineer for Ports and Communications reporting on the design for the bridge, communicated to the Financial Department.

C 30-3-74.
R 31 — —
C 31 — —

For Orders

45

Under the circumstances an Iron Bridge - Cheltenham & Cornice - is the only structure to recommend. Under this head will be highly remunerative. Once this is established there will be no difficulty in getting an additional one.

I would write immediately to the Secretary - and also advertise here. At the same time I would ascertain the rate of interest

The Chingleput Local Fund Board obtained some time ago a loan of Rs 105,420 for the construction of an iron girder bridge across the Cortellier.

The District Engineer, Colonel Lushington, thought an iron bridge would take longer to build and be less enduring as well as more expensive than a masonry structure. The Local Fund Board agreed and requested the sanction of Govt to the change. The P. W. Dept. it was pointed out that some of the District Engineers objections were not well founded and that in fact the subject had been very imperfectly discussed by him. The Inspecting Engineer for Communications was then called on to report fully on the subject.

This he has now done and his report has been transmitted to the Financial Department for disposal.

Colonel Farewell condemns the District Engineers plan for a masonry structure on its

own merits, and as he also states that the conditions of the existing foundations are such as to render very problematical the permanency of masonry arches constructed thereon, he recommends the adoption of an iron superstructure as originally proposed, seeing no reason to doubt its durability to such an extent as all events as to render it a paying ~~super~~ structure.

According to a revised estimate from the Superintendent of Public Works Workshops the cost at present rates (including superintendence) of the iron girders would be - Rs 145,425
Work done 68,077
Building piers & pillars &c 25,642
Total Cost 239,144

In conclusion Colonel Farewell remarks that he considers the Workshop estimate excessive and ~~suggesting~~ suggests advertising for tenders for contract work, or ascertaining cost of supply of the Walls when should be carefully Examined in any & Every case at the Chief Engr can decide.

It seems ludicrous to charge the a Workshop - to Estimate that we cannot afford to get it.

L. D. S.

31. 3.

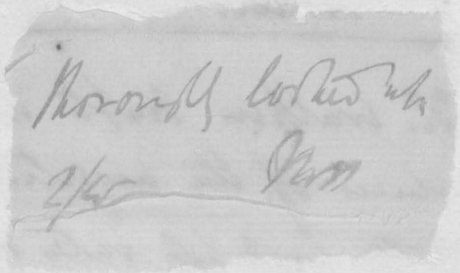
It must have an iron bridge (if any) and I suppose the carriage will be got

55

In the Public Works Workshop orders

C.R. Walker doubts the correctness of the assertion that the workshop rates are high - It is therefore proposed to await the result of the advertisements and the Enquiries at home -

There is a consensus of opinion to the subject and Trial Boring at the whole Road



From the Home & Colonial Department.

Can further inquiry be made whether it might be more economical in the end to have Nickeled iron plates for flooring in lieu of teak-wood as now proposed

With reference to the latter it may be remarked that when the Canada Board proposed using iron plates the Superintendent of the Workshops remarked that it would be like flooring a bridge with sleepers: probably better than teak on the cross-beams however.

J.L.

28/3

8/12
For the Board
& Robinson
Orders
5/45

The Workshop prices can be compared with the tenders prices when received

J2

The whole should not be sent again

J2

2 Dispatch
Jas
J2
£117-

& at what extra cost,

& apply prices additional loan—

I quite agree with you in regard to the Workshops.

What is at present up for, if not for works such as this?

What does it cost us, and would it not be better to work & construct in all cases?

J2

Clearly the iron bridge is the best and adopted should the revised loan which is applied for.

If the Govt. should adhere to their present decision and refuse any loan at any rate for the purpose of the Railway - in regard to the foundation of the Bridge at Colombo - it will be necessary that a Committee of Engineers should be appointed to examine the whole subject of the means of communication between the Fort and Pettah - Should it be a great central Factory at which all Work could be executed more economically and speedily than at present - I does not follow that Contracts should be made to do - the present doing away with the necessity of Administration can make no difference -

21/4 The Board of Works with Mr's Department

Why are the Work Shops wanted by the Work Shops Committee? Mr

Read Min of Govt in the Exec Dep. 4 May 74. No 86.

Order

By Actg 1st May 74. No 81

The Govt are satisfied that an iron bridge will be the most satisfactory ~~as~~ in the circumstances though the most expensive.

With reference to Colonel Farrells concluding suggestions the Director Engineer will be directed in the public Works Department to furnish the President of the Local Fund Board with a draft form of advertisement for tenders to take up the work on contract, for insertion in the Local papers, and with a specification of the articles regarding which it is proposed to ascertain the terms on which they could be supplied by the Store Department at Home.

An application for an increased loan can be submitted when the estimated cost of the bridge has been finally determined.

With reference to the Hon'ble [illegible] remarks it is submitted that [illegible] are only condemned as unsuitable for a [illegible] structure. They were quite well adapted for the purpose for which they were originally intended. The timbers recovered can be compared with the new with their price.

23. 4. 74

12 Enclosures from Govt Dept
20 July 1874

Govt. of {1874} Madras.

Financial

To

The Board of Revenue.

Len

Progt sent to Govt
28-5-74

G.O. May. 11 , 187 , No. 812.

Nos. 106. 107.

Cost of the bridge has been finally determined -

Cortelliar Bridge. The opinion expressed that an iron bridge will be the more satisfactory under the circumstances though the more expensive. The H. Engr. ordered to be directed in the P. W. Dept: to furnish the Presd. of the L. F. Bd. with a draft form of advertisement for tenders to take up the work on contract &c. & the Presd. informed that an application for an increased loan can be submitted when the Estimated