

- (1) பக்கங்களின் எண்ணிக்கை 30
 (2) புதுக்கித் திருப்பிய நாள் 12/89
 (3) ஆதாரங்குறிப்பவர் சுருக்கொப்பம் 6/89

தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

P. 010 துறை

அரசாணை எண். 2197
 மு. கோப்புத் தாள் எண்.

அச்சுதம்
பலவகை

நாள் : 13-8-1890

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மடிக்கவோ கண்டபடி கையாளவோ கூடாது

Notes by Local Hind Engineers on the Con-
struction of the Bridge over Bouraure
River. 2197

In October 1887, the collection & manu-
facture of materials for the Bridge
was started, sheds erected and
bricks making commenced - also
well pits and collection of lime
stone all being executed - on the
Paddy Contract System on piece
work Agreements and in January
the estimate being sanctioned
by Government the work of construction
was started with a fair start of well
bricks in hand. The South abut-
ment & 1st five piers on the South
were just put in hand, and a
ring land enclosing this for protection
from floods was started. It was
my intention to put in all the
wells for the whole structure in
this year i.e. to build them up
6 ft. and sink to that depth parrying
the top of well above 2 ft. below river
bed level, and fill up with sand
allowing floods to pass over them
so as to go on with them again in
the next working season. The
wells I think would have remained
uninjured and a good start
would have been made in
this way. But the latter end of
April & May proved wet and we
ran out of well bricks. The
Contractors could not be per-
suaded to make a fresh start
to cut bricks till the latter end
of May. During May we
experienced a Cyclone and
the river was in flood for a week

It must be. All thoughts of putting
in the wells were then given up
with intention to put them in
during the month of January, February
or March. Well Sinking has been a
source of much trouble people
working for a few days receiving
Advances from Contractor and
abscinding, this work has therefore
been slow. In the Superstructure
I have used table moulded
bricks and it was my intention
to use only table moulded bricks
for the whole of the Superstructure.

Bricks turned out are fairly good.
The earth is not the best kind but
it is the best procurable here. A
small quantity of bricks have been
made on the South bank but we
have exhausted all the available
earth, and no more can be looked
for here unless we can get out
Devanoyaga mudstone field. (see
Correspondence with Talsildar) Bricks
have therefore been mostly brought
across from the North bank of the River.
The Contractor who is cutting table
bricks must be supplied with
new moulds as those he is now using
are worn & the result is that he is
not turning out as clean bricks
as he did at first.

The well under South abutment
are in 2 ft clay & sunk $14\frac{1}{2}$ ft below
floor level or 21 ft below bed level.
Boring carried 8 ft below bottom of
wells showed stiff clay and it
was

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was considered safe to leave the wells
on this. The same with regard to wells
under 1st & 2nd piers these were sunk $15\frac{1}{2}$ ft
& 3 ft in clay. As you get further into
piers the clay bed shelves & the wells
will need to be deeper. All wells to
be $3'6" \times 5'$ Piers are down at various depths
but we have not been able to go on
with them for want of Bricks, there
are now burnt and in 3 kilns on
the South Bank not unpacked.
Contractors have only just learnt that
I have been ordered to unpack &
deliver on the work being resumed
by D. S. W. A strong ring beam
has been put up enclosing the first
5 piers on South side the 5 being an
abutment pier & I think work can be
continued to the Superstructure of
Piers so far completed by October or
November when we get the regular
monsoon floods.

The Chief Engineer increased the
depth of retaining walls from 6 to
8 ft reducing width of same from
4 to 3 ft. I tried to get in this
retaining wall of laterite boulders
in mortar but found it quite im-
possible to drain foundations to a
depth of 8 ft. The springs below 4 ft
were very great, and it would
have been necessary to use Cofferdam
or to stop it from considerable
distance. I tried bailing out
with Engine & Centrifugal Pump
Pistons but could make no im-
pression below 5 feet. I do not

