Water supply
from lake of Gardens.

Laying of pipes commenced - Rep. 1907 p 1
completed Rep 1908 p. 4

From whom	Supt. of Gardens
Place	"
Date	15. 4. 04

States that owing to drought during the last few months it has been necessary to employ all the Cattles in carrying water. That as this is expensive, it is suggested that water should be laid out part of the Garden; Ask if an Officer of the A. W. & Board Could Come and address

Former Papers.	MINUTES	Final Paper.

C.E.

Please report

S/d E.B.S 18/4

E.S.

1. I regret the delay in reporting on this subject but it has been unavoidable.

2. Enclosed I forward a tracing of what is necessary to provide water for the garden together with an estimate of the cost.

3. It is proposed to extend the municipal water main from the Junction of Grange and Jarvis Rd. as far as the point A, along Cluny Road, with 4" pipes at a cost of about $5,800.

4. This cost should ~~be~~ properly be borne by the Municipality but if they are not yet prepared to carry out the work

I would suggest that Govt. doth, on the understanding that the Municipality would refund the cost whenever they made other connections to the main.

5 It would be possible to obtain water if this main were extended only as far as B. with a decrease in the cost of about $1800 as regards the main but with an increase as regards the actual water service inside the Gardens of about $900

6. From this main it is proposed to lay an 1½" pipe to a Reservoir capable of holding 12,000 gallons or about 5 days dry weather supply and from there to lay the supply pipes to the plant house and a 3/4" pipe to a point near the band stand.

7. The Director has also asked that water may be laid on to a point near his house and this is also provided for in the Estimates.

8. The Estimated cost of the Reservoir and pipes in the Gardens is $3300 and

Extension of the main $5800

or a total of $9,100

9. The object of the Reservoir is to provide against any shortage of water by the Municipality cutting off the water in times of drought.

Sd. C. S. Ker

18/7/05

S.

It no doubt cost money to carry water during dry weather but it w.d not be so expensive as this proposal. I shall be surprised if either Government or the M.C. or both together will spend 9000 to 10,000 dollars on this.

Ask, however, the M.C. if they are prepared to extend the main to "A" as suggested by the J. W. J.

Sd. W. J. 20/7.

Water Supply to Botanical Gardens

Estimate of the Expense necessary to be incurred for Water Supply to Botanic Gardens 3500 OH

Specification	Quantities	$ Rate $	¢	Amount $	¢	Total $ ¢
Excavation Cubes	64.5		60	38	70	
Portland Cement Concrete "	23	36	00	828	00	
Cement rendering ¾" thick square yards	I36	00	90	I22	40	
Cement rendering ½" thick "	36	00	60	2I	60	
Cement rendering on bottom average thickness I½" sq yrs..	36	I	60	57	60	
Steel joists 6"x4½"	2240		20	448	00	
I½" iron supply pipe including screwed and leaded joints elbows etc .... Lineal feet	320	00	60	I92	00	
¾" Pipe ..... "	I500	00	30	450	00	
I" Pipe ..... "	I050	00	40	420	00	
2" C.I.Overflow pipe ....."	I4	I	60	22	40	
2½" C.I.Shedge pipe ..... "	I4	2	00	28	00	
4" Earthenware drain pipes ..... "	40	00	63	25	20	
Stopcock I½" pipes Nos.	3	5	00	I5	00	
Stopcock ¾" pipes ..... Nos.	2	4	00	8	00	
Strong shedge valve ..... No.	I	I5	00	I5	00	
Taps for ¾" pipes Nos.	2	4	00	8	00	
Taps for I" Pipes Nos.	4	5	00	20	00	
Strong ball tap for supply No.	I	I0	00	I0		
Rose for outlet No	I	5	00	5	00	
Labour-Fitters and Coolies Days	I0	5	00	50	00	
Transport of pipes				I0	00	
Brickwork in manhole in Cement mortar Cubic feet	I28	00	64	8I	92	
3" Flag manholes covers sq. ft	24	00	60	I4	40	
Prtland cement drip stones for band stand and Supts's house	08	00	36	2	88	
Iron ladder 9'long No.	I	I0	00	I0	00	
Galvanized iron pipe Nos.	200	00	30	60	00	$2,964-I0
Add I0% Contingencies						296-4I
5% Supervision						I63-02
						$3,423-53

sd. C. S. May
S.W.S.

No Minutes should be written on this page. A separate half-sheet to be used if required.

Col. Secretary 958/05

(G 3)

From whom	Colonial Secretary
Place	Singapore
Date	II- II- 05.

Water Pumping apparatus for the Botanic Gardens.

Former Papers.	MINUTES	Final Paper.
Muncpl. 9173/04 -do- 8288/04 Gard. 3500/04		

C.E.

What will be the cost of pumping apparatus for the Botanical Gardens. It is useless taking Municipal Water because it will not be fully available when it is most wanted.

Intd. E.L.B. II-II-05

C.S.

The cost of deepening and enlarging the present well, providing a two throw pump with pumping main, constructing service tank on the hill, and laying distributing mains to the Plant Houses etc will be $5000.

sd. H.T. for CE

29-II--05

Y.E.

Mr. C.S. Murray spoke about this in Council. It is no use having Municipal Water as that may be cut off when most needed. Besides it would be through a meter and I expect rather costly. I understand that the upkeep of the pumping installation will cost $600 a year.

sd. E.L.B

3-12-05

B1.4>/6

To. F.C. If they want it I am not going to stand in the way.

sd.J.A.

8-12-05

Treasurer

Please refer to the F.C.

sd. W.S.for C.S

9-12-05

C.S.

Would it not be better to refer this to Mr.Lidley first, I understand that he has collected information from various sources as to design of pumping etc. The proposal of the Gardens Cttee. was that the water should be pumped up from the pond to a storage reservoir at the top of the hill and this distributed by gravitation. I was under the impression that he had written in about it.

sd. J.O. A

11-12-05

D.of Gardens

For your observations.

sd. E.L.B.

12-12-05

Hon.Col.Sec

Herewith the plans from the public Works Dept. The proposal to deepen the well is unnecessary.The supply at present is adequate in the well,and as the water is of exceptionally good quality it would be risky to deepen and perhaps spoil the water. The pump proposed by the P.W.D.is a hand pump I understand.There is always a difficulty in getting coolies to work this.I enclose also an Estimate by Hogan's firm for a hot air Engine.This is a little more expensive but has advantages in probably requiring less cooly labour.

sd. G.N.L.

Dec. 22 05

I should say that hand pumps would be more satisfactory,at any rate at first- and would probably cost much less than a power pump in the hands of unskilled men.

sd. H.P.S 22-12-05

C.E.

What will be the total estimate with the hot air pump and also what will be the cost of up-keep annually.

sd. E.L.B.

22-12-05

C.S.

The total estimate allowing for a gas engine and pump will be $6,700. This allows for a small engine shed.

2.- The cost of up-keep will be $750. per annum.

sd. M.T.for C.E

30-12-05

Plan & estimate retained.

Treasurer

This may go to the Finance Committee and if they desire it a Vote can be marked in Council.

sd. E.L.B.2-1-0

No. 3227 Col. Secretary 9589 / 05

(G 29)

Memorandum.

FROM Treasurer, S.S.

TO The Members of the Finance Committee, Singapore.

DATE 3rd. January, 1906.

(G.P.D.-10,000-Feb., 1902.)

