(1) பக்கங்களின் எண்ணிக்கை 18

(2) புதுக்கித் திருப்பிய நாள் 12/89

(3) ஆதாரங்குறிப்பவர் சுருக்கொப்பம்

தமிழ்நாடு ஆவணக் காப்பகம்.

49

தமிழ்நாடு அரசு

PWD துறை

அரசாணை எண்.	அச்சகம்
மு. கோப்புத் தாள் எண். 1141	பலவகை
நாள் : 29.4.1889	19 .

மடிக்கவோ கண்டபடி கையாளவோ கூடாது

8 sheets + 1 = 9

ஆவண. எ-1—18,006—15-6-87.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

General.
Account.

READ—the following papers :—

From Colonel H. M. VIBART, R.E., Superintending Engineer, V Circle, to the Chief Engineer, Public Works Department, dated Chepâk, 17th August 1888, No. 2208.

I have the honor to forward the plan s, &c., for the iron girders for the Gadilam bridge, South Arcot—

1 Tracing sheet, No. 2.
1 do. No. 3.
1 do. General elevation of two spans and section.
1 Sheet of calculation (19 pages).

2. I understand that you considered it would be desirable to have the piers 7 feet thick without batter, instead of 8′ 6″ at bottom and 6 feet at top. The span will then be 61 feet in the clear instead of 62.

3. Although these plans, &c., are to be forwarded to England, so that the iron work may be obtained from Home, Mr. Peters informs me that you considered girders of the same pattern as the "type designs" would be far preferable, as all the members being connected by pins there would be no riveting to be done in this country.

4. The width of roadway allowed in the type designs is only 14 feet, whereas it will be necessary to arrange for obtaining girders which will carry a roadway of 18 feet width.

5. It is more than probable that the design herewith forwarded will be revised in England, so it was not considered necessary to alter the original drawings which are intended for a clear span of 62 feet.

6. In ordering the girders, &c., the following points should be noted—

(1) There are to be 13 spans of 61 feet clear.
(2) The width of roadway is to be 18 feet.
(3) All the members of the girders to be connected by pins to avoid riveting in this country.
(4) Floor to be carried on buckle plates instead of planking.

7. Mr. Martin took the live-load on the bridge at 100 lb. per square foot. In the type design it is taken at 120 lb.

8. In the design sent up by Mr. Martin, buckle plates are allowed for an average thickness of gravel ·63 foot. In the type designs planking is allowed with several inches thickness of gravel. It is thought that the buckle plates will be more lasting than the planking.

9. Mr. Martin's calculations of the girders accompany the plans which have not been altered except the small scale elevation and section of two bays which show the slight alteration proposed in the design.

10. It would be as well if the iron work was to reach this country in January. The cost of it could then readily be adjusted before the close of this official year.

ENCLOSURE.

From C. J. PETERS, Esq., Executive Engineer, in charge of Ponniár and Gadilam bridges, to the Superintending Engineer, V Circle, dated Cuddalore, 12th August 1888.

In accordance with the Chief Engineer's instructions, I have the honor to forward herewith the plans for the iron girders for the Gadilam bridge.

2. The Chief Engineer considered that the following alterations should be made in the design :—

The piers to be vertical and 7 feet thick from bottom to top instead of 8′ 6″ at bottom and 6 feet at top.

The span to be 61 feet clear instead of 62.

3. Although these plans are to be forwarded to England with the indent for the girders, it was considered that girders of the same pattern as the "type designs" would be far preferable, as all the members being connected by pins there would be no riveting to be done in this country.

4. As, however, none of the type designs have a greater width of roadway than 14 feet, it will be necessary to work out girders for a clear width of roadway of 18 feet.

5. As in any case it is probable that the design herewith forwarded will be revised in England, it was not considered necessary to alter the original drawings which are intended for a clear span of 62 feet.

6. Briefly the following are the main points to be noted in ordering the girders :—

(1) There are to be 13 spans of 61 feet clear.
(2) Width of roadway 18 feet clear.
(3) All the members of the girders to be connected by pins to avoid riveting at the site.
(4) Floor to be carried on buckle plates instead of planking.

