

(1) Number of pages 146

(2) Date of repair _____

(3) Initials of the Referencer _____

MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No.	2835	Press
		Mis.
Dated	24. 10	1876.

*Original*Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
24th October 1876. No. 2,835.*

No. 357. Read the following letter from the President of the Municipal Commission, Tanjore, through the Financial Department, dated 12th October 1876, No. 195:—

No. 358. ORDER THEREON, 24th October 1876, No. 2,835.

ESTABLISHMENT, No. 26.

THE services of Captain Brockman cannot be placed at the disposal of the Tanjore Municipality until after Lieutenant-Colonel Oakes shall have returned from leave in January. He will then be permitted to employ himself on the work in question until its investigation shall have been completed to his satisfaction; after which he will be allowed to avail himself of furlough, with the usual preparatory leave in anticipation of the same.

2. The investigation of Irrigation Projects in the Madura District for which Lieutenant-Colonel Oakes was detailed in G.O., No. 2,637, of 30th September, will under these circumstances, devolve on Mr. G. T. Walch, on his return from furlough in February.

(True Extract.)

Major-General, R.E.,
Secretary to Government.

To the District Engineer, Tanjore.
Madura.
" Examiner of Public Works Accounts.
" Financial Department.
" Chief Engineer for Irrigation.
To Mr. G. T. Walch, with papers.

Exd. E. C. Shunker.
Spare Copies

that it is not a matter of
fact, but a matter of opinion.
The President is a good

and Municipal Commissioner
for the Town of San Jose
Gentlemen.

I humbly beg to state
that I am a foreigner, and am
by profession a mechanical Engineer,
I learned my trade in England (a
foreign country to me) not theoretically
but practically, because I was against
paper and pen, but I beg to state
that I can answer any question regard-

ing machinery, and so on, but owing
to my being a foreigner I am unable
to express my ideas in English, but
if any one who understands my
language were to examine me, he
will be satisfied as to my abilities.
I'll then show I have
hitherto

hitherto worked for, have been perfectly satisfied with me and I therefore wish to have a trial in London to prove my capacity for example:-

One man learns his sword exercise by book (theoretically) and another practically which of these two if in action, will come off victorious? but a man, who has learned both theoretically and practically must have a far better knowledge than the two preceding.

I therefore beg that competent judges will take my ideas from the beginning to the end and pass their opinions without partiality and judge accordingly.

If any thing is deficient it is not owing to my lack of knowledge but to my not being able to express my ideas better in a foreign tongue.

Regarding the water supply project, I can say it is impossibility when

when we have steam power as our agent.

Supposing a 25 horse power Engine has to lift a column of water in an iron pipe 1 foot in diameter and 100 ft long the contents would be 75 c ft and 10 foot of distilled water weighing 62½ lbs there-fore in 1 ton or 2240 lbs there will be 33 $\frac{5}{7}$ c ft and therefore my column of distilled water of 75 c ft will weigh a little over 2 tons and having 25 horse power therefore each horse power has to lift only 179 $\frac{1}{5}$ lbs which is very easy.

The portable engine will do all the necessary work if the channel and Reservoir were done away with.

I hope therefore that the Gentlemen here assembled will allow me a fair trial and pass a just opinion on my idea of the

the above mentioned water supply
project, and if I have to do the
work I shall show my superiors
my capabilities, and also gain
their applause

I beg to remain

(Signed) L. A. Gardy

Laurel (True Copy)

3^d March 1876

Capacity to be tested and
time has been allowed for the
test - the result of the test will
be done a 40 to double action
Engine is required.

(Signed) R. F. W.
(True Copy)

Comp^d
Am^d
R. F. W.
President

the above mentioned water supply
project, and if I have to do the
work I shall show my superiors
my capabilities, and also gain
their applause

Summary of water-project

I propose to get what water I can by a channel to catch the rain fall and bring it into the Shivanga tank.

The connection between that tank and the Shivanga tank I would cut off so that this dirty rain water might not go into the Shivanga tank but into the trench.

The Shivanga tank will be kept clean for holding filtered water only.

The water in the trenches of the larger and smaller ports will be regulated by valves so that they may both be full.

What more water is wanted I will get by a channel of about a mile long from the Vadavar and pump it up so as completely to fill the trenches.

1976.

In a letter

from the Assistant

Municipal Commissioner

to the Chief Secretary

to Government

Mysore

Dated 12th October 1976

1975.

Encl.

The meeting to give him a fair trial is coming out the poor lot of funds with for the work of Bangalore

trenches.

The water from the trenches will pass through a filter into a well from which the Sarni Engine will pump it up into the Shivaganga Tank to a height from which it will run by gravitation into the town.

Water wasted in the town will again run into the trench and eventually come through the filter again so that we shall never be in want of water.

The details of this summary are explained in the eight enclosed memoranda attached to the plan.

The drinking water will be distributed in the town by 70 stop cocks in different parts of the town where required.

The drainage will be regulated by valves in each main road.

Signed

13
Sujno (Signed) L. A. Gardy
28 February 1876

Comd
Km V

/True Copy/
Mr. Murali
President

and in the year 1855.
 Regarding the water supply
 proposed for the town of Sanja
 the undermentioned are the
 articles required for the same, and
 their respective costs, also for the labor

1. Stationary Engine	Rs 15,000
2. Portable (centrifugal)	10,000
Cast iron pipes of different dimensions	5,000
Engine materials	2,000
Fitting materials	1,000
Estimate for coolies for cleaning ditch	1,000
Channel for conveying water from Vadavara to the tank corner of the fort	5,000
Fort from 2 to	

Contingent Expenses Rs 7,000
 Total Rs 10,000
 The Sanja tank is situated
 west of the small fort is too high
 a

a level for to be used, for the same water project, but in the mean time it may be let alone so that in raining weather when it becomes full, it will run of itself into the trench.

3. I will get my water from the Vadavur, which will run in a channel constructed from the Vadavur to a newly constructed tank which will be situated at the North west corner of the Fort on the Southern side of the tank will be erected an engine shed for a stationary engine to pump water from the new tank into the Small Fort Levinger tank being the highest part of the town, which when full will supply the town with the necessary water.

The thick black line with a dotted side line indicates the pipe which will convey filtered water

water from the New Tank above mentioned to the Small Fort Levinger Tank. 17

5. The red line running along the Western trench indicates the highest level of the trench, which runs round the Small Fort as far as the gate of the Great Pagoda, where will be a screw valve for letting water when required into the line marked yellow, which runs as far as the Foot of the Basal or Pilgrimage Gate, where is also a screw valve, which when required lets water into the line marked blue which is the lowest level of the trench.

6. Each part or division of the trench, which is cut across by roads can retain its own water if required.

(Signed) L. A. Gardy

Bangalore 18 February 1876 } True copy

Compd
Amv

M. M. M. M.
President

a level for to be used, for the same water project, but in the mean time it may be let alone so that in raining weather when it becomes full, it will run of itself into the trench.

3. I will get my water from the Vadavur, which will run in a channel constructed from the Vadavur to a newly constructed tank which will be situated at the North west corner of the Fort on the Southern side of the tank will be erected an engine shed for a stationary engine to pump water from the new tank into the Small Fort Sinking tank being the highest part of the town, which when full will supply the town with the necessary water.

4. The thick black line with a dotted side line indicates the pipe which will convey filtered water

water from the New Tank above mentioned to the Small Fort Sinking Tank. 17

5. The red line running along the Western trench indicates the highest level of the trench, which runs round the Small Fort as far as the gate of the Great Pagoda, where will be a screw valve for letting water when required into the line marked yellow, which runs as far as the Foot of the Canal or Library Gate, where is also a screw valve, which when required lets water into the line marked blue which is the lowest level of the trench.

6. Each part or division of the trench, which is cut across by roads can retain its own water if required.

(Signed) L. A. Hardy

Ranjore
18 February 1876

{ True copy }

Compt
Ranjore

M. M. M.

President

The population of the Town of
 Panjau according to last Census is 17

I. Pu (Port) 18,675
 II. Pu (Kannhattangudij) 16,433
 III. Pu (Kuanambocchavady) 16,453

Total 51,561

allowing at the rate of 4 gallons per
 head per diem, the daily consump-
 tion would be $51,561 \times 4 = 206,244$ Gallons
 and for 1 year $206,244 \times 365$
 = 75,279,060 gallons.

Expenditure for cleaning the
 town at the rate of 10,000 gallons per
 diem for 1 year 36,500,000 gallons

The quantity of water the trench
 of both Ports will contain, being
 20,000 ft long, 40 ft broad,
 and 13 ft deep = 2,520,000 cubic
 feet and each cubic foot
 containing 4 gallons will amount
 to 10,080,000 gallons.

The

The quantity of water in the
 Small Fort tank being 9375,000 c ft
 at 4 gallons per c ft = 2700,000 gallons
 and taking the total of both trench
 and Small Fort tank = 103,500,000 gals.

The Evaporation for 1 year will be	10,000,000	Gallons
The leakage Do	3,000,000	
Drinking water Do	75,279,060	
Drainage water Do	3,650,000	
Total Expenditure in gallons	91,929,060	

The total quantity
 of water in both trench
 and Small Fort tank } 103,500,000 gals

educting Expenditure 91,929,060
 Total water remaining 11,580,940

At the time of the rainy season
 which lasts about 2 1/2 months
 and also during the summer months
 the supply in the trench will not
 be used because it shall get
 enough rain water and river water
 down my channel, and during
 the rainy weather I shall refill
 what

what water may be left in the
 trench so that I shall always have
 an over surplus water on hand
 and also during the rainy weather
 water for drainage purposes will not
 be required, as the rain water will
 of itself be sufficient to clear
 the drains.

Some parts of the trench are over
 40 ft. broad and some parts are
 over 18 ft. deep and will therefore
 contain a great deal more water
 than what I have mentioned
 which will cover all the amount
 allowed for evaporation.

Leakage by percolation will go
 on for a year or so till the ground
 is wet and soaked and then, less
 percolation and leakage will take
 place and during rainy weather,
 the rain falling over such a large
 space will give me enough water
 to cover the evaporation and will
 allow me to have always 10 to 12 ft
 deep water in the trench.

This

This is without taking credit
for the water which will be used
over again after passing through
the town into the fort ditch
and out of the ditch through
the filter into my reservoir B
and being again pumped up

into the town into the Small
Fort Tank.

Louise D. (Signed) L. A. Hardy
21st Feb 1896

True Copy

St. Maria
Comptroller
Kinn
President

...

The Shappa Tank bed
being only 104 ft level, and two steps
from the top of the top of the Small
Fort tank being 124 ft, therefore the
Shappa tank can only fill
the Small Fort Tank up to 104 ft
being its own level which leaves
yet 20 ft in the Small Fort Tank
to be filled.

If this tank was only filled
to 104 ft then the water running
into the town the highest level
of which is 114 and nearly half
of which is over 100 can not leave
any force, whereas if filled to
124 being 20 ft higher, it will
naturally have a stronger force.

As it is, the Shappa Tank
tank running with great force
brings with it mud, sand, stones &c
which deposit of sand to may
be stopped by the present small
masonry tunnel being widened
to

to 20 ft, with a small breakwater
at its commencement and allowed
to run clear.

This Shappan tank tank
water must not be allowed to
run into the Small Fort tank
for a particular reason; viz
Supposing the Shappan tank
tank water were enough to fill
up the whole of the
trench (and water
having a tendency
to find its own level) this
water will naturally run down
to the northern part of the town,
from whence it must again be
pumped up to the highest part
to fill the Small Fort tank,
which is the only way it may
be brought into the town.

