

SANITATION.

JULY.

File No. ^S of 1913.
63

Nos. 1-4.

Establishment of a Vaccine Depot at Namkum in Ranchi.

LIST OF PAPERS.

No.	PAGE
1. From the Officiating Sanitary Commissioner, Bihar and Orissa, No. 2979, dated the 4 th November 1912, forwarding plans and estimates of the above scheme for administrative approval.	1
2. From the Sanitary Commissioner, Bihar and Orissa, No. 1501, dated the 14th March 1913, forwarding revised plan and estimate for administrative approval.	1
A.—Enclosure to No. 2—	
The plan	2
B.—Enclosure to No. 2—	
The estimate	2
C.—Enclosure to No. 2—	
A note in the estimates of the Vaccine Depot by Colonel Hare.	2
3. To the Sanitary Commissioner, Bihar and Orissa, No. 4340M., dated the 29th April 1913, conveying administrative approval to the above scheme, at a cost of Rs 1,44,250.	9
4. To the Public Works Department of this Government, No. 4341M., dated the 29th April 1913, forwarding copy of the above, together with the plan and estimate in original.	9

NOTES.
MUNICIPAL DEPARTMENT.

SANITATION. 2

S
File No. — of 1913.
63

Establishment of a Vaccine Depot at Namkum in Ranchi.

Education Department—

Sanitary Commissioner is working out a proposal to locate a Vaccine Depot for the province near Ranchi and finds that the site originally chosen for the Engineering College is extremely suitable for the purpose. Could the Education Department say if this land is likely to be required for the College or any other purpose now?

E. L. TANNER—2-8-1912.

Probably the Civil Engineering College will not come to Ranchi. In this connection kindly see Sir W. Duke's note,* dated 19th December 1911. We have not received a copy of the proceedings of the committee appointed by the Government of Bengal to consider the question amongst others of the advisability of removing the Civil Engineering College to Ranchi.

*In file $\frac{1-T}{1}$ of 1912, A., January, Nos. 33-36.

H. D. G.—5-8-1912.

Kailas—5-8-1912.

Under-Secretary—

Papers about the disposal of the site acquired for the Calcutta Free School are submitted below.

In this connection kindly see a cutting from the *Statesman* of 7th August 1912. Probably the Civil Engineering College will be removed to Dacca. In any case, the land acquired at Ranchi for the Civil Engineering College will not be required for the purpose for which it was acquired.

H. D. G.—8-8-1912.

Kailas—8-8-1912.

Chief Secretary—

Please see the above. We can take it for granted that the site will not be wanted for the Calcutta Engineering School and we ourselves, I suppose, will develop the Bihar Engineering College, on the other hand, the site in question is far too fine for the purpose suggested (Chief Secretary will have seen it from the railway) and I do not think should be handed over permanently to the Medical Department, for a Vaccine Depot for which any sort of place would do. It is true the Education Department has no immediate use for the site, but if Ranchi becomes the permanent hot weather station, it is likely to be required before long. However, we may reply to Financial Secretary's query in the negative.

B. A. COLLINS—11-8-1912.

We may reply—say that the land will not be required for an Engineering College.

The disposal of the sites which have been acquired for different purposes will no doubt form the subject of full discussion later on, and I do not think we should claim any sites on the ground that they were originally acquired for educational purposes.

H. LEMESURIER—13-8-1912.

Hon'ble Mr. Gait—

The Sanitary Commissioner has enquired whether the site originally acquired for the Ranchi Engineering College could be made over to him for the purposes of a Vaccine Depot. The Education Department, in their notes above, say that it can be safely said that the land will not be required for an Engineering College. I am not sure whether this is sufficient basis on which to give a reply to Colonel Hare. He wants to get out his proposals for a vaccine depot as soon as possible and these will, of course, depend on the particular site selected, and if possible, we do not want to give him unnecessary trouble in drawing up estimates which may subsequently have to be revised, because the site anticipated cannot be given. There are, I think,

other objects for which sites are wanted near Ranchi, for instance, the Director of Agriculture wants a site for an experimental farm and it may be well if before definitely allotting this site the claims of all schemes requiring land near Ranchi were considered with reference to this site and other Government sites in the neighbourhood.

E. L. TANNER—20-8-1912.

E. A. GAIT—21-8-1912.

The case should go to Revenue Department to ascertain if there are any other claimants for this particular site among the Heads of Departments subordinate to them.

E. L. TANNER—21-8-1912.

Under-Secretary (through Section A.)—

As desired, we may ask the Director of Agriculture and the other Heads of Departments subordinate to the Revenue Department if they would require the site in question.