The attached papers are herewith submitted for the consideration of the Finance Committee. Will you please state whether it is your wish that a vote amounting to $6,700 for provision of pumping plant at the Botanical Gardens and $750 for its up-keep should be taken in Council.

sd. J.O.Anthonisz

Treasurer S.S.

The Hon'ble	Auditor General, S.S.	Yes. sd. E.C.E. 4-I-06
,,	W.P.Waddell	I am not in favour of the expenditure. sd. W.P.W.
,,	Tan Jiak Kim	The expenditure is too heavy sd. T.J.Kim II-I
,,	John Anderson	Capital expenditure too heavy in my view sd. J.A.
,,	Hugh Fort	Droughts are not very common, and I doubt whether it is worth while incurring this expenditure. H. F.
,,	C.S.Murray	The amount now asked for is much more than originally estimated $4,300. If Mr.Ridley says he must have the pumps I do not oppose. sd. C.S.M.

B1.42/7

C.S.

The F.Committee consider that the expenditure is too heavy.

sd. J.O.A

17-I-06

Y.E.

Submitted

sd. E.L.B. 18-I-06

I agree with the Committee

sd. J.A. 18-I-06

No Minutes should be written on this page. A separate half-sheet to be used if required.

(G 53

Botanic Gardens. Singapore.

STRAITS SETTLEMENTS.

No:- 44/06

31st. January 1906. 190

Sir,

I have the honour to state that the matter of the Water Supply was again referred to the Gardens Committee, who agreed unanimously that the Estimate of the Public Works Department was far too high and desire to state that the requirements of the Gardens could be met at a much more modest expenditure, and they request permission to be allowed to call for tenders for the work from outside.

What is required is a pump, preferably a hot air Engine and 1½ inch piping for 1,650 feet, a cement tank an iron rivetted tank to hold 2,000 gallons of water and 3 or 4 stand pipes.

The whole cost should not exceed 4,000 dollars. The cost of up-keep estimated by the Public Works Dept. at $750 per annum would cost not more than $200. viz one Engine driver at $12. a month = $144 and Contingencies say $50 = $194 per annum.

As probably any of the large firms would execute the work at about the figure estimated by the Gardens Committee, I would ask that tenders might be called for for the work.

B1-42/10

T. C.S.

I have the honour to be

Sir

Your obedient servant

H N Ridley

Director of Gardens S.S.

Gardens 4/6

(O 3)

From Whom ...	Director of Gardens
Place	S.
Date	31-I-06 No.44-06

Water Supply to the Botanic Gardens.

Requests permission to call for tenders for the work.

Former Papers. MINUTES. *Final Paper.*

C.E.

What can be done for $4,000?.
sd.E.L.B. I.2.06

C.S.

The estimate can be reduced to $4,000 by making the following omissions and deductions:-

a.- Leaving the well as it is at present.

b.- Omitting the brick tanks provided for the storage of water at the various Plant Houses and asked for by Assistant Superintendent of Gardens (Mr.Derry).

C.- Providing a temporary Engine House formed of plank walling and atap roof in lieu of brick walls and tile roofs.

2.- With reference to (a) & (b) the Director of Gardens should be informed as he considers these items unnecessary now he will not be allowed to Requisition for them afterwards and thus seriously cripple the Minor Works Vote.

3.- Regarding the cost of upkeep referred to by the Director in his letter it would be interesting to know how the hot air is to be generated for the engine as nothing is allowed in his estimate for liquid fuel neither do I see any provisions made for engine oil waste and other necessaries to say nothing for repairs or upkeep. To the lay mind these items cost nothing but as to how much they do cost will be inferred from a comparison between the Director's estimate of upkeep and that prepared by this Department.

4.- The amount allowed too for the wages of engine driver is absurd, if we could obtain a competent man for double the figure we should be lucky.

sd. A.M. I4/2/06

Y.E.

Submitted. I think that it might now wait till next year and we might ask the Council for $4,000.

sd. E.L.B. I5/2/06

sd. J.A. I5/2/06

Draft to D of Gardens

sd. E.L.B.

Gardens 1916/1916

Botanic Gardens
Singapore
Jan 31 1916

Sir,
I have the honour to state that the matter of the water supply was again referred to the Gardens Committee, who agreed unanimously that the estimate of the Public Works department was far too high and desire to state that the requirements of the Gardens could be met at a much more moderate expenditure, and they request permission to be allowed to call for tenders for the work from outside. What is required is a pump, preferably a hot air engine and $1\frac{1}{2}$ inch piping for 1650 feet, a cement tank ~~to~~ an iron rivetted tank to hold 2,000 gallons, water and 3 or 4 standpipes. The whole cost should not exceed 4000 dollars. The cost of upkeep estimated by the Public Works Department at 950 dollars per annum would cost not more than 200 dollars.

ing the Engine driver at 12 dollars a
Month, = 144 dollars
Contingencies say 50 dollars = 194 dollars
per annum

As probably any of the large
firms would execute the work
at about the figure estimated
by the Gardens Committee, I would
ask that tenders might be
called for for the work.

I have the honour to be
Sir
Your obedient Servant
Henry H Ridley

No Minutes should be written on this page. A separate half-sheet to be used if required.

.ow

we could

Mr Fox came from Penang 3 days after I had left and received all the correspondence which showed by my clerk the arrangements made, lists of pipe & positions of engine & tank etc., and as we then had enough money in the vote from rubber sales asked Government first if this money ~~was~~ might be used for the water works. The Government agreed and ~~called for tenders~~ were called for from Messrs Howarth Erskine Riley Hargreaves and the Borneo Co ~~He also~~ Mr Fox made enquiries as to previous fitments from Mr Kerr, Mr Pierce and Mr Greeny. and Mr Pigott and a number of other engineers. I quote below all the references I can find in Mr Kerr's or in the correspondence. The tenders were received and submitted to the Gardens Committee Mr Fox had put a "brickwork tank" in the specifications, but Messrs Howarth Erskine urged a steel tank [illegible] Ed, The other tenderers declared and urged that as the war differentiated the specifications fresh tenders ~~were~~ should be called for, This was valid argument and the tender was given to Messrs Howarth Erskine and the work nearly finished at my return. In fact the engine was started on the day of my return, Mr Kennedy came up several times and taught my Headman Sahib to ~~be~~ run the engine. I saw to its working all right. I never heard of Mr Greeny in connection with the water works. He Mr Heteran succeeded Mr on Sunday, He certainly never came here.

Water supply land in the Botanic Gardens,

The main water supply for the plant houses till a few years ago was derived from a well on the further side of Garden road, which was surrounded with a hand pump and being in private grounds was filled up on the opening up of the Nassau Hill estate, since then water has had to be drawn by carts from the lake to the plant houses, owing to the extremely dry weather during the past two years the water carts have had to be employed regularly every day for some months at a cost of 75 dollars a month. to which has to be added the cost of four coolies employed all day in filling and emptying the carts, at 9 dollars a month (each), so that this expense amounts to about 1300 dollars a year.

