(1) பக்கங்களின் எண்ணிக்கை 34
(2) புதுக்கித் திருப்பிய நாள் ஜூன். 1995
(3) ஆதாரங்குறிப்பவர் சுருக்கொப்பம்

தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

பொதுப் பணித் துறை

அரசாணை எண். மு. கோப்புத் தாள் எண்.	2548. W.	அச்சகம் பலவகை
நாள் :	7.10.1893.	198 .

மடிக்கவோ கண்டபடி கையாளவோ கூடாது

ஆவண. கா-1—18,006—15-6-87.

1/2548

7th October 1893, No. 2548 W., Public Works.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

Read—the following papers :—

From Major A. W. SMART, R.E., Superintending Engineer, IV Circle, to the Chief Engineer, Public Works Department, dated Coimbatore, 18th August 1893, No. 326 E.W.

Adverting to paragraph 2 of G.O., No. 1185 W., dated 1st May 1893, I have the honour to submit, for sanction of Government, a plan and an estimate, amounting to Rs. 42,500, for constructing a suspension bridge of 200 feet span with 10 feet roadway across the Kullar river on the Méttupálaiyam-Coonoor road calculated to carry a live load of 120 lb. per square foot.

2. Messrs. Burn and Co., Calcutta, have furnished plans of masonry towers and anchorage which are herewith forwarded for information. A few alterations on the masonry are thought necessary, such as the strengthening of the anchorages and the building of the inner faces of the tower piers vertical instead of on steps.

3. Orders were given to Messrs. Burn and Co. in this office No. 204 M., dated 26th May 1893, to put the iron work in hand.

4. Data for various rates given in the estimate are enclosed.

5. The depth of foundations of the towers is to be 15 feet, provided rock is not reached before. The foundations of the wings are to be 6 feet deep; it is not thought necessary to take these down to the full depth allowed for the towers.

6. Materials to be used—

Foundations.—Stone surki concrete encased by rubble masonry.

Superstructure.—Table moulded brick in mortar with cut stone string courses, &c.

7. If the plan and estimate meet with your approval, a specification will be drawn up of the several kinds of work to be done.

Note by the Chief Engineer, Public Works Department.

The soil in foundation consists of boulders embedded in clay. It is not known to what depth this foundation goes. This can only be ascertained by actual excavation. Foundation pits for towers have up to the present been excavated to a depth of 5 feet below deep bed of river. The Superintending Engineer has allowed for taking the foundations to a depth of 15 feet below deep bed of river and the towers will be so founded unless the natural formation underlying boulders is met with it at a higher level. I consider that this will be perfectly safe. The bridge is designed to carry a live load of 120 lb. on every square foot of road surface. The total height of towers to carry the suspension bridge is 49½ feet above river bed.

(Signed) J. HANNAN,
Ag. Chief Engineer, P.W.D.

22nd September 1893.

Order—dated 7th October 1893, No. 2548 W., Public Works.

The estimate, amounting to Rs. 42,500, for constructing a suspension bridge across the Kullar river on the Méttupálaiyam-Coonoor road is sanctioned.

2. The work has been put in hand in anticipation of an allotment of funds which will be made shortly. Meanwhile the bills for iron work should be paid.

3. This sanction has been registered as Provincial No. 96 W. of 1893-94 and classified as Communications, Original Works.

(True Extract.)

Major, R.E.,
Under Secy. to Govt., P.W.D.

To the Superintending Engineer, IV Circle,
with plans and estimate (8).
" Examiner, Public Works Accounts.
" Local and Municipal Department.
Editors' Table.

Exd. C. A. Munisawmy.
Spare Copies

2/2548

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1893} Madras.
PUBLIC WORKS.

Dated October, 7th.

Recd. Encl.

G.O., 7th Oct. 1893, No. 2548 W.

OCTOBER.

Suspension Bridge

Estimate of Rs. 42,500 for constructing a — across the Kullar river on the Méttupálaiyam-Coonoor road, sanctioned with remarks.

PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

3/2548

READ the following

From the S.E. IV Circle No. 326 EW dd 18 Augt. 1893

The estimate, amounting to Rs. 42,500, for constructing a suspension bridge across the Kullar river on the Mettupalayam-Coonoor road is sanctioned.

