(1) பக்கங்களின் எண்ணிக்கை 24
(2) புதுக்கித் திருப்பிய நாள் 11/88
(3) ஆதாரங்குறிப்பவர் சுருக்கொப்பம்

தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

P.W துறை

அரசாணை எண். மு. கோப்புத் தாள் எண்.	3891 W	அச்சகம் பலவகை
நாள் : 11.12.1888		~~198~~

மடிக்கவோ கண்டபடி கையாளவோ கூடாது

ஆவண. கா-1—18,000—15-6-87.

3891/1

11th December 1888, No. 3891 W., Public Works.

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 rivetters 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. 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.

	£	*s.*	*d.*
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.)

Captain, R.E.,
Under-Secy. 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.

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 14734.

SECRETARY TO GOVERNMENT, P.W. DEPARTMENT, MADRAS.
6 DEC 88

3891/3

India Office,
Whitehall, S.W.,
16th November 1888.

11p

Print

Sir,

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

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.

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 Secretary to the
Government of Madras,
Public Works Department,

in the enclosed report, from which it will be seen that the total estimated cost of the 13 spans (including freight) is:

For type design. . . . . . £8482..10..0
" rivetted –"– . . . . £6298..10..0

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

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

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

A.A. Jopp
Director General of Stores.

3131.2 w 6.10.88
527 w 16.2.88
2899 w 15.9.88
2388 w 6.8.88
2157 w 16.7.88
1777 w 15.6.88
1984 w 3.7.88
399 w 4.2.88
550 w 27.8.88
1947 w 26.6.88
3274 C 13.9.87
2636 w 9.10.86
237 w 29.1.85
1757 w 29.7.85

Print

Director General. Endorse 3S 7499

I very much prefer the design sent home to the type design for 60' and 70' spans. The only justification for adopting the type, in my opinion, would be the impossibility of obtaining rivetters 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 replaced by rivetted girders in consequence of the deterioration of the pins by rust.

38/5

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 shewn in the type designs for 60 and 70 feet

(see back)

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.

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.

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 Roadway 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 & nuts, the other with rivets.

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
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.	Per Span
Girders 19 tons at £12..0..0 =	£228..0..0
Flooring 19 tons at £11..0..0 =	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.

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 3/4" 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.

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 -

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.

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.

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.

(Signed) A. L. Rendel

16/11/887

389/9

In this case there will be no difficulty in obtaining rivetters from the Railway or P.W. Workshops, so that there would be no advantage in adhering to the type design for pinned girders for the [illegible] 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 ~~top~~ 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.

I would recommend that the following telegram be despatched to the Director General of Stores.

~~Prof~~ Rendel's design rivetted girders approved.

8.12.08

8/12/08

3891/18 P. W. Dept 6 P

Print

~~For Orders~~ Note by the Ch. Engr. P. W. Dept.

The Director General of Stores India Office with his No. S.14734 of 16th November 1888 forwards revised designs for the ironwork 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, ~~were~~ was designed by my instruction.

3. In any case the difference of span and the

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 design

Cost per span £ 652-10-

(b) Based on Mr Martin's design.

Cost per span £ 484-10-

As there are 13 spans, the cost of the iron work for the whole bridge will be

(a). £ 8482-10-0

(b) £ 6298-10-0

4.

4. In this case there will be no difficulty in obtaining rivetters from the Railway or P. W. 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, the

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.

"Pandel's design rivetted girders approved"

~~The Hon'ble Mr H.S. Stokes~~

R
11/12

10/12/88

A No. 3891/12 [illegible]
Approved

H.S.
9 Dec

Tel. despatched
11/12

S.E. V Circle, with 2 plans

10/12

D. 10/12/88

1 Dec. 9/12

3891/12

Govt. of (1888) Madras.
PUBLIC WORKS.

12/12

Dated

Recd. Encl.

