(1) Number of pages 80

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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

P.W.D. DEPARTMENT

G.O. No. / B.P. No:	1764. W.	Press. / Mis.
Dated	18. 7. 1884	198 .

Not to be folded or roughly handled

39 + 1 No. 1 (39) 18. A.

Archives 1--10,006 1 -80.

1764

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads
Civil Works.

—the following papers :—

From Lieutenant-Colonel H. R. MEAD, R.E., Superintending Engineer, VI Circle, to the Chief Engineer, Public Works Department, dated Kodaikánal, 26th April 1884, No. 4 C.

have the honor to forward with the enclosures a letter from the President of the Fund Boards, Tinnevelly, addressed to the Board of Revenue. I have written port on the estimate, but as it exceeds Rs. 10,000 and requires your opinion, ard it to you and request you will dispose of it.

ENCLOSURES.

A. J. B. ATKINSON, Esq., President, Local Fund Boards, Tinnevelly, to the Secretary to the Board of Revenue, dated Tinnevelly, 16th April 1884, No. 56—(Through the Superintending Engineer, VI Circle).

1 reference to G.O., No. 1541 F., dated 21st October 1882, communicated in Proceedings Board of Revenue, Mis. No. 8473, dated 4th November following, I have the honor to submit an estimate for Rs. 1,05,000, together with plans, &c., noted in the margin, for constructing an iron girder bridge over the Srivaikuntham Anicut, and to request that you will be good enough to obtain the sanction of the Board and Government for the same.

1 Estimate for Rs. 1,05,000.
1 Specification.
1 Report with calculation.
7 Plans.

The estimate has been prepared in accordance with the instructions given in paragraph 5 Chief Engineer's Note embodied in the Government Order quoted above and in reference note, dated 28th August 1883 (a copy of which is also enclosed).

The bridge is to have thirty-three openings, each of 38 feet clear span, the girders are to feet above the crest of the anicut. The report accompanying the estimate gives a full of the works proposed.

The Local Fund Board, Tinnevelly Circle, has approved the plan and estimate; and a copy Resolution No. 2, dated 3rd April 1884 is submitted.

A sum of Rs. 25,394, being the unspent balance of the contribution paid by villagers s the construction of the anicut and refunded to Local Funds in G.O., Mis. No. 1516 F, 17th July 1883, is available to commence the work.

Report by the Superintending Engineer, VI Circle, on the Design and Estimate for a bridge proposed to be constructed across the Támbraparni River at Srivaikuntham Anicut at an estimated cost of Rs. 1,05,000.

1 Detailed estimate.
1 Abstract do.
1 Report.
1 Specification.
1 Calculation.
1 Copy of Local Fund Board's Proceedings, dated 3rd April 1884.
1 Copy of Note by the Chief Engineer for Irrigation, dated 28th August 1883.
1 Letter, No. 56, of 16th April 1884, from the President, Local Fund Board.
7 Plans sent by banghy to Ootacamund.

When the Srivaikuntham anicut was built, foundations were put down for a bridge and the piers built up to the level of crest of anicut; these piers are 5 feet wide, having openings of 36 feet, their length, including the breadth of the top of anicut and the rear cut-water, is 27½ feet; there are 33 openings.

2. The Local Fund Board have for some years wished to construct a bridge across the river at this point, and the villagers and people interested have subscribed largely towards it; some of the money collected was expended in building the piers and their foundations; a reference to G.O., No 1516 F., dated 17th July 1883, will show that now there is a sum of Rs. 25,394 available for the work. The present proposal is for an iron Warren girder bridge; it has been most carefully prepared by the Local Fund Engineer, and with it are sent complete calculations.

3. The undersigned does not consider it necessary for him to go over these calculations and details, because if the general design of the bridge is accepted, he thinks they ought to be sent to an expert or to some officer who has had experience in iron bridges for opinion; he, therefore, as the amount of estimate exceeds Rs. 10,000, forwards the plans, &c., to the Chief Engineer, as his approval is required, with the following remarks.

4. The height of the bottom of the girders is 17½ feet above the crest of the anicut. The Chief Engineer for Irrigation, in his note, dated 28th August 1883, considered that it should be 17¾ feet; the difference is so little, it is thought that the 17½ feet allowed may be accepted.

5. The piers 17½ feet high above crest of anicut, which is 6 feet above rear apron or bottom of the present piers, are proposed to be made 4 feet thick of coursed rubble masonry gneiss, being the stone available; the specification is carefully drawn, and if carried out, it is thought that the 4 feet width of pier is sufficient.

6. The width of roadway is 17½ feet between the flanges of the girders; this is considered narrow for a bridge of more than a ¼ of a mile in length, and as the piers already built allow a greater breadth, it should be increased, say to a breadth of 19 feet; this would allow a roadway of 17½ feet and wheel guard on each side ¾ foot in width.

7. The flooring of the bridge is proposed to be made of ⅛ of an inch thick corrugated iron plates covered with asphalte in the proportion of 2 of sand to 1 of asphalte. This in the opinion of the undersigned will not answer; he is not aware that corrugated iron of this thickness is even made in Europe, and doubts if it could be procured except at a great cost; but supposing it is available, he considers that the asphalte 1¾ inches and 3¼ inches thick on the corrugated iron would soon crack and break up.

He believes a flooring of 2-inch teak-wood covered with diagonal planking, say ¾ of an inch thick, of common wood well tarred and sanded would make a better and cheaper floor.

