(1) பக்கங்களின் எண்ணிக்கை 38

(2) புதுக்கித் திருப்பிய நாள் 18-11.88

(3) ஆதாரங்குறிப்பவர் சுருக்கொப்பம்

தமிழ்நாடு ஆவணக் காப்பகம்.

㉑

தமிழ்நாடு அரசு

P.W.D. துறை

அரசாணை எண்.
மு. கோப்புத் தாள் எண். 25

அச்சகம்
பலவகை

நாள் : 8-1-1889 ~~19~~.

மடிக்கவோ கண்டபடி கையாளவோ கூடாது

18 Sheets

ஆவண கா-1—18,006—15-6-87.

7A

8TH JANUARY 1889, No. 25 W., PUBLIC WORKS.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Military Works.

READ—the following paper:—

Note by the Acting Chief Engineer, Public Works Department.

BANGALORE WATER-SUPPLY.

In Colonel Hasted's note, dated 14th July 1888, it was recommended that the Magudi road and the Nagaweram tank schemes should be investigated, and, at the end of August last, Mr. Larminie, Executive Engineer, was sent to Bangalore to do this. I regret that the progress of the investigation, estimates, &c., has not advanced as I could wish, but much information has been collected.

2. In addition to these two schemes, orders have been received for the Hebel tank scheme to be examined, and I consider it desirable that a scheme for the supply of the troops alone from a clean catchment basin should be, if practicable, prepared. A site that appears to the eye a most favorable one was found by Mr. Larminie and myself about three-fourths of a mile above the Magudi road, and this should, in my opinion, be estimated for; this is advisable, as in the event of the municipality declining to undertake a large scheme for the supply of the cantonment and the troops, it will be necessary for the Government to undertake a separate scheme for the supply of the troops alone.

3. From Mr. Larminie's investigations we have the following information regarding the schemes. That given in the essays was only approximate:—

(1) *Magudi Road.*—Catchment area, 8½ square miles. The whole of it practically free.
Distance from Bangalore, 5 miles.
Lift to be pumped, including friction of pipes and height required for filtration, 380 feet.

(2) *Hebel Tank.*—Catchment area, 13·3 square miles, of which only 4½ is free.
Distance from Bangalore, 2½ miles.
Total lift, 187 feet.

(3) *Nagaweram Tank.*—Catchment area, 17·3 square miles, of which 8½ is free.
Total lift, 216 feet.

(4) Site, ¾ mile above Magudi road; for troops alone.
Catchment area, 5 square miles; the whole practically free.
Distance from Bangalore, 5½ miles.
Total lift, about 260 feet.

4. It will, I fear, take Mr. Larminie two months more to prepare the approximate estimates for these four schemes.

They should be prepared on the same data and will show the probable cost of each.

With this information Government will be able to compare the relative cost, advantages, &c., and there should be no difficulty in coming to a final decision as to which is the best and which should be worked out in full detail.

5. I have, in consultation with Mr. Larminie, laid down the following as the data on which the schemes should be worked out; this of course is laid down in an arbitrary way.

For the supply of the military alone about 10,000 cubic feet per day. This is a slight increase on the amount now used and may be taken as 4,000,000 cubic feet per year. For the supply of the military and cantonment 110,000 cubic feet per day, or say 40,000,000 cubic feet per year.

As in Colonel Hasted's note, 7,000,000 to be taken as the minimum supply from a square mile of free catchment basin, and in order that the supply should be maintained in a year like 1876, storage to be provided for at least one year's supply.

With regard to the allowance for evaporation, soakage and leakage, it is difficult to lay down data, but as the leakage and storage from any reservoir near Bangalore must be very great, especially when water is stored at a great depth, which for economy as regards evaporation is necessary, I consider it is absolutely necessary to allow a very liberal allowance and therefore decide on allowing a loss of ·28 inches per day or ·7 feet per month in depth over the water surface in the reservoir throughout the year.

6. On the above data with contour surveys of the four sites there will be no difficulty in determining the heights of the dams required at each site and the cost of the work; it will be advisable, however, for a few borings to be taken below Hebel and Nagaweram tanks so that we may know something of the nature of the sub-soil.

