

(1) Number of pages _____

(2) Date of repair _____

(3) Initials of the Referencer _____

MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No. <i>487 (W)</i>	Press ~~Mis.~~
Dated <i>13-2-</i>	<i>1877.</i>

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
13th February 1877. No. 487.*

Read the following papers:—

No. 330. From the District Engineer, Bangalore, dated 8th Nov. 1876, No. 170.
No. 330-A. Chief Engineer's Memorandum, „ 21st „ „ „ 1,322-T.
No. 330-B. From the District Engineer, Bangalore, „ 8th Dec. „ „ 198.
No. 330-C. Chief Engineer's Memorandum, „ 24th Jan. 1877, „ 82-T.

No. 330-D. From Major ROSS THOMPSON, R.E., Officiating District Engineer, Bangalore, to Lieutenant-Colonel J. MULLINS, R.E., Secretary to Government, Public Works Department, dated Bangalore, 3rd February 1877, No. 215.

I HAVE the honor to forward herewith, for sanction of Government, a plan and estimate, amounting to Rupees 520, with specification for supplying a lightning conductor to the recent enlargement to Sapper Magazine at this station, prepared in accordance with the instructions conveyed in your memorandum, No. 82-T, dated 24th January 1877.

No. 330-E. From the District Engineer, Bangalore, dated 8th Feb. 1877, No. 219.

No. 331. ORDER THEREON, 13th February 1877, No. 487.

MILITARY WORKS, No. 5-A.

(a) *Heads of Service.*—Imperial.
Fund.—Ordinary.
Class.—Original Works.
Main-head.—Military.
Sub-head.—Military Buildings.
Section.—Accommodation for Native Infantry.
Name of Work.—Supplying a lightning conductor to the recent enlargement to the Sapper Magazine at Bangalore.
Amount.—Rupees 520.
To be carried out by the Public Works Department.
* Letter No. 2,675 of 21st November 1876.

THE plan and estimate of Rupees 520, for supplying a lightning conductor to the recent enlargement to the Sapper Magazine at Bangalore, are sanctioned, and the requisite funds are transferred from the amount surrendered* by the District Engineer, North Arcot, for an armourers' shop at Vellore.

2. This sanction is registered as Imperial No. 129—W of 1876-77.

(True Extract.)

Colonel,
Acting Joint Secretary to Government.

To the District Engineer, Bangalore.
„ „ North Arcot.
„ Examiner of Public Works Accounts.
„ Military Department.

Exd. E. C. Shunker.
Spare Copies

Acctt. Off. District Engineer.

BANGALORE 8th February 1877.

NO.

217.

From

The District Engineer

Bangalore.

To

The Chief Engineer
D. P. W. Madras.

Sir,

With reference to your
Telegram dated yesterday I
have the honor to inform you that
Rupees One hundred and ninety
seven have been spent on the Light-
ning Conductor Lapper Magazine
up to date. Copper rods &c
were supplied by the Superin-
tendent of Public Works Work
shop, and bills for them have
not yet been received.

The work is completed.

I have the honor to be, Sir,
Your most Obedt. Servant.

A.D.
Asst.

P. Thomas Major A.D.
Off. District Engineer.

DISTRICT ENGINEER'S OFFICE - Q-257

BANGALORE 3rd February 1877.

From

The District Engineer

Bangalore.

To

The Chief Engineer P. W. D.

Madras

Sir

I have the honor to forward here with for
sanction of Government a plan and Estimate amounting
to Rupees 520 with Specification for supplying
a lightning conductor to the recent enlargement
to Gajpers Magazine at this station prepared in
accordance with the instructions conveyed in your
Memo no. 82 I dated 24th January 1877.

I have the honor
to be Sir

your most obedient servant

R. R. Thompson Major R.E.
offg. District Engineer Bangalore

Leb

No 219
from

The Med. Diet. Conf.
Dungaree

Mr. Whitcomb
P. M. H.

Notes } February 1777
Re: }

in forms that the work
of such persons by filling
cards to the persons
responsible is completely
and that the responsibility
on the same amount
to the 197.