If an iron floor is thought necessary, buckled iron plates should be used, but it is feared that there will be considerable difficulty in getting a round surface of small weight that will stand on iron plates.

8. With regard to the general design of the iron bridge, 33 spans of 38 feet clear width, it is thought that for small spans of this sort a Warren girder is out of place.

The undersigned believes that it is an accepted fact that for spans up to 70 feet ordinary plate web girders are the best and cheapest. The estimated cost of the proposed bridge (not including the cost of foundations, abutment and wing-walls which have been built) is Rs. 76 a foot run; this appears very high, and he believes that 40 feet wrought iron girders of a suitable design with cross girders, say 6 feet apart, adapted for teak-wood planking, could be procured without delay at a less cost direct from England, and he would urge this being done.

9. In conclusion, the Superintending Engineer would recommend that the raising of the piers 17½ feet in height, 4 feet wide, and a length of 22½ or, including cutwaters, 26½ feet (that is 1 foot longer than designed) may be sanctioned at once, so that the masonry work may be put in hand without delay. Should the Chief Engineer consider it advisable, a considerable reduction might be made by building the piers of brick in chunam with cut-stone cut-waters in front and rear and cut-stone ashlar facing for, say, a height of 3 feet above crest of anicut.

KODAIKANAL,
26th April 1884.

(Signed) H. R. MEAD, Lieut.-Col., R.E.,
Superintending Engineer, VI Circle.

1764
2

Note by the Chief Engineer, Public Works Department.

The estimate, amounting to Rs. 1,05,000, for constructing a bridge over the Srivaikuntham Anicut, is submitted for the consideration of Government.

2. The work proposed is to raise the piers, the lower parts of which were built at the same time as the anicut, and to erect thereon a superstructure of wrought iron girders with platform complete. There will be 33 bays, each span being 38 feet clear.

3. The first design, now abandoned, was for girders made of old rails, which were objected to by the Chief Engineer for Irrigation.

4. The main girders now designed are of the Warren type, the transverse girders being attached to verticals hung from the vertices of each alternate pair of triangles. The transverse girders are crossed by small longitudinal girders, and the whole covered with corrugated plates, on which is to be laid a flooring of asphalte.

5. The Superintending Engineer, VI Circle, considers the roadway of 17½ feet between the flanges too narrow for a bridge over ¼ mile in length, and recommends a breadth of 19 feet. This alteration is certainly desirable, but the wider roadway will entail stronger and deeper transverse girders and more iron in the main girders.

6. The Superintending Engineer also objects to the platform of ⅛ inch corrugated iron plates, and is apparently not aware that such plates are made in Europe. Colonel Mead is of opinion that a flooring of 2 inches teak-wood covered with diagonal planking ¾ thick, of common wood, would make a better and cheaper floor. This proposed modification is important, for, if adopted, the girders may of course be made lighter. Corrugated iron, with asphalte or concrete, even of the slight thickness allowed (which is thought to be quite insufficient), forms a heavy platform and adds greatly to the dead weight. But to compare the merits of the two systems, an alternative estimate is clearly required.

7. A further point which requires consideration may here be touched upon. The transverse girders resting on the lower booms, which are 17½ feet apart, are necessarily heavy; and the section and weight must be greater if the roadway is widened as recommended. It does not appear to have been considered whether the roadway might not rest on the top booms, which can then be brought closer together and the whole weight lessened. This appears to be a suitable position for the arrangement of floor above girders; for, the head-way being left as it is, the great length of bridge makes a slight raising of the approaches a matter of small comparative expense.

8. There will be of course the cost of the railings to be considered; but, as a set-off, it would be easy to effect a considerable saving by reducing the length of the piers.

9. In his paragraph 8, the Superintending Engineer remarks that the Warren girders appear to be out of place. That, in fact, plate girders for such small spans are best and cheapest. There can be no doubt about this, if there are no difficulties as regards transport to the place. A series of 11 continuous plate girders—continuous, that is, over every 3 bays—with a light overhanging roadway, appears to be a suitable arrangement.

10. The work as designed is estimated to cost over a lakh of rupees; and the question as to what will be the best and most economical superstructure should be carefully considered.

11. In his concluding paragraph, the Superintending Engineer asks that sanction may be given at once to the construction of the piers, the length to be 1 foot longer than designed.

The raising of the piers does not affect the question of the type of girder to be used, nor the kind of roadway; but the length to be given to the piers depends on the adoption of a platform resting on the bottom booms as designed, or of one resting on the top booms as suggested in paragraph 7 of this note. Until, therefore, it has been finally settled which of the two alternatives should be followed, it will be well to restrict action to the preparation of materials, leaving the construction of the piers

2

untouched for the present. The decision respecting the design for the superstructure should be arrived at with as little further loss of time as possible.

(Signed) J. SHAW-STEWART, Col., R.E.,
Chief Engineer, Public Works Department.

18th July 1884.

Order—dated 18th July 1884, No. 1764 W., Public Works.

The Government consider that the suggestions of the Chief Engineer, in paragraph 11 of his note, should be adopted, and they accordingly sanction the preparation of materials for the piers. With respect to the concluding sentence of the Superintending Engineer's report, paragraph 9, the piers throughout should be of coursed rubble in mortar as estimated for.

2. With respect to the superstructure of the bridge, the Local Fund Board will be called upon to submit an alternative estimate, providing for plate girders continuous over three bays, as suggested by the Chief Engineer, and for an over-hanging road, nineteen feet in width between the railings, the floor to be constructed of timber as recommended by the Superintending Engineer.

