

Public Works (1896) Department.

G.O., No. 115 to

DATED 11-1-96

Bridge. [Despatch Abstract.] Estimate of Rs 13,250 for  
Constructing a warren girder—over  
the Germal stream in South Canara  
D.C., sanctioned with remark.

No. 115 W., 11<sup>TH</sup> JANUARY 1896.

GOVERNMENT OF MADRAS.  
PUBLIC WORKS DEPARTMENT.

Buildings and Roads.  
Civil Works.

READ—the following papers:—

From J. HANNAN, Esq., Superintending Engineer, IV Circle, to the Chief Engineer, Public Works Department, dated Ootacamund, 30th July 1895, No. 299 W.

No. 299 W

I have the honour to submit for sanction of Government an estimate, together with plans, amounting to Rs. 13,250, for constructing a Warren girder bridge of one span of 80 feet in clear, over the Yermal stream in the 22nd mile of Coast road No. 23 from Mangalore to Byndoor in the Udipi taluk, South Canara.

2. The President, District Board, informs me that the Coast road is an important line of communication between the Northern towns and Mangalore, and a bridge at Yermal has been a much-felt want to avoid a troublesome break.

3. A copy of the District Board's Resolution approving the estimate is enclosed.

*Note by the Chief Engineer, Public Works Department.*

The undersigned considers that the girders should be tested and weighed before purchase, and that, if tested to sustain a dead load of one ton per running foot, it will suffice.

(Signed) J. PENNYCUICK, Colonel, R.E.,  
Chief Engineer, P.W.D.

7th December 1895.

ORDER—No. 115 W., dated 11th January 1896.

The estimate, amounting to Rs. 13,250, for constructing a Warren girder bridge over the Yermal stream in the South Canara district, is sanctioned.

2. Attention is drawn to the Chief Engineer's note recorded above.

3. This sanction has been registered as Local No. 14 W. of 1895-96.

(True Extract.)

Under Secy. to Govt., P.W.D.

To the Superintending Engineer, IV Circle.  
 " Examiner, Public Works Accounts.  
 " Local and Municipal Department, with six enclosures.

Exd. T. K. Narayana Aiyangar.  
Spare Copies

BUILDINGS AND ROADS.  
CIVIL WORKS.

Govt. of {1896} Madras.

PUBLIC WORKS.

Dated January, 11th.

Recd.

Encl.

G.O. No. 115 W., 11th Jan. 1896.

JANUARY.

## Bridge

Estimate of Rs. 13,250 for constructing a Warren girder — over the Yermal stream in South Canara district, sanctioned with remark.

## PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following

Letter from the Supt. Engr. (H.E. No. 299 W. of 30 July 1895)

Note by the Chief Engineer  
P.W. Dept: —

The undersigned considers that the girders should be tested and weighed before purchase, <sup>and that if tested to</sup> ~~the point of rupture~~ if they could sustain a dead load of one ton per running foot, it will suffice.

S  
71- En 30

Order: — <sup>copy</sup> 285

No 115 W of 11 Jan 1896

W  
8 Jan

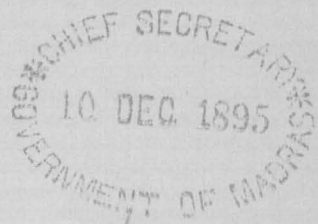
The estimate amounting to Rs. 13,250 for constructing a

warren girder bridge over  
the Yermal stream in the  
South Canara District is  
sanctioned.

Estimate for construction of  
warren girder bridge over the  
Yermal stream in the S. Canara District

attention is drawn to  
the Chief Engineer's note  
recorded above.

This sanction has been  
registered as Local No.  
14 W of 1895-96.



The Hon. the Chief Secy  
for favor of countermanding

24/12/95

h.w.p.  
h. xi. 95

T. H.  
Bills

Chms  
2/2/95

S. E. L. L. L.

Ex P. W. Accts.

Local & Mumb depts into bands.

W.C.

This may please  
be made call for  
the papers again  
afterwards

1071

Cu

Encl C.S. 9/12  
48 6/12 R 10/1.

## Memorandum.

With reference to letter from the Superintending Engineer, IV Circle, No. 299/W. dated 30th July 1895, the undersigned has the honor to return the plans and estimates for constructing a warren girder bridge over the Yermal stream in the South Canara District, and to observe that the discharge by Ryves' formula equals 2088 cubic feet per second which can be passed through a bridge of 50 feet span with a depth of 8.75 feet, and at a velocity of 5 feet per second. The reason for allowing a bridge of 80 feet span should therefore be fully explained.

I believe that a crossing of 250 ft is required on the flat part; the width is of 5 miles from the west, but the hills come very near the river there and prevent further extension in the hills; I believe that 750 is the high water mark and this would give 34800 cfs.

$$\frac{34800}{2 \times 80 \times 8.75} = 4.97 \text{ feet/sec.}$$

The actual bed is a good deal contracted at the bridge and the soil is not so good, but would accept the 80 feet span.