7. I observe that Mr. Martin takes the live-load on the bridge to be 100 lb. per square foot. I think in the type designs it is taken as 120 lb.

8. As regards the dead-load, the buckle plates may make a slight difference and Mr. Martin allows for ·63 thickness of gravel which amounts to about 80 lb. per square foot. I do not recollect what the weight allowed for gravel, &c., is in the type designs.

9. Mr. Martin's calculations of the girders accompany the plans which have not been altered except the small scale elevation and section of two bays which show the alterations in the design.

Office note from the Examiner, Public Works Accounts, dated Madras, 27th September 1888, No. 2325.

With reference to the accompanying letter No. 2433 A, dated 6th September 1888, from the Superintending Engineer, V Circle, forwarded to the Chief Engineer, Public Works Department, through me with an indent in triplicate for a wrought iron lattice girder bridge for the Gadilam river, I have to observe that the value of the bridge is not stated and I am unable to furnish the certificate prescribed by Code appendix G, para. 16.

2. In the note from the Chief Engineer, Public Works Department, No. 292 D, dated 8th June 1888, printed with Proceedings communicated with G.O., No. 2157 W., dated 16th July 1888, it is stated that exclusive of any payment to be made in England for iron works, a sum of Rs. 30,000 for each bridge will probably suffice, that is, Rs. 60,000 for the two bridges over the Gadilam and Ponniár rivers.

3. Arrangements are now being made to place a grant of Rs. 1,15,000 from Local Funds at the disposal of this department for the two bridges.

4. Please therefore inform me how much of the grant may be considered as set apart to meet the expenditure in England on account of this indent.

ENCLOSURE.

From Colonel H. M. VIBART, R.E., Superintending Engineer, V Circle, to the Chief Engineer, Public Works Department (through the Examiner of Public Works Accounts), dated Bangalore, 6th September 1888, No. 2433 A.

With reference to your memorandum No. 580 D., dated 27th August 1888, I have the honor to forward an indent (in triplicate) for a wrought iron lattice girder bridge for the Gadilam river in Cuddalore.

1141

ORDER—dated 6th October 1888, No. 3131 W., Public Works.

Ordered that the indent be transmitted to the India office for compliance with request that the cost of the bridge work be intimated to this Government in view to the requisite funds being set apart for payment.

(Here enter No. 3132 W., dated 6th October 1888.)

(True Extract.)

(Signed) J. O. HASTED, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintending Engineer, V Circle.
" Examiner, Public Works Accounts.
" Local and Municipal Department.

LETTER—to the Director-General of Stores, India Office, London, dated Ootacamund, 6th October 1888, No. 3132 W.

I am directed to forward herewith an indent, in duplicate, for the iron work required for the Gadilam bridge in the South Arcot district.

2. The indent is accompanied by three tracings and a sheet of calculations. Tracing No. I shows the general elevation of two spans of the bridge, with cross section, and it is proposed to build the bridge in accordance with the modifications of the design here given. The other plans * are forwarded unaltered, as it is probable that they will be revised in the India office ; but I am to request that the iron work may be prepared so as to allow for thirteen spans of 61 feet clear, the piers being 7 feet thick as shown in plan No. I.

* Nos. II and III.

3. The girders should be of the same pattern as those shown in the "type designs," all the members being connected by pins, so that there would be no riveting to be done in this country.

4. The width of roadway allowed in the type design is 14 feet, but the girders now indented for are intended to carry a roadway of 18 feet width. The floor is to be carried on buckle plates instead of planking, and the live-load is to be taken at 120 lb. per square foot as in the type design.

5. It is desired that the iron work should, if possible, reach this country by January, and that meanwhile the probable cost of the bridge work be intimated to this Government in view to the requisite budget provision being made to meet it.

(Here enter No. 3133 W., dated 6th October 1888.)

(Signed) J. O. HASTED, Colonel, R.E.,
Secretary to Govt., P.W.D.

ENDORSEMENT—dated 6th October 1888, No. 3133 W., Public Works.