think

think either that strong work could
be got into a wall 3 feet wide &
8 ft 6 in high constructed of such
materials as laterite boulders
were. Supposing I could have kept
the foundations dry. I have therefore
put in my retaining walls so far
as I have done (see sketch)
plain cement & first pier on 4 feet
walls plus 3 feet Bricks in chimney.
This I think is much more secure and
altogether stronger work and does
not cost any thing like what the other
would cost taking leading into con-
sideration what would be a
very serious item as it is we
have required as yet very little
in the way of leading I have only
one of Stoney's excavators on the
work & that belongs to the South
Indian Railway and will most
likely have to be given up
again - immediately as well
sinkers make a great fuss to
sink when clay is reached.
It will be necessary to get a
few of Stoney's excavators that
I do not see them down in the
P.W. Stores list.

Though not provided in Es-
timate I purchased 6 bags
of Portland Cement for setting
the granite stones across wells
and it was my intention also
to cement plaster put waters
and piers up to spring line. This

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This can be met from saving in
wells & other items.

The Establishment on the
Work has consisted of
1 Sub Overseer on Rs. 35
2 Maistris — 25 each.
1 Clerk and a Gunastah all
paid from the provisions in
the Estimate for Petty Supervision.
I have temporarily dispensed
with the services of one Maistry
& Gunastah.

As soon as orders were received
to hand over Bridge Work to D.W.
Contractors all slackened off work
and I have found it dif-
ficult to get anything done the
fact is they are uncertain as to
whether they will be kept on
and I have since the 1 July
practically stopped work with
exception of well sinking. By terms
of Piece Work Agreement the
Local Head Engineer may
put an end to such agreement
at his option at any time and if
other arrangements for doing the
work are contemplated I
fancy the Cancellation of Agree-
ments will have to be made
by

leg me with whom the engager
ments were entered into.

Prof R. E. Norfor. F.E.
Local - Fund - Engineer.

True Copy
These were given to the Engineer Cuddalore Works
in July 1888.

W. S. Burton. Secy R.E.
Superintending Engineer 5th Div.

No. 1936. 2197
4

Inspection Notes
of Colonel. W. H.
Burton. R.E.
Superintending Engineer
5th Div.

16417 July. 1890.

The Bridge of 16 arches of
60 ft. span each now
under construction was
Cuddalore over the
Ponnai River.

1. All the piers have
been turned except the
15 & 16 next the North
abutment & the face
walls have been built
between the piers over
the 1, 2, 3, 4 & 5 piers (all)
Piers being the one next
the North abutment
up to the height of the
locking course.
Also the concrete filling
of the piers & walls has
been done over the 1,
2, 3 & 4 Piers and the
sand or earth filling
intended

intended necessary
to form a foundation
for the road metal
has been done over
the 1, 2 & 3 piers.

Thus on the 1, 2 & 3 piers
all the weight which
they will have to carry
has now been loaded
on except that of
a 18" thick of road
metal which mea-
suring $6\frac{1}{2} \times 18 \times 1\frac{1}{2}$
may be taken as
equal to 96 tons in
weight on each pier

(b) and the locking course
of brick work & parapet
walls which may be
taken as equal to 56
tons in weight on
each pier.

2. The 1, 2 & 3 piers show
signs of settlement see
Enclosure to my letter
N^o. 175 dated 14-7-80
to Chief Engineer.

The 1st pier has a hair
crack running through
it apparently from
North to South side

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pier is 8' high to spring
ring: this is about in
the middle of the length
of the pier.

The Pier has sunk to
the extent shown by
Mr. Peters in his letter
of 12th and has gone down
further a $\frac{1}{4}$ " between the
12 & 16. So on 16th it had
sunk $1\frac{5}{8}$ ". There is no
fault visible in the
brickwork or in any
other part of the pier.

The 2nd pier. This has a
hair crack running
up about 12" above
the floor in the
middle of North side
the pier has sunk
to the extent de-
scribed by Mr. Peters
on 12th July but on the
12 & 16 there was no
hair crack visible,
not until the morning
of the 17th July.