3. On receipt of this alternative estimate, final orders will be passed.

(True Extract.)

(Signed) J. SHAW-STEWART, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Board of Revenue, with fifteen enclosures.
,, Superintending Engineer, VI Circle.
,, Financial Department.

Exd. A. F. Aaron.
Spare Copies

1764
3

3

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1884} Madras.

PUBLIC WORKS.

Dated July, 18*th*.

Read. *Encl.*

G.O., 18th July 1884, No. 1764 W.

JULY.

Bridge

Passing orders on letter from the Superintending Engineer, VI Circle, submitting plans and estimate for a — over the Srivaikuntham Anicut.

Srivaikuntham Anicut Bridge.

1764

I see no objection to the papers being sent back to the Board to enable them to consider the advisability of adopting the alternative design submitted with the Superintending Engineer's letter dated 27th May 1884 and to state whether they see any objection to the sanction now applied for being accorded in anticipation of the receipt of the Secretary of State's sanction to the transfer of the Talavasal Bridge to the Public Works Department.

The reference to the "deck-off" in para 8 of the Board's letter is not quite clear to me.

K. S.
17/6/84

Letter issued back to P.W.D.

No. D.

GOVT. OF MADRAS. } 1884. { P. W. DEPT.

SECRETARY.

Chepauk, 27th May 1884.

1764

OFFICE NOTE.

To W.

Bridge over the Srivaikuntham Anicut.

Estimate, Rs. 1,05,000.

The work proposed is to raise the piers, the lower parts of which were built at the same time as the anicut, and to erect thereon a superstructure of wrought iron girders with platform complete. There will be 3 bays, each span being 30 ft. clear.

The first design, now abandoned, was for girders made of old rails, somewhat similar in arrangement to the rail girders proposed for the Talavasal Bridge, which formed the subject of a recent controversy. To these girders E.I. objected and his remarks regarding them would apply with equal force to the Talavasal Bridge.

1764

Substitute for 2nd part of para 11 of Govt letter

The raising of the piers does not affect the question of the type of girder to be used, nor the kind of foundation, but the length to be given to them depends on the adoption of a platform resting on the bottom boom as designed, or of one resting on the top booms as suggested in para 7 of this note. Until finality is settled by the Local Fund Engr. which of the two alternatives Nos 1 & 2 should be adopted, it will be well to restrict action to the preparation of materials, leaving the construction of the piers untouched for the present. His decision Nos 1 & 2 by [illegible] arrived at, [illegible] without loss

No. D.

GOVT. OF MADRAS. } 1884. { P. W. DEPT.

SECRETARY.

Chepâk, 27th May 1884.

1764

OFFICE NOTE.

To W.

Bridge over the Srivaikunham Anicut.

Estimate, Rs. 1,03,000.

The work proposed is to raise the piers, the lower parts of which were built at the same time as the anicut, and to erect thereon a superstructure of wrought iron girders with platform complete. There will be 7 bays, each span being 38 ft. clear.

The first design, now abandoned, was for girders made of old rails, somewhat similar in arrangement to the rail girders proposed for the Talavasal Bridge, which formed the subject of a recent controversy. To these girders E.I. objected and his remarks regarding them would apply with equal force to the Talavasal Bridge.

No. D.

GOVT. OF MADRAS. } 1884. { P. W. DEPT.

SECRETARY.

Chepâk, 27th May 1884.

1764

OFFICE NOTE.

To W.

Bridge over the Srivaikunham Anicut.

Estimate, Rs. 1,05,000.

The work proposed is to raise the piers, the lower parts of which were built at the same time as the anicut, and to erect thereon a superstructure of wrought iron girders with platform complete. There will be 11 bays, each span being 30 ft. clear.

The first design, now abandoned, was for girders made of old rails, somewhat similar in arrangement to the rail girders proposed for the Talavasal Bridge, which formed the subject of a recent controversy. To these girders E.I. objected and his remarks regarding them would apply with equal force to the Talavasal Bridge.

To W.

1764

The draft proposal for Srivaikuntam and that for Srivaikuntam Anicut are certainly from the same standpoint, the former in its para 11, the latter in its para 6.

I have forwarded them for consideration in the accompanying office giving proposed modifications of them two forms.

The modified draft will I think meet the case, tho' I am not quite sure that it would not be wiser to allow sanction only to the preparation of materials for the piers, withholding sanction to raising them until the question of girders & roadway has been finally settled. Decision on this point might be arrived at jointly by the S.E. & Local Board.

Should you decide on preparation of materials only, and negative on building up of a few of the lower courses, & settings being left, further modification of draft will be necessary, but it will be easy.

CJ

21.6.84

To D.W.

I concur in what I gather the above to be your opinion — that it would be better to record sanction only to the preparation of materials for the piers, & not to the building up of any of the masonry.

8

V

The construction of the piers
intended with the sanctioned
projecting type of girder &c.
have been finally settled.
It remarked by you, the
decision on these points should
be referred at without much
further loss of time
Have now the drafts revised
accordingly.

26/5

Ref. If the accompanying
modified lay-out plan
be approved, revised
Class drafts will be
submitted otherwise.

Cl
1.7.84

Approved — Cl
1.7.84

2nd part of para 11.