Head of service Imperial
 Fund Ordinary
 Class Original Notes
 Main Head Military
 Sub Head Accommodation for Native Infantry

To be charged out by the P. H. L.
 Revised Detail Estimate No. 2 of 1876/77

District Bangalore
 Name of work Supplying a Lightning Conductor
 to the recent enlargement to the Sapper Magazine
 Bangalore

Particulars of work No. 1
 Measurements Length Breadth Total

<u>Copper strips</u>			
Around the eaves of Old &			
new building	106		106
Edge or Corner of the roof	2	20	40
— do — for new building	2	8	16
Over top between Conductor			
points	1	14	14
Angles or Corner of Magazine	2	16	32
From the above to foot of			
Compound outside	2	15	30
— do — do to Harrows	4	17	68
For Harrows	4	6 $1\frac{3}{4}$	42
Add to contingencies for overlaps &c			34
Total			382

From
 The Dist Engineer
 Bangalore
 To the Chief Engineer
 P. H. L.
 Bangalore
 No. 215
 Date 2/15/77
 Lightning Conductor
 to the recent enlargement
 to the Sapper Magazine
 at Bangalore
 amounting Rs 520 for
 materials in accordance
 with the Bangalore estimate
 No. 1

Particulars of work	No.	Measurement			Contents	Total
		L	B	D		
<u>Deduction</u>						
Stripping off and relaying						
From angles of Magazine	4	15	.	.	60	
Around the eaves	.	94	.	.	94	
Down the side to ground	4	16	.	.	64	
Top	.	5	.	.	5	

Total Dreduction 223

Total Rft. of new Copper strips 3" wide and $\frac{1}{8}$ " thick with Copper screws 159
Labor for fixing $\frac{1}{2}$ "

New Conductor

do for new & old building 4 7 $\frac{1}{4}$. . . 29

Total Rft. of solid copper rod for upper ends of Conductor 29

Copper points

Harrows 4 9 . . . 36

Total Copper points $\frac{1}{4}$ " & $\frac{1}{2}$ " and 6" long for Harrows 36

Excavation

From angles or corner of Magazine to outside of Compound 2 15 $\frac{1}{2}$ 3 135

do to Harrows 4 76 $\frac{1}{2}$ 3 288

For Harrows 4 3 3 3 108

Total Cft. of Excavation 531

Cft. of Filling in with coke and covering with stone slabs $\frac{1}{2}$ " 531

Head of service Imperial
Fund Ordinary
Class Original works
Main Head Military
Sub Head Accommodation for Native Infantry
To be carried out by the P. W. D.

Revised Abstract Estimate No. of 1876/77

District Bangalore

Name of work Supplying a lightning conductor to the recent enlargement to the Laffer Magazine Bangalore.

Quantity Description of work Rate per unit Total

159 Rft. of new Copper strips 3" wide and $\frac{1}{8}$ " thick with Copper screws $\frac{1}{2}$ " 1 8 . Rft. 239

29 do New solid copper rod for upper ends of Conductor 1 12 . . 51

36 Copper points $\frac{1}{4}$ " diameter and 6" long for Harrows 8 . C 18

531 Cft. of Excavation for trenches 1 cft. 3

531 do Filling the above trenches with coke and covered with stone slabs $\frac{1}{2}$ " 4 . . 133

Carried Over 444

Quantity	Description of Work	Rate Per Unit	Total
			P.W.D. 1174
	Brought forward		444
	Scaffolding		30
			474
	Sundries		46
	<u>Total Estimate Refers</u>		<u>520</u>

District Engineer's Office
Bangalore
3rd February 1877

W. Thompson
Major P.E.
off. District Engineer

Lt.
Ad. S. S. S.

(192)

Specification to accompany
a Revised Plan and Estimate for sup-
-plying a lightning Conductor to the
recent enlargement to Lappers Sina-
-gazine Bangalore.