If more channels were
cut from outside to collect
rain water for the Shappan tank
tank

tank the rush of water being
like a torrent will bring a great
quantity of sand mud, &c

I think it would be better
to let the tank as it is to throw
its natural water into the trench,
which water will naturally come
of itself to my reservoir in the
north west corner of the Big Fort,
from whence it will be filtered
and pumped by steam power, clean
up to the Small Fort tank which
will save me a great deal of
labor and expense.

In connection with my Vada-
-var Supply I will explain it
in opposition to the Shappan tank
tank.

Panjore
21st Feb
1876

(Signed) L. A. Gardy

/True Copy/

Compd of

Mr. Thomas

President

the

never mind the distance, it will not
be a the Vadavar supply in
undisturbed at intervals of some years.

The Vadavar coming into Bangalore
from a great distance,
all its deposit of sand
being deposited in
its bed long before
it reaches Bangalore.

Therefore the water which
it will get from its
will not have to be
filtered to such a degree as it is
at least clear of all its impurities
which will save me a great
deal of labor and expense regard-
ing the cleaning and filtering
part.

The Vadavar has water
running nearly throughout
the year and has at present (21st
Feb 1876) 1 ft 6 inches square of
water running, vainly, which
cannot be used for irrigation.

I therefore think that
this

this water, instead of being used by private parties, would be of more use to sustain the population of Pauze.

The Shappaw Nalk tank has water only during heavy rains which I think will not be sufficient for the purpose required, whereas the Vadavar can be used throughout the year without any impediment to irrigation.

Pauze (Signed) L. A. Gardy
21st Feb 1876
(True Copy)

Comptroller
M. Mima.

President
M. Mima.

13 27430 Black Sheet
Regarding the Steam Engine 31

The Stationary Engine will be situated at the southern side of my reservoir which will be 73 feet level and the small Fort trench is 94 feet level distance between 1000 yards which shows a gradual incline of 2.1 feet in 1000 yards I will therefore raise my Engine 10 or 15 feet which will make it 88 feet level and I will have to pump my water only 6 feet in 1000 yards for the trench and the small Fort tank being 124 feet level when full and the distance 1500 yards I will have 36 feet high to pump filtered water.

Supposing the Engine to be 25 horse power with a pipe 1 foot in diameter it would pump from 15 to 20,000 gallons per hour, and for a day of 12 hours it would pump $20,000 \times 12 = 240,000$ gallons.

The supply of water pump per

her hour depends upon the power of the
Engine, machinery and pipes.

At Alexandria the Engine
of 80 horse power is situated 4 miles
from the town and pumps the water
a height of 800 feet in the reservoir
for the supply of the population and
drainage which water comes from
the Nile a distance of 6 miles through
a small channel 2 feet broad.

Which proves that there
is no difficulty whatever to
bring the water into the reservoirs
and from thence into the town by
steam power.

(Signed) Lt. Genl. Girdle

Lanjare D
28 February
1876

Comd
H.M.S.

(True Copy)

H. M. M. M.

President

33434 Bland Street
Regarding the trenches 35

Each trench was made according
to the level of the ground surrounding
it and not on an uniform level
and accordingly the south part
being the highest level the water
will naturally run down to the North
being the lowest level and if the
upper trench is filled the water will
be too high for the lower trench and
will overflow the surrounding country.

I will therefore have to use
valves in all the roads crossing
the trench to regulate the water in
each division of the trench so as
not to overflow, and if I see that
the present crossings are insuffi-
cient for the purpose I will have
to construct more crossings with
tunnels underneath.

The eastern and southern
trenches of the big Fort and also
the trenches of the small Fort require
little

little or no repairs and also require to be cleaned.

The Western trench of the big tank requires a little repairing but it will as it is hold enough water for the year supply.

The Northern trench requires to be deepened and cleaned a little.

The outside parapet or glorio of the trenches being 20 or 25 feet high from the bottom and being above my specified depth viz 18 feet it will therefore require little or no repairs as it will hold more water than required for the yearly supply.

I will have to construct 10 valves for regulating the supply of water for each division of the trench which valve must be on the side of each road crossing the trench.

I directed myself

according to the old levels, and taking fresh levels myself 37 find that my plan for supplying water from the trench is the only way it could be done to keep water in the trenches without overflowing.

I therefore leave it to Competent men to judge.

(Signed) L. A. Hardy

Tanjore
28 February
1876

1 Enclosure

Comd
K. M. S.

A. M. M.
President

Regarding the Channel Reservoir
and Filter 39

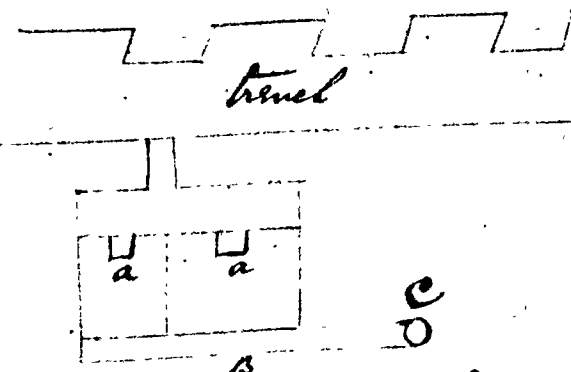
The Channel from the reservoir
to the Vadavoor will be about a
mile or more and a half long
and 3 feet broad and must be
cut on a level with the bed of
the river all the way and slightly
sloped on both sides and have a
fall towards the reservoir and
my reservoir will be 10 feet
below the Channel.

My reservoir will be 100 feet
square and 10 feet deep which
will be quite sufficient for the
water to be pumped into the trench
as my reservoir will be filled as
fast as I pump the water out.

I will have a self acting
gate at the end of the Channel near
the Vadavoor in case the river runs
low. The filter will be situated
at

at the Northern side of the reservoir
 and will be below the level of the
 trench so that the water from the
 trench will of itself pass through
 my filter and from thence through
 a channel into a well near the
 engine to be pumped for drinking
 purposes into the town. I will
 have two valves between the
 trench and my filter to allow water
 in the filter only when required.
 The trenches of both Fort
 and the small Fort tanks will
 contain 103,500,000 gallons of water
 and therefore without calculating
 the water which will come from
 the Chapin tank tank it
 will take me from 40 to 50 days
 to fill the whole or half that
 time if the engine is worked
 day and night and including
 the water from Chapin tank
 tank the trench can probably
 be filled in a number of that
 time.

The filter will be 100 yards long
 100 yards
 broad and 3
 feet high. This



filter reservoir
 will be divided
 into 2 parts,
 each part having a valve leading
 into the trench marked a. a. B.
 is a channel which brings the
 filtered water to a well c. from
 whence the engine will pump
 it into the small Fort tank.

The filter reservoir must
 be divided into two, so I will
 only use half of the above re-
 servoir for 15 days while the
 other half is cleaned and vice
 versa.

(Signed) L. A. Hardy

Tanjore
 28 February
 1876

(True copy)

Comd
 Rm.

Mr. M. M. M.
 President

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

The first of these is the
 fact that the number of
 cases of the disease has
 increased in the last few
 years. This is due to the
 fact that the disease is
 more common in the
 tropics than in the
 temperate zone.

[Faint, illegible handwriting]

[Faint handwritten notes at the bottom of the page, possibly "The end of the world"]

The channel from the Vardaneh
to the reservoir does not pass through
mucky lands but through dry and
undrained land as far as I can see
and its greatest depth (in
high ground) will be about 20
feet and the average 12 feet. Indicated
L.H.

The depth of the reservoir will be 10 feet below the channel and will be altogether 20 feet deep. It can be watered

The streets can be watered
by a hose which can be carried
on the mouth of the water cocks
situated on the sides of the roads,
and marked in the plan by red
squares, and the people can get
their drinking water from the
same water cocks.

The tanks in the town can be filled up with filtered water from the filtered water pipes, and the height of water in them regulated by

by flooding with water from which
Plan is enclosed Initiated L. A. G.

The Portable Engine will
be used to clean out my tank
or trench that requires to be re-
paired or cleaned without inter-
fering with the other trenches

or even the water supply and also
in case of the stationary engine
getting out of order we can
use the portable engine

If I were to do away
with both channel and reser-
voir I will have to place
my portable engine, raised
at the river side and pump the
water through the pipes laid on
the ground to the nearest trench
and from thence the stationary
engine will pump it up to the
highest part of the town (southern)
and from thence through all the

15
trenches it will then pass through
my filter and again be pumped
for drinking purposes, in the
chevazungu tank.

If the channel and the
reservoir were not constructed
it would save Rs 5000.

The Portable Engine will
only be kept at the Vadovor bank
till the trenches are complete &
filled and also whenever there
is water in the river so that my
supply of water in the trench
will not be wasted but the
pipes from the Vadovor to the trench
will have to be laid down for good

(Signed) L. A. Gady.

Tanjore 3
1st March 1876 3 (Tuesday)

Compa
K. M.

K. M. M. M.

President

P.W.D.
22 OCT 76
No. 7008

1876.
In a letter
from
Mr. A. D. Gandy
to the Assistant and
Municipal Commissioner
for the Town of Bangalore
dated 31st March 1876.
Recd
Summary of Works
proposed.
L 72 L 2309
76

12753
Superintending Engineer's Office,
Bangalore, 26 May 1876

From
The Superintending Engineer,
Bangalore.

To
The Vice President
Municipal Commission
Bangalore.

In returning the papers
which accompanied your letter of
3rd March, I have the honor to inform
you that I have looked over Mr. Gairdner's
report for the supply of Bangalore from
the Padavara.

There is no doubt that Bangalore
can be supplied by pumping water
from the Padavara during the best
months during which it is in flood,
and by storing the water required
to tide over the dry months, in the

P.W.D.
 22 OCT 76
 7008
 No. _____

12753
 Superintending Engineer's Office
 Tanjore, 26 May 1876

From
 The Superintending Engineer
 Tanjore

To
 The Vice President
 Municipal Commission
 Tanjore

In returning the papers
 which accompanied your letter of
 3rd March, I have the honor to inform
 you that I have looked over Mr. Gardin
 sketch for the supply of Tanjore from
 the Vadavai.

There is no doubt that Tanjore
 can be supplied by pumping water
 from the Vadavai during the brief
 months during which it is in flood,
 and by storing the water required
 to tide over the dry months, in the

1876.
 In a case
 from
 in & of Gardin
 to the Municipal Comm
 of the Town of
 Tanjore
 Secretary
 Municipal Comm
 Tanjore

L 211 L 2309
 76

at
 wa
 the
 and
 Ever
 high
 and

Shivagunga and Shapanaiken tanks
and in the Fort Ditch the combined
capacity of which are sufficient
for the purpose.

3. A few brief remarks in
the margin of Mr Gardie's report indi-
cate in which respects his data
are inaccurate and hence show
that his estimate is far too low.