The Suptg. Engineer, IV Circle, with

6 enclosures.

CLM  
5/2/95

Cu

Flow area is  
Ordinary water level

$$\begin{aligned}
 4 \times \frac{0.63}{2} &= 1.26 \\
 224 \times \frac{0.63 + 0.37}{2} &= 112.00 \\
 27 \times 3 &= 27.00 \\
 73 \times \frac{.83}{2} &= 30.30 \\
 72 \times \frac{0.83 + 0.96}{2} &= 64.40 \\
 9 \times \frac{0.96 + 1.84}{2} &= 12.60 \\
 74 \times \frac{1.84 + 2.02}{2} &= 162.80 \\
 25 \times \frac{2.02 + 1.39}{2} &= 42.50 \\
 120 \times \frac{1.39 + 0.24}{2} &= 97.20 \\
 140 \times \frac{0.24}{2} &= 16.80 \\
 &= \underline{\underline{566.80}}
 \end{aligned}$$

Wetted border = 793

$H_m = 0.71$

Bedrock to  
T

$$\begin{array}{r}
 8.75 \\
 80 \\
 \hline
 700.00
 \end{array}$$

$2088 = 700 \times 3$

$$\begin{array}{r}
 700/2088 \quad (2.9) \\
 1400 \\
 \hline
 -6880 \\
 6000
 \end{array}$$

By 3' a second

Wm  
1/2

Warren Gider bridge  
over Yermal stream  
South Canara Dist.

Flow area -

|                                    |   |         |
|------------------------------------|---|---------|
| $56 \times \frac{2.15}{2}$         | = | 60.20   |
| $60 \times \frac{2.15 + 5.18}{2}$  | = | 219.90  |
| $112 \times \frac{5.18 + 5.30}{2}$ | = | 586.88  |
| $4 \times \frac{5.30 + 6.38}{2}$   | = | 23.26   |
| $224 \times \frac{6.38 + 5.38}{2}$ | = | 1317.12 |
| $100 \times \frac{5.38 + 6.58}{2}$ | = | 598.00  |
| $72 \times \frac{6.58 + 6.71}{2}$  | = | 478.44  |
| $9 \times \frac{6.71 + 7.59}{2}$   | = | 64.35   |
| $99 \times \frac{7.59 + 7.14}{2}$  | = | 729.13  |
| $120 \times \frac{7.14 + 6.99}{2}$ | = | 847.80  |
| $300 \times \frac{6.99 + 4.34}{2}$ | = | 566.50  |
| $100 \times \frac{4.34 + 3.41}{2}$ | = | 387.50  |
| $317 \times \frac{3.41 + 0.00}{2}$ | = | 556.33  |
| area of section                    |   | 6435.51 |

Wetted border - 1601 ft.

H. M. D = 4.02

691/2050 (3)  
2073

The discharge by  
Ryves formula  
equals 2088 cubic  
feet per second.  
which can be passed  
through a bridge 50  
feet span with a depth  
of 7.75 feet. The  
reason for allowing an  
80 feet span therefore  
requires explanation.  
Without this information  
available it being  
impossible to deal  
with the situation.  
To be referred for the  
necessary information on  
the subject.

Public Works Department.

Current No. 5935  
Letter No. 299/  
Dated 30<sup>th</sup> July 1895  
From the Super Engineer & Civil

NOTE BY TECHNICAL SECTION.

Name of work. Constructing a Warren Gider  
bridge over the Yermal stream in the  
South Canara District.

Amount of estimate Rs 13,250.

The plan & estimate under review  
amounting to Rs 13,250, provide for  
constructing a Warren Gider bridge  
of 80 feet span over the Yermal  
stream in the 22<sup>nd</sup> mile of Coast road  
No. 22, from Mangalore to Bynndoor  
in the Udipi Taluk, South Canara  
District.

It is reported that this Coast  
road is an important line of com-  
munication between the northern  
hills & Mangalore, and that a  
bridge at Yermal has been a much  
felt want to avoid a troublesome  
break, owing to the crossing a low  
lying tract of cultivated paddy  
land & during the monsoons be-  
comes submerged for a considerable  
length, thereby forming serious  
obstacle to traffic. It is therefore  
proposed to construct a bridge of  
80 feet clear span over the Yermal  
river & form approaches on  
both banks to the north & south  
of the proposed bridge.

A Warren girder bridge is adopted owing it is stated to these class of bridges being available for sale on several of the railways in the north & at very favorable terms.

The area of the catchment basin at the site of the proposed bridge is 10 square miles & as the country is only 5 miles from the coast a coefficient of 4.50 is taken for the purpose of calculating the discharge & by Major Pynes formula  $D = c \sqrt{A}$ , the discharge will be 2088 cfs per second.