It was suggested last year that the water should be laid on from municipal water supply, but this was negatived on account of uncertainty as to whether the municipality would be able to supply it when needed. It was then suggested to leave

the water laid on to the plant-
houses and lands then by
the a portable engine from
the well by the side and an
estimate was obtained for
this work from Messrs Hogan
(copy enclosed)
The Dr would build a tank
or reservoir on the land adjoining
to which the water could be
pumped up and then distributed
over the garden where necessary
in pipes
The cost of the Engine would
be £850 and the Dr estimate
the cost of the tank at
£3.500

This would give a much more
larger supply of water than
the carts do and also save more
expense in cooly labour, as the
water would be actually laid on
to the places requiring it where as
the carts can only deposit
the water at one or two places
The carts only carry 100 gallons
which at 6 trips a day each gives
600 gallons a day. The pump would
supply if required about 4.000
gallons a day

Specifications

1 One. 2 H.P. oil Engine - with Engine House
~~[illegible]~~ one force pump attached - together with all necessary fittings - suction pipe etc.

2 About 2000 feet of galvanized 1½ inch delivery pipe.

3. One storage tank of brick & cement capable of holding 10,000 gallons of water & to be covered on top with 2" thick planking -

4. Six stand pipes with necessary cocks etc. & fire taps.

5. Widening & deepening the present well from 4'-9" in diameter 8' feet deep to 10' in diameter & 25' deep.

Primary cost of Eugene
pipes & Stack $4,300.

Cost of water on present
system per annum $1300

Thus the whole cost of the installation would cost less than four years consumption on the present system and supply more than six times the amount of water

1-11-05

This letter was sent to Mr B.O.B.
down for the perusal of Mr
G.T. Murray

K. J. V 17. 7. 07

W. Harvey. Mexico — Seed seed

W. Cummins Negri Sembilan — plants

Water supply

Galvanized
Pipe $1\frac{1}{2}$ inch to Tank 920 feet
at 50 cents = 460

Tank to plant stages
280 = 140

Tank to Plant House
direct 450 = 225

895

~~or to~~

or to small tank = $182.\frac{1}{2}$
365 ft

or 782.50

Cost of Engine & erection
including shed & foundation 850

Tank

Stand pipes

Labour

Shed " Engine

Foundations "

Gardens 2192

(G 3)

From Whom ...	Director of Gardens
Place	Singapore
Date	April 3rd. 1907

Water Supply to Botanic Gardens

Regarding:-

Former Papers.	MINUTES.	*Final Paper.*
Gards.3519/06	C.S.	
Gards.716/06	I cannot find it in the Estimates for 1906., in	
C.S.9589/05 ✓	what page and item it is shewn. These pages to	
Muncl.9173/04 ✓	D of G to state. When the last drought occured and	
Muncl.8288/04	for how many days it lasted.	
Gards.3500/04 ✓	2.- Also to state whether the cost of up-keep	
	will be $750 p.a. as given in the C.E's Minute of	
	30th Decr.05 in 9589/05.	
	sd.A.Y.4/4/07	
	I don't think it was in the Estimates for 06. The Finance Committee was asked to approve $6700, they considered this too much. Later on it was re-presented that $4,000 would be enough and it was determined to put it off till 1907, but it was cut out of the draft Estimates.	
	D of G	
	Please reply to the C.S's questions.	
	sd.E.L.B.4/4/07	

Hon. Col. Sec

Drought in 1907 Jan 20 to Feb 17th. March 26th to date but only 0.69 part of an inch has fallen since march 12th. So far this year two water carts have been employed on 29½ days each which including the services of two men for filling the carts cost $106-20, even this is in advantage for the plant sheds only, and all the rest of the flower beds etc have to be supplied by water hand carried, practically using the services of the greater number of the coolies in watering instead of keeping the place clean grass cut etc.

The cost of up-keep will be very much less than that estimated from a well known Engineer in Singapore, who is well acustomed to this class of work. He estimates the cost at $171-30 a year. This is only estimated for 60 days but if the Engine were required for a whole year the cost would come to about $300.

sd. H.N.R. 9/4/07

C.E.

For your remarks on the Estimate for cost of up-keep.

sd. A.Y. 9/4/07

C.S.

The cost of working five hrs each day throughout the year will be $750 as stated in my minute of 30-12-05 in C S. 9589/05.

2 - It is now proposed to work the pump 60 days a year only according to the D of G figures., in this case his estimates $183/30 is about correct

2/

Gardens 2184/1907

($171-30 quoted by the D of G is not correct, attendants wages 60 days at 40 cts -$24 not $12 as shewn).

According to the Director's estimate of 9-4-07 in Garden's 2184 of 07 he would possibly come considerably more than $200 per diem in water carts and coolies if this was available.

I would suggest if the work is sanctioned that this working if do be placed in the charge of the Gards. Dept and paid it from the Garden's Vote.

sd.F.J.P? 16/4/07

Y.E.

I do not think there is anything to complain of as to the Botanical Gardens being kept clean and the grass cut.

I am not prepared to recommend $4,000 or $6700 should be expended on the purchase of this pump and there is also the amount "up-keep" to be considered.

sd. A.Y. 18/4/07

I agree

sd.J.A. 18/4/07

D. of G

To note

sd.E.L.B. 19/4/07

Hon.Col.Sec

Noted

sd.H.N.R. 19/4/07

Gardens 2184/1907

Singapore.

April 8th.1907.

H.N.Ridley,Esq.F.R.S.etc.
Botanic Gardens.
Singapore.

Dear Ridley,

In making the following estimate of the c of running your proposed pumping plant,I assume that your requirements per day,during sixty days of drought in the year,will be : -

Supplied from high level tank . . . . 3000 Gallons

Supplied from stand pipes . . . . . 600 "

After making ample allowance for obstructions in delivery piping and so forth I find that the pumping set recommended by Howarth,Erskine (which consists of a powerf force pump geared to a two horse-power oil engine) is easil capable of delivering 600 gallons an hour to the height you mentioned - 30 feet. The plant would therefore be running for 360 hours only and the detailed cost per annum would be as follows : -

a. Tank Kerosine Oil,90 gallons at 27 cts. . .	$24.30
b. Attendant's wages at the rate of 30 cts per diem . . .	12.00
c. Waste,lubricating oil and sundries	10.00
d. Repairs and renewals,say 5 per cent on the capital outlay of $2500	125.00

A total of $171.30 a year.

It is obvious that item "d" is absurdly over-estimated for the number of hours running and I have no doubt that H Howarth,Erskine would be prepared to guarantee to supply any necessary renewals and keep the plant in thorough working

B1 4/2/04

order for half the amount, or less.

There would be absolutely no necessity to employ a man with any special qualifications as an engine attendant, one of the Gardens coolies would acquire sufficient knowledge in a week to start and stop the plant and no attention at all is necessary during a six hours run.

The amount of kerosine oil required would actually be rather less than 90 gallons and the price at present is $2.10 per case of eight gallons or rather less than the figure I mention.

As for item "c", I would only mention that you could easily purchase sufficient waste and lubricating oil for the whole year (360 hours) for less than a quarter the sum allowed.

I hope this will be of some use to you. It seems really ridiculous to carry on with the present carting system when so much more could be done with the money.

Yours sincerely,

C. P. Thomas

No Minutes should be written on this page. A separate half-sheet to be used if required.

Gardens 36

(D 3)

From Whom ...	D of Gardens
Place	&
Date	7-6-07 233/07

Regarding the water Supply at the Botanic Gardens.

Requests authority to incur an Expenditure not Exceeding £5,000 in providing a Suitable installation

Former Papers. | MINUTES. | Final Paper.

D. of G

There is not only the Capital cost but also the annual up-Keep to Consider

A proper Estimate of the Cost and annual up-Keep & how the Latter is to be met should be stated.

S/d. A. Young 12/6/07

Hon C.S.

I have Seen the Supt. of Works & Survey about this. He is preparing a detailed Estimate which I will Submit when ready.

