PWM-344

PWM-39

No 176 W a/ 16th January/88

Ann

BD/

PPH 15 Jan

Communicated to the Supdg Engr VI Circle in continuation of G.O. No 3309 W of 3rd Decr 1887.

WAB
14.1.88

No 1706 W a/24.6.87
" 4286 C a/24.11.87
" 3309 W a/3.12.87

B
18/1

S.E. VI circle
Despd. 17-1.88.

A.M. 14.1.88 ~~A 16.1.88~~

a.t.c.
20/1

JS
24/1

Gobt. of {1887} Madras.

LOCAL AND MUNICIPAL.

Issued

Recd. 13.1.88 Encl.

G.O., 20th Dec. 1887, No. 2529 L.

No 176 W a/ 16th January/88

DECEMBER.

Srivaikuntham Bridge.

Ordering despatch of a telegram to the Secretary of State approving the proposal to use plate girders for the — in Tinnevelly.

2 Copies to Offy

w/Records

PWM N-344

1887.

P. W. DEPARTMENT.

Current No. 4298.

From

Messrs Richardson & Cruddas.
Bombay.

ENCLOS.—1

G No. 4418

Dated 4th June 1887.

Received 7th " "

SUBJECT.

Srivaikuntham Bridge —

Fordg copy of a letter from the E.E. Engr Tinnevelly intimating refusal of the Gof I to sanction the supply from local sources, of the iron work for the — and soliciting a statement of the grounds upon which the refusal is based, & urging their claims to Government patronage.

DISPOSAL.

No. 211 D. Dated 9d June 1887.

Transferred to the Local and Municipal Dept. in continuation of No 79 D, of 7th May 87.

Sd

J. O. Hasted Col. R.E.
Secy to Govt P.W.D.

OLS 63 VI

G
To L & M Dept with record

despd 9/6/87.

Local and Municipal Department.

1911/174

Despd 16-1-88

Filesent to L & M Dept
with No 79 D 7-5-87

1887.

P. W. DEPARTMENT.

Current No. 3500

From

The Local & Municipal Dept

ENCLOS.— 8
with file

No. 771
Dated 2 May 87
Received 7 — —

SUBJECT.

Srivaikuntham Bridge —

Communicating for remarks in the P.W.D. papers relative to the supply of iron girders for the ——.

DISPOSAL.

No. 79 D. Dated 7th May 1887.

Retransmitted with remark that there is no objection in this Department to the Original design; (which has already been approved) being adhered to; and

---

Local and Municipal Department.

and the contract given to Messrs Richardson and Cruddas.

Sd J. O. Hasted Col R.E.
Secy to Govt P.W.D.

9. Local & Municipal Dept
(Papers returned)
and No 1067C with file
19-3-87.

846 W dy 7.6.85 A
987 C dy 11.3.86.
1764 W dy 18.7.84
1977 C dy 29.5.86
1067 C dy 19.3.87

desp. 7.5.87

CHIEF SECRETARIAT, MADRAS.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following paper :—

Telegram from the Secretary of State dated 15th November 1887 :-

"Chief Secretary to Government Madras letter 1913, 8th October last Rendel thinks bridge too light, advises plate girders makes whole weight ten tons per span, estimated cost erected at per ton two hundred Rupees if you agree telegraph the one word 'yes'."

Order thereon dated 21st Novr 1887 No 2263 L / Mis

Communicated to the Public Works Department and the President District Board, Tinnevelly for very early remarks.

2.

2. The following telegram will be despatched to the Secretary of State.

"Your telegram 15th; Does rate Rs200 cover transport from Tuticorin and erection bridge at site. If so at what rate?"

(True Extract)

W. L. Ludger

Asstt Secretary.

To

The Public Works Dept.

& Presdt. Dist Bd, Tinnevelly

A.

No 4280 C of 24-11-87

Memo

With reference to G. O dated 21st Novr 1887, No 2263 L (Mis) the undersigned has the honor to state that he sees no objection to the use of plate girders for the Srivaikuntham bridge –

Jdt
23/11/87. W

To the Local & Municipal Dept

Despd 25-11-87

Clerk
24-11-87

W/ Do 28/11

P W C No 95

Govt. of (188) Madras.
Local & Municipal Dep

To

The P. W. Department

23 NOV 87
DEPARTMENT MADRAS

No. 4280 C of 24-11-87

Rd 23.11.87

Proceedings, dated 21st November 1887.
No. 2263 L (mis).

Subject.

Communicating to the P. W. Department and the President Dist: Bd Tinnevelly for very early remarks, telegram to the Secretary of State regarding rate for transport of iron work &ca for the Srivaikuntham bridge – Tinnevelly District

With memo

With memo

Cl. 9520

PROCEEDINGS OF THE MADRAS GOVERNMENT.

READ the following paper :—

Endorsement of the Private Secretary to the Right Hon'ble the Governor of 24th November/87 on the following telegram from the Secretary of State dated 23rd November 1887.

"Your telegram of 21st November/87 rupees 200 meant to cover everything deducting manufacture and freight leaves transport from Tuticorin and erection at site estimated rupees sixty."

Order thereon of 29th November/87 No. 2339 L. (Mis:

Communicated to the Public Work Department and the President District Board Tinnevelly in continuation of G.O 21st November 1887 No. 2263 L. The report fro the District Board called for in in that G.O. will be awaited.

(True Extract)

Asst. Secretary.

To

The Public Works Department

" President, District Board, Tinnevelly.

B No 3309 W d/3rd Decr/87

Read G.O. 2263 L. d/21st Novr 87
" " No 4286 C d/26th Novr 87
" " 2339 L d/29th " " "

Communicated to the
Communicated to the
Suptg: Engr VI Circle
Suptg: Engr. VI Circle

2.12.87

2/12/87

5/12

4820 C d/24/11/87
1706 W d/24/6/87

S.E. VI Circle
S. E. VI Circle

3/12

6/12

9/12
8/12

PWC No 957/4

Govt. of (188) Madras.
Local & Municipal Department

To

The P. W. Department

SECRETARY TO GOVERNMENT
1 DEC 87
DEPARTMENT MADRAS

No 3309 W d/3rd Decr/87

R/1-12-87

Proceedings, dated 29th November 1887
No. 2339 L (mis).

Subject.

Communicating to the P. W. Department and the President Dist. Board Tinnevelly telegram from the Secretary of State of 23rd November/87 regarding cost of carriage of iron-work &c for the Srivaikuntham bridge in the Tinnevelly Dist.

Northorden

20th December 1887, No. 2529 L., Local and Municipal.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

Read—again the following papers :—

G.O., dated 21st November 1887, Mis. No. 2263 L., Local and Municipal.

Read—the following telegram from the Right Honorable the Secretary of State for India, to His Excellency the Governor of Madras, dated 15th November 1887 :—

Chief Secretary to Government, Madras, letter 1913, 8th October last. Rendel thinks bridge too light, advises plate girders, makes whole weight ten tons per span, estimates cost erected at per ton two hundred rupees. If you agree, telegraph the one word "yes."

Order—dated 21st November 1887, Mis. No. 2263 L., Local and Municipal.

Communicated to the Public Works Department and the President, District Board, Tinnevelly, for *very early* remarks.

2. The following telegram will be despatched to the Secretary of State :—

"Your telegram 15th. Does rate, Rs. 200, cover transport from Tuticorin and erection bridge at site ; if so, at what rate ?"

(True Extract.)

(Signed) H. E. STOKES,
Chief Secretary.