The flood area of the stream is 6.434 sq ft & the velocity is stated to be 2.3 feet per second (fall of the stream not mentioned) the discharge will therefore be  $6.434 \times 2.3 = 14,798$  cfs per second.

The girder bridge is to be obtained from the R.W. Railway it is to carry a roadway of 12 feet between wheel tracks. The girders are to be placed 14 feet apart from center to center & supported by masonry abutments raised 10 feet above bed level. The foundations of the abutments & wings are to be sunk  $9\frac{1}{2}$  feet below bed level in hard laterite. The soil according to the borings taken was found to be conglomerate of sand & clay for about  $9\frac{1}{2}$  feet below hard laterite.

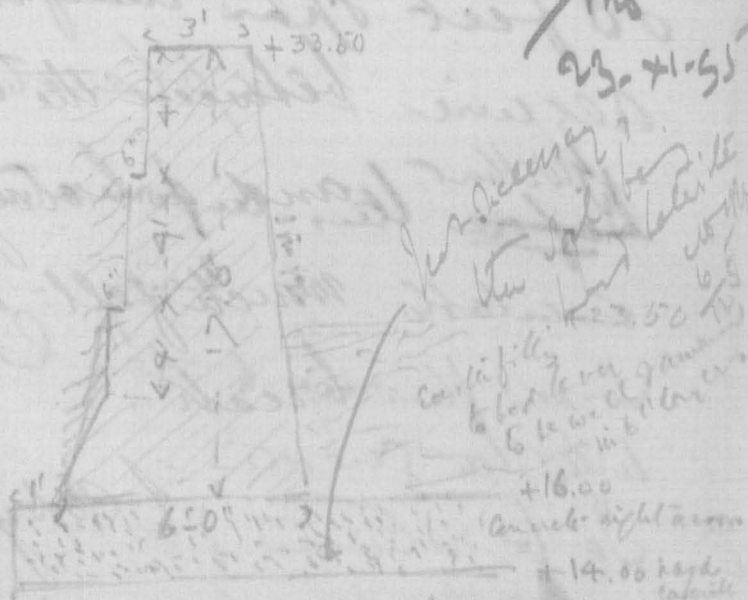
The foundations are to be grouted in mortar & the superstructure of wadded stone is mortar with cast iron coping over parapets. The platform is to be carried on wooden beams placed over angle

2 1/2" bamboo wood planks & the surface asphalted over which 6 inches of gravel is to be laid. The approaches to be gravelled to a width of 15 feet with 6 inches of gravel.

The details of girders &c. are submitted but it is stated in the Chief Engineer's letter to section N.W.R. to the Manager N.W.R. that the girders will sustain in addition to their own weight a dead load of 1.36 tons per foot run of span without the stress exceeding 5 tons in the square inch.

The ratio as far as can be checked are fair.

The plans & estimate have been counter-signed by the President Dist. Board & approved in Dist. Board Proceedings dated 28th March 1895.



No 299  
Supg. Engrs Office 4 Circle  
Camp Coatacampund 30th 1895

From,

J. Hannan Esq

Supg. Engr 4 Circle

The Chief Engineer

N.W.D. Madras.

Sir,

Enclosures 6.

- 4 Plans
- 1 Estimate
- Report and Specification
- 1 Copy of Resolution

I have the honor to submit for sanction of Government an estimate together with plans, amounting to Rs 13,250 for Constructing a Warren Girder Bridge of one span of 80 feet in clear, over the Yermal stream in the 22nd mile of Coast road No 22 from Mangalore to Byndoor in the Eclipse Taluk, South Canara.

2. The President District Board informs me that the Coast road is an important line of Communication between the Northern towns and Mangalore and a bridge at Yermal has been a much felt want to avoid a troublesome break.

A Copy of the District Board's

Resolution

Resolutions approving the estimate  
is enclosed.

I have the honor to be,

Sir,

Your most Obedt Servant.

Wm. D. Harris

Supg. Engr. & Civil

I have the honor to acknowledge the receipt of your letter of the 10th inst. in relation to the proposed bridge over the stream in the 22nd mile of Coast road, 2.25 from Mangalore to Thunders in the British Isles, South Province. The President District Board informs me that the Coast road is an important line of communication between the stations towns and Mangalore and a bridge at present location would feel want to avoid a troublesome break.

A copy of the District Board

Resolutions approving the estimate  
is enclosed.

I have the honor to be,  
Sir,  
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A copy of the District Board

P. V. CUMMERS No. 5935

From

The Supg. Engineer,  
4<sup>th</sup> Circle.

Enclos<sup>x</sup> 6 (4 plans)

Ans: 2. 8. 95

Dated 30<sup>th</sup> &  
Despatch 31<sup>st</sup> } July 1895.

No. 299  
W.

Enclosures 6.

Warren girder Bridge  
over the Yekmal Stream,  
South Canara District.

Submits for sanction of  
Gov<sup>t</sup> an Estimate amtg. to Rs 13,250  
for constructing a —

✓