2. The work ~~may be~~ has been put in hand in anticipation of an allotment of funds which will be made ~~later in the year as soon as funds become available~~ shortly. Meanwhile the bills for upon works should be paid.

3. This sanction has been registered as Provincial No. W of 1893-94 and classified as Communications, Original Works.

funds must be provided at once the work is compd & completed & bills for same submitted for payment

Note It is proposed to place this G.O. on the Editor's table

To The S.E. III Circle with plans & estimate.
.. Exr. P.W. accts.
.. Local and Municipal Dept.
.. Editor's table

(40—3,000—12-4-93.

Estimate for
Suspension bridge
over the Kullar river
Mettupalayam Coonoor
road

Records. Soon

Public Works Department.

Current No. 7357 4/25-8

Letter No. 336/Wr.

Dated 18 August 1893

From the Supdg. Engineer IV Circle.

Note by Technical Section.

Name of work. Suspension bridge across the Kullar river, Nilgiri Dist.

Amount of Estimate Rs 27,500

This estimate has been framed with reference to G.O. No. 1185 W dated 1st May 1893 & provides for constructing a suspension bridge across the Kullar river on the Mettupalayam - Coonoor road in the Nilgiri District.

The bridge is to be erected at the site of the ruined masonry bridge of 200 feet clear span with a roadway 10 feet wide between wheel guards to carry a live load of 120 lbs per sq ft. as per design submitted by Messrs. Burn & Co. of Calcutta.

The piers & anchorages are to be of masonry. The depth of foundations proposed for the piers or towers is 15 feet & the wing walls & returns 6 feet. The foundations are to be built of concrete in surki mortar cased with rough stone in surki cunki 2 feet thick all round. The superstructure walls are to be raised 30 feet high up to road level & built of table moulded bricks in cunki mor-tar. The towers are to be raised 31½ feet above road level to top of coping & provided with an arched entrance 10 feet wide & 20 feet high to crown.

The roadway is to be planked on teak cross beams of a section 4" × 6" placed 2½ feet apart from centre to centre. The planking is to be 3" thick with an additional 1½" as wearing surface. These scantlings it is stated have been calculated on the stress in the bridge.

Slight alterations have been made in the plan under masonry work by building the piers above the foundations vertical instead of in steps, increasing the depth of foundations & strengthening the anchorages.

The rates are fair, & data lists for concrete in cunki, rubble in cunki & table moulded brick-work are submitted.

It is thought that the lump sum provision for excavating foundations of piers, anchorages & forming road viz Rs 2000 applies for both the piers & anchorages otherwise the estimate will have to be increased by Rs 2000.

Orders have already been issued by the S.E. to put the new work in hand as if the plan

---

Og of G O

Obs 227

25248W
7/10/93

If estimate be approved, the S.E. states that a specification will be drawn up for the work.

16.ix-93

25248W

8

INDIAN TELEGRAPH.

Monthly Local No. 158

Madras

Station Triplicane

From Station Ootacamund

Words.	Day.	Hour.	Minute.
25	18	15	50

OFFICIAL INSTRUCTION.

To (Person) Second assistant

From (Person) Chief assistant

1 P.W. Secretariat

2 Chepauk

3

4 Plans and

5 estimates Kullar

6 bridge should

7 if received be

8 sent up by

9 return post

10

11

12

13

14

RECD. FROM L. N.

AT Hrs. Mts. By

SENT TO

AT Hrs. Mts. By

TRIPLICANE 18-9-93

Postmaster.

RATES OF CHARGE FOR INLAND TELEGRAMS.

The address (including name of Sender, and name and residence of Addressee) is transmitted free.

	First 8 words.	Each additional word.	
Deferred Message	... 8 Annas	... 1 Anna,	A group of 3, or less figures, is reckoned as one word.
Ordinary „	... 1 Rupee	... 2 Annas,	
Urgent „	... 2 Rupees	... 4 Annas.	

No charge for delivery within a distance of 5 Miles.

C.A.W.

Herewith the papers with draft sanction.

I'd write on the plans & estimates were received on Saturday evening, & B. dealt with the papers today. They were about to be despatched when your Telegram arrived.