To the Public Works Department.
" President, District Board, Tinnevelly.

G.O., dated 29th November 1887, Mis. No. 2339 L., Local and Municipal.

Read—the following telegram from the Right Honorable the Secretary of State for India, to His Excellency the Governor of Madras, dated 23rd November 1887 :—

Your telegram of 21st November 1887. Rs. 200 meant to cover everything deducting manufacture and freight leaves transport from Tuticorin and erection at site estimated Rs. 60.

Order—dated 29th November 1887, Mis. No. 2339 L., Local and Municipal.

Communicated to the Public Works Department and the President, District Board, Tinnevelly, in continuation of G.O., dated 21st November 1887, No. 2263 L. The report from the district board called for in that Government order will be awaited.

(True Extract.)

(Signed) H. E. STOKES,
Chief Secretary.

To the Public Works Department.
" President, District Board, Tinnevelly.

READ—also the following papers:—

No. 4286 C.

MEMORANDUM.

With reference to G.O., dated 21st November 1887, Mis. No. 2263 L., the undersigned has the honor to state that he sees no objection to the use of plate girders for the Srívaikuntham bridge.

MADRAS,
24th November 1887.
(Signed) J. O. HASTED, Colonel, R.E.,
Secy. to Govt., P.W.D.

To the Local and Municipal Department.

Telegram from the President, District Board, Tinnevelly, to the Chief Secretary to Government, dated 17th December 1887.

Yours 16th. District Board consent to Secretary State's proposals Srívaikuntham bridge.

ORDER—dated 20th December 1887, No. 2529 L., Local and Municipal.

The following telegram will be despatched to the Secretary of State:—

"Your telegram of 15th November last. Bridgework. Yes."

(True Extract.)

for *Chief Secretary.*

To the President, District Board, Tinnevelly.
" Public Works Department.

Exd. P. L. Pereira.

G.O. 1679 W 2. 7. 86
" 202 W 25-1. 86
B. No 469 W 12-2. 83
Mis 2348 W 16-9-86...

P.W.C. No 4514

Govt. of (1887) Madras.

LOCAL AND MUNICIPAL.

(7)

S.S.C

1706 W a/24th June/87

B

Communicated to the S.E. VI Circle for information

Communicated to the S.E. VI Circle for information

Issued

Recd. 14. 6. 87 Encl.

G.O., 26th May 1887, No. 945-A L.

Joe 21/6/87

B. No 1706 W a/24-6-87

MAY.

Bridges.

Informing the President, District Board, Tinnevelly, that the Government of India having disapproved of the purchase in India of the iron-work required for the Srivaikuntham bridge, it will have to be obtained through the Secretary of State.

S.E. VI circle ✓

S.E. VI Circle

[illegible] 24/6
[illegible]

O.S. 132 VI
M. 21.6.87

[illegible] 30/6

C. 18.6.87 R. 23.6.87

With order

Desp. W. 17-7-88

26TH MAY 1887, No. 945-A L., LOCAL AND MUNICIPAL.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—again the following paper:—

G.O., dated 10th May 1887, Mis. No. 823-A, L., Local and Municipal.

Read—again the following papers:—

G.O., dated 25th February 1887, Mis. No. 386 L., Local and Municipal.

Read—the following papers:—

From J. LEE-WARNER, Esq., President, District Board, Tinnevelly, to the Chief Secretary to Government, dated Tinnevelly, 8th January 1887, No. 2.

In forwarding indent with two tracings for iron work required for Srívaikuntham bridge according to the revised estimate (Rs. 1,10,000) sanctioned in G.O., dated 6th October 1886, No. 2620 W., Public Works, I have the honor to solicit a reconsideration of the order passed in paragraph 2 of G.O., dated 30th March 1886, Mis. No. 371 L.F. As I have already pointed out in paragraph 6 of my letter, No. 5, dated 25th January 1886, I believe that the iron work can be procured much more expeditiously in India from the firm of Messrs. Richardson and Cruddas, because they have the required iron in stock, and are accustomed to take such orders, than if the order is sent home. The delay in obtaining costly iron work through the Store Department of the India Office has been noticed in paragraph 20 of G.O., No. 867, dated 26th July 1886, reviewing reports on the operations of Local Funds for 1884-85. Besides this, Messrs. Richardson and Cruddas tender to deliver the work *at Tinnevelly* for Rs. 220 a ton, against Rs. 260 a ton, the cost of execution and delivery *at the Public Works Workshops in Madras*. It will be thus seen that Messrs. Richardson's tender was cheap and reasonable. There is yet another reason why the Government should be favorably disposed towards the present proposal. If the iron work comes out from England the pieces will have to be fitted after arrival, which will necessitate our getting plant and entertaining skilled labor and supervision specially for it; whereas the Bombay firm, in consideration of having the whole contract, offer to transport, erect, and paint the whole at the bridge-site for Rs. 50 a ton.

2. If the Government will be pleased to permit us to accept the tender of Messrs. Richardson and Cruddas in Bombay, we propose to order the iron work at once, raising a loan of Rs. 50,000 for the purpose from the Zemindar of Etaiyápuram, whose manager, who is also one of the members of the district board, at our last meeting promised to procure the same at the rate of 5 per cent. per annum on the security of the land-cess. We have no other means of meeting the cost except by borrowing, as the whole balance available at present is barely Rs. 30,000, which is required for the masonry, wood work, and other charges. A detailed scheme concerning the raising and repayment of this loan will be submitted as soon as the orders of the Government are received on this letter.

ENCLOSURE.

INDENT for Iron work of Bridge across the Srívaikuntham Anicut.

All the iron work shown in the accompanying plans is to be furnished with the exception of iron rails for wheel guards which need not be supplied, as old iron rails can be procured locally and there are a number in stock. The iron work required is therefore :—

(1) 66 main braced girders for 33 spans (each of 38 feet): the girders being 40 feet in length with all bars, angle irons, T-irons, rivets, &c., complete.

(2) 132 rolled iron cross girders, 12 inches × 6 inches, weighing 56 lb. per foot run. Each cross girder to be 18 feet 4⅞ inches in length.

(3) 825 rolled iron longitudinal girders, 6¼ inches × 2 inches, weighing 11 lb. per foot run: of these :—

(*a*) 330 at ends of spans will be 7 feet 9 inches in length, and
(*b*) 495 in three centre bays of spans will be 7 feet 11⅜ inches in length.

These rolled iron beams will have to be cut so as to fit against and be connected with cross girders. All rolled iron must have rivet holes where shown; and angle irons to form connections together with rivets complete as per drawings.

(4) 6,600 bolts, ⅜ inch in diameter (to hold down lower flooring planks to longitudinal girders), with head, washer and nut; also 6,600 clips to suit bolts as per drawings.

The main girders should have a camber of ¾ inch; and the cross girders a camber of ½ inch.

The iron used in constructing girders will be ordinary bridge iron, and such as will withstand a tensional strain of 20 tons per square inch of section. The rivets to withstand a shearing strain of 20 tons per square inch of cross section.

Angle and T irons will, where shown in drawings, be cranked round and carefully welded up (*e.g*, in vertical stiffening pieces to main girder). Rivet holes must be carefully punched or, where necessary, drilled, with the correct pitch and of the correct size as shown in drawings.

Each main girder when built up to be subjected to a distributed load of 25 tons, under which the deflection is not to exceed one-half of an inch at centre of length of girder, the ends being supported, as they will be, when erected on piers.