His scheme is briefly to
obtain water from the Vadavur and
convey it by gravity to a reservoir
at the N.W. angle of the Fort from
thence to pass the water thro' a
filter and then to pump it up to
the Shivagunga tank from which
the Ditches can be filled, the Town
Wells supplied and the town
drains flushed and he proposes
after the drains have been flushed

to pass the water again thro' the
filter and so to utilize it again.
The cutting from the
Vadavur would be about $\frac{3}{4}$ in length
and it would be from 12 to 30
feet deep and the reservoir
way 20' in feet deep and 100' wide
and 8' deep. The reservoir would be 100' x 100' x 8'
and the cutting 10' deep. The
excavation of the reservoir 100' x 100' x 8'
line would cost upwards of 7500.
while with inclinations to the bottom
it will a further sum of Rs 2500
would be required and thirdly
independently of the filter and the
cutting of the channel and yet for
all this Mr Gardie puts down the
modest sum of Rs 5000, it would
not cost less than Rs 20,000 in all,
and unless the ditch or trench were

lined with Masonry, or in fact covered in, it would constantly become obstructed and means would have to be provided to pass the drainage from the west over this hence it would be better at once to put in a pipe from the Padarnas to the Sevagunga tank and to place the stationary engine on the Padarnas bank and there to raise an iron 6x6x5 tank to a level sufficiently high to admit of the Sevagunga tank being supplied by gravitation as in fact proposed in my No 247 of 8th February where instead of a tank I dignify the erection by calling it a tower. The scheme of supplying Tanjore with water from the Padarnas is described in Enclosure A and is estimated in enclosure C No 2

to cost Rs 15,000; my scheme however is less ambitious than that of Mr Gardie he proposes to supply (perhaps Page 2 I should say provide for the Rs 50,000, for pipes would not diminish the supply) the Inhabitants not only of the Fork but also of the suburbs of Waratattangudi & 1865
x 16,433
= 16,433
51,561 and Manamboo Chirady with water at the rate of 4 litres which is 10 gallons of a cubic foot or 6 1/2 gallons daily. This would not be sufficient independently of flushing the drains; my scheme provides at the rate of 15 gallons daily for the Inhabitants of the Fork only and for flushing drains this being the consumption for the same purposes in Madras. But the quantity of water stored would be sufficient for the supply of the people from the

lined in suburbs who now come for their water
covered to the Fish; probably not 20 feet and
come of the population of the suburbs
have to 90 per cent of the population of
drainage Karuntattangudi draw their water
hence it from the Government and Parliament
to put and would continue to do so unless
to the taps were provided at their own cost
the slat and numerous wells and the
built a tank supply the eastern suburbs
tank to 7.5. The Gardiner scheme in
to admit another aspect, differs from mine
being in as much as he proposes to ad-
mid-fach - large the water which has passed
8th Feb through the sewers and to pass it
I design through the Filter in order that I regard
a Town as much objectionable for the water
coming in the Ditch purified with may be
Tangore Fish so every morsel of filth cannot
as deer be consumed or absorbed immediate-
-mated

by it passes into the Ditch and some
55
time at least should be allowed
for purification or the water should
pass through 2 or more reservoirs before
passing into the Filter.

S. In my scheme I do not propose
to make use of any water which
has passed through the sewers or drains
a second time but the water may be
retained in the Ditch and if it can
be sufficiently purified by Fish to
be suitable the people will use the
water.

In enclosure A I describe
a scheme for providing the Town
of Tangore with water independently
of the Parliament by supplementing
the supply from the Chappanaskan tank
now received from drainage by draw-
ing a supply from the Pullarputty
channel. In writing generally on

this subject in my 1227 of 18th Febru-
-ary 1876. I say "If water can
be obtained from the South and
South West it will run into the
Fork by gravity and no pumping
is saving will be necessary" It
is true that water will run by
gravity from the Chappannankam
tank to the Sivaganga tank and
thence to the Loral tank does so now;
but as the supply of water will
not be continuous it is necessary
to store water during the monsoon
to tide over the dry months and
as storage capacity cannot be af-
forded above the level at which
the Loral can be commenced, it is
necessary to take advantage of the
ditches of the tank to store water and
as the level of their bottoms is below
the level which is necessary to

maintain water in the Sivaganga
tank, pumping has in this case
also to be resorted to for the purpose
of raising the water to the requisite
level.

The cost of this scheme is
estimated at Rs 9,500 but
C. 121

before it is determined to
adopt it the contour lines for the
channel from the Pulliarputty
draining any of the ditches or tanks
which it might be desirable to drain
and clean from time to time. The
cost of the fixed Engines has been
entered approximately as specific in-
formation relative to the engines
has not been procured, though in-
formation on the subject has been
sought from the Superintendent of
Public Works stores at Madras.
In enclosure C the cost
14.

N^o 1. scheme R² 1,91,100
N^o 2. scheme R² 2,56,200

57
 should be employed to work upon the
 detailed estimate for pipes and
 fittings, valves, &c., after which
 the estimate would be determined where the
 quantity of material to be procured
 is known. The specification for the
 contractor should also be prepared
 in accordance with the estimate and
 the work of laying pipes &c. for
 the water supply would be carried out
 in accordance with the specification
 of the 3rd estimate. The specification
 for the water supply works
 might be consulted in preparing
 the specification for either of the
 schemes to be carried out. In
 the case of the 3rd estimate
 of sewage it is unnecessary
 to say anything here as my suggestions

on the subject will be found in
Report A.

17. I may perhaps mention
that Mr Gardier's latest idea rela-
tive to the supply of Tanjore was
to raise water from the Padavane
a wheel worked by the running
water in the stream. The objections
to the scheme are 1st That the
wheel could not be placed in posi-
tion without contracting the water
way to the stream which is already
far too limited. 2nd That with water
varying in depth from 4 to 18 or 20 ft
in the Padavane the wheel could not
be worked in high floods and 3rd
That no wheel so worked would
have the power to do the duty re-
quired to supply Tanjore with water.

18. I regret to report that

61
Messrs Phillips was employed
for me for nearly a month in
surveying lands his work was found
to be utterly useless as it was in-
correct and Mr Paul eventually
took the land required and in-
curred an expenditure of Rs 8-10-11
as shown in the enclosed bill in
no doing and I remark that the
amount may be repaid to me.
The following plans are
17.

forwarded herewith.
Survey and levels of country
between Tanjore and Villam.
Sections of Nappanankan and
Sivaganga tanks.
Sketch of country east of Tanjore
by Engineer Chockalingam showing
drain proposed by him.
Correspondence with Mr Modley

which accompanied 12106 of 6th May 1875
 Mr Gardier Report which ac-
 -companied 12243 of 3rd March 1876
 with 2 views.

I authentic tracing of the
 to illustrate Report.

Report on supply of water
 a MemoB on obtaining supply from
 a Pulliarputty channel.

Approximate Estimates and
 appendices Mr Phillips field book
 Bill for 1875-1876

I have &c
 (Signed) R. F. Baker Esq. Col. R.E.
 Supd Engineer, Tanjore
 (True Copy)

Comptd
 H. M. M. M.
 Mr. M. M. M.
 President

...

Report on the supply and storage of
 water for the Bangalore Fort -
 1. The method of supplying Bangalore has

been suggested -
 1st By arresting the drainage from the high
 ground to the west of Bangalore and from the
 Ridge which extends to and beyond Valluab
 2nd By obtaining a supply from the
 Madras -

2 By the first method Shreeganaga tank
 is now supplied thro' the Shepnaiken
 tank and from the former the minor tanks
 in the Fort draw their supply from the
 following figures it would appear either that
 a considerable quantity of water is now
 wasted thro' the minor tanks and the Town
 when the water in the Shreeganaga tank
 stands above the level of the conduit
 which supplies the Town or that the
 yield

1876.
 in a letter
 from

The President
 Municipal Commission

to the Chief Secretary to
 Government

Dated 12th October 1876.
 Recd.

1876
 12th Oct

Suggesting that
 = terminate schemes
 for the water supply of
 Bangalore.

65
A
Report on the supply and storage of
water for the Bangalore Fort -
1. One method of supplying Bangalore has

been suggested -
1st By arresting the drainage from the high
ground to the west of Bangalore and from the
Widger which extends to near beyond Yellamur

2nd By obtaining a supply from the
Chudamur -

2 By the first method Shreeganga tank
is now supplied thro' the Shepavaike
tank and from the former the minor tanks
in the Fort draw their supply from the
following figures it would appear rather that
a considerable quantity of water is now
wasted thro' the minor tanks and the Town
when the water in the Shreeganga tank
stands above the level of the Conduits
which supplies the Town or that the
yield

1876.
in a letter

from

The President

Municipal Commission

to the

Chief Secretary to

Government

Bangalore

Dated 19th October 1876.

Yr^l 1975

Encl¹ 7

Suggesting that

the drainage scheme

for the water supply

Bangalore.

Report on the supply and storage of water for the Bangalore Fort -

1. Two methods of supplying Bangalore have been suggested -

1st by arresting the drainage from the high ground to the west of Bangalore and from the ridge which extends to the Bangalore hills -

2nd by obtaining a supply from the

2. By the first method Shreeganaga tank is now supplied thro' the Shepavaike tank and from the former the minor tanks in the Fort draw their supply from the following figures it would appear either a considerable quantity of water is now wasted thro' the minor tanks and the tank when the water in the Shreeganaga tank stands above the level of the country which supplies the town or that the yield

1876.
in a letter
from
The President
Municipal Commission
to the Chief Secretary to
Government
Bangalore
Dated 19th October 1876.
No 195
Encd.
Suggesting that a
terminative scheme
for the water supply of
Bangalore.

Yield of the Rain-fall is not so great as the following estimate shows; tho' for so small an area as that drained into the Sheppaichin Creek viz. 1 square mile, the estimate is very low —

3 The average of the Rain-fall at Lujose & Vullum for the 6 years from 1869 to 1874 is as per margin. To facilitate calculations take 1 square mile as 3,000,000 square yards 1 of drainage will then yield 83,333 cubic yards or 14,000,000 gallons nearly; rejecting all yield prior to August and taking only $\frac{1}{2}$ the Rain-fall subsequently or 14.35 out of 28.71 we have a supply of 200 million gallons, while the supply required by the population of the Port at 15 gallons per man is 103 $\frac{1}{4}$ million gallons (per annum) or the yield of $\frac{1}{2}$ the Rain-fall on a square mile is more than double the supply the population of Lujose

	Inches
January	0.17
February	1.28
March	0.35
April	1.31
May	2.18
June	1.15
July	1.63
August	4.64
September	6.01
October	7.00
November	7.16
December	3.41
January to July	28.00
August to Dec	28.71
Total	56.71

Pop	gals	Value
18956	15	365
103784	100	

5 Lujose requires — During the months from August to December the loss by evaporation would be small but from January to July it would be very considerable as shown in the following table —

	Level at which water is estimated	Content	Evaporation	Left
			In millions of Gallons	
Sheppaichin Tank	110 $\frac{1}{2}$	60	38 $\frac{1}{2}$	21 $\frac{1}{2}$
Shuangunga	115	38 $\frac{1}{2}$	7	31 $\frac{1}{2}$
Ditch along north face of small port to bridge in west ditch	110	11	2 $\frac{1}{2}$	8 $\frac{1}{2}$
From 62 to entrance opposite to bridge entrance	110	36 $\frac{1}{2}$	11 $\frac{1}{2}$	25
From 62 to entrance to small port	103	16	6	10
From 62 to north gate entrance or north ditch of large port	98	15	3 $\frac{1}{2}$	11 $\frac{1}{2}$
		177	69	108

5 Taking Credit for $\frac{1}{3}$ of the Rain-fall from April to July we get 28 millions of gallons while of the 31 $\frac{1}{2}$ gallons left in the Shuangunga tank 17 millions of gallons, being below the level of 105, from which level the

the town mains must be supplied and the drains be flushed, must not be credited as available supply hence the actual available supply may be said to be $119\frac{1}{2}$ millions of gallons and as the supply required by the population and for flushing the drains in the Fort from January to July would be $59\frac{1}{2}$ millions of gallons the storage capacity of the Ditches and of the tanks noted above will be sufficient and no use need be made of the ditch of the large Fort for the storage of water.

6. From a report by the late Municipal Engineer Chakrabarti it would appear that the following are the tanks &c in the Fort from which the inhabitants now obtain their supply and these tanks appear to draw their supply from the Shwagunga tank.