Copy of the above, with copy of indent, forwarded to the Government of India for information.

(Signed) J. O. HASTED, Colonel, R.E.,
Secretary to Govt., P.W.D.

Exd. J. Henricus.
Spare Copies

2

GENERAL.
ACCOUNT.

Govt. of {1888} Madras.

PUBLIC WORKS.

Dated October, 6th.

Recd. *Encl.*

G.O., 6th Oct. 1888, Nos. 3131, 3132, 3133 W.

OCTOBER.

Gadilam Bridge, South Arcot District

Forwarding copy of indent for iron work required for the —.

1141

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

READ—the following papers:—

From A. A. JOPP, Esq., Director-General of Stores, to the Secretary to the Government of Madras, Public Works Department, dated India Office, Whitehall, S.W., 16th November 1888, No. S. 14734.

With reference to your letter, No. 3132, of 6th October 1888, transmitting an indent for iron work for the Gadilam bridge, South Arcot, I have the honor to forward a copy of a report on the subject by the Consulting Engineer to this office.

2. You will observe that Sir A. Rendel prefers the design sent home from Madras to the type design referred to in your letter, and that, in his opinion, the latter cannot be adopted as it stands for this bridge.

3. Fresh designs have therefore been prepared, based on both the above plans, and they are sent herewith for your consideration. The estimated cost per span of each design, including freight, is given in the enclosed report, from which it will be seen that the total estimated cost of the 13 spans (including freight) is —

	£	s.	d.
For type design	8,482	10	0
For rivetted design	6,298	10	0

4. I suggest that your decision as to the type of bridge to be supplied be communicated by telegraph.

5. I may add that it would not, in any event, have been possible for the iron work to arrive at Madras by January next.

—

ENCLOSURE.

REPORT by Sir A. M. RENDEL, Consulting Engineer, India Office, dated 16th November 1888.

I very much prefer the design sent home to the type design for 60 feet and 70 feet spans. The only justification for adopting the type, in my opinion, would be the impossibility of obtaining riveters in the part of India to which the girders are to be sent. I should doubt its being more difficult to get them anywhere than to get the class of men required to properly erect the type girders. As to the supposed superiority of pins over rivets, I have more failures of pinned girders than of rivetted girders. For instance, pinned girders sent out for the East Indian Railway 35 years ago are now being re-placed by rivetted girders in consequence of the deterioration of the pins by rust.

2. In respect to the roadway, under the circumstances of this case, I agree with the opinions expressed in India that a wrought iron flooring covered with from 6 to 9 inches of gravel on it is to be preferred to the timber planking with a thin coating of gravel and asphalte shown in the type designs for 60 and 70 feet spans. But such a roadway is much heavier than that of the type design, and would add materially to the quantity of material in the girders.

3

3. We cannot adopt the type design as it stands for many reasons. For instance, the girders required are about 65 feet centre to centre, the nearest type is 60 feet. The type roadway is 14 feet wide. The roadway asked for is 18 feet wide, and is not only wider but as I have said much heavier per square foot. A new design is therefore necessary in any case.

4. I have prepared two designs, which I think should be considered in India before we order the work. One is based on the type, the other on the design sent home, the roadways being similar in width and character in each case. The essential difference is that the type design will be put together in India with pins and bolts and nuts, the other with rivets.

5. The weight of the type design will be girders 22½ tons, roadway 22½ tons, or 45 tons in all. That of the other design will be 19 tons for the girders and 19 tons for the roadway, or 38 tons in all. In point of cost the girders of the type design will be fully £2-10-0 a ton dearer than those of the other. I should estimate the cost of each as follows:—

Type design.

	Per Span. £	s.	d.
Girders, 22½ tons, at £14-10-0 = ...	326	5	0
Flooring, 22½ tons, at £12-0-0 = ...	270	0	0
Total cost in England ...	596	5	0
Freight to India, 45 tons, at 25	56	5	0
Total ...	652	10	0

Rivetted design.