Amount of Estimate Rs 520--

Copper bands 3 broad and 8
thick will be carried around the
eaves and along the ridges of Sina-
-gazine as shown on plan. The lower
ends of the conductor will be copper
strips of similar dimensions and
continued under the foot of the
compound wall to the outside ter-
-minating in two branches each
16 feet in length and diverging at
an angle of 90 from each other,
the ends of the branches to be
fastened to Harrows made of copper
strips as shown in the plan with
copper points of $\frac{1}{4}$ dia and 6 long
fixed at each joint. The joints to
be also firmly rivetted together
and strongly soldered to insure per-
-fect metallic contact. The conduct.

stripes to be laid in trenches 3 feet deep and 18 inches broad and packed below above and at the sides with coke, the Harrows will also be placed on and surrounded by coke. To facilitate the necessary frequent examinations of the earth contact it is proposed to cover the coke filled trenches with slabs of stone. The stone slabs being in their turn covered with earth up to the general level of the ground.

The trenches will be so arranged as to lead a flow of water over them during the rain which generally accompanies thunder storms.

The upper ends of the conductors will be solid copper rods projecting freely into the air 6 feet from the roof as shown on the Drawing and filed to points.

M. Thompson

Major R. G.

District Engineer's Office

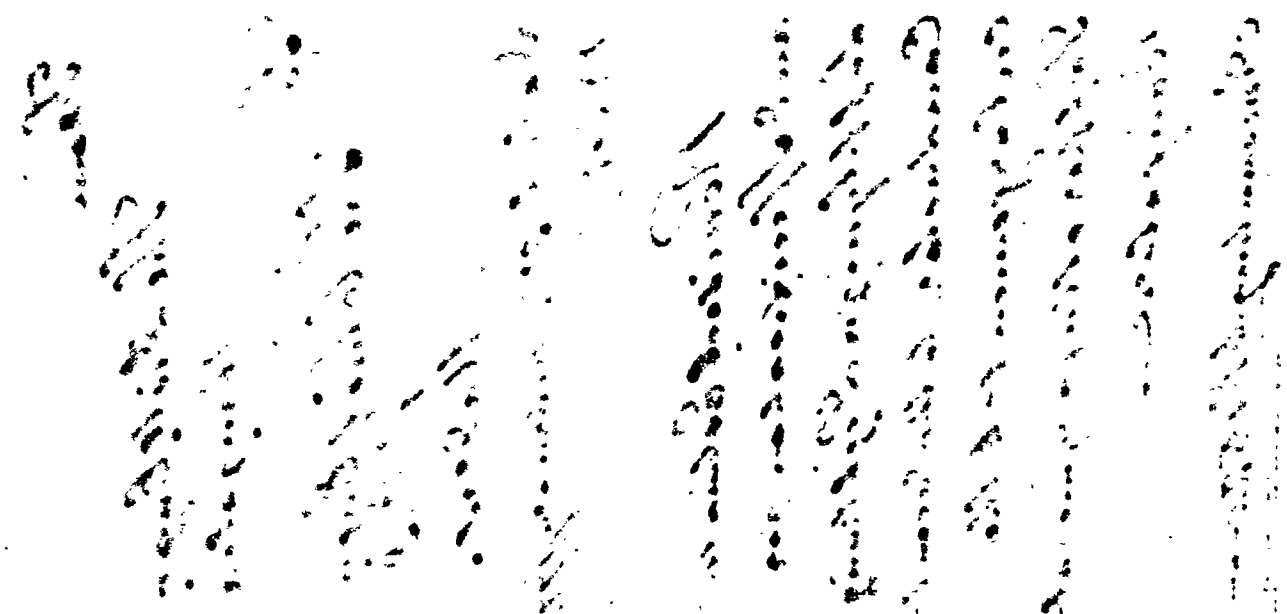
Bombay 3rd Febry 1877

Off. District Engineer

1877

Lt

H. P. Dr. H. P. Dr.



P.W.D.

Feb 77

1174

118

Received

From

The Dist. Engr.

Bangalore

To

The Chief Engr.

P.W.D.

Madras.

Dated 3rd February 1877.
Recd.

Received Estimate

and specification for

supplying & supplying

conductors to the recent

enlargement of the

supply of the supply of

Bangalore.

Amounting to Rs 520-0-0

330-31

No 825

of 25th January 1877.

MEMORANDUM.