D.W.
Submitted
[illegible] 30.1.93

I'd write require to be dealt with by [illegible] before the sanction can be [illegible]

6/2548

Chief

Draft to be rewritten — for sum only.
The bills can I suppose be authorised to be paid for at once.
What does the reserve stand at? Have there been any recent surrenders.

[illegible]
20.5.93

D.W. The draft has been rewritten. It now provides immediate payment for iron work. Funds found at once and The Budget Clerk at Madras will be consulted. There are only Rs 2786 available in the Provincial Reserve and it may thus be necessary to curtail the grants of other works in progress at all events, as a temporary measure.

C.S.
20.IX.93

Note by C.E. to accompany Esti. for the Kuslan Bridge.

The ~~nature of~~ soil in foundation consists of ~~a~~ boulders embedded in clay. It is not known to what depth this formation goes. This can only be ascertained by actual excavation. Foundation pits for tower have up to the present been excavated to a depth of 5 ft. below deep bed of river. The S.E. has allowed for taking the foundations to a depth of 15 ft. below deep bed of river, unless ~~with~~ – to the tower will be founded at the natural formation underlying boulders is met with at a higher level. I consider that this will be perfectly safe. The Bridge is designed to carry a live load of 120 lbs on every ~~both~~ the square foot of road surface.

The total height of towers to carry the suspension Bridge is 44½ ft. above deep bed

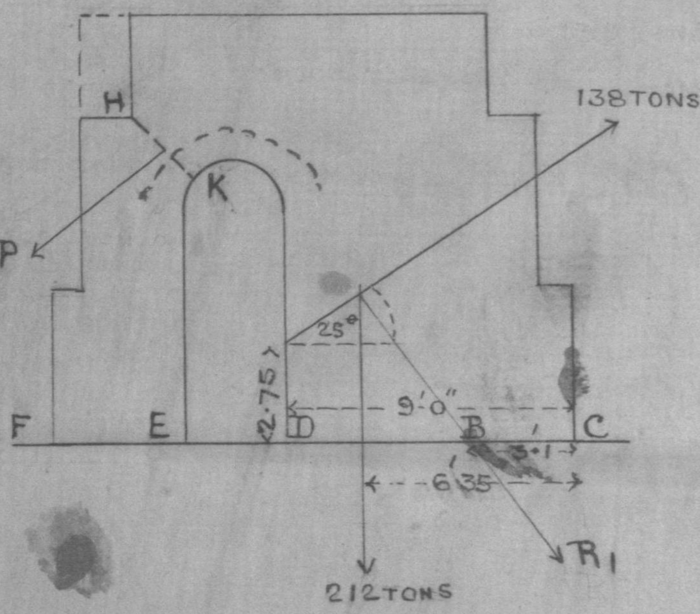
J.H.
21.9

Stability of Revised Design for Anchorage for Kullar Bridge.

The stability of abutment and foundation will be considered separately.

I Abutment.

The weight is 212 tons, and the vertical through C of G. cuts lowest bed joint 6.35 ft. from toe C Compounding this with Chain tension of 138 tons, resultant R_1 measures 199 tons. B.C. = 3.1 ft.



Hence abutment is safe against Overturni

As regards Crushing, D.C is approximatel 3 times B.C. Hence the compression extends from a maximum at C to zero at D. The joint EF is in tension. The normal component of R_1 is 153 tons, distributed over 270 S.ft. ∴ mean pressure = 0.56 tons per S.ft. Maximum pressure = 1.12 tons per S.ft. whic is safe.

As regards Sliding, the angle of R_1 with

with the vertical is 39° which is less than the limiting angle of resistance (about 54°) still for safety it is recommended that the surface of the Concrete foundation be stepped.

Although the abutment is safe as a whole, it is possible that a fracture might occur along HK. Let P tons be the resistance developed at HK. when the resultant pressure acts through B. Taking moments about B we have $P \times 12.25 + \overset{*}{182} \times 2.2 = 138 \times 4.95$ whence $P = 23$ tons. The torn surface will be 1.7×24 s.ft. for the arch, plus $2 \times 1\frac{1}{2} \times 3\frac{1}{2}$ s.ft. for the abutment ends (allowing only from top of abutment to level of crown of arch, since stress will not be uniformly distributed right down to lowest bed joint) or 57.3 s.ft. Resistance per s.ft. = 0.45 ton i.e. 7 lb per s.in. This is higher than should be allowed for green masonry, and it is recommended that abutment should be built up as shewn by dotted lines.