S/d W. F. 19/6/07

Treasurer,

Is there any objection to Carrying out this work from Sale of Rubber receipts.

S/d A. Young
11th July 07

C.S.

Rubber receipts go to the Gardens Committee. It is for them to decide whether this work should be paid for out of this money S/d J.O.A 13-7-07

31.02/27

D of G

What does the Committee say.

Sd A. Young 18.7.07

D of Gardens
Treasurer
Auditor General
To note

Sd A.H. L. 22/7/07

Hon S.

The Committee Concurs. We had a meeting on Monday Evening last. When I submitted the Estimate of the P. W. D. They were of opinion that when authority is granted to incur the necessary Expenditure, public tenders should be called for to do the work.

Sd W. J. 17.7.07

Hon S.

Noted

Sd W. J. 23.7.07

Graph

But did they recommend that the cost should be met from Rubber receipts.

Sd. A Young 18/7/07

Hon S.

Yes. They have agreed all along. but to make sure that they recommend it I sent round a circular which I enclose

Sd W. J. 20.7.07

Y. S.

The £5000 may be Expended and met from Rubber receipts.

Sd A. Young
22nd July 07

Sd

J. a.

[illegible]

(2,000—7/06.) (Misc. 56)

No:-233/07

Botanic Gardens, Singapore,

STRAITS SETTLEMENTS.

7th June 1907, 190

Sir,

Gardens 3500/04
Muncl.8288/04
Muncl.9173/04
C.S. 9589/05
Gardens 716/06
Gardens.3519/06
Gardens.2184/07

With reference to Correspondence noted in the margin regarding the water supply at the Botanic Gardens I have the honour to ask for authority to incur an expenditure not exceeding $5,000 in providing for this purpose a suitable installation

2.- The question is not a new one .It has cropped up at different times as long as I have been connected with the gardens,and has always been dropped for want of funds.The necessity of dealing with the question becomes more urgent as time goes on,partly by reason of the ~~greatest~~ increasing accumulation of the collections of pot plants, partly by the supply of water that was formerly drawn from a well near the plant Houses having been cut off, and lastly by the prolonged droughts experienced lately.

3.- The present system of ~~handling~~ hauling water from the lake by bullock carts is a costly ,obsolete and inadequate one and requires only to be mentioned to be condemned.

4.- Since I have been in charge the question has forced itself on my attention and I have gone thoroughly into the matter,I have spoken to several Engineers on the subject and Mr.Peirce the Municipal Engineer was good enough to send the

The Hon'ble

The Colonial Secretary S.S.

This is a technical matter and I hesitate to give an opinion as to which is the best pump for our requirements.

I would like to see tenders submitted for Mr. Fraser and to be guided by his opinion.

[illegible]
23/8/07

I am in favour of a Ram pump to get the required head of water and also approve suggestion of 6,000 gallon Water tower. 15 ft. high. But as this was not specified for by the Committee. I think it only fair that the other tenderers should have an opportunity of quoting with these alterations.

[illegible]
24. 8. 07.

B142/29

(2,000—7/06.)

Botanic Gardens, Singapore,

STRAITS SETTLEMENTS.

23rd. August 1907, 190 .

TENDER FOR SUPPLYING AND ERECTING A WATER INSTALLATION AT THE BOTANIC GARDENS-SINGAPORE.

1.- The Borneo Coy.....$3,561-12

2.- Riley Hargreave's $3,850-00

3.- Howarth Erskine $3,800-00

Gentlemen,

The last named firm suggest having a steel tank of 5,000 gallons capacity raised 15 feet on steel tower to get a sufficient head or pressure for this they require an additional sum of $450- bringing up their tender to $4,250. This is an important point as it is not much use having a storage tank without pressure. As regards the Engine and pump I have consulted Mr. Pierce and Mr. Coveny and they both condemn a centrifugal pump for our purpose. It seems to rest between the 2nd and 3rd tenders, and from the pains they have taken in trying to meet our requirements I think we cannot do better than accept Messrs. Howarth Erskine's tender .

Will the Committee be good enough to vote for one or the other.

The Borneo Coy. Riley Hargreave's. H. Erskine

Hon. W. J. Napier

Hon. J. O. Anthonisz

W. E. Hooper Esq,

P. T. Evatt Esq,

St. V. B. Down Esq,

P. T. Evatt

H. Ridley

as Director of Gardens

Registered Telegraphic Address.
"BORNEO, SINGAPORE."

Borneo Company, Limited.

Singapore, 6th August, *1907.*

Sir,

WATER INSTALLATION AT BOTANIC GARDENS.

We have the honour to hand you enclosed Specification of Plant and Materials to be supplied and erected at the Botanic Gardens Singapore.

Our inclusive quotation for the Plant, Materials and work is $3,561.12 (Dollars three thousand five hundred and sixty one and cents twelve).

We have the honour to be

Sir,

Your obedient servants,

THE BORNEO COMPANY, LIMITED.

W. Fox, Esq.,

Acting Director of Gardens,

S i n g a p o r e.

SPECIFICATION FOR A WATER SERVICE INSTALLATION.

at

THE SINGAPORE BOTANICAL GARDENS.

OIL ENGINE & CENTRIFUGAL PUMP.

An Oil Engine 2½ H.P. coupled direct to a 3" Centrifugal Gwynne's Pump, of 150 Gallons per Minute capacity, at 550 Revolutions per minute, against a 20 ft head as per sketch, the Engine and Pump to be fixed over the existing well near the Lake, having a two way Cock on the Suction Pipe one branch leading into the well the other into the Lake thus enabling to Pump from either the Well or Lake.

SUCTION PIPES.

The Suction Pipe to the Lake to be a 3" Galvanised Iron Pipe laid under the road way between the Well and Lake, having a Large Rose and Strum Box fitted to keep weeds and grass from being drawn up by the Pump. The Suction Pipe to the well will also have a Rose and Strum Box fitted.

TWO WAY COCK.

The Two way Cock to be of C.I. with a Brass plug Cock properly marked so that Man in charge can see from which Suction the Pump is drawing water.

ENGINE HOUSE.

A suitable Engine House to be erected over the Engine and Pump about 15' x 12' x 8".

STORAGE TANK.

The Storage Tank to be built of Brick and Cement, dimensions 16' x 16' x 6'6" deep, capable of holding 10,000, Gallons of /

of water, the Tank to be covered in with 2" planking, having a Draw off Cock fitted to Distribution Pipe.

DISCHARGE PIPE. The Discharge Pipe from the Pump to the Storage Tank to be 1½" Galvanized Iron, to be laid below the ground surface, in as direct a line as possible, Approx length 2,000 ft.

DISTRIBUTION PIPING. The water to be Distributed from the Storage Tank through a 1" Galvanized Iron Pipe, to where required, Approx. length 2,000 ft.

STAND PIPE. Approx. number required 10, made of C.I. placed at Convenient Distances apart along the line of Distribution Piping, having a Bib Cock on one side, and a Plug Cock and Hose Connection, without caps, on the other side, thus enabling Watering by hose or Bucket as may be desired.

GENERAL. The whole of the workmanship and material to be of the best possible, all excavation work to be smoothed over after all joints along the lines of piping have been inspected and found tight.

TIME. The approximate time required to complete the whole of the work to be about 3 months from the date of order.

GUARANTEE. The Contractor will hand over the whole plant to the Authorities after having run same for one month after completion.

for THE BORNEO COMPANY, LIMITED.