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

Gadilam Bridge

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

10

C/12/12 C/12/12

(1) பக்கங்களின் எண்ணிக்கை 24
(2) புதுக்கித் திருப்பிய நாள் 11/88
(3) ஆதாரங்குறிப்பவர் சுருக்கொப்பம்

தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

P.W துறை

அரசாணை எண். / மு. கோப்புத் தாள் எண். 3891 W அச்சகம் / பலவகை

நாள் : 11.12.1888 ~~198~~

மடிக்கவோ கண்டபடி கையாளவோ கூடாது

ஆவண. கா-1—18,006—15-6-87.

3891/1

11th December 1888, No. 3891 W., Public Works.

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.

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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 rivetters 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.

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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.

	£	*s.*	*d.*
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.

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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.

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(*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.

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"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.)

Captain, R.E.,
Under-Secy. 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.

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 14734.

SECRETARY TO GOVERNMENT, P.W. DEPARTMENT, MADRAS. 6 DEC 88

India Office,
Whitehall, S.W.,
16th November 1888.

Print

Sir,

With reference to your letter No 3137 of 6th October 1888, transmitting an indent for ironwork for the Gadilan bridge, South Arcot, I have the honor to forward a copy of a report on the subject by the Consulting Engineer to this Office.

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.

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

3891/4

in the enclosed report, from which it will be seen that the total estimated cost of the 13 spans (including freight) is:

For type design. . . . . . £8482..10..0
" rivetted –"– . . . . £6298..10..0

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

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

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

A.A. Jopp
Director General of Stores.

3131. 2 w 6.10.88
527 w 16.2.88
2899 w 15.9.88
2388 w 6.8.88
2157 w 16.7.88
1777 w 15.6.88
1984 w 3.7.88
399 w 4.2.88
55 w 27.8.88
1967 w 26.6.88
3674 C 13.9.87
2636 w 9.10.86
237 w 29.1.85
1757 w 29.7.85

Print

Director General - Indian 3SP 7499

I very much prefer the design sent home to the type design for 60' and 70' spans - The only justification for adopting the type, in my opinion, would be the impossibility of obtaining rivetters 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 replaced by rivetted girders in consequence of the deterioration of the pins by rust.

38/5

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 shewn in the type designs for 60 and 70 feet

(see back)

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.

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.

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 Roadway 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 & nuts, the other with rivets.

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
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.	Per Span
Girders 19 tons at £12..0..0 =	£228..0..0
Flooring 19 tons at £11..0..0 =	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.

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 3/4" 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.

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 -

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.

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.

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.

(signed) A. L. Rendel

16/11/88

389/9

In this case there will be o difficulty in obtaining rivetters from the Railway or P.W. Workshops, so that there would be no advantage in adhering to the type design for pinned girders for the Yodalam 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 ~~top~~ 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.

I would recommend that the following telegram be despatched to the Director General of Stores.

Prof. Rendel's design rivetted girders approved.

8.12.05

8/12/05

3891/16 P. W. Dept 6 P

Print

~~For Orders~~ Note by the Ch. Engr. P. W. Dept.

The Director General of Stores India Office with his No. S.14734 of 16th November 1888, forwards revised designs for the ironwork required for the Gaddam Bridge, prepared under the orders of Sir A. Rendel.

2. Sir A. Rendel considers that the designs for the girders sent from India are better than the type designs received some time ago from the India office. The plan of the girders sent from here, ~~were~~ was designed by my direction.

3. In any case the difference of span and

the

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 design

Cost per span £ 652-10-

(b) Based on Mr. Martin's design.

Cost per span £ 484-10-

As there are 13 spans, the cost of the iron work for the whole bridge will be

(a). £ 8482-10-0.

(b). £ 6298-10-0

4.

4. In this case there will be no difficulty in obtaining rivetters from the Railway or P. W. 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, the

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"

~~The Hon'ble Mr H. G. Stokes~~

11/12

10/12/88

A. No 389 [illegible] of 18th Decr/88
Approved

H.S.
9 Dec

Tel. despatched
11/12

S. E. V Circle, with 2 plans

20/12

10/12/88

11/12

389/12

Govt. of (1888) Madras.

PUBLIC WORKS.

12/12

Dated

Recd. Encl.

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

Gadilam Bridge

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

E 12/12 E 12/12