Each cross girder to be subjected to a distributed load of 10 tons under which it should not deflect more than one-half of an inch at centre of length of girder, while testing, the ends to be supported as shown in design.

The whole of the iron work in main girders as well as cross and longitudinal girders to be coated with two coats of coal-tar applied hot.

(Signed) R. C. LOWRY,
L. F. Engineer, Tinnevelly District.

From J. LEE-WARNER, Esq., President, District Board, Tinnevelly, to the Chief Secretary to Government, dated Tinnevelly, 9th February 1887, No. 19.

With reference to your telegram, dated 7th February 1887, I have the honor to send up the original tenders, as well as copies of correspondence with Messrs. Richardson and Cruddas of Bombay. The Local Fund Engineer has also prepared a note in which he fully explains how he arrived at his calculations for the cost of the iron work per ton.

ENCLOSURES.

From R. C. LOWRY, Esq., Local Fund Engineer, Tinnevelly district, to Messrs. RICHARDSON and CRUDDAS, Bombay, dated Kristnapuram, 23rd August 1885, No. A.

I send herewith copies of sanctioned plans as well as extracts from specification and estimate for an iron girder bridge that the District Board of the Tinnevelly district propose to construct across the Támbraparni river at the Srívaikuntham anicut, Tenkarai taluk.

The district board require tenders for supplying and erecting the iron work of this bridge according to the sanctioned design, and if you propose to undertake the work, I shall be happy to lay your tender for the same before the board.

I do not guarantee the accuracy of the calculations and weights of iron shown in the estimate, and I would therefore recommend you to check these before framing your proposals.

In the event of your tendering for the work, I would suggest that your offer give details as to—

1. (*a*) The rates that you are prepared to accept for iron of the quality specified.
   (*b*) Rates for iron of inferior quality which you will guarantee to stand the specified tests.

2. The lump sum for which you are prepared to carry out the whole of the iron work under both conditions (*a*) and (*b*) above, payment being made on its completion.
3. The lump sum for which you are prepared to carry out the whole of the iron work under both conditions (*e*) and (*b*) above, on the understanding that one-third of the money due for the same will be paid to you on completion of the work, and the balance within two years from that time.

Please return the plans, &c., as soon as possible, as they will have to be sent to other firms to elicit proposals from them.

TESTS to which iron work will be liable and which it will be required to stand satisfactorily.

All bars, tee and angle irons to be tested to 9 tons per square inch of cross section, and to be struck with a heavy hammer while strained.

Each main girder when built up to be subjected to a load (distributed) of 25 tons under which the deflection is not to exceed ½ (one-half) inch at centre of length of girder; the ends being supported, as they will be, when erected on piers.

Each "cross girder" will be subjected to a load of 10 tons (distributed) under which it should not deflect more than ½ (one-half) inch at centre; the ends to be supported while testing as shown in design.

Each "longitudinal" girder will be subjected to a load (distributed) of 2 tons under which the deflection at the centre of its length should not exceed ¼ (one-fourth) inch; the ends being supported as shown in drawings.

All rivets to withstand a shearing strain of 20 tons per square inch of cross section.

Every facility will have to be given by the contractor for the testing of iron-work by a competent agent of the district board; and everything required for the operations will have to be supplied by the contractor, who will be required to defray all expenditure incurred thereon.

Not more than one-eighth (by weight) of the iron and iron work will be tested by the board's agent.

MEMORANDUM.

The Srívaikuntham anicut (on which the bridge is to be built), is situated 15 miles east of Palamcottah, and there is a good metalled road to it from the latter town. The Tinnevelly Railway Station is 1½ miles north of Palamcottah and 36 miles from the Port of Tuticorin. There is also a road practicable for carts from Tuticorin to Srívaikuntham, about 30 miles, which is metalled for about two-thirds of its length.

The girders will be erected at a height of 24 feet above the bed of the river (which is sandy) and 17½ above the crest of the anicut; the latter is 6 feet wide.

LOCAL FUND PUBLIC WORKS DEPARTMENT.

TINNEVELLY DISTRICT—TINNEVELLY CIRCLE—TENKARAI TALUK.

Original Abstract Estimate No. 34 *of* 1884-85.

Head of Service—Communication.
Class—Original Works.
Name and Nature of Work—Constructing a bridge across the Srívaikuntham anicut.

Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
	Masonry Work.	RS. A. P.		RS. A. P.	RS. A. P.
57,230·75	Cubic feet of coursed rubble	45 0 0	100 cubic feet.	25,754 0 0	
2,352	Do. of cutstone work	1 0 0	Cubic foot. ..	2,352 0 0	
362	Squares of pointing	3 8 0	Square ..	1,267 0 0	
					29,373 0 0
	Iron Work.				
225·40	Tons of iron for main girders, including upper and lower booms, diagonal braces, suspending pieces, end pillars, and outside T-irons, cross girders, and longitudinal girders.	145 0 0	Ton	32,683 0 0	
					32,683 0 0
9·371	Tons of best Lowmoor iron in rivets for main, cross and longitudinal girders.	300 0 0	Ton ..	2,811 0 0	
					2,811 0 0

Quantity.	Description of work.	Rate.	Per.	Amount.	Total
		RS. A. P.		RS. A. P.	RS. A. P.
234·743	Tons of erecting and fitting iron work of girders, and painting the same with two coats of light grey Carson's anticorrosive paint on a red-lead ground.	40 0 0	Ton ..	9,390 0 0	9,390 0 0
	Forming ramps to approaches and metalling the same.	..	..	300 0 0	300 0 0
6,412·16	Cubic feet of Congoo wood for planking and bed plates.	2 0 0	Cubic foot ..	12,824 0 0	12,824 0 0
2,780 feet or 37,066⅔ lb.	Iron rails bolted to flooring (for fender pieces) weighing 40 lb. per yard including bolts and fixing.	0 0 6	Per lb. ..	1,158 0 0	1,158 0 0
	Total ..	..	..	..	88,539 0 0
	Contingencies, at about 2½ per cent. ..	..	..	..	2,230 0 0
	Superintendence do. ..	..	..	..	2,231 0 0
	Grand Total of Estimate ..	..	..	..	93,000 0 0

Revised Abstract Estimate No. 1 of 1886-87.

Head of Service—Communication.
Class—Original Works.
Main head—Metalled and bridged roads.
Sub-head—Iron girder bridge of 33 openings of 38 feet span each.
Name and Nature of Work—Constructing an iron-braced girder bridge across the Támbraparni river over Srívaikuntham anicut.

Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
	Masonry Work.	RS. A. P.		RS. A. P.	RS. A. P.
480	P. C. Concrete	50 0 0	100 cubic feet	240 0 0	
7,680	Coursed rubble in P. C. mortar. Battered portion.	50 0 0	do· ..	3,840 0 0	
50,286	Coursed rubble in Surki mortar	45 0 0	do.	22,629 0 0	
1,437	Cutstone in mortar	1 0 0	1 cubic foot ..	1,437 0 0	
2,715	Concrete	12 0 0	100 cubic feet	326 0 0	
345	Pointing	3 8 0	Square ..	1,208 0 0	
32	Removing old concrete on piers and dressing stones on anicut crest to take first course of new piers.	3 0 0	Each ..	96 0 0	
					29,776 0 0
	Iron Work.				
128·50	Tons of iron for main girders, including upper and lower booms, diagonal braces, suspending pieces, end pillars, subside T. irons, rivets, bolts, clips, &c.	250 0 0	Ton	32,125 0 0	
92·75	Tons of rolled iron beams for cross and longitudinal girders.	175 0 0	Ton	16,231 0 0	
221·25	Tons of erecting and fitting iron work ..	40 0 0	Ton	8,850 0 0	
					57,206 0 0
	Wood Work.				
6,450½	Planking and bed plates	2 4 0	1 cubic foot ..	14,514 0 0	
1,607	Top planking	2 8 0	do. ..	4,018 0 0	
					18,532 0 0
37,066⅔	Iron rails for fenders	0 0 6	lb.	1,158 0 0	
					1,158 0 0
	Forming ramps to approaches	..	..	..	300 0 0
	Tools and plant, scaffolding, &c., at about 1½ per cent.	..	..	..	1,378 0 0
	Superintendence and contingencies at about 1½ per cent.	..	..	..	1,650 0 0
	Grand Total of Estimate ..	..	..	..	1,10,000 0 0

From Messrs. RICHARDSON and CRUDDAS, Bombay, to the Local Fund Engineer, Tinnevelly district, Madras, dated Bombay, 1st September 1885, T. No. 1087.

We are in receipt of your letter of the 23rd ultimo, enclosing three tracings of wrought-iron girder bridge work. In reply, we beg to say that we are fully prepared to carry out the work, for which we beg to quote as follows :—

	RS.
For 33 spans, as your tracings and specification, B. B. Staffordshire iron and Lowmoor rivets as described, delivered free at Tinnevelly station	62,500
For the same, made of our usual quality iron, and guaranteed to stand the tests specified, same delivery as above	59,750

2. We have also estimated for erection in place, but would prefer to see a section of the bed of the river with height of water, &c., before quoting definitely for this item. In quoting as above, we beg you to note that we have assumed that you would allow us to modify *slightly* one or two of the sections which are of unusual dimensions and would be difficult to obtain. We would guarantee equal area in all cases, and would submit plans showing any modification we proposed for your approval before proceeding with them.

3. We have made a calculation by which we find we could supply a design of plate girders and rolled beam cross girders of equal strength to your tracings at a much cheaper rate than the latter can be made for. We could deliver 33 spans at Tinnevelly, as before, for Rs. 51,475. If it would be of any service, we would be very pleased to make and send you plans of our suggestion, which we think you would find as satisfactory in every way as the tracings we return and much simpler. As a general rule, braced web girders are not economical for spans as small as this.

4. The design we refer to would be arranged for wood flooring the same as the tracings you send, but we could also arrange iron plating at a cost of *about* Rs. 1-4-0 per square foot complete, delivered Tinnevelly, if you should prefer it to wood.

5. If you wish us to send plans of these suggestions, will you kindly mention the data, live load, &c., you wish them worked out upon. On receipt of the section of the river bed mentioned, we shall be glad to send you the further estimate for erection.

Trusting our quotations will be satisfactory, we are, &c.

From Messrs. RICHARDSON and CRUDDAS, Bombay, to the Local Fund Engineer, Tinnevelly district, Madras, dated Bombay, 7th September 1885, T. No. 1119.

With reference to our letter, T No. 1087 of the 1st instant, tendering for the bridge work you require, we beg to enclose a tracing of a rough design explaining our suggestion of a cheaper structure for your information. On receipt of the particulars we mentioned, we could arrange the design in detail.

2. We omitted to refer to the paragraphs on the subject of payment in your letter of the 23rd ultimo. We beg to say that our usual custom is to receive part payment on account as soon as the material is cut up and machined for the work, and the balance on despatch of the finished material from Bombay. Our tendered quotations were estimated on this basis, but we beg to say that we are prepared to accept the terms we stated on the basis of half payment on arrival of the material at Tinnevelly, and the remaining half on completion of erection.

3. We trust you could arrange this in case we are favored with the order, as we would prefer it to the proposed arrangement mentioned in your paragraph 3, to which we could not agree without revising our tender.

From Messrs. RICHARDSON and CRUDDAS, Bombay, to the Local Fund Engineer, Tinnevelly district, Madras, dated Bombay, 18th September 1885, T. No. 1191.

We are in receipt of your letter of the 8th instant and the accompaniments mentioned.

2. We have gone into the figures again very carefully and beg to submit the following :—

	RS.
(1) For 33 spans, as your specification, B.B. Staffordshire iron and Lowmoor rivets as described, delivered and erected complete in place inclusive of all charges so far as *iron work* is concerned	74,800
(2) For the same, made of our usual quality iron, sections slightly modified as mentioned, guaranteed to stand the tests specified, delivered and erected complete in place as above	71,950
(3) For 33 spans as before, main girders made as your tracings, sections slightly modified, cross girders and longitudinal girders of rolled beams instead of riveted girders, our usual quality of material throughout, delivered and erected complete in place	62,350
(4) For the same, main girders with plate webs as our suggestion, other arrangements as above, delivered and erected complete in place ..	60,750

If the main girders are made as your tracings we would propose to modify the following sections :—

Tee iron struts 4″ × 2″ × ¼″ to 3″ × 3″ × ¼″ angle iron.
Do. 5 × 2 × ⅜ to 4 × 3 × ⅜ " " or
5 × 2½ × ⅜ tee iron (angle preferred).

We also notice that you show two different sections of main angles in the flanges —2½ × 2½ × ⅜ at centre, and 2½ × 2½ × ¼″ at ends. We think you would find ¼″ angles in such a situation objectionable and we would propose to make the angle irons the same section throughout, modifying the flange plate to suit if required. If the flange section is comparatively small, we find it is both more economical and better in every way to employ two angles of fairly stiff section *without any plate*, rather than two weak angles and a plate. Of course, such an arrangement would be subject to your approval.

We think, after the correspondence which has already passed, you will prefer rolled beams for both cross girders and longitudinal beams instead of riveted girders. If not, we should ask you to be allowed to modify the sections of these on the same lines as just explained.

You would see by the tracing sent you with our letter T-1119, of the 7th instant, that we had calculated upon carrying the roadway beams on the lower flange of main girders. Our main girders would be from 3′ 6″ to 4′ 0″ deep, the rolled beams would be spaced about 4 or 5 feet apart, and would be 9″ or 10″ deep according to the spacing.

We do not, of course, include the cost of railing in our estimate, but it would be only a small item. We have made several designs of similar railing.

We have adopted the figures you mention for live load and weight of flooring.

The timber flooring and fittings are not, of course, included in our estimate.

We think the bearing allowed for the main girders, viz., 12″ at each end, might be increased, say, 3″ or 6″ with advantage, unless the stone is very hard and durable. In estimating the cost of erection, we have assumed that we should be able to work on a dry bed throughout. All charges for cart traffic, &c., are included. We presume carts can be obtained to carry the usual weights at As. 12 to As. 14 each per day.

We return per book-post the three tracings after having retained copies of them, and we will send you the sketch-plan in the course of a few days.

The "all round" rate for No. (2) is about Rs. 250 a ton delivered at Tinnevelly Railway Station, and about Rs 50 for erecting.

The "all round" rate for No. (3) is about Rs. 220 a ton delivered at Tinnevelly Railway Station, and Rs. 50 a ton for erecting.

This is the lowest tender received.

(Signed) R. C. LOWRY,
Local Fund Engineer.

NOTE.

To accompany tenders from Messrs. Richardson and Cruddas of Bombay for supply and erection of iron-work of Srivaikuntham bridge.