Girders, 19 tons, at £12 = ...	228	0	0
Flooring, 19 tons, at £11 = ...	209	0	0
Total cost in England ...	437	0	0
Freight to India, 38 tons, at 25	47	10	0
Total ...	484	10	0

and I should have said that erection would be about the same for each, but local opinion would be better than mine on such a point.

6. The rivetted design would be sent out, as to the top and bottom booms, each in two or at the most three pieces fully rivetted up, except the gusset plates. The cross girders would of course be sent out rivetted up. The amount of rivetting to be done in India would not be large, and I should provide that the rivets should not be more than ¾ inch diameter so that they would not require any great strength to close them. The type design would be put together in India entirely with bolts and nuts.

7. Steel must be used for the channel bars in both designs because good iron channel bars cannot be got. In fact the principal parts of both designs would be steel used at the strains allowed for iron at the most. Steel is so little dearer than good iron, if at all, that this involves no waste. The supposed greater tendency to rust of steel need not, I think, be considered, and I should not shape out the bars in the type design. Forging is out of date or impossible, and the material saved by shaping does not pay for its cost.

8. Having said so much, it is for the authorities in India to say which or what other design they will have, but I have no doubt, in my own mind, that the type design is not nearly so good as the other.

9. In order that as little time may be lost as possible by a reference to India, I am having contract drawings for each design prepared, so that on receipt of a telegram tenders may be at once invited for the design selected.

10. I may perhaps say in conclusion that I prefer to either design for such a span plate girders. I do not propose them, because they will weigh, including roadway, say, 42 tons, and would involve the transport of large and heavy masses as well as rivetting in India.

Note by the Chief Engineer, Public Works Department.

The Director-General of Stores, India Office, with his No. S 14734 of 16th November 1888, forwards revised designs for the iron work required for the Gadilam bridge, prepared under the orders of Sir A. Rendel.

2. Sir A. Rendel considers that the designs for the girders sent from Madras are better than the type designs received some time ago from the India Office. The plan of the girders sent from here was designed by Mr. Martin.

3. In any case the difference of span and the width of roadway between the type design and the girders required for the Gadilam bridge is such that new designs have been found necessary, and two have accordingly been prepared.

(*a*) Based on the type designs— Cost per span £652-10-0.	(*b*) Based on Mr. Martin's design — Cost per span £484-10-0.

As there are 13 spans, the cost of the iron work for the whole bridge will be (*a*) £8,482-10-0, (*b*) £6,298-10-0.

4. In this case there will be no difficulty in obtaining rivetters from the Railway or Public Works Workshops, so that there will be no advantage in adhering to the type design for pinned girders for the Gadilam bridge; but I feel sure that, in a large number of cases, the difficulty of obtaining rivetters will make it advisable to use the pinned girders shown in the type designs, and although pinned girders do wear out more rapidly than rivetted ones when there are frequent and heavy live loads, this argument does not apply to bridges where the live load consists of country carts.

5. I would recommend that the following telegram be despatched to the Director-General of Stores:—

"Rendel's design rivetted girders approved."

(Signed) H. R. MEAD, Col., R.E.,
Ag. Chief Engineer, P.W.D.

8th December 1888.

Order—dated 11th December 1888, No. 3891 W., Public Works.

Approved.

(True Extract.)

(Signed) H. R. MEAD, Colonel, R.E.,
Ag. Secretary to Govt., P.W.D.

To the Superintending Engineer, V Circle, with two plans.

Exd. J. Moses.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1888} Madras.

PUBLIC WORKS.

Dated December, 11th.

Recd. *Encl.*

G.O., 11th Dec. 1888, No. 3891 W.

DECEMBER.

Gadilam Bridge

Sir A. Rendel's design for rivetted girders for the —, approved, and the Director-General of Stores, India Office, informed accordingly by telegraph.

1141

No. 5825

SUPERINTENDING ENGINEER'S OFFICE,
V Circle, Madras,
Chepâk, 27 February 1889.

From Lt.-Col. W. H. Burton, R.E.
SUPERINTENDING ENGINEER, V CIRCLE,

To THE Chief Engineer
P.W. Department.

SIR.

Enclosures.