$108\frac{1}{2}$
 $\frac{28}{756\frac{1}{2}}$
 $\frac{17}{119\frac{1}{2}}$

Syngatolum — 59,110 C. gals.
 Sandraicolum — 50,503
 Viripandithurolum — 45,36
 Kisthambalam — 2,160
 Meerajur — 19,94 $\frac{1}{2}$
 Meerimund — 5,926
 Pothimal — 7,11 $\frac{3}{4}$
 Chidambalam — 5,75 $\frac{3}{4}$
 125,547

or 21 millions of gallons —

This quantity of water will still have to be supplied from the Shwagunga tank and will be used for bathing purposes and much of it probably will be lost by evaporation during the dry months. We then have —

Para 3. For population and flushing drains — 103 $\frac{3}{4}$
 4 By evaporation — 69
 6 For bathing purposes — 21
 193 $\frac{3}{4}$

while the yield of $\frac{1}{2}$ the rain fall from August to December is shown in para 3 to be 200 millions of gallons and hence it would appear

appear

appear that the drainage of one square mile which the Shwaganga tank ~~receives~~ receives thro' the Sheppanaikun tank is sufficient for the supply of Tanjore throughout the year and hence it is clear that a large quantity of water is now wasted -

8. The supply and the quantity of water required are too close to admit of a full supply being ~~relied~~ relied upon in unfavorable years & a sufficient margin for wastage is not afforded & no provision is made for keeping the northern and eastern Ditches full of water throughout the year. As the President desires to do hence a further supply must be looked for elsewhere. This may be obtained by placing a Dam in the Pottarputty Channel about 4 miles from the Sheppanaikun tank above the point at which the dam would probably have to be placed the Pottarputty Channel

71
Channel receives the drainage of about 1 1/4 square miles a portion of which however is retained in the Pottarputty tank but the channel from the Dam in the Pottarputty tank would skirt the high ground on which the Corunges Main Asiam stand & would intercept the drainage of a tract 2 square miles of Country - a portion of this is rather a thirsty Country the soil being light and sandy & during heavy falls of rain it would not be possible to divert all the water thro' the supply Channel so if only 1/3 of the Rain fall is reckoned upon as the yield to the Sheppanaikun tank a further 300 millions of gallons may be obtained for the supply of Tanjore - a separate Memo on this Channel is enclosed -

appear that the drainage of one square mile which the Shungun tank ridge receives thro' the Sheppanaiken tank is sufficient for the supply of Saurajore throughout the year and hence it is clear that a large quantity of water is now wasted —

8. The supply and the quantity of water required are too close to admit of a full supply being ~~relied~~ relied upon in unfavorable years & a sufficient margin for wastage is not afforded & no provision is made for keeping the northern and eastern ditches full of water throughout the year. As the President desires to do hence a further supply must be looked for elsewhere. This may be obtained by placing a Dam in the Peltiarputty Channel about 4 miles from the Sheppanaiken tank above the point at which the dam would probably have to be placed the Peltiarputty Channel.

71
Channel receives the drainage of about 1 1/4 square miles a portion of which however is retained in the Peltiarputty tank but the channel from the Dam in the Peltiarputty tank would strike the high ground on which the Corungee Moulaspain stand & would intercept the drainage of about 2 square miles of Country. A portion of this is rather a thirsty Country the soil being light and sandy & during heavy falls of rain it would not be possible to divert all the water thro' the supply Channel so if only 1/4 of the Rain fall is reckoned upon as the yield to the Sheppanaiken tank a further 300 millions of gallons may be obtained for the supply of Saurajore — a separate Memo on this Channel is enclosed —

9. From the entries in the Column headed
 'Limit at which water is to be retained'
 in para 4 it will be observed that
 there is a difference of 17' between $\frac{115}{98}$
 the water level in the highest & lowest
 Reservoir when full hence it is necessary
 to lift the water by means of a steam power
 into the Shwagunga tank and in order
 to effect this it is proposed to provide
 a 20 H.P. Engine and place it at the western
 extremity of the South ditch of the large
 fort at Z where the water level is 98
 when the ditch is full and the bottom
 of the ditch is 83. If it is desired to
 filter the water before it is passed into
 the Shwagunga tank the water must
 be pumped from Z to the filters which
 may be placed at Y in the rampart
 between the Shwagunga and Shippamukha
 tanks.

10. The Reservoirs would be supplied
 in

73
 in the following order if all water which
 enters the Shwagunga tank is to be filtered
 1st Shippamukha tank thence north
 west and South ditch of small fort
 thence to each ditch & thence the
 South ditch of the large fort & from
 the last the water would have to be
 pumped to the filters & thence
 pass into the Shwagunga tank
 by gravity, it is possible that
 this arrangement may at times prevent
 the possibility of securing all the water
 brought down by the supplying Channel
 and for the purpose of securing all the
 water available it may be necessary
 to receive water directly from the Shippa-
 mukha tank to the Shwagunga tank as
 at present without the water being
 filtered.

11. The arrangement of letting the water
 fall to the lowest Reservoir and then to
 pump it up to the Shwagunga tank
 appears to be an awkward one and one in
 which

Which there is much wastage of power
but this could be helped under the
circumstances, in as much as the height
at which the water is primarily received
is below that at which it is necessary
to retain water in the Shuangzong tank
in order to make use of the capacity
of the tank, along the line from which
the drains must be flushed and as
the Reservoirs are on different levels
in order to hinder their full capacity
available, it is necessary that as the water
falls the last drop may be rendered
available. —

12. To form the Reservoirs situated
to Para 4 a bank would have to be
placed at or near X and sluices and
towers or other arrangements for working
the shutters would have to be provided
at each of the Cross Links, it may be
impossible to make use of some of the
existing

Existing sluices —

13. The Cross Links as now placed
do not afford the opportunity of making
the most of the Capacity of all the Ditches
but their storage Capacity would
appear to be sufficient, but if not
it can be very much increased by
raising the level of the Crossways
across the various Ditches, there are now
for the most part below the level of
the level of the Sluice & hence the
level to which water can be retained
in the various ponds or Reservoirs into
which the Ditch is divided. —
The second method of obtaining
a supply for the Park is to obtain it
from the Vadwan a branch of the
Cannal which runs about 1/2 a
mile north of the Park —

15 It may be said that from 6 to 7 months in the year water flows in the stream; the bed of the stream at the point from which water can be most conveniently drawn is 52 1/2 above datum; while, as shown Para 4 above, it is desirable to retain water in the Shungunga tank at 115 & the level of the filter thro' which the water is to pass would be at 120 so the water would have to be raised by 1/2 ft in the dry months; however when there is no water in the River the level of water in the tank would be below the level of the Vadavoor bed and the water might have to be lifted 40 feet the engine to be provided will be capable of raising the necessary supply 80 feet the quantity required

See sketch map 2

required daily is 2,45,000 gallons. This water supply can be obtained from the River for only 6 months in the year, it is necessary to provide for the quantity required daily while the River is running & thus the engine is to accomplish working 12 hours a day -

The Shungunga tank from which the water for the tank are to be supplied and the chains are to be flushed is 1 1/2 miles from the Vadavoor & hence it is proposed to fix the engine on the Vadavoor bank & to lift the water there into a Cistern supported on Cast Iron Cylinders or pipes & iron cylinders or pipes & together with the filter alone water to put it in the tank by gravitation

17. A Reservoir or tank must be formed adjacent to the Vadavannur Capital of containing 2 days supply below the level of the bed of the Vadavannur; to this tank water will be led by a Channel from a sluice in the Vadavannur bank with its floor $\frac{1}{2}$ ' below Channel bed



18. The Reservoirs or tanks to hold the supply for the dry months would be as follows and would hold more than a year's supply if necessary

	Estimated water in the tank	Length in millions of feet	Width in feet	Depth in feet
1. Shuangunga tank	115	38 1/2	7	3 1/2
2. Sheppanankan	110 1/2	60	38 1/2	2 1/2
3. Ditch along north face of small fort to Bridge in west ditch	110	11	2 1/2	8 1/2
4. From D.C. to Causeway opposite Pagoda entrance	115	44	1 1/2	32 1/2
5. From D.C. to entrance to small fort	103	16	6	10
6. In west ditch of large fort from * to west entrance	93	9	1 1/2	7 1/2
7. From D.C. to Anakkumari	50	20	8	12
* only a part of this supply could pass to engine tank thro' the south & west ditch of small fort side levels of bottom of ditch		198 1/2	75	123 1/2
		Bedrock		17
				106 1/2

19. The Shuangunga tank would be supplied directly from the Estuary at the Vadavannur thro' the filter & the other Reservoir may be filtered from the tank but hand pumps may be taken from the main pipe to fill 2 & 4: 3 & 5 would be filled from 4 & (6 & 7) from 3 & 4 when all were full 2 & 4 might be filled to 115 from the filter directly or from the Shuangunga tank -

20. The evaporation would not cause so great a loss as is estimated for after the water in 4 had been reduced to 110, as it fell below this from the supply would be drawn from the Sheppanankan tank as fast as possible or a vent might be provided from the tank D.C. 3 so as to empty the former as early as possible; both on account of the great loss by evaporation

evaporation in the tank, owing to its shallowness, and also in order that the tank may be available to receive any supply from local drainage it is estimated that the 200 million gallons which the Shippani Kan tank receives from drainage would not only cover all loss by evaporation but would also provide sufficiently for filling the South East & North ditches of the Main Fort if necessary this however will be admitted to later.

21. When the supply via the Vardanah Canal it would be necessary to allow water to return from the reservoir to the tank in which the engine worked thro' the western ditch of the Fort to the Amakhan tank whence a pipe would lead to the tank & the supply would then be pumped up

81

to the Shruvanga tank —

22. Owing to the length of pipes required for the extra lift by the engine the cost of this method of supply would be Rs 155,000 as shown in Enclosure C instead of Rs 95,000 the cost by the first scheme.

23. By both schemes it is proposed to raise the water in the Shruvanga tank to 115 & thence the lower mains shown along the 4 main streets would be supplied & from thence the drains would be flushed. At the head drains would be flushed. At the head at which it is proposed to retain water in the various ditches the water will stand above the level of the natural rock (which under lies the laterite or gravel) on which the Fort walls stand the highest level at which the water is to be retained is 115 while the main streets in the fort may be laid

evaporation in the tank, owing to its shallowness, and also in order that the tank may be available for receiving any supply from local drainage it is estimated that the 200 Million Gallons which the Shwamankh tank receives from drainage would not only cover all loss by evaporation but would also provide sufficiently for filling the South East & North ditches of the Main Fort if necessary this however will be admitted to later.

27. When the supply to the Vardaanah Canal it would be necessary to allow water to return from the reservoir to the tank in which the engine worked thro' the western ditch of the Fort. The Amakhanah tank which is a pipe would lead to the tank & the supply would then be pumped up to the main tank.

81
to the Shwamankh tank —
22. Owing to the length of pipes required for the extra lift by the engine the cost of this method of supply would be Rs 155,000 as shown in Enclosure C instead of Rs 95,000 the cost by the first scheme —
23. By the scheme it is proposed to raise the water in the Shwamankh tank to 115 & thence the lower main drains along the 4 main streets would be supplied & from thence the drains would be flushed. At the head at which it is proposed to retain water in the various ditches the water will stand above the level of the natural rock (which under lies the laterite or gravel) on which the Fort walls stand the highest level at which the water is to be retained is 115 while the main streets in the fort may be laid

said to be from 15 to 35' below this
level and it is matter for consideration
whether the retention of water at this
level would tend to keep the water
in a perpetual state of moisture &
thus to render it unhealthy.