These tenders were received from Messrs. Richardson and Cruddas in September 1885, in reference to the first sanctioned estimate* for the Srivaikuntham bridge†. This estimate provided for riveted girders throughout—main, cross, and longitudinal girders—the total weight of iron being 234·743 tons In their T. No. 1087, dated 1st September 1885, Messrs. Richardson and Cruddas offer to deliver all iron-work for this design, of the "usual quality and guaranteed to stand the tests specified," for Rs. 59,750. Again, in their T. No. 1191, they offer to deliver and *erect* this iron-work for Rs. 71,950; the cost of erection being therefore estimated at Rs. 12,200, or, say, Rs. 50 a ton.

In T. No. 1191, Messrs Richardson and Cruddas tender (*vide* item No. 3) for 33 spans as before, "Main girders made as per tracings, sections slightly modified, cross girders and longitudinal girders of rolled beams (instead of riveted girders), our usual quality of materials throughout, delivered and erected complete in place, Rs. 62,350."

Dividing Rs. 62,350 by 234·743 (tons) (the estimated weight of iron work), the result is Rs. 266 per ton for iron-work delivered and erected; and subtracting from this rate Rs. 50, being the cost of transporting and erecting at site, the rate tendered by Messrs. Richardson and Cruddas is shown to be Rs. 216, or, say, Rs. 220 a ton.

A revised estimate was submitted for the bridge, and sanctioned in G.O., No. 2620 W., dated 6th October 1886. This revised estimate‡ provides for lighter main girders than the original one, and for rolled iron beams instead of riveted cross and longitudinal girders; the whole weight of iron being reduced from 234·74 tons to 221·25 tons.

* Sanctioned in G.O., No. 846 W., 7th April 1885.

† Copy of abstract estimate and plan annexed for reference.

‡ Copy of abstract annexed for reference.

It may therefore be expected that Messrs. Richardson and Cruddas will accept a considerably lower figure for supplying and erecting the iron work of the bridge as per revised estimate than that shown in their tenders.

(Signed) R. C. LOWRY,
L. F. Engineer, Tinnevelly District.

9th February 1887.

No. 594-T.N.

Note by Superintending Engineer, VI Circle, on the revised design and estimate for a bridge proposed to be constructed across the Támbraparni river at Srivaikuntham anicut.

Amount of estimate, Rs. 1,00,000.

In G.O., No. 846 W., dated 7th April 1885, an estimate for Rs. 93,000 was sanctioned for this work; the plan now forwarded, with the exception of some differences in details to be noted hereafter, is practically the same as that before approved and sanctioned by Government. As this is the case, it is unnecessary for the undersigned to do more than to remark on the alterations proposed.

2. The rate per ton for iron work in the original estimate was Rs. 145. The Local Fund Board propose to procure the iron work from Messrs. Richardson and Cruddas of Bombay, who have tendered to deliver the iron work at Tinnevelly for Rs. 220 a ton; the cost of carriage and putting up is estimated at Rs. 30 a ton, making the total cost Rs. 250 a ton against Rs. 145 a ton, the original rate.

3. The Superintending Engineer does not agree with the statement in para. 6 of the President's letter that the girders can be delivered at Tinnevelly Railway Station built up and ready to be placed on the piers. The girders to be carried by rail from Bombay to Tinnevelly (with a break of gauge), and again for the journey by road from Tinnevelly Railway Station to Srivaikuntham, a distance of 16 miles, will have, for many reasons, to be sent in pieces and built up on the bridge piers. As this is the case, it is thought that there is no special advantage in obtaining them from Bombay, and probably they could be sent out from England through the Secretary of State at a considerable saving.

4. The undersigned sees no objection to the minor alterations proposed in the main girders; but, as before stated in his report, dated 26th April 1884, paragraph 3 (printed in G.O., No. 1764 W., dated 18th July 1884), considers it advisable they should be examined by an expert, or some officer who has had experience in iron bridges for opinion.

5. The substitution of rolled iron beams for the built girders is considered good, but the proposal to have wooden joists in place of the small iron longitudinal girders is thought not advisable. The undersigned considers it would be preferable to have rolled iron beams instead of these wooden joists. The extra cost is but small, and the iron work, if properly maintained, will be much more durable.

6. The proposed alteration of the piers is approved; the decrease in water-way is but trifling, and the piers will be stronger.

7. With regard to the roadway, the original estimate allowed for a thickness of 3 inches of Congoo wood planking, with old iron rails as fenders to prevent wheels of carts, &c., from knocking against the main girders.

The estimate now forwarded does not allow for any fenders, and also allows for wooden planking over the bridge flooring and asphalt on cement over the piers.

It is considered that the wooden planking should be carried over the piers, and that fenders of some sort are absolutely necessary.

Again, that the 3-inch planking should be covered by diagonal planking, say ¾ of an inch thick, well tarred and sanded; this to be renewed as required; and all wear and tear be kept off the lower planking 3 inches thick. This is an important point, as the cost of maintenance of the thin diagonal planking will be but little, but the cost of renewing the lower planking would be very great.

8. As the Superintending Engineer has not, as explained, gone through the calculations, &c., as he proposes certain modifications, and as he has already expressed his opinion in his former note, paragraph 8, that it would be cheaper to get out ordinary 40 feet wrought-iron plate web girders from England, he has not signed the plans.

TRICHINOPOLY,
24th February 1886.

(Signed) H. R. MEAD, Colonel, R.E.,
Suptg. Engineer, VI Circle.

Order—dated 25th February 1887, Mis. No. 386 L., Local and Municipal.

The tender of Messrs. Richardson and Cruddas having been made in 1885 with reference to the plan and estimate sanctioned in G.O., dated 7th April 1885, No. 846 W., Public Works Department, the President should now ascertain the terms upon which the firm would supply and put up the iron-work required according to the revised estimate sanctioned in G.O., dated 6th October 1886, No. 2620 W., Public Works Department.

2. The President is also requested to submit a detailed scheme, showing how the interest on the proposed loan, and the sinking fund for its repayment, can be provided with reference to the income and other necessary expenditure of the board.

3. Meanwhile, the copies of the tenders submitted by, and correspondence with, Messrs. Richardson and Cruddas will be referred to the Public Works Department for remarks, (1) as to the advisability of accepting the arrangement now proposed by the President, and (2) as to the suggestion of the Superintending Engineer in his note of the 24th February 1886, No. 594 (G.O., dated 30th March 1886, No. 371 L.F.), that the plan and estimate should be scrutinized by an expert, or some officer who has had experience in iron bridges.

(True Extract.)

(Signed) H. E. STOKES,
Ag. Chief Secretary.

To the President, District Board, Tinnevelly.
„ Public Works Department.

G.O., dated 2nd May 1887, Mis. No. 771 L., Local and Municipal.

Read—the following letter from J. LEE-WARNER, Esq., President, District Board, Tinnevelly, to the Chief Secretary to Government, dated Tinnevelly, 18th April 1887, No. 44 :—

In the matter of G.Os., Mis. Nos. 386 L. and 607 L., dated 25th February and 30th March 1887, respectively, directing me to ascertain the terms upon which Messrs. Richardson and Cruddas would supply and put up the iron-work according to the revised estimate sanctioned for the bridge over the Srivaikuntham anicut, to submit a detailed scheme showing how the proposed loan and interest therein can be provided, and to submit the design and estimate of cost obtained from the firm, I have the honor to report as follows :—

2. The rate offered for delivering iron-work at the Tinnevelly railway station is about Rs. 191 per ton, and that for conveying to site and erecting the same is about Rs. 57 per ton, so that the rate per ton in position and ready to take flooring would be under Rs. 250. This seems to be fairly cheap.