N^o. 3 Pier. This also has a
hair crack running up
the middle North side
about 6" or 8" and it
also like that in N^o. 2
pier was first seen
on the morning of the
17th

17th

the other for the Local
Fund Engineer who
commenced this Bridge
in 1888. Before its
construction was taken
in hand by the
Madras P.W. Dept.
was good enough to
meet the Engineer & myself on
the morning of 17th.
He assured me that
in April & May 1888
(vide also copy of a
Memorandum he handed
to the P.W.D. when handing
over charge of the Commission
Bridge Works to the D.O.W.)
when the two sets of No. 1 &
2 Piers were being sunk
that he personally as-
certained that they
reached at a
depth of 14' hard
stiff black clay
clay - and that
he consequently di-
rected them to
be filled up with
Concrete as specified -
that

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that he was absent from
Cuddalore and the
P. Bridge in the District
1/2 his time - said that
he had not Supr.
- influence capable
of being left to carry
on such a large
work.

The 3 piers were
commenced in Mr.
Norford's line. Sunk 4 1/2 ft.
as I understood by
him - and then to their
present depth of 19 ft.
by Mr. Peters.

Mr. Peters also had no
doubt about the suit-
ability of the foundation
when at above depth
& so also had the
wells filled in with
lime concrete. i.e. of
the 3rd Pier.

3. The 3 wells forming
the foundations of No.
1, 2, 3 Piers are built
of table moulded
bricks

bricks laid in lime
mortar 9' exterior Casing
diameter built on
wood Kers 15" deep
of the usual section
adapted for easy
sinking & when sunk
to the depth 100 =
sided by the
Local Pump Engines
or by the Excavation
Engines, as the case
might be. mixed
hearted with sand
& coke - mixed with
Surtchi mortar,
the concrete was
lowered into position
well tacked & rammed
in under the Kers
and for the first 2 or
3 ft. of depth and after
wards thrown in from
the top and rammed
as it was brought up
to the top of the well:
it was so far as I
am made to believe
properly consolidated:
whether it has set hard
from

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from bottom to top it
is impossible to say -
The foundation area of
each of these piers is thus
that of 3 solidly filled wells
having a diam^r of 9' and so
= 190.85 ft² sup^r ft².

The weight now on the 3
Kers of the wells is
that of well rings, Tons.
and concrete - 123.

& the weight of air & 2
2 cut waters } 85.

& the weight of arch 235 Tons
" face walls. 60 722

& " concrete
backing over } 39
piers }

& " earth filling to
level of underside
of metal - 180

or 3.73 tons per square foot
if nothing is allowed for
friction of earth & against
sides of the wells.

of course it may be that
the lime concrete in these
wells has not yet suffi-
ciently set & has not therefore
yet bear about weight
per ft² sup^r - on the other
hand the weights im-
posed on the 190.85 ft²
sup^r of foundation is
100

too great and it would
have been more pro-
per in view of the ex-
tent to be imposed on
each of these piers to
have allowed 6
wells to each pier than
only 3.

The Design of the
Bridge was, as I
understand, the
Warfare - it was
approved by Colonel
Vibart as Superintending
Engineer on the 19th Oct 1894
and by Colonel Hasted
Chief Engineer on the 12th
November 1894. See G.O. No. 3148 of
21 November 1897.

4. At present that is up
to the 17th July 1890, there
was no crack or flaw
visible in any part
of the Bridge other than
those described in
piers No. 1, 2 & 3. none
for instance in any
of the 13 arches turned
stones or the settle-
ments are so calicied
under the parts only
of the Bridge - now
nearly fully loaded
it

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it seems expedient
to lighten the perma-
nent load as much
as is feasible: this
can be done by
removing the earth
filling (180 Tons) over the
spandrels & and build-
ing small brick arches
about 6' span each
to carry the road
metal also if possible
to reduce the weight
of blocking course
& parapets - also
possibly to reduce
the weight of road
metal. The Exec.
this Engineer is getting
out alternative Estimates
for these items: and
is prepared to start
up the South Side of
No. 3 pier with cutting
timber which will be
set free in a few
days (the last 2 arches
are being turned) in
case there is any
sign

sign of the fractures
extending themselves
so as to reach the
perches at present
as before there are
no signs of such
in the perches.