24th In bottom scheme it is proposed
to make use of the ditches of the
small fork for storage purposes
& these ditches must be cleaned &
the Rucknuck wall in the south
west angle must be repaired, but
it is proposed to make use of the ditch
of the large fork to a very limited extent
1st because the capacity of the ditch
of the small fork is sufficient for storage
purposes for the supply of Singapore.
2nd because the capacity of the ditch
of the large fork, limited as it is at
present

presently by the level of the Rucknuck,
to small and is because the ditches
Eastern & Northern ditches, especially
the latter, are very filthy the latter
is estimated now to contain 2,000,000
cubic feet of sewage between the
Rucknuck bank & the north
Eastern entrance to the Pagoda and
it is not possible to estimate the
sewage in the North East ditch
because much of it is over land
with the earth obtained in opening
the Eastern entrance to the dock;
but that the sewage is considerable
can be judged from the fact that
the surface of the existing land may
be made to tremble by the stamp
of a foot or two by walking over it
showing that the surface soil rests
on loose sand far from solid ground
the

then circumstances in which the
ditches are not required for the storage
of water for the supply of water
for the city of the large
for it is very important and its capacity
approximately is as follows

	Millions	Gallons	W.L.
South Ditch from entrance to small spot to S. Causeway	15	98	100-5
From - 00 00 to East gate Causeway	49	85	* 81.25 must be raised to 98 to hold this water
From 00 to N. E. gate Causeway	25	76	8 18 1/2
From 00 to Anna Kunari	4 1/2	73	# 75 1/2
	93 1/2		

The supply to fill these ditches in the 2nd
scheme can be provided from the 200
millions of gallons which the Shoppa
tank permits and hence need
not be provided from the Vadaman
while if water is to be supplied from
Pulicat to supplement the
supply

85
supply now provided by the Shoppa tank
and if there will be sufficient water
to fill these ditches under the scheme
during the dry months more than 1/2
this water is lost by evaporation of the town
wells are flooded daily into the ditch
which is lost from the 8 1/2 million
gallons daily this would cover
evaporation in the dry months & would
perhaps require it necessary to provide
for the escape of some of the water
received during the period of 200
26. With regard to the disposal
of the bridge which now passes into
the Fort ditch, it has been suggested
by the President of the Municipal Board
that if water can be retained in the
ditch all the year round fresh water
be introduced into the ditch which
will

will carry the sewage & render its
exhalation into the ditch innocuous. On
this point it is not necessary for
me to express an opinion I would
only observe that the Coom at
least as the open water for two
8 months in the year & the full
of fish is not maintained in a bush
or even in offensive condition, if the
the attempt to keep the water in the
ditch clean & free from stench by
means of fish fails. I would suggest
that a ditch from the Eastern gate
to the Amara mound, embankment
or as far as possible embankment to be
placed at or near us (if the drain
which enters the ditch there cannot
be diverted Eastward within the
ditch) should be filled up to the
level

87
level 73 this would give a layer of earth
of from 3 to 4 1/2 over the sewage
and would cost about Rs 12,000
27. If the sewage cannot
be disposed of into the fort ditch
and there rendered innocuous
it has been suggested that it
shall be conveyed to the inculti-
vated plot of ground N. and
N.W. of the Fort and between
it and the Vadaraur. If the
sewage could be delivered on
this plateau in the form of pon-
drette there might be no objection
to its disposal as proposed, but
as it must be delivered in a
mud or semiliquid state, it
could not but be very offensive
and

will convert the sewage & render its
 reception into the ditch innocuous. On
 this point it is not necessary for
 me to express an opinion I would
 only observe that the Coom ap-
 pears as the open drain for 6 or
 8 months in the year & the full
 of fish is not maintained in a bucket
 or even in offensive condition, if then
 the attempt to keep the ditch in the
 ditch clean & free from scent by
 burning fish fails. I would suggest
 that a ditch from the Eastern gate
 to the Amabandi Enhan (bank)
 or as far as possible without being
 placed at or near W. (if the drain
 which enters the ditch there cannot
 be diverted Eastward within the
 ditch) should be filled up to the
 level

level 73 this would give a layer of earth
of from 3 to 4½ over the sewage
and would cost about \$12,000
27. If the sewage cannot
be disposed of into the fork ditch
and there rendered innocuous
it has been suggested that it
shall be conveyed to the unculti-
vated plot of ground N. and
N.W. of the Fort and between
it and the Vadamour. If the
sewage could be delivered on
this plateau in the form of pom-
drette there might be no objection
to its disposal as proposed, but,
as it must be delivered in a
mud or semiliquid state, it
could not but be very offensive
and

will, however, the sewage & render its
 reception into the ditch unobtrusive. On
 this point it is not necessary for
 me to express an opinion I would
 only observe that the Coom at
 least as the open drain has for two
 8 months in the year & the full
 of fish is not maintained in a bucket
 or even in offensive conditions, if then
 the attempt to keep the water in the
 ditch clean & free from sentry
 of fish fails. I would suggest
 that a ditch from the Eastern gate
 to the Armaments Embankment
 or as far as convenient should be
 placed at or near W. (if the drain
 which enters the ditch there cannot
 be diverted eastward within the
 ditch) should be filled up to the
 level

level 73 this would give a layer of earth
of from 3 to 4½ over the sewage
and would cost about \$12,000
27. If the sewage cannot
be disposed of into the fort ditch
and there rendered innocuous
it has been suggested that it
shall be conveyed to the unculti-
vated plot of ground N.W.
N.W. of the Fort and between
it and the Vadamour. If the
sewage could be delivered on
this place in the form of pon-
drette there might be no objection
to its disposal as proposed, but,
as it must be delivered in a
muck or semi-liquid state, it
could not but be very offensive
and

with ~~the~~ sewage & render its
reception into the ditch innocuous. On
this point it is not necessary for
me to express an opinion I would
only observe that the Coom is
used as the open drain for two
8 months in the year & that full
of fish is not maintained in a bush
or even in offensive conditions, if that
the attempt to keep the water in that
ditch clean & free from scent by
means of fish fails. I would suggest
that a ditch from the Eastern gate
to the immediate neighbourhood
or as far as convenient and convenient to be
placed at or near W. (if the drain
which enters the ditch there cannot
be diverted Eastward within the
ditch) should be filled up to the
level

level 73 this would give a layer of earth
of from 3 to 4 1/2 over the sewage
and would cost about Rs 12,000
27. If the sewage cannot
be disposed of into the forth ditch
and there rendered innocuous
it has been suggested that it
shall be conveyed to the inculti-
vated plot of ground N. and
N.W. of the Fort and between
it and the Vadamur. If the
sewage could be delivered on
this place in the form of poi-
drett there might be no objection
to its disposal as proposed, but
as it must be delivered in a
mud or semiliquid state, it
could not but be very offensive
and

and even if it were possible to
arrange that no drainage should
pass from this plateau to the
Vadavur under ordinary cir-
cumstances, it would not be
possible during the fall of heavy
rain to prevent the drainage
from the plateau from passing
into the Vadavur and that
stream would be polluted: this
cannot for a moment be allowed
in as much as the villages of Undi
Vadavoor and Mannargudi de-
pend upon it for their supply
of water.

28. Another objection to the
deposit of the sewage as proposed
is that the plateau is too near the
Fort and the northern suburb
of Tanjore between the North Gate
and

and the Vadavur. 89.

29. The sewage should I
think be carried well away from
or beyond the eastern suburb.

30. The sewage which now
finds its way into the western
Ditch of the Fort should be diverted
thru' the Town into one of the
drains which now discharge into
the North Ditch. The drains which
discharge into the latter should
be connected and be carried across
the ditch near the N.E. causeway
or be carried within the escarp
wall from thence to the drain at
the eastern gate, which is on the
highest level, and crossing the
ditch at the eastern gate should be
conveyed by an underground Masonry
drain.

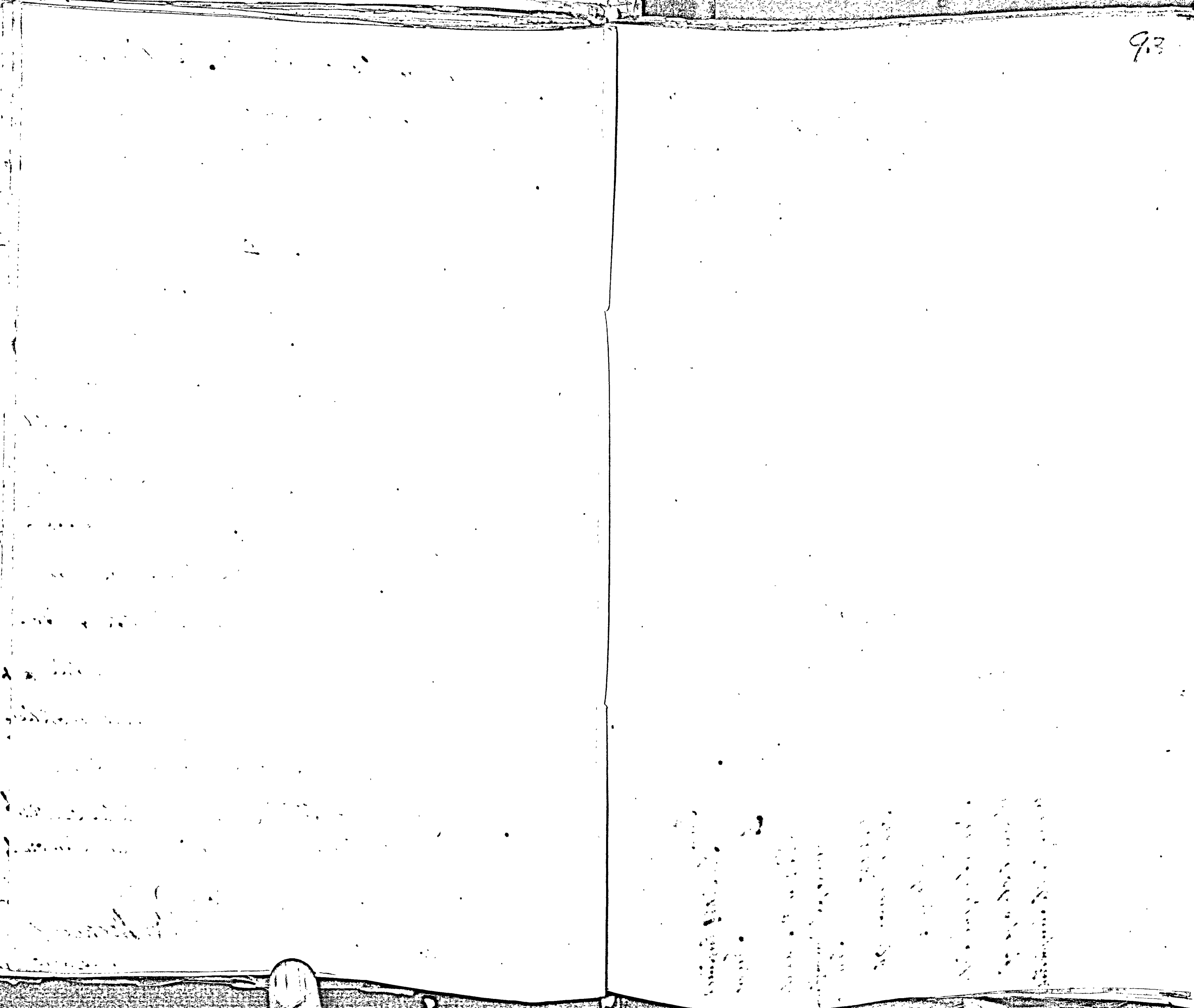
drain 3' in diameter (egg-shaped)
 to the south of the Dakshinamur
 and thence to land lying beyond
 east of the Toll gate on the road
 in rear of the Mariamman Canal
 tank bank, well beyond the
 limit of the suburb of Marambur
 Chavady and be there delivered
 on a tract of dry cultivation which
 would be much improved by the
 manure even here some little care
 would have to be taken that the
 drainage from the land manured
 did not, during the fall of heavy
 rain, find its way into the
 Vadavur.