The raising of the piers
not affect the question of a
of girder to be used, nor
kind of roadway, but the height
to which piers depends on
the adoption of a platform resting
on the lower booms or designed
or one resting on the top booms
as suggested in para 7 of the
letter, therefore it has been
settled by the Local Fund Member
consultation with the Superintending
which of the two alternatives
be followed, it will be well
build up only the lower end
of the piers & the cost of
for continuing further until
Rumping Roadway, Footings &
left so as to build in the additional
length of masonry that will be
ultimately it is decided to for
platform as originally proposed
decision should be quickly arrived
at, so that but a few feet of
the piers need be built up
this exact height is finally de

Cl
11.6

No. D.

GOVT. OF MADRAS. } 1884. { P. W. DEPT.

SECRETARY.

Chepâk, 27th May 1884.

1264

OFFICE NOTE.

To W.

Bridge over the Srivaikunham Anicut.

Estimate, Rs. 1,05,000.

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oposed for the Talavasal
idge, which formed the subject
a recent controversy. To
ese girders E.I. objected and
s remarks regarding them
uld apply with equal force
the Talavasal Bridge.

Proceedings, 22

1764

3

The Government consider that the recommendation of the Superintending Engineer in favour of his report may be adopted to the extent suggested by the Chief Engineer, and they accordingly sanction the immediate raising of the Anicut piers to the height necessary for the intermediate girders and a hanging platform. The piers themselves should be of concrete rubble in mortar as estimated.

2. As per form 2 for original draft.

As per form 3 in

CH.

21.6

No. D.

GOVT. OF MADRAS. } 1884. { P. W. DEPT.

SECRETARY.

Chepâk, 27th May 1884.

1764

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The work proposed is to raise the piers, the lower parts of which were built at the same time as the anicut, and to erect thereon a superstructure of wrought iron girders with platform complete. There will be 33 bays, each span being 38 ft. clear.

The first design, now abandoned, was for girders made of old rails, somewhat similar in arrangement to the rail girders proposed for the Talavasal bridge, which formed the subject of a recent controversy. To these girders E.I. objected and his remarks regarding them would apply with equal force to the Talavasal Bridge.

Bridge over Srivaikuntam Anicut

1764

9.

Draft note & letter submitted for approval. Please see note by Bd. Printed with P.L. No 1521 Financial Dy 21.10.84, in which Government direct that the design for the work be submitted to them for approval before commencing the work.

Cm
9.6.84

Yes — I think the letter & note referred to. Has this last better come for? Then for note of the orders. Next as proposed & my remarks. Hereon for my wish & offer.

DL
10-6-84

9

No. D.

GOVT. OF MADRAS. } 1884. { P. W. DEPT.

SECRETARY.

Chepâk, 27th May 1884.

1764

OFFICE NOTE.

To W.

Bridge over the Srivaikuntham Anicut.

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Sent W.O. 2-7-84
(Rct. 2/6/84)

No. D.

GOVT. OF MADRAS. } 1884. { P. W. DEPT.

SECRETARY.

Chepâk, 27th May 1884.

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3617

D.W.

It looks as if the Asst. Engr. should be asked to send down the plans referred to in the accompanying papers.

C.E. 14-5-84

I think then this had better go on to D.W.T. & plans to C.A.W. by S.E. & report to be kept back - viz: in view to the work starting soon.

C.E. 14-5-84

C.A.W.

Cur. 3617 was before me for some time by I, pending receipt of the plans.

On receipt of the Secretary's note of 7.5.84, D.W. directed the file to be kept for a few days longer, as it seemed probable that the plans would be sent down for scrutiny.

It now seems as if it is not your intention to send the plans to Madras, &

No. D.

GOVT. OF MADRAS. } 1884. { P. W. DEPT.

SECRETARY.

Chepâk, 27th May 1884.

OFFICE NOTE.

To W.

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12

No. D.

GOVT. OF MADRAS. } 1884. { P. W. DEPT.

SECRETARY.

Chepâk, 27th May 1884.

1764

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The main girders now designed are of the Warren type, the transverse girders being attached to verticals hung from the vertices of each alternate pair of triangles. The transverse girders are crossed by small longitudinal girders, and the whole covered with corrugated plates on which is to be laid a flooring of asphalte.

The S.E. (VI Circle) considers the roadway of 17½ ft. between the flanges too narrow for a bridge of over ¼ mile in length, and recommends a breadth of 19 feet.

This alteration is certainly desirable, but S.E. forgets that the wider roadway will entail stronger and deeper transverse girders and more iron also in the main girders.

He objects to the platform of ½ inch corrugated iron plates, and is not aware that such plates are even made in Europe. Here he is quite wrong, corrugated iron plates up to ¼ inch thick being expressly manufactured for such platforms. The cost no doubt is

heavy - it used to range up to £ 13 a ton. These plates, however, add greatly to the stiffness of a bridge.

1764

Col. Mead thinks that a flooring of 2 inches teakwood covered with diagonal planking ¾ thick, of common wood would make a better and cheaper floor. This proposed modification is important, for if adopted the girders may of course be made lighter. Corrugated iron with asphalte or concrete even of the slight thickness allowed (which is, I think, quite insufficient) forms a very heavy platform and adds greatly to the dead weight. But to compare the merits of the two systems an alternative estimate is clearly required.

Here I may touch on a point which I think requires consideration. The transverse girders resting on the lower booms which are 17½ ft. apart, are necessarily heavy, and the section and weight must be greater if the roadway is widened as recommended. It does not appear

to have been considered whether the roadway might not rest on the top booms, which can then be brought much closer together, and the whole weight lessened. This appears to be just the position for the arrangement of floor above girders, for, the headway being left as it is, the great length of bridge makes a slight raising of the approaches a matter of small comparative expense.