Letter Number 198

dated the 1st December 1876.

from the District Engineer of Bangalore

The District Engineer's attention
is called to the several orders
under subject of new works
& repairs. It is shown
therein included in
the same estimate. The
estimate is therefore submitted
to the D.E. in order that
he may eliminate the
repairs from the new works
on which would seem by
the specification to be
the case, that the telephone
conductors of the old (original)
building was to be removed
or dismantled in which
case the head of the
conductor, ~~as also~~
as also
para 1 of the letter
under notice, ^{should be retained} as then
it is recommended that
the specification simply
states that the plates
at points of junction
are to riveted together
the best method is
under subject. It seems
that the specification
is insufficient
and is particularly
pointed out that

-w- G. H. G.

to make the ^{intended} contact.
complete plates or
rods or ropes or tapes
or joints of sections
should be thoroughly
soldered together

Wk
23-1-77

Specification intended
to plan etc to H. E. Bangalore

N. 330 C

NO.

From

The District Engineer

Bangalore.

To

The

Chief Engineer

Public Works Dept., Madras.

Sir,

With reference to your
Memorandum No. 1322 dated 21st
November 1876. I have the honor
to forward for the sanction of Govern-
ment, the accompanying Revised
plan and Estimate amounting to
Rupees 590. for supplying a lightning
Conductor to the recent enlargement
to the Upper Magazine and for re-
pairing the Conductor of the old
part of the Magazine.

2.

The plan and Estimate
have been approved of both by the
Major General Commanding the
Division and His Excellency the
Commander-in-Chief.

P.W.D.

90076

No. 8000

11

Thousands for winter
of Government ad-
vised plan and Es-
timate amounting to
Rupees 570-0-0 for
supplying a lighting
conductor to the
Banyan Magazine Ban-
galore.

Order of 20th Dec 1876
Recd. 21st Dec 1876

From
The District Engineer
Banyalore
To
The Chief Engineer
S. D. S. N.
Madras

No 1340 S of 24th Nov 76.
Misc No 15 of 4th Dec 76

No 82 S.
The 24th Jan 1877.

The Specifications - Estimated Plans
sent to the D.E.

No 330 B.

Ar 12-2-77. Ar 12-2-77

DISTRICT ENGINEER

No 1322 S of 21st Nov 76
MEMORANDUM.
190

Letter Number 190
dated the 18th Nov 1876
from the District Engineer of Banyalore

The Clerk required
approval of the suggestion
made in the letter quoted
above but thinks that
the plan submitted
when with the plan
submitted was not
returned. He has
submitted the plan
as usual
be submitted to
to Mr. Tando in
Chief -

Wk
21.11.76

From

The District Engineer

Bangalore.

To

The

Chief Engineer

Public Works Department

Madras.

Sir

In G.O. No 15 of 4 September 1876, the District Engineer, Bangalore was directed to submit a plan and detailed estimate, for supplying "a lightning Conductor to the recent enlargement to the Copper Magazine Bangalore, and for repairing the Conductor of the old part of the Magazine."

They were accordingly prepared (Estimate amounting to Rs 1260) and forwarded with the approval of the Major General Commanding the Mysore Division to the Quarter Master General Madras, on the 16 October 1876 for submission to

His Excellency the Commander-in-Chief.

The Major General Commanding the Mysore Division Considering the work to be of an emergent nature requested that it might be undertaken in anticipation of sanction. I have however, led to pause before doing so, as a careful consideration of the points insisted upon by Mr. P. J. Mann M. D. F. R. S. in his paper circulated with G. O. No. 49 of 8 April 1876 and several conversations I have had at Madras with Mr. Pogson the Government Astronomer, on the subject of "Earth Contacts" and their usual insufficiency and inefficiency - have convinced me that the building in question may be more securely and economically protected from lightning by a rather different arrangement of the Conductors and earth contacts, to that provided for

for in the plan and estimate forwarded to the Quarter Master General on the 7th October. It will be observed in the revised plan herewith submitted that the earth contacts are continuations of the conductors themselves terminating in ample pointed earth contacts also of Copper. This I believe to be preferable to making the earth contacts by means of iron chains, which are difficult to preserve in such a state of tension as to keep the links in constant and perfect contact. Iron chains even when galvanized are liable to corrode and as corrosion would also take place between the points of contact of the links, metallic contact is almost certain to be destroyed and as a natural consequence the electric fluid to be interrupted in its passage to earth.