J. C. Wrefman

Riley, Hargreaves & Co., Ltd.

CIVIL, MECHANICAL & ELECTRICAL ENGINEERS,
SHIPBUILDERS,
IRON AND BRASS FOUNDERS
AND
GENERAL CONTRACTORS.

Telegraphic Address:
"HARGREAVES," SINGAPORE.

CODES USED;
A. B. C. 4th & 5th Editions, A. I., Engineering,
Lieber's and Private.

A.F./R. **SINGAPORE,** 7th August, **1907.**

The Ag. Chairman Gardens Committee,

Singapore.

-:-:-:-:-

Dear Sir,

Botanic Gardens Water Supply.

In answer to your esteemed enquiry of the 25th July re above, we beg to give you the following quotation:-

(1). For building a brick and cement water tank capable of holding 10,000 gallons, covered with a suitable covering.

(2). Supplying and erecting a "Samson" Pumping Plant; this plant is an Oil Engine and Single Ram Pump combined, which has a capacity of 750 gallons per hour and designed to work against any head up to 150 feet. Makers The Campbell Gas Engine Co., Ltd., Halifax, England.

(3). Supplying and laying 2,000 feet of 2" Galvd. discharge piping to suit the above pump.

(4). Supplying and laying 1,200 feet of 1" Galvd. discharge piping.

(5). Six ornamental C. I. Stand Posts with taps and connections for hose.

(6). To connect well with lake in such a way that water level in well cannot fall below that in lake. Pump to draw from either.

7th August, 1907.

7th August, 1907.

No. 2.

(7). Engine and Pump to be fixed over well and covered in with a suitable covering.

Our price for this would be Dollars THREE THOUSAND EIGHT HUNDRED & FIFTY ONLY $3850.00

In this price we have allowed 34½ Cents per foot for 2" Galvd. pipe, and 17¼ Cents per foot for 1" pipe, laid complete.

The whole job would be carried out as per your instructions and finished to your complete satisfaction.

Hoping to be favoured with your esteemed order, which would receive our best attention,

We are, Dear Sir,

Yours faithfully,

MANAGER.

7th August, 1907.

the Engineer in charge of the pumping station to give me his ideas on the subject I have also read through the papers and Estimates by the Public Work Department, Messrs. Howarth Erskine, Messrs. Riley Hargreaves and Messrs. Hogan & Co. The Estimates range from $7,400 to about $3,000, so that in asking for authority for $5,000 the best parts of each Scheme can be selected.

5.- The money that is to pay for this I would respectfully beg leave to take from the proceeds of our rubber sales. I have at present a credit balance of $5,400 which will be increased to nearly $7,000 in about two months when the next sale of rubber takes place, and as the monthly expenditure is only about $100 it will be seen that there is plenty of money to do the work at once.

I have the honour to be

Sir,

Your obedient servant

H. F.

Ag. Director of Gardens S.S.

The Hon'ble

The Colonial Secretary S.S.

Singapore.

No Minutes should be written on this page. A separate half-sheet to be used if required.

Tenders for supplying and erecting a water Installation at the Botanic Gardens

	£	cts
1. The Borneo Co:	3561	12
2 Riley Hargreaves	3850	—
3 Howard Erskine	3840	—

The last named firm suggest having a ~~steel~~ steel tank of 5000 gallons capacity ~~require~~ raised 15 feet on steel pillars to get a sufficient head or pressure for this they require and additional £450 - bringing up their tender to £ 4290

steel

Tower

not much use having a ~~tank~~ storage tank without pressure

This is an important point. As regards the engines and pumps I have consulted Mr. Pierce & Mr Corney - & they both condemn a Centrifugal pump for our purpose. It seems to rest between the 2nd & 3rd tenders - and from the pains they have taken in trying to meet our requirements I think we cannot do better than accept Messrs Howard Erskine's tender -

Will the Committee be good enough to vote for one or the other.

1 Messrs Howard & Erskine
2 " Riley Hargreaves
3 " The Borneo Co.

Dorsit House

Scotland Road

Penang, 18th May 1907

Dear Mr. Fox,

The system of pumping water at the Crag is by a combined Oil Engine and double plunge pump of two horse power. A tank at the top close to the hotel holding about 6 tons of water and a reservoir at the bottom below the pump holding about the same. An iron suction pipe from the pump to the bottom of the reservoir about 15 feet in length. From the pump to the tank on top 2½" iron piping, 720 feet in length, and the actual height 300 feet as per sketch inclosed.

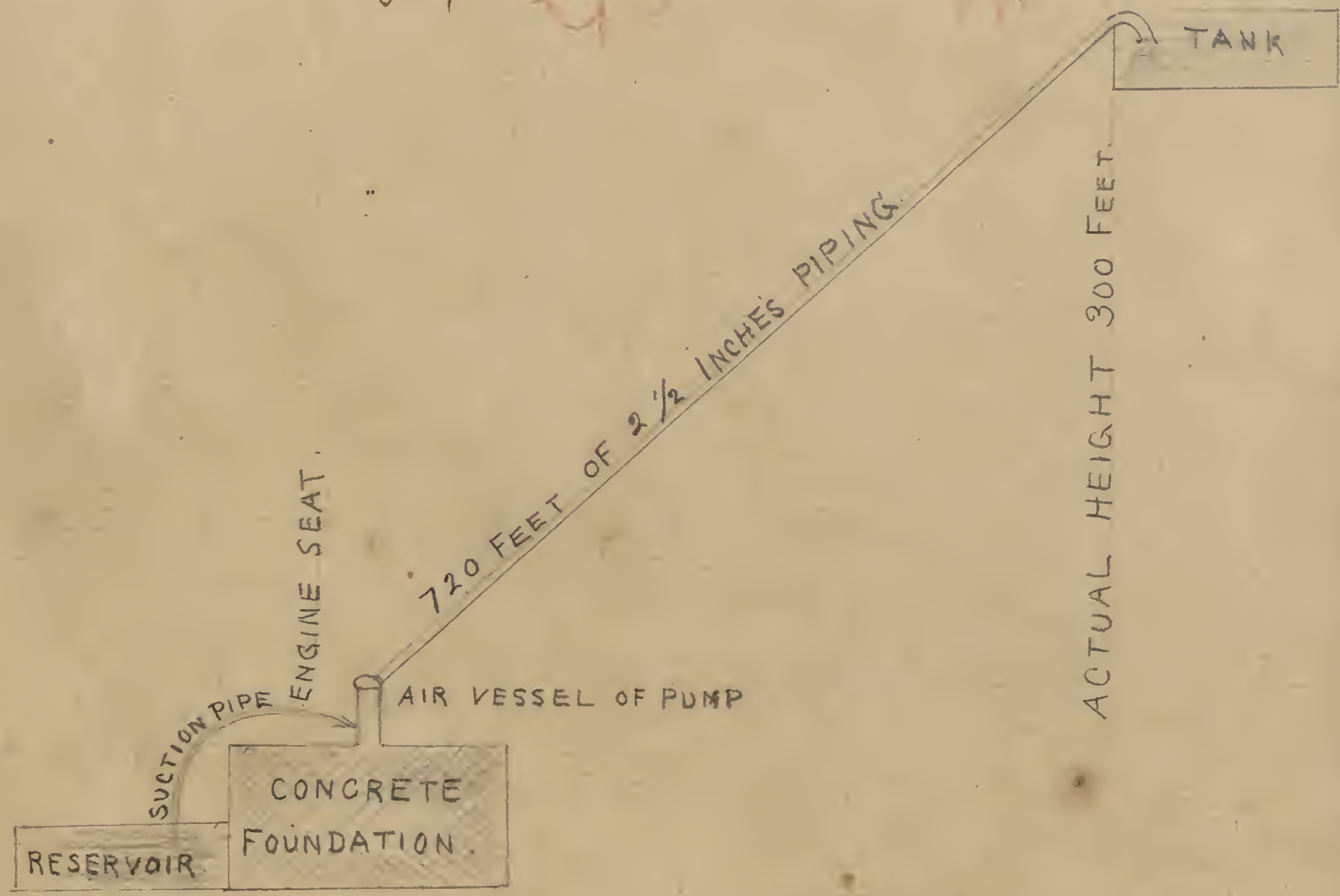
I really forgot the number of gallons per hour but it took from 2½ to 3 hours to fill the top tank and an average of 3 hours working per day, used 5 tins of Langat Oil per month and driven by one of the Kaboons. The cost of the Engine and pump £112 F.O.B. the piping extra. It has been a great success working now 4½ years with only few repairs.