There will be of course the cost of the railings to be considered, but as a set off against this it would be easy to effect a considerable saving by reducing the lengths of the piers.

In his para 8 the S.E. remarks that the Warren girders appear to be out of place. That, in fact, plate girders for such smallspans are best and cheapest. There can be no doubt about this, if there are no difficulties as regards transport to the place. It seems to me to be just the place for a series of 11 continuous plate girders - continuous that is over every 3 bays -

with a light overhanging roadway.

1764/14

The work as designed is estimated to cost over a lakh of rupees, and it appears to me that it should be fully considered what will be the best and most economical superstructure.

In his concluding para S.E. asks that sanction may be given at once to the construction of the piers - the length to be 1 foot longer than designed.

This does not affect the question of the type of girdor to be used nor the kind of roadway, so this part of work might not be delayed.

The question which I have proposed - the feasibility of having the roadway above and overhanging the girders - does however, to some extent affect the question of the length of the piers.

C.S.

D.W.

D.W.

6/11

The recommendations of the S.E. in para 4 of his report may I think be adopted, and the raising of the piers sanctioned

for immediate execution, in accordance with the estimate (i.e. of coursed rubble, not brickwork as suggested.)

With respect to the superstructure an alternative estimate should be called for, providing for plate girders continuous over 3 bays, as suggested by Mr., and for an overhanging roadway 19' in width between the railings — the floor to be constructed of timber as suggested by Mr. E.

W.
3-6-84

File sent Engineer-in-Chief's Office.

Draft orders accordingly.
CW.
6-6-84

15

1764

Public Works Department, 188--85.

Current No. 3627

Letter No. 2C

Dated the 20th April 85

From the S.E.VI Circle

NOTE OF REMARKS.

1. The accompanying plans and estimate provide for completing the bridge proposed to be constructed across the Sambhar river over the Swaikeen dam-anicut, immediately Direct. The estimated amount is Rs. 105000.

2. Where the Swaikeen dam-anicut was built, piers with foundations 6'-0" per depth, were erected & not levelled with the crest of the anicut with a view to the construction of a bridge at a future period. It is now intended to carry out the design to the completion. The present proposal is for a Warren Girder Bridge.

9/5

Dy. 25-4-85. Ex. 6-6-85.

The piers are 32 in number, the piers to be 2½ feet in length, 2 feet wide, and 17½ feet high, and to be built of coursed rubble masonry. but stone beds holding wooden plates, have been provided for the main and longitudinal girders which rest on piers and abutments. The bays, 33 in number and each 38 feet in length, are spanned by main girders on which rest the cross and longitudinal girders which support the corrugated iron plates bearing the asphalte concrete of the roadway.

3. The tops of piers are 2¾ feet above M. F. L. as laid down by S. E. — S.E. considers this sufficient. S.E. recommends that the width of roadway should be increased to 19 feet — the width now allowed is 17½ feet

S.E. considers a wooden flooring would be a better and cheaper one than that proposed to be adopted.

4. The plans and estimate have been countersigned by the President of the L. F. Board

23d May/84

Former case 16
R 814 W. d/o. 11.82

No. 1057 D.

GOVT. OF MADRAS. } 188 . { P. W. DEPT.

SECRETARY.

Chepâk, 10th June 1884.

OFFICE NOTE.

To E. I.

Adverting to your note No 88 J. dated 9th September 1882, para 5, the plans & estimate for constructing a bridge over the Srivaikuntham Anicut are forwarded for your information.

The orders proposed to be issued are also forwarded, for note, & for any remarks you may wish to offer thereon.

C.S.

Ch. E. I. to Govt
No 8

1764

29

17

9th Dept.

1764

Note by the Chief-Engineer, P.W.Department — dated June 9th 1764

Referred

The estimate amounting to Rs 10,500 for constructing a bridge over the Sirvaikkuathum Anicut is submitted for the Consideration of Government.

2. The work proposed is to raise the piers, the lower parts of which were built at the same time as the anicut, and to erect thereon a superstructure of

20 brought

wrought iron girders
with platform com-
plete. There will be
33 bays, each span
being 38 feet clear.

3. The first design,
now abandoned, was
for girders made of
old rails, which
were objected to by
the Chief Engineer for
Irrigation

4. The main girders
now designed are of the
Warren type, the 11
transverse girders being
attached to verticals
hung from the vertices
of each alternate
pair of triangles.
The transverse girders
are covered by
small

1164

small longitudinal
girders, and the
whole covered with
corrugated plates
on which is to be
laid a flooring of
asphalte.

5. The Superintending
Engineer VI Circle
considers the roadway
of 17½ feet between
the flanges too narrow
for a bridge over ¼
mile in length, and
recommends a breadth
of 19 feet. This
alteration is certainly
desirable; but ~~the Superin-~~
~~-tending Engineer~~
~~forgets~~ the wider
roadway will
entail

1864.

is of opinion

& Col. Mead thinks that a flooring of 2 inches teak-wood covered with diagonal planking ¾ thick, of common wood, would make a better and cheaper floor. This proposed modification is important. For if adopted, the girders may of course be made lighter. Corrugated iron with asphalte or concrete, even of the slight thickness allowed, (which is thought to be quite sufficient) forms a very heavy platform, and adds

add

detail stronger and deeper transverse girders, and more iron in the main girders.

b. The Superintending Engineer also objects to the flat-form of ⅛ inch corrugated iron plates, apparently and is not aware that such plates are made in Europe. Corrugated iron plates upto ¼ inch thick are however expressly manufactured for deck platforms. The cost of no double is heavy, ranging upto £13 a ton. These plates, however, add greatly to the stiffness of a bridge.

b.

adds greatly to the
dead weight. But
to compare the merits
of the two systems,
an alternative estim-
-mate is clearly
required.