---

* Note. 182 tons is the wt. of portion of abutment to right of HK.

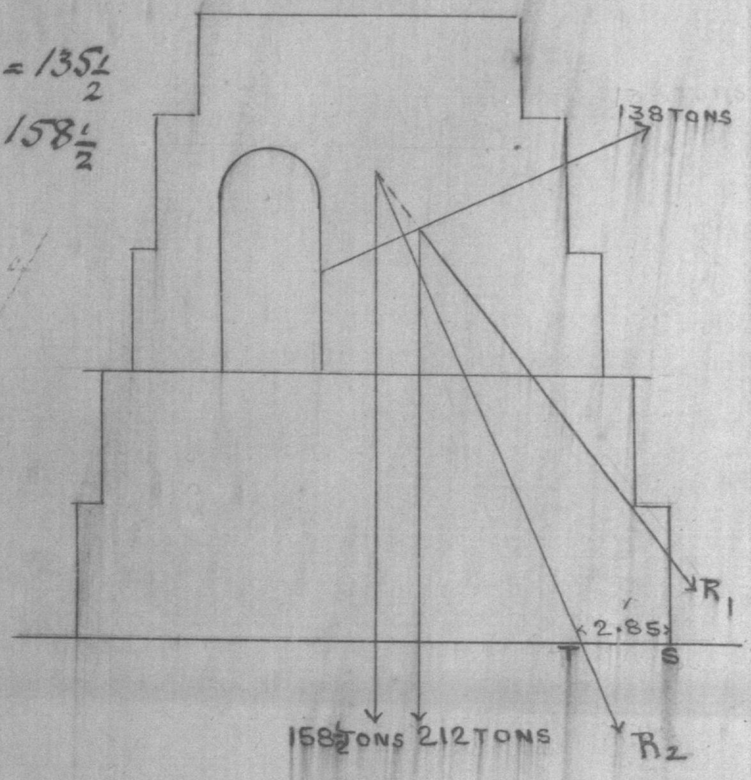
The vertical through its C of G cuts lowest bed joint 2.2 ft. from B.

10/25e8

II. Foundation.

Weight of foundation

	cft.		tons
Masonry	344	at 150 lb. =	23
Concrete	2532	at 120 =	$135\frac{1}{2}$
			$158\frac{1}{2}$



Compounding wt. of of abutment and chain tension, as before, we get R_1. Compounding R_1 with $158\frac{1}{2}$ tons we get final resultant R_2.

$R_2 = 357$ tons, angle with normal 22°.

Hence abutment is safe against overturning, distance TS being 2.85 ft.

As regards Crushing, vertical pressure, i.e. vertical Component of R_2 is 312 tons. This pressure acts over $32 \times (3 \times 2.85)$ sft. = 274 sft.

∴ mean pressure = 1.14 ton per sft.

Maximum pressure at S = 2.28 tons per sft. which is excessive for any but very hard soil. Hence foundation should be added to on the right.

Summary of recommendations.

(1) Top surface of Concrete foundation to be stepped.

(2) Rear face of abutment to be vertical or nearly so

(3) Foundations to be pushed 1½ ft to the front.

[illegible] H. D. L.
30-8-93.

P. S.

No deduction has been made for chain openings and man hole in abutment. These will reduce weight of abutment by 5 tons, and will not appreciably affect the figures given above.

True copy
20/9/93

To be attached to the Kullar bridge papers.

W.B.
23.9.93

12

No. 326
E.W.

Supdg. Engr. Office 4th Circle
Coimbatore 18th August 1893.
Despd. 24th do

From.

Major A. W. Smart, R.E.
Superintending Engineer,
4th Circle,

To

The Chief Engineer
P.W. Department.