In reference to G.O. dated 6th October 1888 No. 3131 W, ordering that the iron work for the Bridge over the Gadilam River be indented for on the India Office, and understanding that no mention of the port of embarkation was named in the Indent I have the honor to request that Secretary of State be asked to have it all shipped to Cuddalore. There

5

There are about 500 tons
of iron Erected and its cost in Har-
bour dues & cartage from
the Harbour to Goods Station
Egmore & thence by Rail
to old Cuddalore will
considerably exceed Rs. 4,000
whereas Harbour dues
landing charges at old
Cuddalore will be com-
paratively small.

I have ascertained that there
will be no difficulty in get-
ting a Ship to call in at
Cuddalore with this quan-
tity of iron work.

I have the honor to be
Sir
Your most Obedt Servt

W. H. Burton Lt. R.E.
Superintg Engr 5th Circle

3131-2 W 16/10/88
3891 & 7/11/1788

From Lieut 1953rd
The Supg: Engineer
5th Circle

To
The Chief Engineer
P. W. Department.

Dated 27th
Read 28th } February 1889

SECRETARY TO GOVERNMENT
23 FEB 89
P.W. DEPARTMENT, MADRAS.

No 5825.

Iron work for the Bridge over Gaddilam River

Requests that the Secretary of State be asked to have shipped at Cuddalore

1141

No 610 W

PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 1st March 89

READ the following

From the S. E. V Circle No 5825 of 27.2.89.

The Director Genl of Stores, India Office will be addressed accordingly.
H.S. No 611 W of 1st March 89

S.E. V Circle
D 2/3

Letter from the Secy to Govt. Mily Dept. dated 16.11.88 to the Dy. of Stores 3132 W of 6.10.88
Do from the Dy. of Stores No 14734 of

To The Dy. of Stores
India Office
London

Sir,

With reference to the letters quoted in the margin, I am directed to request that if freight can be made available, the iron work

works for the Gadsden bridge may be shipped to the port of Cuddalore. If this can be done, a material saving will be effected in landing and inland transit charges.

Agent

Wells
1.3.89

1/3/89

Dated
5/3/89.

13.20 610/611 rdy 1-3-89

1141

Cu

P 8/3.2.13

BW/M

bA= 8

8

No 610 W dy 1st March 1889

From work for the Gadilam Bridge — ordered that the Director-General of Stores, India office London, be asked to ship the — t Cuddalore

No 611 W dy 1st March 1889

The Director-General addressed

It is requested that in any further communication on this subject the undermentioned letters and number may be quoted, and the reply addressed to

The Director General of Stores,
India Office,
Whitehall,
S.W.

S 4558

Received 18 Apr 89

3405

India Office,
Whitehall, S.W.,
29th March 1889.

1141

Sir,

With reference to your letter No 611 W of 1st March 1889, I have the honour to inform you that the ironwork for the Gadilam bridge will be shipped to Cuddalore, as requested therein and in the original indent.

Border at Madras
3911/18.11.89

3891 W 4 11/12/88

The last paragraph of my letter of the 16th November 1888, was only intended to intimate that the ironwork could not be supplied in time to arrive in India by January 1889 as requested in your letter of the 6th October 1888.

3132 Way 6/10/88

I have the honor to be,
Sir,
Your obedient Servant,

M. Jopp

Director General of Stores.

The Secretary to the Government
of Madras
Public Works Department
Madras.

89

A Y 16544. 3 rms.—1/88. I. 3046.

24

610
611W 1-3-89.
3891W. 11-12-88
3181-32-33W 6-10-88
610 1141W d/29-4-89.

Contd. to the
Secn 2.. to the

Supdg Engr: V Circle
Supdg: Engr: V Circle
with reference to 610
with reference to 611.

No. 3121. 10. W. 8/6. X. 88.
" 3891. 10. W. 8/11. XII. 88.
" 610. 10W. 8-1-3-89.

MCM
23.4.89

Asst Dr
24.4.89

No. 1141 dt 29-April 89

J. 24/4
29-4-89

V Circle
E. V Circle

(8)

Dir
W

Write order

W 19/4 Encl
retd 25-4-89
18/5