7. A further
~~How~~ point which
requires consideration
may ~~be~~ here be touched upon.
The transverse girders
resting on the lower
booms which are 17½
ft apart, are necessa-
-rily heavy, and the
section and weight
must be greater
if the roadway is
considered as re-
-commended.
It does not appear
to have been consider-
-ed whether the
roadway

roadway might
not rest on the top
booms, which, can
then be brought
~~much~~ closer together,
and the whole weight
lessened. This appears
to be a suitable
~~the~~ position
for the arrangement
of floor above girders,
for, the head-room
being left as it is,
the great length of
bridge makes a
slight raising of
the approaches a
matter of small
comparative expense.

8. There will
be of course the
cost

Cost of the parling to be considered; both, as a set-off, against it would be easy to effect a considerable saving by reducing the length of the piers.

9. In this para 8, the Superintending Engineer remarks that the Warren girders appear to be out of place. That, in fact, plate girders for such small spans are best and cheapest. There can be no doubt about this, if there are no difficulties as regards transport

Do not Guilt see how the Government is recommended to the best form of span to be adopted, when the Construction of the piers is [illegible] longer than designed. The old to be cut more out on hand.

If the length of the piers is [illegible] continued on the design accepted for the original tenders

I do not see how the construction can be authorised until the design is determined

21

transport to the place. It seems to be just the place for a series of 11 continuous plate girders. Continuous that is over every 3 bays, with a light overhanging roadway appears to be a suitable arrangement.

10. The work as designed is estimated to cost over a lakh of rupees, and it appears to the Chief Engineer that it should be [illegible] the question as to what will be the best and most economical

Economical superstructure, should be carefully considered.

11. In this concluding para, the Superintending Engineer asks that sanction may be given at once to the construction of the piers, — the length to be 1 foot longer than designed. This does not affect the question of the type of girder to be used, nor the kind of roadway. So this part of the work need not be delayed.

The

17614

The question proposed, — the feasibility of having the roadway above and overhanging the girders, — does, however, to some extent affect the question of the length of the piers.

No 44 23 Sup? Engrs office 6: Circle
Kodaikanal 26th April 1884.

1764

From,
The Sup? Engineer
6th Circle.

To,
The Chief Engineer
P. W. D.

Sir,

Encls: 16. I have the honor to forward
Report with with the enclosures a letter from the
enclosures. President of the Local Fund Board
Tinnevelly addressed to the Board
of Revenue. I have written my
report on the Estimate, but as it
exceeds Rs 10,000 and requires your
opinion. I forward it to you and
request you will dispose of it.

I have the honor to be
Sir
your most obd? servt

Lieut Col: R.E
Superintending Engineer

G.O. No 483 w.f. 21-2-84
" 3211 w.f. 6-12-82

Madras

Forwd.

The Supt Engineer
b: Circle

To,

The Chief Engineer
P.W.D

Head Quarters

No 14 C

Dated 26th April 1884.

Encl: 16.

Bridge over the Sri.
-varkumthan aricut

Forwards with report
plans & Estimate for
a —

10656.

Sent to C. 217 24. 18-7-84
Octy 4-10-84

Octy 21-6-84

24 No 56

Local Board Office
Tinnevelly
16th April 1884.

1764

From

C.J.B. Atkinson Esquire
President Local Board
Tinnevelly

To,

E. Gibson Esquire
Secretary to the
Board of Revenue
(Through the Superintending Engineer Madras
VI Circle)

Sir,

In reference to P.O. No 1541. F.
dated 25th October 1882 Communicated
in Proceedings of the Board of Revenue
No. No 5473 dated 4th November
following, I have the honor to sub-
mit an Estimate for Rs 105,000 to-
gether with plans &c noted in
the margin, for constructing an
iron girder bridge over the Sri-
varkumthan aricut and to
request that you will be good
enough to obtain the sanction of
the Board and Government for
the same.

Estimate for Rs 105,000
1. Specification
1. Report with calculations
7. Plans.

*Last depended for a fair Copy. Railway receipt attached.

2. The Estimate has been prepared in accordance with the instructions given in para 5 of the Chief Engineer's note Enclosed in the G.O. quoted above and in reference to his note dated 28 August 1883 (a copy of which is also enclosed)

3. The bridge is to have 33 openings each of 38 feet clear span; the girders are to be 17½ feet above the crest of the Anicut. The report accompanying the Estimate gives a full detail of the works proposed.

4. The Local Board Executive have approved the plan and Estimate and a copy of its Resolution No 2 dated 3rd April 1883 is submitted.

5. A sum of Rs 25,394 being the unspent balance of the Contribution paid by ryots

25

towards the construction of the Anicut and refunded to Local Funds in G.O. No 1516-J. dated 17th July 1883 is available to commence the work.

I have the honour to be
Sir
Your most obedient Servant
C. Hathaway
President

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Copy

INTERIOR ENERGY
SEP 21 AM 84
6TH CIRCLE

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18A

G.O. No. 5571

EXECUTIVE ENGINEER
21 APR 84
TINNEVELLY

1884

LOCAL FUND BOARD'S OFFICE

TINNEVELLY.