3. The amount of estimate as finally revised and sanctioned in G.O., No. 2620 W., Public Works Department, dated 6th October 1886, comes to Rs. 1,10,000. Rs. 61,000 have already been secured—Rs. 26,000 (in round figures) from the contribution of villagers transferred from the Provincial to Local funds, and Rs. 35,000 by a loan raised from the surplus of the Endowment fund—(*vide* G.O., dated 10th November 1885, No. 1000 L.F.). There is thus only a sum of Rs. 49,000 to be raised now. Towards this, a further sum of Rs. 15,000 may, after allowing a sufficient margin for

unforeseen expenses connected with the institutions, be availed of from the surplus of the Endowment fund :—

	RS.
From Tirukumugudi chattram	6,000
„ Kutalam „	1,000
„ Pandarakulam „	2,000
„ Market funds	1,000
By deferring repayment of debt to the Endowment fund during 1887-88	5,000
Total ..	15,000

For the remainder Rs. 34,000, the Zemindar of Etaiyápuram, as reported in my letter, No. 2, dated 8th January 1887, has already proposed to give us Government paper, our expenses in the conversion of which into money may possibly come to Rs. 1,000, if not more. We will, therefore, require to borrow Rs. 35,000 in all from him. This amount may be repaid in ten equal instalments of Rs. 3,500 each, and that to the Endowment fund at Rs. 5,000 instalments, as originally proposed and sanctioned by Government in their aforesaid order, the period of repayment only being increased from seven to ten years.

It will thus be seen that the amount of annual extra expenditure over the budget * figures of 1887-88 with which the local funds will be saddled by raising the loan of Rs. 50,000 as above described will be Rs. 6,000 only as noted below :—

	RS.
Repayment of principal	3,500
Interest on Rs. 50,000 now raised at 5 per cent. per annum	2,500
Total ..	6,000

This small sum may very safely be secured without violating the general provisions of the budget and without any appreciable difficulty.

As the allotments annually made on account of new works and repairs of communications are not fully utilised, as a rule, within the year, Rs. 5,000 may be curtailed in that direction. Rs. 300 may be expected as income from the tolls which it is in contemplation to impose on the bridge after its completion, Rs. 700 may be met from the general local funds, the whole making up Rs. 6,000 a year. The repayment of both the debts will commence from 1888-89 and end in 1897-98. Should the Government be pleased to accord their sanction to the above proposals, the consent of the several taluk boards under whose control the various institutions, the surplus of which is proposed to be drawn, are, will be obtained therefor, and necessary arrangements will also be entered into with the Zemindar of Etaiyápuram, and the result be submitted to Government for approval.

4. Should the Government be pleased to advance the sum required (Rs. 34,000) at the lower rate of 4 per cent., the board would make the same arrangement for repayment of the loan and would be greatly benefited through gaining the accommodation on better terms, and not having to incur any loss on account of the conversion of Government paper into money.

5. A tracing of Messrs. Richardson and Cruddas' alternative design for a bridge of web girders and rolled iron beams was submitted to Government, accompanied by Local Fund Engineer's note, with my letter, No. 19, dated 9th February 1887. In reply to a reference made to the firm on receipt of the last Government Order on the subject, they state that there would be no appreciable difference in cost at present rates, between the sanctioned design of braced girders and an alternative one of web girders. This being so, the Local Fund Engineer thinks the advantages are in favor of the braced girder : the latter is lighter in appearance and presents a smaller surface laterally to resist wind pressure, which, considering the exposed situation—twenty-four feet above the bed of the river—is a point of some importance.

The papers received subsequently from the firm are enclosed.

* Which already includes a provision for repayment of Rs. 5,000 instalment and interest thereon.

ENCLOSURES.

From Messrs. RICHARDSON and CRUDDAS, Bombay, to the Local Fund Engineer, Tinnevelly District, Palamcottah, dated Bombay, 19th March 1887, P.T. No. 94.

We beg to acknowledge receipt of your letter, No. A, of the 12th instant, together with the enclosures mentioned therein.

We have again gone into the matter as carefully as possible, and beg to quote as follows in the form requested :—

	RS.
(1) For delivery of the whole of the iron-work as your plan and quantities free at Tinnevelly railway station	42,190
(2) For delivery and erection of the same at bridge site, and responsibility until the whole is delivered over as satisfactory ..	54,690

The neither of the quotations of course include any wood-work, which we presume you would otherwise arrange for.

The design seems to us very suitable and economical, but there are one or two points which we venture to bring to your notice :—

1st.—The width of flange plate is mentioned in your letter as 10", but marked on the tracing 10½".

The former would work into stock all right, but the latter would not.

2nd.—The flange angles are 2½ × 2½ × ½ in the middle and ⅜" thick at ends.

We would strongly advise you to allow us to use *one* thickness in order to get a satisfactory joint, which we rather doubt with unequal thickness.

3rd.—The section of the longitudinal rolled beams is given as 6¼" × 2" × 11lb.

We think you would find it worth the difference to use 5" × 3" × 13lb., as on account of the extremely narrow flange of the former—only about ¾" practically—the fastening down of the timber becomes a difficulty; and we think also that there is a greater possibility of the "springiness" which you objected to in previous correspondence arising with such a narrow section. The difference would be Rs. 1,100, including carriage and erection, and we think you would find it economical.

If you approve of our suggestions, we would be pleased to make a revised tracing showing exact details of our working plan, so that you could approve of our action before we carried it out.

We are sure we should give you every satisfaction, and we have given you the very lowest rates consistent with good workmanship and material throughout.

We would send down a complete staff of men under one of our European foremen with complete lifting tackle for the erection. We have just completed about ¾ths of a large contract for very similar erection for the Cuddapah-Nellore State Railway, which has been done with perfect satisfaction to the Chief Engineer.

We beg to advise despatch per book-post of our new sheets of rolled beam sections, full size, which we trust will prove serviceable to you.

You will note that we have given you much lower quotations than before and all the benefit of the present low prices of iron, but we should mention that we cannot, of course, bind ourselves to these for any indefinite time, and would be much obliged by early intimation of the acceptance of our tender, to enable us to take advantage of present rates for the rough material.

R. and C.

From R. A. LOWRY, Esq , Local Fund Engineer, Tinnevelly District, to Messrs. RICHARDSON and CRUDDAS, Bombay, dated Tiruchendur, 8th April 1887, No. F.

I enclose a design of yours for a bridge of web main girders and rolled cross beams. Please wire the lowest figures at which you will—

(1) deliver all iron work for thirty-three spans of this design at Tinnevelly railway station ;

(2) deliver and erect all iron work on piers at Srivaikuntham.

2. I also request that you will fill in dimensions of all parts on the enclosed plan, or submit another one drawn up in greater detail if you think this necessary. Government, in their Order, Mis. No. 607 L., dated 30th March 1887, have asked for this information.

3. If you find that you could not do the work according to your own design for a lower figure than the sanctioned one, you need not trouble about the matter further, but just telegraph to say so.

4. I think myself that the sanctioned design is more suitable from every point of view, and if there is not an appreciable difference, say, more than Rs. 1,000, in favor of your design, it will not be worth your while to trouble about preparing fresh plans.

5. I may mention that Government is likely to withdraw its objections to the work being contracted for by a private firm in India, and that your tender has been recommended for acceptance.