7. In some of the essays wells or natural filtration have been advocated. I do not think it likely that the sanitary authorities would be satisfied with this arrangement, nor do I consider that we can hope to obtain the large supply required from wells at a reasonable cost. It is decided, therefore, that settling ponds, filters, &c., should be estimated for.

8. Mr. Larminie considers that the Mundapum hill has most advantages for the three schemes as the site for the filters, &c., and therefore it is decided that the three schemes should be worked out for the filters, &c., being placed on this site.

It will be a question as soon as final project is decided on whether a site on or near the high ground should not be tried for the Magudi road project or one on the Sapper quarry for the Nagaweram tank scheme.

For the military supply project the best site probably will be found at the west end of the parade ground.

9. With regard to distribution, the cost must depend greatly on the system adopted. In Madras, under the Municipal Act, the least distance measured in a straight line from any house in the populous parts of the town to a hydrant is laid down as 450 feet.

It is proposed to adopt a distance of 600 feet in Bangalore cantonment. Also not to make any provision for the supply of the houses in the high ground, because doing so owing to the height would considerably increase the cost of the work. Special arrangements for this might be made hereafter.

With regard to the distribution of the minor project for the supply of the military alone, the water will be delivered to the present cisterns at the barracks and distributed as now.

10. When at Bangalore, a scheme proposed by Colonel Vibart was brought to my notice. It is to bring water from Hessergutti tank in the Arkavutty valley. I inspected the tank. It is a fine tank that could be enlarged at comparatively a small cost and has a catchment basin of 236 square miles (not free). This basin is open to the objection that there is extensive cultivation and several villages in it.

This distance from Bangalore is 11 miles and the lift would be about 356 feet.

I do not consider it advisable for this scheme to be further thought of. It cannot be advisable to go to this distance from Bangalore and to incur the cost of this great lift to obtain what cannot be considered a pure supply.

20th December 1888. (Signed) H. R. MEAD, Colonel, R.E.,
Ag. Chief Engineer, P.W.D.

No. 5181 C.

Copy of the Chief Engineer's note on Bangalore water-supply forwarded to Mr. Larminie for information and guidance.

20th December 1888. (Signed) H. R. MEAD, Colonel, R.E.,
Ag. Chief Engineer, P.W.D.

ORDER—dated 8th January 1889, No. 25 W., Public Works.

His Excellency the Governor in Council approves of the proposal that the three schemes, viz. :—

1st.—Magudi road-site.
2ndly.—Nagaweram tank-site.
3rdly.—Hebel tank-site for the supply of the Bangalore cantonment and the barracks should be approximately worked out in detail so that their costs and advantages may be compared and the best may be selected. Also that a small scheme for the supply of the troops alone from a site above the Magudi road be also investigated.

2. The Government learn with regret that so little progress in the investigation has been made, but trust that the report and estimates may be received in two months from this date, and will enable the Government to come to a decision as to the scheme which should be finally adopted.

(True Extract.)

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

To J. C. Larminie, Esq., Executive Engineer.
To the Superintending Engineer, V Circle.
" Examiner, Public Works Accounts.
" Military Department.

Exd. J. Henricus.
Spare Copies

BUILDINGS AND ROADS.
MILITARY WORKS.

Govt. of {1889} Madras.

PUBLIC WORKS.

Dated January, 8th.

Recd. *Encl.*

G.O., 8th Jan. 1889, No. 25 W.

JANUARY.

Bangalore Water-supply Project

Orders on note by the Acting Chief Engineer, Public Works Department, on —.

[illegible] G.O.

25/3

Copy of the G.O. noted — Bangalore water supply forwarded to the Res. Commr for information and guidance

20/12/[illegible]

This shd go at once to the Res. C

attd 16.

3 3

the copy is sent

Irrib G.O.

25/4

285

H.E. ~~[illegible]~~ the
Govern- in Council
~~accept~~ approves of
the proposal for the
3 schemes namely
1st Nugade River
~~in~~ road site
2nd Nagawara Tank
site
3rd Hebbal Tank site
for the supply of the Bangalore
Cantonment and the
Barracks shall be
approximately worked
out in detail so that
their cost & advantages
may be compared and
the ~~[illegible]~~
best may be selected
Also that a small
scheme for the supply
of the Troops alone
from the a site above
4 the Nugade River
be also investigated 4

2 The Govr [illegible] will

regret that more
progress in the investigation
has not been made
but trust that the
~~[illegible] survey estimates~~
report & estimates
may be received ~~early~~
in 2 months and
that it will enable
the Govt to come to
a decision as to
which scheme may
be so finally adopted

Note by the C.E.