The name of the Engine, Hallifex, I got it through Messrs. Alexander Young & Co, No. 8 Leadonhall Street London. These particulars are from memory and I have no books or papers with me.

With kind regards

Yours sincerly

Sd. F. Ker


TANK
ACTUAL HEIGHT 300 FEET.
720 FEET OF 2 1/2 INCHES PIPING.
ENGINE SEAT.
AIR VESSEL OF PUMP
SUCTION PIPE
CONCRETE FOUNDATION.
RESERVOIR

Copy/

Gardens Notes 1907

Office of Colonial Engineer &
Surveyor General, Straits Settlements.
Singapore, 6th July 1907.

No:-134/06

Dear Mr. Fox

The estimated cost of providing A Water Supply to the Botanical Gardens as per your requirements is $6,800. This includes a service reservoir to contain 10,000 gallons to be built next your house, an oil engine and force pump capable of lifting at least 2,000 galls in 6 hours, pumping main, an Engine House, (temporary) for same, distributing mains to Plant Sheds and Monkey House with a dozen stand-pipes, and enlarging the Well next the pond from 4'9" in diameter and 8' deep to 10' in diameter and 25' deep,

If the service reservoir could be built next the Band Stand the cost would be reduced to $5,000.

Yours faithfully

sd. H. V. Towner

B1 42/42

...ying ... amount demanded ... separate receipt from Cashier. No receipt will be recognised unless it bear... ... Manager, Director or Secretary. All Cheques to be crossed, and payable to order.

2/08

Dr. to Howarth Erskine, Limited.

Bill No. 1184 J. **THE COLONIAL GOVERNMENT OF THE STRAITS SETTLEMENTS**

Date of Supply.	Nature of Service.	Amount. $	
	Vide Sanction 3577/1909		
	The Botanical Garden		
	per Walter Fox Esq.,		
	acting Director.		
Jany	To Supply and erection of 2 H.P. Combined pump and Oil Engine gear driven with suctions to well & lake with strainers and footvalves. Supply & erection of a corrugated shed over engine, also 1 steel tank of 5000 Gallon capacity with tower 15 feet high. Supply & erection of six stand pipes as per Contract	2850	00
	2080 feet of delivery piping from Pump to Tank with two brass Non Pattern Valve as quoted 40c. per foot for 1½"	832	00
	Two Non return Valves	26	0
	Price extra allowed for fitting 2 & 1¾ instead of 1½	50	
	2188 feet of 1½" Supply pipe to Garden	756	
	3 Extra Stand Pipe with 1" piping ¼ Cocks supplied	189	
	1 Hose Reel complete with 150' of Delivering Hose, 1 Nozzle & Sprays	195	00
		$ 4898	
	Part payment on the above	$ 4000	

E. & O. E.

HOWARTH ERSKINE, LTD.
Hamberger
ACTING SECRETARY.

When payments are made by Public Officers for Petty Expenses for which it is not practicable to obtain Under-Receipts, the following certificate must be signed by such Officers.

I certify that the charges marked thus*, amounting to $..... have been actually incurred and PAID by me,

* Witness to the ... ments made in my presence.

...reby certify that the above service has been duly performed, and that the pric... are according to the Contract & fair & Reasonable. H. N. Ridley Director of Ga...

Received from the Director of Gardens S.S. the sum of

Treasurer.

HOWARTH ERSKINE, LIMITED.

Fraser & Neave, Limited, Printers, Singapore.—8922-07.

HOWARTH ERSKINE, Limited.

No. 8901

$ 4000 00

HEAD OFFICE,

Singapore, 30th January 1908.

Received from Colonial Government, Botanical Gardens

the sum of Dollars Four thousand only

in payment of Bill No. 1184 J. to a/c.

HOWARTH ERSKINE, Limited.

Secretary.

Acta

HOWARTH ERSKINE, LIMITED.

Fraser & Neave, Limited, Printers, Singapore.—1922-07.

HOWARTH ERSKINE, Limited.

No. 8472

$ 898 =

HEAD OFFICE,

Singapore, 11th April 1908

Received from The Botanical Garden

the sum of Dollars Eight hundred & ninety eight

only

in payment of Bill No.

HOWARTH ERSKINE, Limited.

Secretary.

81 42/46A

Dr. to Howarth Erskine, Limited.

Bill No..... **THE COLONIAL GOVERNMENT OF THE STRAITS SETTLEMENTS**

Date of Supply.	Nature of Service.	Amount. $	c.
	THE BOTANICAL GARDEN per Walter Fox Esq., Acting Director		
Jany	To Supply & erection of 2 H.P. Combined Pump and Oil Engine Gear Driven with Suction to Well & Lake with Strainers and Footvalves. Supply and Erection of a Corrugated Shed over Engine, also One Steel Tank of 5000 Gallon Capacity with Tower 15 feet high. Supply & Erection of 6 Stand Pipes as per Contract	2850	00
	2080 feet. of Delivery Piping from Pump to Tank with two Brass Non Pattern Valve as quoted 40 c. per foot for 1½"	832	00
	Two Non return Valves	26	00
	Price Extra allowed for fitting 2 & 1½ instead of 1½	50	00
	2188 feet of 1½" Supply Pipe to Garden	755	00
	3 Extra Stand Pipe with 1" Piping & Cocks supplied	189	00
	1 Hose Reel complete with 150' of Delivery Hose 1 Nozzle & Sprays	195	00
		$ 4898	00
	Received on 30/1/08 The Sum of	4000	00
	BALANCE DUE	$ 898	00

E. & O. E.

HOWARTH ERSKINE, LTD.

Thos. D. Canning

When payments are made by Public Officers for Petty Expenses for which it is not practicable to obtain Under-Receipts, the following Certificate must be signed by such Officers.

I certify that the charges marked thus*, amounting to $ ..... have been actually incurred and PAID by me.

WITNESS to the above marks and its made in my presence.

I hereby certify that the above service has been duly performed, and that the prices charged are according to the Contract

A. W. Hedley
Director of Gardens

Received from the Director of Gardens,

Treasurer, ... the sum of Dollars Eight hundred & ninety eight only

above Serv...

Town Store
SINGAPORE

HOWARTH ERSKINE, LIMITED.

Fraser & Neave, Limited, Printers, Singapore.—3022-07.