Telegram from Messrs. RICHARDSON and CRUDDAS, Byculla, to the Local Fund Engineer, Palamcottah, dated 4th April 1884.

Your letter eighth instant. We consider previous design sent with yours twelfth ultimo more suitable. No appreciable difference in cost at present rates. Will make details if necessary.

Order—dated 2nd May 1887, Mis. No. 771 L., Local and Municipal.

Communicated to the Public Works Department for early remarks, with reference to its memorandum, dated 19th March 1887, No. 1067-C.

(True Extract.)

(Signed) H. E. STOKES,
Ag. Chief Secretary.

To the Public Works Department.

Read—also the following paper :—

Telegram from the President, District Board, Tinnevelly, to the Chief Secretary to Government, dated 5th May 1887.

Richardson and Cruddas wire cannot keep offer open long. Falling exchange, rising prices. Solicits early favorable orders. Letter 44 of 18th ultimo.

No. 79-D.

Retransmitted, with remark that there is no objection in this department to the original design (which has already been approved) being adhered to, and the contract given to Messrs. Richardson and Cruddas.

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

OOTACAMUND,
7th May 1887.

To the Local and Municipal Department.

Order—dated 10th May 1887, Mis. No. 823-A L., Local and Municipal.

Ordered that the following telegrams be despatched to the Government of India and to the President, District Board, Tinnevelly :—

Telegram to the Secretary to the Government of India, Department of Finance and Commerce.

Tinnevelly District Board propose to construct iron girder bridge 33 spans over Támbraparni river at Srívaikuntham. Plans approved and sanctioned by Public Works Department. Total weight of iron work required is 221 tons. Messrs. Richardson and Cruddas, Bombay, offer to supply, convey and erect this at total cost of Rs. 250 per ton. Cost of making up iron alone at Government Workshop, Madras, would be Rs. 260 per ton. Iron got out from England through Secretary of State might be cheaper than workshop rates, but board have no sufficiently skilled agency to set it up. Under these circumstances, please sanction board's entering into contract for work with Richardson and Cruddas. Chief Engineer, Public Works Department, who has been consulted, concurs. Similar sanction given last year in case of Malabar; see my letter, 28th May 1886, No. 595. Please wire reply, as the firm cannot keep present offer open long owing to falling exchange.

To the President, District Board, Tinnevelly.

Sanction of Government of India for arrangement with Richardson and Cruddas asked by wire.

(True Extract.)

(Signed) H. E. STOKES,
Ag. Chief Secretary.

READ—also the following papers :—

From J. LEE-WARNER, Esq., President, District Board, Tinnevelly, to the Chief Secretary to Government, dated Tinnevelly, 3rd May 1887, No. 48.

In continuation of my letter, No. 44, dated 18th April 1887, I have the honor to point out that included in the estimate is the provision for the supply of timber, which amounts to not less than Rs. 18,532 for 8,057½ cubic feet of wood and the cost of bringing it to site in proper shape. It is likely that, if the order is given to the District Forest Officer, some arrangement can be come to with the department for deferring payment with the sanction of Government. In this case, the remainder which has to be provided by the raising of a loan will be reduced to Rs. 20,000, which is a comparatively small amount. I therefore earnestly solicit favorable consideration of my suggestion in paragraph 4 that the Government should advance the amount (Rs. 34,000) instead of driving the board to borrow in the market.

Telegram from the Secretary to the Government of India, Department of Finance and Commerce, to the Chief Secretary to the Government of Madras, dated 24th May 1887.

Your telegram 10th May. Government cannot sanction proposal regarding Támbraparni bridge, as proceeding would be in violation of Secretary of State's express orders.

ORDER—dated 26th May 1887, No. 945-A L., Local and Municipal.

His Excellency the Governor in Council regrets that the Government of India have found themselves unable to sanction the purchase in India by the Tinnevelly District Board of the iron-work required for the Srivaikuntham bridge. The iron-work will now have to be obtained by the board through the Secretary of State in accordance with the rules published in G.O., 31st January 1883, No. 190.

66 G.O. 87 /83

2. The total estimated cost of the bridge is Rs. 1,10,000. Of this sum, the board have already procured Rs. 61,000, viz., Rs. 26,000 by private contributions, and Rs. 35,000 by a loan from their Endowment fund sanctioned in G.O., 10th November 1885, No. 1000 L. F. This latter sum, which was borrowed at 5 per cent. interest per annum, was to be repaid by yearly instalments of Rs. 5,000, commencing from the current year.

3. In his letter, dated 18th April 1887, No. 44, which was recorded in the Government Order read above, the President proposed to raise the Rs. 49,000, or in round numbers Rs. 50,000, still required, in the following manner :—

(*a*) Rs. 5,000 by suspending repayment of the sum borrowed from the Endowment fund (1st instalment) during the current year.

(*b*) Rs. 10,000 by contracting a further loan from the Endowment fund on the same terms as the preceding.

(*c*) Rs. 35,000 by a loan from the Zemindar of Etaiyápuram, to be repaid in yearly instalments of Rs. 3,500 with interest at 5 per cent. per annum.

The total sum borrowed by the board would thus be Rs. 80,000, viz., Rs. 45,000 from the Endowment fund, to be repaid in 9 yearly instalments of Rs. 5,000 each commencing from 1888-89, and Rs. 35,000 from the Etaiyápuram Zemindar, to be similarly repaid in 10 yearly instalments of Rs. 3,500 each.

4. In his present letter, however, the President proposes an alternative plan. The timber required for the bridge, which will be procured from the Forest Department, is estimated to cost Rs. 18,500, and it is suggested that the board should be allowed to obtain this wood without immediate payment. A sum of Rs. 10,000 is apparently to be obtained from the Endowment fund, and the Government is asked to lend the board the balance of Rs. 21,500 at 4 per cent. per annum.

5. The Government regret that they are unable to accede to these latter proposals. The attention of the President is directed to paragraph 5 of the rules under the Local

Authorities' Loan Act published by the Government of India in notification, No. 2749, of 17th August 1883. It is therein laid down that "without the consent of the Government of India, no loan shall be granted to any district committee for the construction of any public work, unless it be estimated that a direct net revenue will be derived therefrom equal to at least 4 per cent. per annum on its capital cost." The tolls which will probably be established when the bridge is completed will certainly not yield anything like such a return, and in the present state of the finances it is most improbable that the Government of India would sanction the grant of a loan by Government for a comparatively unremunerative work. The proposal that Government should supply the board with timber on credit amounts virtually to the grant of an additional loan, and is inadmissible for the reasons above stated.

6. The board must therefore fall back on the President's first scheme described in paragraph 3 above. Sanction will be given by this Government to the proposals relating to the Endowment fund, and there is no reason to suppose that the Government of India will refuse their consent to the borrowing of Rs. 35,000 from the Etaiyápuram Zemindar. The President should prepare a statement in due form for submission under Section 7 of the Local Authorities' Loan Act.

7. The following telegram will be despatched to the President :—

"Government of India refuse to sanction board's contract with Richardson and Cruddas. Iron-work must be obtained through Secretary of State in the ordinary way."

(True Extract.)

for *Ag. Chief Secretary.*

To the President, District Board, Tinnevelly,
with 4 plans returned.
" Public Works Department.

Exd. A. Raitt.

E.S.C

G.O. 1679 W 2. 7. 86
" 202 W 25-1. 86
B. No 469 W 12-2. 83
Mis 2348 W 16-9-86 ...