From

The PRESIDENT

LOCAL FUND BOARDS,

Tinnevelly,

To

The SECRETARY to the

BOARD of REVENUE,

Madras.

through the Superintending Engineer

Dated 16 April

Despatched } 21-4-84 1884

Received

No. 86.

Enclosures 5. Sheets.

No. 7 Plans

SUBJECT.

Submitting plans and Estimates for constructing an iron girder bridge over the Srivaikunthum Ancient and requesting to obtain the Sanction of the Local Board and Government for the same

Sheets: 15.
1. Detailed Estt.
1 abstract
1 Report.
1 specification
1 Calculations
1 Copy of L. Fr. B. of Proceedings of 3rd April 1882.
1 Copy of note by the Executive Engr. of 28/3/83.
1 Letter No. 56 of 11th Apl 1884 from the President L. F. Board.
7 Plans sent by Railway to Collr. recommd.

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1764

Report by the Superintending Engineer 6th Circle on the Design and Estimate for a Bridge proposed to be constructed across the Tambraparni River at Srivaikunthum ancient at an estimated cost of Rupees. 1,05,000.

When the Srivaikunthum ancient was built, foundations were put down for a Bridge and the piers built up to the level of crest of ancient; these piers are 5 feet wide having openings of 36 feet, their length including the breadth of the top of ancient and the rear cutwater is 27½ feet; there are 33 openings.

2. The Local Fund Board have for some years wished to construct a Bridge across the River at this point and the villagers and people interested have subscribed largely towards it; some of the money collected was expended in building the piers and their foundations; a reference to G.O. No. 1516 Fr. dated 17th July 1883 will show that now there is a sum of Rs. 25,394 available for the work. The present proposal is for an iron Warren Girder Bridge

it has been most carefully prepared by the Local Fund Engineer, and with it are sent complete calculations.

3. The undersigned does not consider it necessary for him to go over these calculations and details because if the general design of the Bridge is accepted, he thinks, they ought to be sent to an expert or to some officer who has had experience in iron bridges for opinion; he therefore, as the amount of estimate exceeds Rupees 10,000, forwards the plans &c to the Chief Engineer as his approval is required with the following remarks.

4. The height of the bottom of the girders is 17 ½ feet above the crest of the ancient. The Chief Engineer of Irrigation in his note dated 28th August 1883 considered that it should be 17 3/4 feet; the difference is so little it is thought that the 17 ½ feet allowed may be accepted.

5. The piers 17 ½ feet high above crest of ancient which is 6 feet above rear apron or bottom of the present piers are proposed to be made 4 feet thick of coursed rubble masonry gneiss being the stone available; the Specification is carefully drawn and if carried out, it is thought that the 4 feet width of is sufficient.

6. The width of Roadway is 17 ½ feet between the flanges of the girders; this is considered narrow for a Bridge of more than a 1/4 of a mile in length and as the piers already built allow a greater breadth; it should be increased, say to a breadth of 19 feet; this would allow a roadway of 17½ feet and a wheel guard on each side 3/4 foot in width

7. The flooring of the Bridge is proposed to be made of 1/8 of an inch thick corrugated iron plates covered with asphalte in the proportion of 2 of sand to 1 of asphalte. This in the opinion of the undersigned will not answer; he is not aware that corrugated iron of this thickness is even made in Europe and doubts if it could be procured except at a great cost but supposing it is available he considers that the asphalte 1 3/16 inches and 3 1/16 inches thick on the corrugated iron would soon crack and break up.

He believes a flooring of 2 inch Teak-wood covered with diagonal planking say 3/4 of an inch thick of common wood well tarred & sanded would make a better & cheaper floor.

If an iron floor is thought necessary Buckled iron plates should be used but

it is feared that there will be consiederable difficulty in getting a Road surface of small weight that will stand on iron plates.

8 With regard to the general design of the iron bridge 33 spans of 38 feet clear width, it is thought that for small spans of this sort a warren girder is out of place.

The undersigned believes that it is one accepted fact that for spans up to 70 feet ordinary plate web girders are the best and cheapest. The estimated cost of the proposed Bridge (not including the cost of foundations, abutment & wing walls which have been built) is Rs 76 a foot run; this appears very high and he believes that 40 feet wrought iron girders of a suitable design with cross girders say 6 feet apart adapted for Teakwood planking could be procured without delay at a less cost direct from England and he would urge this being done.

9. In conclusion the Superintending Engineer would recommend that the raising of the piers 17½ feet in height, 4 feet wide and a length of 22½ or including cutwaters 26½ feet

29 1764

(that is 1 foot longer than designed) may be sanctioned at once so that the masonry work may be put in hand without delay. Should the Chief Engineer consider it advisable, a considerable reduction might be made by building the piers of Brick in chunam with cut-stone cutwaters in front & rear and cut-stone ashlar facing for say a height of 3 feet above crest of ancient.

Kodaikanal
26th April 1884

Lieut Col. R.E.
Superintending Engineer
6th Circle

Report by the Supt. Engineer 6th Circle on the Estimate No 12 for constructing a Bridge across the Sambrapunie River at Srivaikunthum anicut.

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Public Works Department

1764

Noted by the Chief Engineer P. W. Dept. No. ——— 1918

The estimate amounting to Rs 10,500,0 for constructing a bridge over the Srivaikunthum Anicut is submitted for the consideration of Government.

2. The work proposed is to raise the piers, the lower parts of which were built at the same

kind as the ancient,
and to erect thereon
a superstructure of
wrought iron girders
with platform complete.
There will be 33 bays,
each span being
38 feet clear.