Bangalore Water supply

In Col. Hasted's Note
dated 14 July 1888 it
was recommended that
the ~~Naga~~ ~~the~~ Magadi
Road and the Nagawara
Tank schemes sh^d be
investigated and at the
end of August last
Mr Lawson C.E.
was sent to Bangalore
to c [illegible] I regret
progress of the
estimates be
advanced as I
ish that much
tion has been
ted
addition to these
hemes orders have
received for the ~~Hebbal~~
tank scheme to
examined and I
it desirable that
a scheme for the supply
of the town [illegible] a
chosen [illegible] basin
sh^d be if [illegible] the
preferred [illegible] that
[illegible] the cost [illegible]

favourable one was
found by Mr Lawrence
and myself about 3/4
of a mile above the
Hengadi Road and
this sh^d in my opinion
be estimated for; this
is advisable as in the
event of the Municipality
declining to undertake a
large scheme for the supply
of the Cantonment & the troops it will be
necessary for [illegible]
to undertake
separate schem
supply of the tr

3 From the &
investigations m
the following infor
regarding the sc
that given in the
was only approxima

(1) Hengadi Road
Catchment area
8½ sq miles th
of it practically bare
Distance from Bangalore
5 miles
Lift to [illegible] [illegible] [illegible]
bric [illegible] thus 2 height
raised to fill
3

With regard to the 25/8
allowance for evaporation
soakage and leakage
it is difficult to lay
down data but as the
leakage & soakage
from any Reservoir
near Bangalore must
be very great especially
when water is stored
at a great depth which
for economy as regards
evaporation is necessary
I consider it is absolutely
necessary to allow a
very liberal allowance
and therefore for deciding
in allowing + 28 inches in depth
~~[illegible]~~ for every
or 7 ft per annum +
throughout the year

6

6 In the other data with
[illegible] surveys of the
4 sites there will be
no difficulty in determining
the heights of the Dams
required at each site
and the cost of the works
[illegible] the [illegible]
[illegible] to be
Hebbal &
Nag
as

that in every known
something of the nature
of the sub soil

7 In some of the Springs
Wells a natural
filtration have been
advocated). I do not
think it likely that
the Sanitary authorities
would be satisfied
with this arrangement
nor do I consider that
we can look to obtain
the large ~~quantity~~ of
water supply required
from wells at a reasonable
cost it is
decided therefore that
settling tanks & filters
or should be estimated
for

8 Mr Lumsden considers
that the [illegible]
Hill has great advantages
for the 3 [illegible] schemes
as the site for the
Filters &c and therefore
it is decided that the
3 schemes sh'd be
worked out
all [illegible]
in this
I thi[illegible]

as soon as which project
is decided on whether
a site on a near the
high ground sh'd not
be tried for the Magazine
Road project or one in
the the Sappers Quarry
for the [illegible] Tank
scheme

For the Military supply
project the best site
probably will be found
at the West end of the
Parade ground

9 With regard to
distribution, the cost
must depend greatly
on the system adopted
In Madras under the
municipal act the distribution [illegible] is a
straight line [illegible] [illegible]
[illegible] in the suburbs
parts of the town to a
hydrant is about [illegible]
as 450 ft
It is proposed to adopt
a distance of 600 ft
One pillar hydrant
then [illegible] [illegible] any
[illegible] the supply of
[illegible] houses - the [illegible]
[illegible] because being
[illegible] to their [illegible]

would considerably increase the cost of the work. Special arrangements for this might be made hereafter.

With regard to the distribution of the various projects for the supply of the Military where the water will be delivered to the several cisterns at the Barracks and distributed as now.