P.W.C. No. 4514

Gobt. of (1887) Madras
LOCAL AND MUNICIPAL.

(7)

S.S.C

1706 W d/24th June/87
B

Communicated

Communicated

to the S.E. VI Circle.

to the S.E. VI Circle

for information

for information

Issued

Recd. 14. 6. 87 *Encl.*

G.O., 26th May 1887, No. 945-A L.

B. No 1706 W d/24-6-87

MAY.

Jell
21/6/87

Gray

Bridges.

Informing the President, District Board, Tinnevelly, that the Government of India having disapproved of the purchase in India of the iron-work required for the Srivaikuntham bridge, it will have to be obtained through the Secretary of State.

S.E. VI circle ✓

S.E. VI Circle

D
Ledg 24/6
to ool

O.S. 132. VI
M. 21.6.87

30/6

O. 18.6.87 R. 23.6.87

With order

G.O. 1679 W 3. 7. 86

No 176 W d/ 16th January/88

Comd. to the Supg. Engr. II Circle in contn. of G.O. No. 3309 W d/ 3 Decr 1887.

(S) W.L.C.B.

To S. E. II C

Govt. of {1887} Madras.

LOCAL AND MUNICIPAL.

Issued

Recd. Encl.

G.O., 20th Dec. 1887, No. 2529 L.

No 176 W d/ 16th January/88

DECEMBER.

Srivaikuntham Bridge.

Ordering despatch of a telegram to the Secretary of State approving the proposal to use plate girders for the — in Tinnevelly.

6,1679W 3.7.86

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

Read—again the following papers :—

G.O., dated 21st November 1887, Mis. No. 2263 L., Local and Municipal.

Read—the following telegram from the Right Honorable the Secretary of State for India, to His Excellency the Governor of Madras, dated 15th November 1887 :—

Chief Secretary to Government, Madras, letter 1913, 8th October last. Rendel thinks bridge too light, advises plate girders, makes whole weight ten tons per span, estimates cost erected at per ton two hundred rupees. If you agree, telegraph the one word "yes."

Order—dated 21st November 1887, Mis. No. 2263 L., Local and Municipal.

Communicated to the Public Works Department and the President, District Board, Tinnevelly, for *very early* remarks.

2. The following telegram will be despatched to the Secretary of State :—

"Your telegram 15th. Does rate, Rs. 200, cover transport from Tuticorin and erection bridge at site; if so, at what rate?"

(True Extract.)

(Signed) H. E. STOKES,
Chief Secretary.

To the Public Works Department.
„ President, District Board, Tinnevelly.

G.O., dated 29th November 1887, Mis. No. 2339 L., Local and Municipal.

Read—the following telegram from the Right Honorable the Secretary of State for India, to His Excellency the Governor of Madras, dated 23rd November 1887 :—

Your telegram of 21st November 1887. Rs. 200 meant to cover everything deducting manufacture and freight leaves transport from Tuticorin and erection at site estimated Rs. 60.

Order—dated 29th November 1887, Mis. No. 2339 L., Local and Municipal.

Communicated to the Public Works Department and the President, District Board, Tinnevelly, in continuation of G.O., dated 21st November 1887, No. 2263 L. The report from the district board called for in that Government order will be awaited.

(True Extract.)

(Signed) H. E. STOKES,
Chief Secretary.

To the Public Works Department.
„ President, District Board, Tinnevelly.

READ—also the following papers:—

No. 4286 C.

MEMORANDUM.

With reference to G.O., dated 21st November 1887, Mis. No. 2263 L., the undersigned has the honor to state that he sees no objection to the use of plate girders for the Srívaikuntham bridge.

MADRAS,
24th November 1887.
(Signed) J. O. HASTED, Colonel, R.E.,
Secy. to Govt., P.W.D.

To the Local and Municipal Department.

Telegram from the President, District Board, Tinnevelly, to the Chief Secretary to Government, dated 17th December 1887.

Yours 16th. District Board consent to Secretary State's proposals Srívaikuntham bridge.

ORDER—dated 20th December 1887, No. 2529 L., Local and Municipal.

The following telegram will be despatched to the Secretary of State:—

"Your telegram of 15th November last. Bridgework. Yes."

(True Extract.)

H. E. STOKES,
Chief Secretary.

To the President, District Board, Tinnevelly.
" Public Works Department.

Exd. P. L. Pereira.

No 176 W of 16th January/88

Govt. of {1887} Madras.

LOCAL AND MUNICIPAL.

Comd. to the Supy Engr II Circle in contn. of G.O. No 3309 W d/ 3rd Decr 1887

(Sd) W. L. C. B.

Issued

Recd. *Encl.*

G.O., 20th Dec. 1887, No. 2529 L.

No 176 W of 16th January/88

DECEMBER.

Srivaikuntham Bridge.

Ordering despatch of a telegram to the Secretary of State approving the proposal to use plate girders for the — in Tinnevelly.

S. E. II C.

READ—also the following papers :—

No. 4286 C.

MEMORANDUM.

With reference to G.O., dated 21st November 1887, Mis. No. 2263 L., the undersigned has the honor to state that he sees no objection to the use of plate girders for the Srívaikuntham bridge.

MADRAS,
24*th November* 1887.

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

To the Local and Municipal Department.

Telegram from the President, District Board, Tinnevelly, to the Chief Secretary to Government, dated 17th December 1887.

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The following telegram will be despatched to the Secretary of State :—

" Your telegram of 15th November last. Bridgework. Yes."

(True Extract.)

H. E. STOKES,
Chief Secretary.

To the President, District Board, Tinnevelly.
„ Public Works Department.

Exd. P. L. Pereira.

20th December 1887, No. 2529 L., Local and Municipal.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

Read—again the following papers :—

G.O., dated 21st November 1887, Mis. No. 2263 L., Local and Municipal.

Read—the following telegram from the Right Honorable the Secretary of State for India, to His Excellency the Governor of Madras, dated 15th November 1887 :—

Chief Secretary to Government, Madras, letter 1913, 8th October last. Rendel thinks bridge too light, advises plate girders, makes whole weight ten tons per span, estimates cost erected at per ton two hundred rupees. If you agree, telegraph the one word "yes."

Order—dated 21st November 1887, Mis. No. 2263 L., Local and Municipal.

Communicated to the Public Works Department and the President, District Board, Tinnevelly, for *very early* remarks.

2. The following telegram will be despatched to the Secretary of State :—

"Your telegram 15th. Does rate, Rs. 200, cover transport from Tuticorin and erection bridge at site; if so, at what rate?"

(True Extract.)

(Signed) H. E. STOKES,
Chief Secretary.

To the Public Works Department.
„ President, District Board, Tinnevelly.

G.O., dated 29th November 1887, Mis. No. 2339 L., Local and Municipal.

Read—the following telegram from the Right Honorable the Secretary of State for India, to His Excellency the Governor of Madras, dated 23rd November 1887 :—

Your telegram of 21st November 1887. Rs. 200 meant to cover everything deducting manufacture and freight leaves transport from Tuticorin and erection at site estimated Rs. 60.

Order—dated 29th November 1887, Mis. No. 2339 L., Local and Municipal.

Communicated to the Public Works Department and the President, District Board, Tinnevelly, in continuation of G.O., dated 21st November 1887, No. 2263 L. The report from the district board called for in that Government order will be awaited.

(True Extract.)

(Signed) H. E. STOKES,
Chief Secretary.

To the Public Works Department.
„ President, District Board, Tinnevelly.