The frequent examination of earth
Contacts is a point much insisted
upon by Mr. Mair and by Mr.
Ragden - to facilitate this operation
with a minimum chance of injury
to the conducting strips and
terminals I have provided for the
Coke filled trenches being covered
with rough stone slabs which may
be readily be removed from time
to time and the earth contacts
examined.

I enclose herewith Dr. Mair's
paper for reference. I have marked
such portions (in blue pencil) as
I think most worthy of attention.

I have the honor to be
Sir

Your most Obedt servant

W. H. M. M. M. Major R. G.

Offg. Dir. Eng. Bangalore.

Yours truly

H. A. M.

Mis: G.O. No 154/24 Sept/16

From

The District Engineer
Bangalore
To The Chief Engineer
Mysore

Dated 8/11/16

Recd. 3 November/16

No 170.

Enc Co. Silver Ritz
Memo No 1322 74/21/16
Forward Details
of Revised Estimates
with plans for supply-
ing Lightning Conductors
for to the recent
enlargement to the
Lapper Magazine
at this station & for
repairing the Conductor
of the old part of
the Magazine with
certain remarks.

No 380

Encl (2-2) L 12-2-27

(a) Heads of Service— Imperial

Fund. Military

Class. Original Works

Main-head. Military

Sub-head. Military Buildings

Section. Accommodation for Native Infantry

Name of Work. Supplying a lightning conductor
to the recent enlargement to the Lapper
Magazine at Bangalore.

Amount. Rs 520

To be carried out by the P. W. Department.

Print in the margin of G. O. No 4870/13/2/17

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the

Read the following:—

From

The Dist. Eng. Bangalore (H.B. No. 170 d/s 4th Nov. 1876)
Chief Engg's Memo — (n. 1322 J. — 21st —)
The Dist. Eng. Bangalore (n. 198 — 8th Dec. 1876)
Chief Engg's Memo — (n. 82 J. — 24th Jan. 1877)
The Dist. Eng. Bangalore (n. 215 — 3rd Feb. —)

The Plan and
Estimate of Rs 520 for
supplying a lightning
conductor to the recent
enlargement to the Sapper
Magazine at Bangalore
are sanctioned.

2. Application should
be made for an allotment
for the work from the
Reserve of 1877-78.

3. This sanction
is

Dear Mr. H.
 I have just received
 your letter of the 10th inst.
 and am glad to hear
 that you are well and
 hope that you will
 continue to be so for
 many years to come.
 I am very truly
 your friend,
 Wm. Lloyd Garrison

2. This sanction is registered.

L. H. O'Brien

W.H.
10.2.77.

1. The first part of the document is a list of names and addresses, which appears to be a directory or a list of contacts. The names are written in a cursive script, and the addresses are listed below them.

[The page contains several lines of extremely faint, illegible handwriting.]

This image shows a highly textured, high-contrast black and white surface. It appears to be a close-up of a material like paper or fabric, possibly a book cover or endpaper, which is heavily marked with numerous small, dark, irregular spots, scratches, and fibers. The overall effect is one of extreme grain and noise, with no discernible text or figures.

13/2

H.R. Bangalore ✓
 " K. Arcat ✓
 E. P. W. A ✓
 Mich. Dept ✓
 Disp. - 3-3-77

W. A. C. 12-2-75

11/17/98
1380
81192
89892

Govt. of 1877 Madras.

PUBLIC WORKS.

To The H. C. Bangalore

Dated

Issued

Recd.

Encl.

G. O. 18th Feb. 1877, No. 487

Nos. 330-331

Sapper Magazine at
Bangalore The plan and
estimate of Rs 520 for sup-
plying a lightning conductor
to the recent enlargement
to the — sanctioned and
funds provided by transfer

For Mr. M. J.

21/11/98
Cin 12-2-77

Aspd-3-3-77