HOWARTH ERSKINE, Limited.

No. 8463

$129.23

HEAD OFFICE,

Singapore, 25 March 1908.

Received from Botanical Gardens

the sum of Dollars One hundred & twenty nine & cents twenty three only.

in payment of Bill No. 1427 J.

HOWARTH ERSKINE, Limited.

Collector.

Secretary.

B1 42/.5A

AITS S

Date of Supply.		NATURE OF SERVICE.	
		Botanical Gardens	
		O/N.3302	
08 Feby	To	One Tell tale for Tank as quoted	
	3194.	Supplying Erecting & Connecting 36 ft. of pipes as, Drain from Tank Well to Lake	65
	2867.	25 lbs. Wire Nails	1
	3492.	200 lbs. Carriage Bolts & Nuts 2"x $\frac{3}{8}$"	
		36 " ditto $2\frac{1}{2}$"x $\frac{3}{8}$" - 34 lbs. at 22c. per lb.	
	3872.	6 Road Stampers with Handles at 2.50 ea.	1
			$ 129

E. & O. E.

HOWARTH ERSKINE, L[illegible]

Secretary.

When payments are made by Public Officers for Petty Expenses for which it is not practicable to obtain Under-Receipts, the following Certificate must be signed by such Officers.

I certify that the charges marked thus*, ..., have been amounting to $ ..... actually incurred and PAID by me.

B/42/45

payments made in my presence.

I hereby certify that the above service has been duly performed, and that the prices charged are fair & reasonable

H. N. Ridley
Director of Gardens

Received from the Director of Gardens S.S.

~~Treasurer~~ the sum of Doll

One hundred & twenty nine cents - twenty three only

for the above Service, which I certify has been duly performed.

Singapore
25th March 1909.

[NOTE—No signature should b
here until payment has been actually

TELEGRAMS, ERSKINE.

A.1., STEVENS ENGINEERING,
LIEBERS, WESTERN UNION,
A.B.C. 4TH & 5TH EDITIONS,
& PRIVATE CODES USED

AND AT
RANGOON, PENANG, IPOH,
KUALA LUMPOR, BANGKOK,
& CANTON

LONDON OFFICE,
3, LLOYDS AVENUE.

HOWARTH ERSKINE, LIMITED

ENGINEERS, IRON FOUNDERS & CONTRACTORS.

Dict.J.L.H./F.D.M. Singapore August 7th. 1907

B.No.1½

Walter Fox Esqre.,

Acting Chairman Gardens Committee.

Botanical Gardens.

Singapore.

Dear Sir,

In reply to your esteemed enquiry for cost of supplying Water Installation in Botanical Gardens as per your Specification, we have much pleasure in quoting for same and also alternative schemes as discussed with your goodself.

TENDER NO.1 - Widening and enlarging well as per specification, supplying & erecting a 2 H.P.Hornsby Combined Oil Engine and Gear driven plunger pump on common bedplate including necessary foundations. Erecting a Corrugated iron shed over Engine, and pump. Building a brick and Cement tank in ground as shewn on our plan No.6200. marked "Alternative Design" with timber cover ; Supply and erection of Six (6) Standpipes at various points consisting of a Galvanized Tee and Upright pipe with Elbow and Brass cock arranged to take a hose connection and the whole clamped to a Vertical Steel Upright driven into ground.

Price for above Dollars Three thousand five hundred ($ 3,500:00) only.

1.42/46

Piping 1½" Galvanized @ forty (40 cts) cents per foot run laid in position.

" 1" -do- @ thirty (30 cts) -do- -do- -do-

With regard to above tender we would suggest ; Instead of enlarging well which is a most expensive operation and almost impossible to estimate closely upon, in view of its close proximity to the lake, that it be only cleaned out and that the suction pipe from pump be carried into it and a branch from same carried to lake so that if well should run dry a supply could always be got direct from lake.

With this alteration a reduction of Dollars One thousand one hundred ($ 1,100:00) could be made on Tender No.1 .

TENDER NO.2 - As there will be practically no head of water with tank as in tender No.1 and therefore no pressure of water at level of walk round Band Stand, we propose if a 10,000 gallon capacity tank must be adhered to, that a re-inforced concrete tank as shewn on Plan No.6200 marked "Proposed Design" be built on the surface of the ground thereby giving a head of roughly 8 feet when tank is full.

Extra price on Tender No.1 for this type of tank will be Dollars Two hundred and ninety ($ 290 : 00) only.

TENDER NO.3 - To make effective use of a Sprayer on hose pipe we think that at least 20 feet head will be necessary at highest point and therefore propose a steel tank of 5,000 gallons capacity placed on a Steel Tower 15 feet high to design as shewn on Plan No.6199.

The additional price for this type of tank to Tender No.1 would be Dollars Four hundred and fifty ($ 450 : 00) only.

The following is a summary of all above tenders :-

Well enlarged.	TENDER NO.1	Well not enlarged.
$ 3,500:00		$ 2,400:00
	TENDER NO.2	
$ 3,790:00		$ 2,690:00
	TENDER NO.3	
$ 3,950:00		$ 2,350:00

All piping 1½" Galvanized full lengths per foot run laid. = 40 cts.

-do- 1" -do- -do- -do- = 30 cts.

We trust that our additional proposals may be of service to you and hope that you may be able to place the order with us.

We are, dear Sir,

Yours faithfully,

HOWARTH ERSKINE LIMITED.

J. S. Crawford

p.p. ACTING SECRETARY.

B142/48

No. 366/07 Ag. Director

Copy

(G 39)

MEMORANDUM.

From BOTANIC GARDENS, SINGAPORE.

3rd Sept 1907.

To Messrs. H. Lorkine & Co Singapore

Dear Sirs,

I have much pleasure in informing You that Your tender No. 3 (i.e. with the Steel tank) has been accepted and to ask You to put the work in hand at once.

Yours faithfully

Sd Walter Fox

B1.42/49

TELEGRAMS, ERSKINE.

A. STEVENS ENGINEERING,
LIEBERS, WESTERN UNION,
A.B.C 4TH & 5TH EDITIONS,
& PRIVATE CODES USED.

AND AT
RANGOON PENANG, IPOH,
KUALA LUMPOR, BANGKOK,
& CANTON.

LONDON OFFICE,
3, LLOYDS AVENUE.

HOWARTH ERSKINE, LIMITED

ENGINEERS, IRON FOUNDERS & CONTRACTORS.

Singapore

Dict.J.L.H./F.D.M. September 5th. 1907

B.No .1

Ans 375/07 9/9/07

Walter Fox Esqre.,

Acting Director.

Botanical Gardens.

Dear Sir,

We beg to thank you for your esteemed favour accepting our tender for Water Supply Scheme for Botanical Gardens and beg to confirm same as follows :-

Supply and erection of a 2 H.P.Hornsby Oil Engine and Gear Driven Plunger Pump on Common Bed plate with Suction pipe laid to well and lake. Each suction with strum box.

Supply and erection of a corrugated iron shed over Engine.

Supply and erection of 5,000 gallon steel tank erected on a Steel Tower 15 feet high & including foundations.

Supply and erection of 6 stand pipes as before described.

All for the sum of Dollars Two thousand eight hundred & fifty.

($ 2,850 : 00) .

Piping 1½" Galvd in full lengths laid @ 40 cents per foot.