31. There is, it is believed, suf-
 ficient fall to the land indicated
 to admit of the sewage being there
 discharged the covered drain might

under lie or follow the direction⁹¹
 either of the Dakshinamur or
 Mariamman Canal Roads as
 shown by a green line in the
 Sketch Sketch 2
 32. The length of the drain
 would be about 2,000 yards and
 with the section given in the mar-

-gen and which would
 be sufficient would
 cost about Rs 7 or 7½ per 1 foot
 run or from Rs 14 to 15,000 in-
 cluding manholes shafts &c &c.
 The drain from the A.C. to the
 road embankment need not be
 more than 2½ or 2½ diameter.

Suptg. Office (Civ.) R. F. Baker L.C.R.E.
 Bangalore } Supt. Engineer, Bangalore.
 (True Copy) H. M. M. M.
 President



B.

Memo on the proposed
channel from the Pulliam-
gully Channel to the Sha-
puraikan tank

1. The levels on
the survey of country
between Vallum and
Seyore are taken from
a datum 89' above the
floor of the sluice in
Shapuraikan tank which
supplies Shevayanga tank;
to reduce these levels to
those on the Municipal
plan add 13 to them

2. The figures
given in this Memo
will relate to the datum

In a letter 1876.

From
The Deputy Engineer
Seyore

to

The Vice President
Municipal Commission
Seyore

Dated 12th
March 1896.

No 953.

Report on the
Seyore

Hydro and storage of
water for the Seyore

of 89. The following facts
show that the Shapourian
Kern Cante is under the
command of the Pullian -
putty Channel. Broad areas
on which by which Shapourian
Kern Cante is supplied
middle road

Bed of stream on
South Side of } --- 102.36.
Railway bridge

Schools of Pullian
putty Bridge } --- 126.07.

There is a very con-
siderable fault just below
the Bridge over the Pullian
putty Channel.

works for the drainage of

be small & the drainage of

the supply channel is the
best taken as low as possible.
1st because the bottom
ground in the neighbourhood
head of the Bridge, where
the fall is great, would
be avoided, 2nd, because
heavy cutting at the head
of the Channel would be
unnecessary and 3rd, because
the lower the Channel
is carried the greater
will be the area of com-
try the drainage of
which the Channel will
intercept.

4. The channel
from the Pullian putty
drainage.

Drainage must enter the
drainage channel which
supplies the Shapamukine
tank above or south of
the Railway Bridge. Hence
the level is 102.36. The
distance from this point
to the Pullarputty bridge
as the course lies is $3\frac{1}{2}$ miles
but the channel which
must be carried round
the high ground on which
the Coorgumundapine
stands will probably be
 4 or $4\frac{1}{4}$ miles and if a
fall of $\frac{1}{2}$ a mile is given
to the Channel it should
be taken off the Pullarputty

99
channel at about 109. If
the bed is very deep and
the fall considerable a
dam may be raised to
as 5 feet above bed and

would be put
in it at that
level so as to
raise the full
unpooled bed
permanently
4 or 5 feet at
the off take of the Channel.

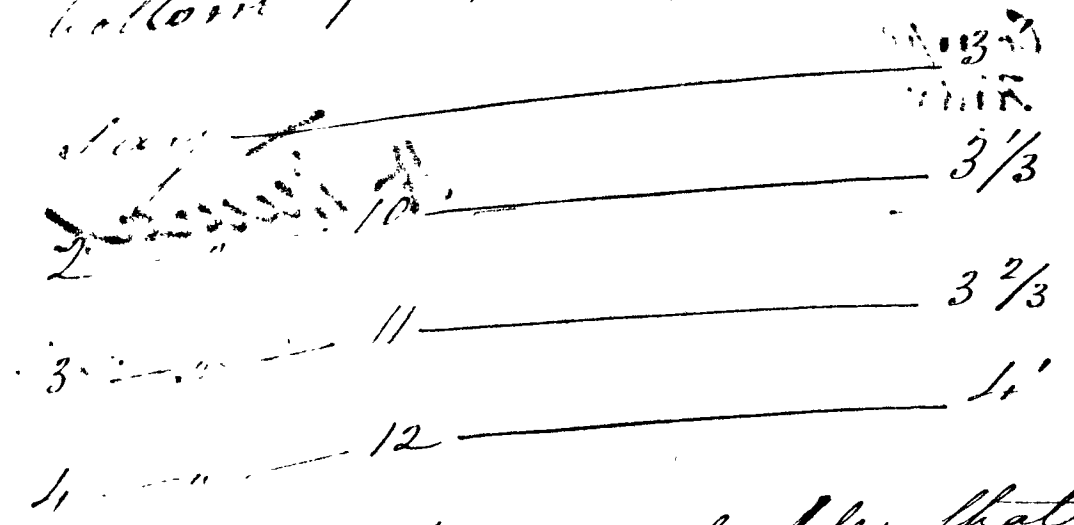
The Channel will
cross another ugly drainage
below the Manjipetty
village, it may probably
be crossed by a similar
work to avoid deep cutting.
The Channel will probably
follow the dotted black pencil
line

lines and well have to
 pass through the Tsumai
 Column, as it should be
 kept south of the high
 bank which skirts the
 north of Tsumai Column.

6. If present
 branches the channel
 had better be cut about
 $3\frac{1}{2}$ or $4'$ in the solid and
 as little drainage as pos-
 sible should be allowed
 to pass directly into the
 Channel; Catch drains
 above or south of the
 Channel should intercept
 direct drainage and be
 passed into the Channel
 at spots specially prepared
 to

to receive it; better soil
 being laid down below than
 appears on the surface
 and if not the velocity
 in the channel should not
 exceed between 2 and 3
 feet per second a depth
 of more than $4'$ should
 not be allowed.

7. The section of
 the channel may be as
 follows the side slopes
 being $1\frac{1}{2}$ to 1, 1st mile
 bottom 9' depth of water



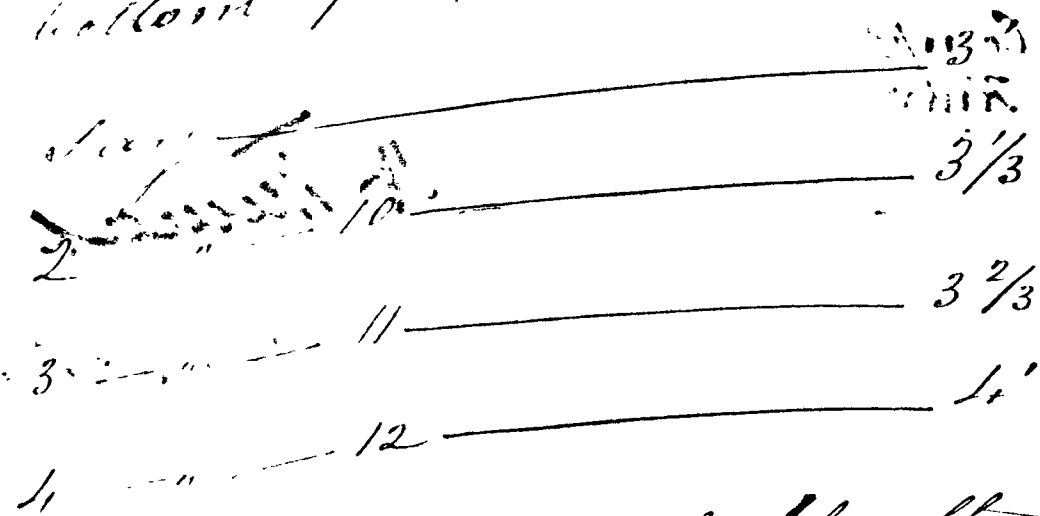
8. It is probable that
 several trial contour lines
 will

lines and will have to
pass through the Tsumi
Column, as it should be
kept south of the high
bank which skirts the
north of Tsumi Column.

6. To prevent
breaches the channel
had better be cut about
 $3\frac{1}{2}$ or $4'$ in the solid and
as little drainage as pos-
sible should be allowed
to pass directly into the
Channel; Catch drains
above or south of the
Channel should intercept
direct drainage and be
passed into the Channel
at spots specially prepared

to receive it; better soil
being laid down below than
appears on the surface
but if not the velocity
in the channel should not
exceed between 2 and 3
feet per second and hence a depth
of more than $1\frac{1}{2}'$ should
not be allowed.

7. The section of
the channel may be as
follows the side slopes
being $1\frac{1}{2}$ to 1, 1st mile
bottom 9' depth of water



8. It is probable that
several trial contour lines
will

Sp. Scheme

Approximate Estimate for obtaining a supply of water from drainage from Pullar-petty and for storing the same &c. &c.

Description	Amount
Cost of channel and dam	10700
Foundation for Iron tank-engine house	6000
Iron tank if placed on level of terrain at about 105 with only have to be raised 20 feet with waste and feed pipes	1250
Cast pipe to fill 18" diameter $\frac{3}{4}$ thick	500
$2400 \times 158 = 367200$ lbs or 163.7 tons	1000
Cost of engine &c.	1900
One 18-TP double action force pump and engine to raise 700 gallons per minute	8500
40 feet with freight &c.	
One Caspary double portable engine	6000
18-TP with 12" of Pump with freight &c.	
Carried over	50743

1876.
In a letter
from
The Deputy Engineer
to the Vice President
Municipal Commission
Dated 11th May 1876.
No 953.
Memo on the proposed
channel from the
highly channel
to the Chaparral
bank.

۵۳۴۸۸

5.5-0, 0, 0

132.00

(Signed) L. J. Parker Lt. Col.
Superintending Engineer

Sup Eng^{rs} office
" June 26th May 1876.

(True copy)

Mr. Mimer.

Chandler

1. The first part of the paper is a list of names, which are written in a cursive hand. The names are arranged in a column, and are separated by commas. The names are: John, James, William, Robert, Thomas, Richard, Henry, George, Edward, and Charles.

Approximate estimate for obtaining a supply of water from the Kadavur for Tanjore

Amount

Description

Forming reservoir 80' x 80' x 7 1/2' below Kadavur bed level with concrete and building supply sluice 1,250

2' x 2' with lines 6" below Kadavur bed 1,300

Foundations for Lion bank on the side of the road

For Lion bank

3 Pillars or piles 1 1/2' diameter 7' thick (with flanges at 7) 3 x 75 x 141.5 31,838 lb

Waste and feed pipes 15" diameter 22,488

3/4" thick 115 x 128.5 54,326

06

24.25 ton 2/25

Cast iron 1560 lb

Cistern wrought iron 6' x 6' x 5' high 2 1/2" iron 2,240 lb

Brace, girders & wrought and put up 38.00 at 22.00 475

Came over 15650

in a letter

from the Engineering Engineer

to the Vice President

of the Municipal Commission

dated 26th

March 1896.

at 953.

Approximate estimate for obtaining a supply of water from Pudukkottai and for storing the same

Cost of 45 Horsepower double action force pump
and engine to raise 950 gallons per minute
80 feet (to work 10 hours a day) with freight 1275

Supply pipe from tank to filter (if added
for flanges) 18" pipe $\frac{3}{4}$ " thick for 8000 feet
8000 x 153th = 1224000

Feed or return pipe to tank near

Adavair 7" pipe $\frac{1}{2}$ " thick (2 for
flanges) ————— 3450 ft x 40th = 138000

Laying pipes ————— 1362,00000
608 tons 6080

Cross bank at W. to 842 350

Sluice shutter &c 650

Cleaning West Ditch of large fork
from X. to W. 1250 2250

1 Gwynnes 33 P portable engine complete & 900

Pump 47

Freight 53

£ 1000 10000

109050

5950

115000

44000

Carried over 157000

Brought forward 159000
85,000
Total estimate £244,000

Disposal of sewage as per appendix D

(Signed) R. F. Baker Lt Col R.E.