10. When at Bangalore a scheme proposed by Col Vibart was brought to my notice. it is to bring water from the Hesserghatta Tank in the Arkavathy valley. I inspected the tank. it is a fine tank that could be enlarged at comparatively a small [illegible] cost and has a catchment basin of 236 sq miles (not less) ~~in~~. This basin is open to the objection that there is continuous cultivation and several villages in it. This distance from Bangalore is 11 miles and [illegible] [illegible] is about 356 [illegible]

I do not consider it advisable for this scheme to be further thought of. It cannot be advisable to go to this distance from Bangalore and to incur the cost of this great length to obtain what cannot be considered a pure supply.

14/12/80

2/8

+ a loss of

+ in depth over the water
surface in the reservoir

[illegible] 7A

(2) ~~Hebb~~ Hebal Tank
Catchment area 13.3 sq miles of which only 4½ is free
Distance from Bangalore 2½ miles
Total Lift 187 ft

(3) Nagawara Tank
Catchment area 17.3 sq miles of which 8½ is free
Total Lift 216 ft

(4) Site 3/4 miles above Magadi Road for Troops alone
Catchment area 5 sq miles the whole practically free
Distance from Bangalore 5½ miles
Total lift about 260 ft

4 It will I hear take the t Commission two mon more to prepare the approximate estimates for these large schemes
They ~~are~~ sh^{d} be prepared on the same data and will show the probable cost of each
With this information Govt will be able to compare the relative advantages & another sh^{d} be no difficulty in

coming to a final
decision as to which
is the best and which
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5 I have in consultation
with Mr Lawrence laid
down the following as
the data on which the
scheme shd be worked
out. This of course is
laid down in an arbitrary
way

For the supply of the
Municipality about
10.000 cft per day this
is a slight increase on
the amount now used
and may be taken as
4.000.000 cft per year

For the supply of the
tary & Cantonment
00 cft per day
say 40.000.000
cft per year

As in Col Hasted's note
7.000.000 to be taken
as the minimum supply
per sq. mile of free
catchment basin and in
order that the supply
shd be maintained in a
year like 1876 Storage
to be provided for at
[illegible] lly

Bangalore Water supply Note on —

H.W. on return
21·XI·88

P.W.D

Note by the Chief Engineer 1P

Bangalore Water Supply. ~~25~~ 25/12

25

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11 14

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Distance from Bangalore 5 1/2 miles.

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25/14

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14

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road

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It is proposed to adopt a distance of 600 feet in Bangalore Cantonment. Also not to make [illegible] provision for the suppl[illegible] the houses in the Hig[illegible] Ground because do[illegible]

Do

95

25/16

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So owing to the height would considerably increase the cost of the works. Special arrangements for this might be made hereafter.

With regard to the distribution of the minor project for the supply of the ilitary alone, the wat ill be delivered to the present cisterns at the Barracks and distributed as now.

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I do not consider it advisable for this scheme to be further thought of. It cannot be advisable to go to this distance from Bangalore and to incur the cost of this great lift, to obtain what cannot be considered a pure supply.

W R Col

20/12/88

No. 5181 C 4/20th Dec. 1888

Copy of the Chief Engr's Note on Bangalore water supply forwarded to Mr. Larminie for information ance

(Sd) H.R.M.
S.W.

Desptd
20/12/88

B & R
Military works

PUBLIC WORKS DEPARTMENT.

No. 25 W.

XY

YP

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the Jan 8. 1889

READ the following

25/18

ote by the Chief Engineer P.W.D. d/ 20th December 1888

His Excellency the Governo
in Council approves of the
proposal that the 3 scheme
namely.

1st Magudi Road site

2nd Nagawaram Tank site,

17

HLS 5/Jan

3rd Hebel Tank site for
the supply of the Bangalo
Cantonment and the Bar
should be approximate
worked out in detail
that their cost and
advantages may be com
and the best may be

~~20~~ 17

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WRh
20/12/88

To [illegible] H.

8.1.89

B 8/89

D 16/1/89

J. C. Lawrence Esq Executive Engineer
Supg Engr 1 Circle
Exe P. W. Accts
Mily Dept.

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~~25~~
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196

Govt. of (1889) Madras.

PUBLIC WORKS.

Dated Urgent 8/1/89

Recd. Encl.

G.O., 8 Jany 1889 No. 25 W

Bangalore water supply Project

Orders on note by the Ag. Chief Engr., P.W. dept. m —

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Id 8/1/89 5/16