W. A. Burton

Cover

Sup. 2 Engrs 5' circle

23 July 1890

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From

The Sup^g Engrs
V Circle

Dated 23^d
Recd } July
1890

No 1936

Inspection notes
of Col W. H. Burton R.E.
Sup^g Engrs V Circle on
Pannier Bridge

No. 1937

2187
SUPERINTENDING ENGINEER'S OFFICE,
V CIRCLE, MADRAS,
Chennai, 23 July 1890.

From

Col W. H. Burton R.E.
SUPERINTENDING ENGINEER,

V CIRCLE,

To

THE

Chief Engineer
P.W. Department.

SIR,

Enclosures. 2

1 Inspected
1 Copy of
the notes

In continuation of my
Report of 1759 dated 14th
July 1890, I have the honor
to forward my Inspection
Notes of 16 & 17 July which
days I spent at Chuddalur.

I have the honor to be
Sir

Yours Most Obedt Servt

W. Burton Col R.E.
Sup^g Engrs V Circle

From

THE SUPERINTENDING ENGINEER,

V. CIRCLE,

H. M. 2017 n 9 5 2-21
348 n a 21-10-87

To

THE

Chief Engineer
P.W. Dept.

Dated

Recd.

23 July

1890.

ENCLOSURES.

2

No. 2197 12/13

No. 1937.

Inspection Notes
of Mr. H. Hunter
Sup. Eng. & Civil
on Pannier Bridge
—
Forwards —

Chs 6987720
Before H. M. that I have
to visit the station during
September and shall be
able to decide after personal
inspection what should be
done —
The work appears to be in
no worse shape than usual, and
it will be well to wait
a short time to see if the
settlement increases. Structures
generally settle a little as
time goes on, and perfectly stable
after this first settlement
has taken place —

2197
11 S. 1. 5

row

Submitted, with
reference to the
above remarks.

C. J.
21-8-90

W.

On the assumption
that the water has
been taken down
to the stratum of
clay, and that
this stratum is of
sufficient depth,
it is difficult to
account for the

Linkage -

$3\frac{3}{4}$ tons on the
square foot is
however a very
great load.

The only thing
that does seem to
be to reduce the
load in some
as possible as
the extent of
of S.E. water.

W.B.

25-7-90

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P. W. D.

Drift - order on Cio - 6989.

The undersigned
proposes to visit Cuddalore
during September, and
be able to decide, after
personal inspection,
what should be done.

Approved
JWS
21/8/9

The work appears
to be in no immediate
danger, and it will be
as well to wait a short
time to see if the settle-
ment increases. Structures
frequently settle a little
at first which are
perfectly stable after
this first settlement
has taken place.

P
W



21/8/9
JWS

2137/4 P. W. S.

Note to the Acting
Chief Engineer, Genl
Buildings & Roads Branch.

I think the
proposals made the
best under the cir-
cumstances, and the
Executive Engineer is
apparently taking
measures for the safety
of the work in the
meanwhile.

P. W. S. Buchanan
esq

Ootacamund. } Lt Col RE,
July 28, 1890 } As Chief Engineer P. W. S.
Genl Buildings & Rds Bk.

No. 2197 W. d/13 Aug 1890

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PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following

From the S.E.I. (Cable) (H.E. No 1937 d/23. vii. '90)
Note by the As. Chief
Eng. P.W.D. _____
d/28. vii. '90

Is it like to have Col.
Pennyman's views on the
proposals of Col. Bunter.
The plan seems to be intended
to make it be better to make more
strengthen the anchors No 1
2 & 3?

3/8/90 L.H.S.

Recorded.

Phcom
29.7.90

S.E.I. (Cable) d/14/8/90
L.H. depts

CM

~~Wm~~

15

~~Wm~~

No. 2177 w. 13 Aug 1897

~~7. 1. 8. 9.~~

~~1. 2. 3. 4.~~

From the Chief Clerk
of the Court of
Common Pleas

we 10/10
Oct 11-17
Oct 22-28
Nov 1-7
Nov 14-20
Nov 27-31

1898