18 Engineers Office
more 26 May 1876

Supd Engineers Office

(True copy)

M. P. M. A.
President

In Appendix D.
The estimate for deepening Norton Ditch, where
it receives the full of water and also
the ditch up to the North East gate entrance

Description	Amount
Excavation with lower or other arrange- ment for carrying off water (S)	
(S.S.) & (S.S.) (S.S.) entrance	4,000
Removal of sewage from ditch between S.S. entrance and	7,500
Excavation of ditch	7,500
Gravel for drainage	500

Total Estimate Rs. 19,500

It is not to be used from these
ditches if it is proposed to clear
the water from the sewage
near the gate.

Signed R. F. Baker Esq. Col. R.E.
Superintending Engineer Tanjore

Superintendent
May 1876

[Faint handwritten notes on the left page, mostly illegible.]

1876
The letter
from
The Superintending Engineer
to the Director
Municipal Commission
Tanjore
Dated 26th
May 1876
Rs. 950.
To the Municipal Commission
for obtaining
the right of water from
the ditches for sewage

Appendix D.

Approximate Estimate for filling -
North Ditch and East Ditch Portage
East entrance and conveying sewage and discharging
it about 1 1/4 miles East of Fort

Description

Amount

Filling up to level of 73	12,000
2 drains from west street to Parkia	
Country Road 3,000 x 5 ft	15,000
2 1/2' diam drain from N.E. to E.	
entrance 1350' x 6 1/2'	8,775
Discharge of sewage from E. gate to	
platform beyond toll gate on Mari-	
auden Civil bank Road 6000' x 7 1/2'	45,000
	80,775
Sundries	4,225

Total Estimate Rupees 85,000

(Signed) R. F. Oakley & Co. Ld. R.E.
Superintending Engineer

Sup & Engg Office
June 26th May 1876

(True Copy)

Compd By

H. M. M. M.
President

Handwritten notes in Urdu script, likely a translation or commentary on the English text above.

Appendix L

Items Common to both Schemes.

Description	Amount
2. Filters each 100' x 100' or covering area of 10,000 square feet, between Thavagunga tank and rear of ditch at Rs 2,000 ———	4,000.00
Cleaning Thavagunga tank ———	1500.00
Supply pipes to town from Thava-gunga tank at (105)	
To Junction of Sand W. Street (102)	
15" pipe 3/4" thick 4,150 ft x 128.5 lb =	147775
8" long Sand W. Street 9" pipe 1/2" thick = 245935	
4,870 feet x 5 1/2 lb.	
Along R. side and East street 6" pipe 1/2" thick 5,250 ft x 34.5 lb = 182160	
	575870.00
	257.08 tons 25708.00

Laying pipes ———	5,500.00
Cleaning Ditches of small foot ———	650
Cross bank at R to 115 ———	750
Plum and shutter for do ———	750
Plum and shutter at Pagoda entrance ———	750
do do entrance to small foot 1,000.00	3,150.00

1876
 In a letter
 from
 Messrs. J. B. & Co.
 to the Hon. Secy.
 Municipal Commission
 Bangalore
 dated 27th May 1876.
 Rs 2985
 Estimate for laying
 north ditch, where
 sewage discharges
 from of water and also
 laid at the upper
 north ditch gate in
 house.

Lundries

2142

44,000

* Includes flanges

(Signed) R. F. Barker & Co. Ltd

Suprs Eng'g office

Tangor 26 May 1876

Suprs Engineer Tangor

(True copy)

Compd By

R. F. Barker

President

Vertical text on the right page, possibly a list or index, written in a cursive script.

Lundries 2/42
44,000

* Includes flanges

(Signed) R. F. Barker & Co. Ltd
Supts Eng'g office }
Tangor 26th May 1876 }
(True copy)

Compd R. F.

M. Thoma

President

Handwritten notes at the bottom of the right page, including the word "Tangor" and other illegible scribbles.

When released.
 Thus common
 to the Vice President
 Municipal Council
 in May 1876.
 No 935-

1876.
 See also
 from
 the Acting Engineer

The nominal rate of daily wages employed for leveling operations for the establishment
 of the project from 1st to 13th April 1876.

Name	Rank	No. of days worked	Rate per workman	Amount	Total	Remarks or Signature
Cañanaray from 1 st to 13 th April 1876	Casero	13	6	2	47	(Signed) Valmala
Alayapop from 3 rd to 13 th April 1876	Do	11	6	2	32	Mark of Laurimul
Sungimast from 3 rd to 13 th April 1876	Do	11	6	2	32	Mark of Manavel
Manaval from 4 th to 13 th April 1876	Do	10	6	2	2	Mark of Manavel
				Total	8 15 11	(Sd) J. E. Paul

Assistant Engineers Officer }
 May 13th April 1876. }
 President
 (True Copy)
 compared to

1876
 No 195 Bangalore President's office
 Bangalore 12 October 1876
 Despatched 13th Oct 1876

From
 M. S. Thomas Esquire
 President Municipal Commis-
 sion Bangalore
 The Honorable W. Braderton
 Chief Secretary to Government
 Madras

Sir
 With reference to the marginal
 Resolved that the resolution of the Municipal
 Government to move the Municipal Commission of the
 town of Bangalore I have the
 honor to seek the favor of the
 Government placing at their
 disposal the entire time of
 Captain R. R. E. Brockman
 responsible for the same and I beg to submit
 the circumstances which
 have led to, and favor, the
 granting of this request.
 We have on hand a pro-
 ject for supplying the mu-
 nicipality of Bangalore with good drinking water,
 and the scheme embraces the replenishing

1876
 The Mayor Bangalore

From
 The Mayor Bangalore
 & The Vice President
 Municipal Commis-
 sion Bangalore

Date 26th May 1876
 Recd 26th May 1876

Amount of 1000
 Rupees employed
 for building operations
 of the Road & drainage
 works proposed from 1874
 to 1875 April 1876

1876
 The Mayor Bangalore

From
 The Mayor Bangalore
 & The Vice President
 Municipal Commis-
 sion Bangalore

Date 26th May 1876
 Recd 26th May 1876

Amount of 1000
 Rupees employed
 for building operations
 of the Road & drainage
 works proposed from 1874
 to 1875 April 1876

1876
 The Mayor Bangalore

No 7608
 P.W.D.
 2500776

of the many existing bathing places, the frequent flushing of the drains, and the flowing of the diluted sewage to cultivation. It is expected to carry with it also the filling by percolation of all the private wells in the town, some possible diminution of temperature, and certainly the additional comfort of dust laid streets. For my part, I shall add to it at a purely nominal cost a careful selection of fish, calculated to yield much food as well as clarify the water of the animalcules with which the Red Hill water seems to be so much troubled.

In brief the project aims at improving the

Extract from the Inspector General
P. Q. Balfour's letter, embodied in the
Proceedings of Government Sanitation
Department dated 7 May 1873 & 1889

1. I found in that town two points worthy
needing attention. One of these was the
state of the Fort ditch and the subsequent
reports from the Deputy Inspector General
of the Southern District at his annual
inspections of 1871-72 and 1872-73 in-
dicate that Fort ditch as the sanitary
defect in the town. In the 1871-72 R.C.
port Deputy Inspector General Johnston
says: "The Fort ditch continues to be the
opprobrium of the place and a serious

sanitation
and comfort
of the town
and is con-
sidered by all
who have looked
into the com-
plex
tent to be
calculated
to be a marked

the sewage of innumerable drains, thus forming in half of its circuit a gigantic cesspool replete with a seething mass of sewage in the midst of which a rank low jungle grows and from sources which deal death and disease amongst the people of the town. In the current year annual inspection, Deputy Inspector General Johnston reports that "since the pool drainage matters remain in statu quo, and the Fort ditch still remains as it was, a cesspool into which the contents of the Fort sewers are emptied. Standing on the margin of this idea was one moral one sees beneath him a black seething bubbling slough, surrounded through a labyrinth of rank sedge vegetation emitting mephitic exhalations, whose abominable stench is one of the least of the evils, so fertile a source of human suffering is daily evolved. In the presence of this all other sanitary defects sink into insignificance, and every effort on the part of the Municipality entrusted with the health interests of the inhabitants of this town should be concentrated on its removal."

blepharitis to the
Municipality.
It is an attempt
to do thoroughly
and in no half
manner, all
that sanitarians
have said to let
needed in San-
itation.
When the
idea was ori-
ginated I
know not but
I can trace it
back as far as
Mr. Collector
Ladell's days
and I am
told it had
been given
in his 18 Montgomerie
days if not before.
Mr. Casell

at any rate, did all he could to further
it but in vain. Collectors and Engineers
have since come and gone, and it has
remained only an abandoned project,
the ghost of a dead idea, till on my joining
the District, now two years ago, it was
mentioned to me by Mr. Fadillo Sheristadas
Venkavami Row. From that day to this
I have kept it unremittingly in view,
and lost not an opportunity of furthering
it or warding off action that would tend
to be hereafter preventive of the scheme.
It was looked on however as my chimera,
and the ruling idea was that sanitation
was only to be gained by the filling in of the
Fort ditch. Filling in therefore and demolishing
Paras. The question that arises in the mind of Stone
in submitting this point is
whether the fortification of military walls was the
importance and whether there
be any military objections to
the filling up of its ditch but as, and I had to
the advantages by levelling all
round the fort to the Commune, I proposed
there cannot be any doubts
of the water scheme before we finally com-
mitted by this destructive process a course
which

12
from which it would be so expensive as to be
practically impossible to retrace our steps.
The then Superintending Engineer Colonel
Roberts could not think with me at all in this
matter, but after much personal persuasion
finally consented to give my ideas an & a
merit. On the very day of his consent
the Municipal Overseer was placed at his
disposal and the levels of the Wyandam
channel, as compared with the Fort, were
taken. This I believe was Mr. Fadillo's idea
of the source from which we might look
for a supply. Months passed and the end
was disappointment. The water would not
run by gravitation, it could only be pumped
by steam, and that was too expensive, and
professional judgment again doomed
the phantom authoritatively to death.
Thus our position was more hopeless
than ever, and all building Estimates came
in as formerly with Fort wall stones included
therein. But steadily and watchfully, though
quietly, I objected to countersigning Estimates
which contemplated demolition, till it was
an understanding between us that we should

mark time awhile in this matter. Non-pro-
fessional though I was, I still had the pre-
sumption to be far from satisfied that riv-
ering had been exhausted and that it was not
yet possible to introduce the desired sani-
tation.

7 Again time past while I looked anxiously
and watchfully about for any outside aid
towards the solution of the pumping difficul-
ty and clung tenaciously to this last straw
for I had unfortunately thought lightly of
and had in a measure lost sight of the idea
even then thrown out subtly by Mr Assistant
Engineer Greenaway of catching the rain fall,
and if I remembered rightly it had been dis-
missed as idle by the Superintending Engineer
Colonel Roberts. He looked upon the whole
scheme as a practical impossibility to begin
with and undesirable even if it could be ac-
complished. He was for filling in the moat
and utilizing stones by demolishing the ramp
of parts. That I believe was his honest opinion
of the right thing to be done under the cir-

129
- circumstances. However we had at
least advanced this step we had learnt that
the *Wjacondan* must be given up and
we must look elsewhere for water.
8 Then *fate* favored us. I met brought
with the Superintending Engineer Colonel

Cakes R. E. and there fell among us a spe-
culative French adventurer who was
not without ability. We paid the latter
some Rs 150 for a scheme and we sent it to
Colonel Cakes for an opinion. This scheme
Colonel Cakes condemned, but in his
usual thorough way he went to the bottom
into the whole matter fully and with an
air of impartiality for which
we are deeply indebted, worked out for us two
alternative schemes by which our aim could
be reached. I enclose a copy of his letter with
its belongings.