3. The first design,
now abandoned, was
for girders made of
old rails, which were
objected to by the
Chief Engineer for
Irrigation.

4. The main-girders
now designed are of
the Warren type, the
transverse

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transverse girders being
attached to verticles
hung from the vertices
of each alternate pair
of triangles. The
transverse girders
are crossed by small
longitudinal girders,
and the whole covered
with corrugated plates,
on which is to be laid
a flooring of asphalte.

5. The Superintending
Engineer VI Circle con-
siders the roadway
of 17½ feet between
the flanges too narrow
for a bridge over ¼ mile

xi

in length, & I do recommend a breadth of 19 feet. This alteration is certainly desirable, but the wider roadway will entail stronger and deeper transverse girders, and more iron in the main girders.

6 The Superintending Engineer also objects to the platforms of ⅛ inch corrugated iron plates, and is apparently not aware that such plates are made in Europe. Colonel Mead is of opinion that a flooring of 2" inches teak-wood, covered

32

1864.

covered with diagonal planking ¾ thick, of common wood, would make a better and cheaper floor. This proposed modification is important; for, if adopted, the girders may of course be made lighter. Corrugated iron, with asphalte or concrete over the slight thickness allowed (which is thought to be quite insufficient,) forms a heavy platform and adds greatly to the dead weight. But to compare the merits of the two systems, an alternative

Continued

estimate is clearly
required.

7. A further point
which requires consid-
-deration may here be
touched upon. The
transverse girders
resting on the lower
booms, which are
17½ feet apart, are
necessarily heavy,
and the section and
weight must be greater
if the roadway is
widened as recommended.
It does not appear
to have been considered
whether the roadway
might not rest on the
top booms, which
could then be brought

closer

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closer together, and the
whole weight lessened.
This appears to be a
suitable position for
the arrangement of
floor above girders;
for, the head-way
being left as it is,
the great length of
bridge makes a
slight raising of the
approaches a matter
of small comparative
expense.

8. Here will
be of course the cost
of the railings to be
considered, but
as a set-off, it would
be easy to effect

a

1764

Continuous that is over every 3 bays – with a light overhanging roadway, appears to be a suitable arrangement.

10 The work as designed is estimated to cost over a lakh of rupees, and the question as to what will be the best and most economical superstructure, should be carefully considered.

11. In his Concluding para, the Superintending Engineer asks that

sanctions

question may be given
at once to the construction
of the piers — the length
to be 1 foot longer
than designed.

The raising of the piers
does not affect the question
of the type of girder to be
used, nor the kind of
area drawn, but the length
to be given to ~~the~~ the piers
depends on the adoption
of a platform resting
on the bottom boom
as designed, or of one
resting on the top boom
as suggested in para
7 of the note. Until
therefore, it has been
finally settled ~~by the~~
~~Board how to proceed~~
which of the two alternatives
should

should be followed, it
will be well to restrict
action to the preparation
of materials, leaving
the construction of the
piers undecided for
the present. The decision
respecting the design for the superstructure
should be arrived at
as little further
with ~~a~~ loss of time as
possible.

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2-7-06

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Mrs. Lapsley's statement to board.

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PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the

READ the following

From the Supdg. Engr. XII Circle } No. No. 4 C dy 26th April 1884.
Note by the Chief Engr. P.W. Dept. } " No. — dy 18th July 1884.

The Govt. consider that the suggestions of the Chief Engr. in para 11 of his note, should be adopted, and they accordingly sanction the preparation of materials for the piers. With respect to the concluding sentence of the Supdg. Engr's report, para 9, the piers throughout should be of coursed rubble in mortar as estimated for.

2. With respect to the superstructure of the bridge, the Local Fund Board will be called upon to submit an alternative estimate, providing for plate-girders

continued

continuous over three bays, as suggested by the Chief Engr and for an over-hanging boat, nineteen feet in width between the railings, the floor to be constructed of timber as recommended by the Supdg Engineer.

3. On receipt of this alternative estimate, a final orders will be passed.

Ch. 1-7-84

VI 1-7-84

VI

To

The Secy of Govt.
with 15 enclosures

" Supdg Engr VI Circle

" Financial Department

(Endorsement overleaf)

Recd 8th Aug 84

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1864

Public Works Department.

Submitted

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Under date the

Read the following

From the Supdg Engr VI Circle - No. 40 dy 26th April 84

Note by the Chief Engr
Pub Wks Dept } —— No. —— dy June 84

The Government consider that the recommendation of the Superintending Engineer in para 9 of his report may be adopted, and sanction the immediate execution of the raising of the piers in accordance with the estimate, that is, of course

rubble, not brickwork as suggested by the superintending Engineer.

2. With respect to the superstructure of the bridge, the Local Fund Board will be called upon to submit an alternative estimate providing for plate-girders, continuous over three bays, as suggested by the Chief Engineer, and for an over-hanging Road, nineteen feet in width between the Railings, the floor to

39

1764

to be constructed of timber as recommended by the Superintending Engineer.

3. On receipt of alternative estimate, this Road Order will be passed and sent to Dublin.

Ch. 16.8.64

D.W. Please see Local Board again & ask if they wish to adopt alternative estimate.

To The Board of Revenue
via 15 Audr.
" Supt Gen'l VI Circle
" Financial Deptt

Ch

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Cobl. of Insurgent
PUBLIC WORKS

39 +1

Bridge

Parcours