" 1" " -do- @ 30 -do-

Regarding our conversation about using different sizes of pipes on discharge side of pump ; The delivery opening on pump being 2" the best arrangement would be a 2" pipe all the way but as

B1 42/150

this ~~tx~~ would be expensive we recommend instead - 2" piping @ 62 cts per foot laid for first third of the total length and 1¾" @ 50 cents per foot laid for second third of length and 1½" to finish to tank.

We have put the whole work in hand for quickest delivery and hope to complete in about 3½ to 4 months from date.

We would be glad to have your final instructions as to piping as soon as possible so that we may put this in hand also.

Again thanking you for your esteemed order.

We are, dear Sir,

Yours faithfully,

HOWARTH ERSKINE LIMITED.

ACTING SECRETARY.

No. 375

Copy

(G 39)

Ag. Director

MEMORANDUM.

From Singapore

9th Sept 1908

To Messrs. N. Erskine & Co Singapore

Dear Sirs,

I have to acknowledge your letter of the 5th inst. and confirm your quotations for the supply & erection of our Water installation as therein set forth. With reference to my conversation with you regarding the size of pipe leading directly from Engine I should be glad if you would put a two inch pipe for a short distance - but not to make the additional expense for this purpose exceed fifty dollars.

Yours faithfully

S. W. Fore

No. 419/07

Copy

(G 39)

MEMORANDUM.

From Ag. Director BOTANIC GARDENS, SINGAPORE.

To Messrs. A. Lostune & Co Singapore

19th Oct 1907.

Dear Sirs,

With reference to the Water Installation you are erecting for us. I should be glad if you would quote me a price for the hose & reel I wish to use in connection with the scheme. The reel should be of india rubber - strong and made to fit the one inch delivery pipe. Length about one hundred & fifty feet - also a nozzle & sprayer for same. The reel should be on wheels.

Yours faithfully

Sd N. Cox

N.B. would the hose be in sections??

TELEGRAMS, ERSKINE

A.I., STEVENS ENGINEERING, LIEBERS, WESTERN UNION A.B.C. 4TH & 5TH EDITIONS, & PRIVATE CODES USED

AND AT
RANGOON, PENANG, IPOH, KUALA LUMPOR, BANGKOK, & CANTON

LONDON OFFICE,
3, LLOYDS AVENUE

HOWARTH ERSKINE, LIMITED

ENGINEERS, IRON FOUNDERS & CONTRACTORS.

Dict.J.L.H./F.D.M. Singapore October 19th. 1907

B.No.1½

Ordered 20431 24.10. N.T.

W. Fox Esqre.,

Acting Director Botanical Gardens.

Singapore.

Dear Sir,

In reply to your esteemed enquiry - we have much pleasure in handing you herewith Blue Print shewing Hose Reels. This machine consists of a strong carriage on which is mounted a reel having a hollow axis connected with the outside of the drum by means of a short pipe, to which one end of the hose is attached. The other end is coupled to a standpost or hydrant and as the machine is drawn forward, the water passing round the reel to the axis is distributed by means of a short length oh hose, as shown in Blue Print. An improved chain gear arrangement is fitted for winding up the hose after use.

When required the branch pipe is detached and affixed to the other end of the hose, which is then run off, as with the ordinary hose reel, while the end to which the branch-pipe was attached is fastened to the hydrant or water-post .

Price to be Dollars One hundred & ninety five ($ 195:00) complete with 150 ft. delivery hose , 1 nozzle and 1 sprayer.

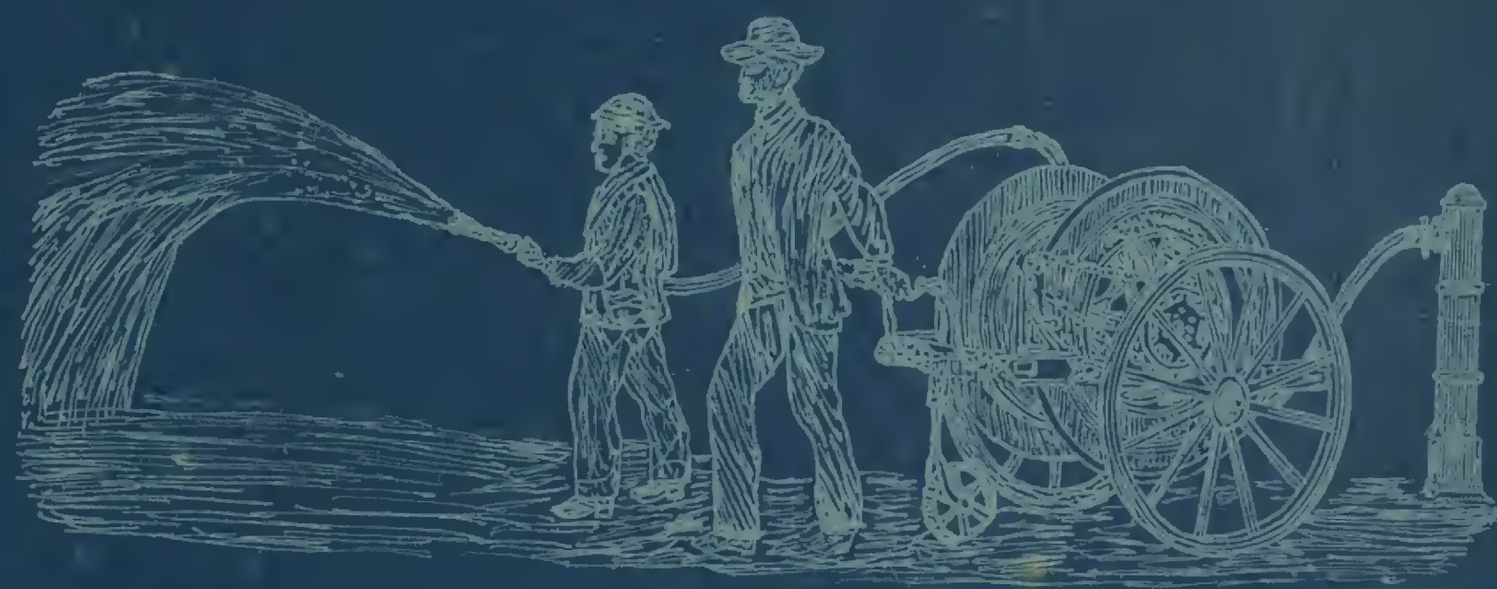
Hoping to be favoured with your esteemed order.

Yours faithfully,
HOWARTH ERSKINE LIMITED.

William Fraser

ACTING SECRETARY.

B1.42|54



ROAD-WATERING AND GARDEN HOSE REELS.

WES[illegible] UNION,
C 4TH & 5TH EDITIONS,
PRIVATE CODES USED.

AND AT
RANGOON, PENANG, IPOH,
KUALA LUMPOR, BANGKOK,
& CANTON

LONDON OFFICE,
3, LLOYDS AVENUE.

HOWARTH ERSKINE

ENGINEERS, IRON FOUNDERS & CONTRACTORS.

Dict.J.L.H./F.D.M. Singapore October 26th. 1907.

B.No.1

W. Fox Esqre.,

Acting Director Botanical Gardens.

Singapore.

Dear Sir,

We beg to thank you for your esteemed order of yesterday's date confirming your verbal acceptance of our tender for the supply of a Hose and Reel for the sum of $ 195:00.

This is now in hand and we will ~~ke~~ expedite delivery as early as possible.

We are, Dear Sir,

Yours faithfully,

HOWARTH ERSKINE LIMITED.

J. S. Crockford