9 Up to this time our information had been
only negative, we had learnt only what could
not be. Now for the first time we had learnt
what could be.

10 But Colonel Oake's schemes did not
1 profess to be complete; they were only a gen-
2 eral sketch, and there was yet much to be
3 done when he left for England. Indeed it was
4 only by ^{very} kindly application that he was able
5 before he left to advance us the definite steps
6 he did.

11 His schemes were two, one to catch the
2 rainfall on the high ground between Tanjore
3 and Vallam by a check drain of about 5 miles
4 in length, and the other to steam pump
5 up the water of the Vadavar branch of the
6 Cauvery. Both schemes had in common
7 the utilization of a large portion of the Tan-
8 jore Fort moat as a storage reservoir for
9 the dry months and the pumped up
10 distribution thence by pipes and hydrants.
11 The former scheme was estimated to cost
12 Rs 191100 the latter Rs 256200.

12 He proposed that we should avail
ourselves of Mr Woolley's special knowledge
in the matter of pipes and Engines, and
that the contour lines for the channel from
the Pulliaspatty drainage channel should
be

be taken for part of the channel will run over
a broken bit of Country and more masonry
works may be required than is supposed.
and that a really good or efficient survey should be employed on the work.
13 Accordingly Mr Woolley was addressed
and Engineers were addressed to see if a Com-
petent Government subordinate could be
spared for a time at enhanced pay and
private applications were considered.
14 Eventually Mr Woolley engaged to help us
and we have agreed to give him Rs 1500
for the purpose.

15 It was hoped that Mr Woolley's plans
and Estimates would be in sufficient de-
tail to enable us to put the matter before
Government ripe for sanction to commence
work on a loan.

16 But as the matter came to be more closely
examined it was difficult of detail and of
hydraulics gave, and ^{with} the advice of the
District Engineer Captain Brockman,
we found we could not fairly demand
so much of Mr Woolley. He will therefore
give us all details at our Engineer's pipes,
hydraulic, fountains and such like specialties.

together with contours, levels and levels
of the several moats both at top and
bottom and some thing more, and the
District Engineer Captain Brockman
R.E. estimates roughly that what remains
to be done could be done by himself in
a month or two.

17. We are particularly anxious that Go-
vernment may be pleased
to allow Captain Brockman
at Rs 150 a day to do this for us and we will
20 percent on salary 190⁴²⁹⁰ thankfully relieve Govern-
ment of his full salary with permanent tra-
velling allowance and percentage towards pen-
sion.

18. We hope that the arrangement will
not put Government to any real inconvenience
for Captain Brockman proposes with
permission to leave for Europe in January,
so that it will only be anticipating by two
months the arrangements which Govern-
ment will then have to make for a successor.

133
19. These two months are thus a minor
matter, we trust, to Government, but as
they are of vital importance, without them
our scheme might by the concession be brought
to completion. Without the concession the
schemes may drag their weary length through
years of disappointment till they are again
ensigned to the limbo of impossibilities.
20. I hear that the Sambre puny water
project in France was commenced
by Mr. Horsley when an engineering student
completed after the lapse of 25 years by
that very same officer as a Colonel, and
that there was found only the variation of a
single inch from the levels first taken by
the design, so that in truth there was no
reason why the project should not
have been carried out at first. The real
reason was that it had not then behind
it, as it had at last, the indomitable per-
severance of a Puckle to resolutely push it
through all difficulties to completion.

together with contours, levels and levels
of the several moats both at top and
bottom and some things more, and the
District Engineer Captain Brockman
R.E. estimates roughly that what remains
to be done could be done by himself in
a month or two.

17. We are particularly anxious that Govt.
monthly salary—Rs 900 permanent may be pleased
to allow Captain Brockman
at Kisadiy—150 to do this for us and it will
20 percent on salary 1900 thankfully relieve Govern-
ment of his full salary with permanent tra-
velling allowance and percentage towards pen-
sion.

18. We hope that the arrangement will
not put Government to any real inconvenience
for Captain Brockman proposed with
permission to leave for Europe in January,
so that it will only be anticipating by two
months the arrangements which Govern-
ment will then have to make for success for.

19. These two months are thus a most
matter, we trust, to Government, but these
they are of vital importance. Without them
our scheme might by the concession be brought
to completion. Without the concession the
schemes may drag their weary length through
years of disappointment till they are again
consigned to the limbo of impossibilities.
20. I learn that the Tambora survey was
projected in June 1871 and commenced
by Mr. Horsley when an engineer only.
Completed after the lapse of 25 years by
that very same officer as a Colonel, and
that there was found only the area of a
single acre from the levels first taken by
the engineer, so that in truth there was
found a great deal why the project should not
have been carried out at first. There is a
reason why that it had not then behind
it, as it had at last, the indomitable per-
severance of a Puckle to resolutely push it
through all difficulties to completion.

21. How many years the Madras Water
Project has been coming into existence,
and how many projects there are that
have never managed to struggle into
existence at all. I am afraid to say.

22. This and the above recorded past
history of our own struggles recorded out
of no egotism but for this reason gives
me grave fears lest our projects should
be among the many that drop out of
existence, not among the few that win;
for it will be borne in mind that every
relapse we have already had too many,
every relapse is a fresh and potent ob-
stacle. Each failure or check weakens
supporters and confirms objectors. It
gives time too for the increase of diffi-
culties, in the growth of vegetation, the
decay and demolition of stone walls,
and the sewage filling of the moat.

23. We trust therefore that the Govern-
ment will be moved to aid us in this
junction with the whole of Captain
Brookman's time till the scheme is
drawn

135
drawn out in the necessary detail of
plans and Estimates to warrant the
sanction thereof by Government
with a view to the obtaining of a muni-
cipal loan for execution.

24. An additional reason for asking Cap-
tain Brookman's services is that we
shall have the District Engineer him-
self preparing the schemes, and we
shall hope to be thereby spared the delay
of submitting them again to another
District Engineer's approval before
they will be received by Government.
For every new officer is new to the pecu-
liarities of the locality, and has there-
fore a thousand new doubts which he
can only solve by personal examination,
and which all take time to dissolve.
Captain Brookman's hydraulic ab-
stainments are also known to the ex-
tremity, and they give us ground to
hope that we shall not only have a scheme
but the best scheme.

25. Regarding the project I may men-
tion that it is enthusiastically desired

by the natives. Water is a thing which
they value most highly.

26 Much of it is also done for a
ready in the Conduit System of the
Rajah, our falling in with which is
popular.

27 As regards money for the current
expenses of examining the scheme
we have enough in hand to pay for
Mr. Kestley, for Captain Brichman
and for such subordinate staff as he
may desire, which we shall leave en-
tirely to him, and we should desire him
to be liberal, that is rather than wasteful
of himself, his brain being the most
valuable. We have Rs. 8000 in hand.

28 As regards the loan for eventual ex-
ecution of the scheme we do not
desire to be delayed by the financial
difficulties of the Government, for
it is life and health and we want it
at once. We propose therefore to go
straight into the open market. But

we are advised that the Madras Bank
will meet us on easy and very convenient
terms the exact settlement of which is
at present premature.

29 As regards eventual repayment
of the loan we have the following means
of guaranteeing it, but with a view
to have the loan as little married
as possible by extra taxation, we propose
to practise all proper economy by
deputing a person to study Mr. Medd's
burn & economy sanitation and we
look eventually for considerable re-
turn from irrigation with our diluted
sewage from the frequently flushed
drains, a return which should more
than suffice to pay all the additional
working & expenses of the Engines for
there is ample area of dry land that
could be laid down in plantains, and
we have already offers for our sewage
water, and the demand for plantains
and plantain plates in Singapore is almost

unlimited. These and there are
our economies and without the item
of sewage water they may be roughly
taken at Rs 8000 per annum but per
guaranteeing extra income is as follows.

30 Our house tax is not at its full.
it is capable of giving us an additional
Rs 6000 a year. Our tolls might be
raised so as to give an annual Rs 5600
extra even after deducting the one
third ordered in Government order
dated 16 August 1896 No 1481. The former
returns of Professional show that we
could annually draw Rs 11000 from
that source. This source of income
is sufficient to wipe out a loan
with interest every year but we should
prefer to lighten the burden by spreading
it over more years.

31 As regards execution we are also pro-
vided with unlimited supply of manual
labour half the Public Works staff.
I don't think the scheme is too bold as
a charity in which many will

139
join. Certainly and one person alone
has the labor of 36 villages willing at
his command.

32 If we can get Captain Brockman
service now that is immediately we
hope that he may complete his work
so that he may be able to take his
desired leave in January and we
may get through the several stages
of obtaining sanction and loans so
as to commence our work in time
to catch and store next year's monsoon.

33 We sanguinely hope for I write for the
Commissioners at their unanimous
request, that the Government will be
graciously pleased to promptly help our
helplessness, especially as they see we
have exhausted every effort to help our-
selves and thus mark its apprecia-
tion of our efforts at improved sani-
tation in this ancient and his-
torical town of Tanjore.

34 I have shown this letter to Cap-
tain Brockman and obtained

his counter signature to him of his
acquiescence in our desire for his
services if the Government be pleased
to allow them.

I have the honor to be
Sir
Your most obedient servant

Wm. M. M.
President

Melbourne
District Officer
Jaipur

...

...

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...

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P.W.D.
23 OCT 76
Nr. 7608

90 24th October/76 No 2835

354

16:50/17:00 - 27/12/1916
 27/12/1916 - 28/12/1916
 28/12/1916 - 29/12/1916

[illegible]

1614.

Thine 1876 Wm
 Howard Crosby
 The President
 Municipal Com
 Jaffee
 To The Chief Justice
 to Government

Date 12th October
Received of \$16.00 — —
Drs. — — — —

Enclosure 2

1/10 195

Depreciating the entire

time on full pay.

ment of Captain

Brookman for the

Examination of the

James Watson

Conrad

No 2835 of 24 Oct/66 (p. 143)
From the President, Municipal } #2. No 195 of 12 Oct/66
Commissioner, Tanjore }
thru Financial Dept - The services of (Capt.
Brockman cannot
be placed at the
disposal of the
Engineer Municipal
until after
to Genl. Order
shall have re-
turned from leave
in January -
He will then be
permitted to dis-
pose of himself
on the work in
connection with
the investigation.
shall have been
submitted to his
satisfaction; after
which he will
be allowed to
leave himself
at liberty, with

1946-12-25 = 3300

10-10-1932

1912

149
 The investigation
 of the same

The investigation
 of the same
 Projects in the
 Madison District
 for which the
 Order was
 entered in the
 No. 2637 of 30th
 will consider the
 circumstances
 develop on the
 S. Watch, and
 return from
 for example in
 following

N^o 357/8
 Dep't of the 20-4-76
 for the
 view of the
 Captain
 of the
 18th May
 1875

151
 The investigation
 of the same

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 The investigation
 of the same

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 The investigation
 of the same
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151
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7608
Govt. of Madras
PUBLIC WORKS.

To *the N.E. Sanjiv*

Dated

Issued

Recd.

Encl.

G. O., *27 Feb* 1876, No. *288*

Nos.

Water Works
Order on letter
President Municipality
Sanjiv, Bangalore
for the service
of Mr. Brockman
employment on the

27 Feb 76
288