Enclos: 7
1 Plan of Bridge
1 Site plan
3 Plans in origl. from Messrs Burn & Co.
1 Estimate with Abstract
1. Data.
7

Sir,

Adverting to para 2 of G.O. No. 1185 W dated 1st May 1893, I have the honor to submit for sanction of Government, a plan and an Estimate amounting to Rs ~~38,000~~ 42,500 for constructing a suspension Bridge, of 200 ft span with 10 feet roadway, across the Kallar river on the Mettupalayam - Coonoor road calculated to carry a live load 120 lbs per square foot.

2. Messrs Burn & Co. Calcutta have furnished plans of masonry

-sonry towers and anchorage which are herewith forwarded for information. A few alterations on the masonry are thought necessary such as the strengthening of the anchorages and the building of the inner faces of the tower piers vertical instead of in steps.

3. Orders were given to Messrs Burn & Co in this office No. 204/m dated 26th May 1893 to put the Iron work in hand.

4. Data for various rates given in the estimate are enclosed.

5. The depth of foundations of the towers is to be 15 ft provided rock is not reached before. The foundations of the wings are to be 6 ft deep; it is not thought necessary to take these down to the full depth allowed for the towers.

6.

6. Materials to be used:-

Foundations — Stone surki concrete encased by rubble masonry.

Superstructure — Table moulded brick in mortar with cut stone string courses &c.

7. If the plan and Estimate meet with your approval a specification will be drawn up of the several kinds of work to be done.

I have the honor to be
Sir,
Your most Obedt Servt

Major R.E.
Superintending Engineer
4th Circle

S.W.S.

P. W. CURRENT No. 7357

No 485 W of 1-5-93

14

From

The Supdg. Engineer
IV Circle

Dated 18th
Despd. ~~19th~~ 24th } August 1893
Recd. 25th

No. 326
E.W.

Enclos: 7. 8 (5 plans)

Suspension Bridge across the Kullar River on the Mettupalayam-Coonoor Road.

Submitting for sanction of Government Plan & Estte. amtg. to Rs ~~38,000~~ 42500 for Constg. a —

O.S. 296

Note by the Chief Engineer

The soil in foundation consists of boulders imbedded in clay. It is not known to what depth this foundaction goes. This can only be ascertained by actual excavation. Foundation pits for towers have up to the present been excavated to a depth of 5 feet below deep bed of river. The Supg. Engineer has allowed for taking the foundations to a depth of 15 feet below deep bed of river and the towers will be so founded unless the natural formation underlying boulders is met with it at a higher level. I consider that this will be perfectly safe. The Bridge is designed to carry a live load of 120 lbs. on every square foot of road surface. The total height of towers to carry the Suspension Bridge is 49½ feet above river bed.

JH
22.9.93

EW.

BM 17
civil works
2558

No. 2548 W. of 7 October 1893.

Public Works Department.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Under date the

Read the following

From the Supdg. Engr., IV Circle, No. 326 E.W. dated 18th August 1893.

Note by the Chief Engineer d/22 Septr. 1893.

W
3 Oct.

The estimate amounting to Rs 42,500 for constructing a suspension bridge across the Kullar river on the Mettupalayam - Coonoor road is sanctioned.

25 Oct.

2. The work has been put in hand in anticipation of an allotment of funds which will be made shortly. Meanwhile the bills for iron work should be paid.

3. This sanction has been registered as Provincial

No. 96 W of 1893-94 and classi-
-fied as Communications,
Original works.

JH
21.9

[illegible]
21.9.93

Estimate for a Suspens
bridge over the [illegible]
river

~~The Hon [illegible] JH Garstin C.S.~~
His Excellency the Govern

The estimate seems very high.

28300	for piers & anchorages.
9700	Ironwork, erected
4500	Sundry temporary work
42500	

[illegible]

Circulate.

The order has been [illegible]

To

The S.E., IV Circle
with plans & estimal
" Examiner, P.W. Accounts
" Local & Municipal Dep

vide 296
[illegible] 20/9
JH 20/9
[illegible] 26-9

H
2548

cNo. 7357

14-9-22

Govt. of {1893 Madras.
PUBLIC WORKS.

CNo 6340

10 312

Dated

Recd. Encd.

G.O. 7 Octr 1893 No. 2548W.

Suspension bridge

=

Estimate of Rs 42,500 for constructing a — across the Kullar river on the Mettapollium Coonoor road sanctd with remarks — 1

100
11

J.C. 10.x

J. 10/10.