R. K. R.—23-8-1912.

(This may be done demi-officially separately, the Financial Department file being returned and that Department being informed of the action which we are taking).

S. N. R.—24-8-1912.

I have spoken to Director of Land Records who does not require the site. Issue demi-officials to the Director of Agriculture and other Heads of Departments. There is no use in returning the file until we have received their replies.

T. W. BRIDGE—25-8-1912.

Under-Secretary—

Draft submitted for favour of approval.

S. N. R.—31-8-1912.

T. W. BRIDGE—1-9-1912.

विह D.-O. No. $\frac{3427-30R(B)}{III-B-69}$.

RANCHI :

The 5th September 1912.

Dear Mr. { Heycock,
Hammond,
Ahmed,
Forteath,

The Sanitary Commissioner desires to take over for the purpose of establishing a Vaccine Depot the site originally acquired for the proposed Ranchi Engineering College which is no longer required by the Education Department. Before final orders are passed, I am desired to enquire whether you require the site for the purposes of your Department.

Yours sincerely,

T. W. BRIDGE.

To W. B. HEYCOCK, Esq., I.C.S., Director of Agriculture, Bihar and Orissa.
E. L. L. HAMMOND, Esq., I.C.S., Registrar, Co-operative Credit Societies.
A. AHMED, Esq., C.S., Inspector-General of Registration.
H. H. FORTEATH, Esq., Conservator of Forests, Bihar and Orissa.

D.-O. No. 73.

RANCHI :

The 9th September 1912.

Dear Bridge,

Your demi-official No. $\frac{3427-30R(B)}{III-B-69}$, dated the 5th September 1912.

The site acquired for the proposed Ranchi Engineering College is not required by any of my departments.

Yours sincerely,

A. AHMED.

To T. W. BRIDGE, Esq., I.C.S.,

Under-Secretary to the Government of Bihar and Orissa, Revenue Department.

D.-O. No. 21-T.

RANCHI:

The 10th September 1912.

My dear Bridge,

The site mentioned in your demi-official No. 3427R(B)—IIIB.-69, of the 5th instant, is not required for any purposes of my department.

Yours sincerely,

E. L.L. HAMMOND.

To T. W. BRIDGE, Esq., I.C.S.,

Under-Secretary to the Government of Bihar and Orissa, Revenue Department.

D.-O. No. 14—112.

FOREST DEPARTMENT:

Dated Ranchi, the 10th September 1912.

Dear Bridge,

In reply to your demi-official No. ^{3927-30R (B)}/_{IIIB.-69}, dated the 5th September 1912, the site is not required by this Department.

Yours sincerely,

H. H. FORTEATH.

To T. W. BRIDGE, Esq., I.C.S.,

Under-Secretary to the Government of Bihar and Orissa, Revenue Department.

D.-O. No. 1851-A.T.

BHAGALPUR:

Dated the 30th September 1912.

Dear Bridge,

Your demi-official No. 4301R(B)—IIIB.-69, dated the 26th September 1912.

The site originally acquired for the proposed Ranchi Engineering College will be of no use to me for the proposes of my Department.

Yours sincerely,

W. B. HEYCOCK.

To T. W. BRIDGE, Esq., I.C.S.,

Under-Secretary to the Government of Bihar and Orissa, Revenue Department.

Please see Financial Secretary's note, dated 20th August 1912, and the replies from the Heads of Departments subordinate to Revenue Department. None of them require the site acquired for the proposed Ranchi Engineering College. This file may now be returned to the Financial Department with the replies.

M. A. H.—3-10-1912.

T. W. BRIDGE—6-10-1912.

The Sanitary Commissioner may be informed that the land is required neither by the Education Department nor by any other Department (in reply to his enquiry of the 19th August 1912).

H. C.—8-10-1912.

Secretary—

G. F. SMITH—11-10-1912.

E. L. TANNER—11-10-1912.

Seen.

E. C. HARE—14-10-1912.

[No. 1] From the Sanitary Commissioner, Bihar and Orissa, No. 2979, dated the 4th November 1912.

2. Establishment of a Vaccine Depot.

The question of establishing a depot near Ranchi for the manufacture and supply of lymph in Bihar and Chota Nagpur has been pending for several years past and now in consequence of the formation of Bihar and Orissa as a separate province, the time has come when a depot on modern lines is required for the regular provision of vaccine for this Province.

Under the circumstances I proposed to build a depot on the land which was acquired for the Engineering Training College at Ranchi about $3\frac{1}{2}$ miles along the Purulia Road half-way to Tattisilwai station. It has been ascertained that the land is not required either by the Education Department or by any other Department. I have examined several sites in the neighbourhood of Ranchi and the site proposed above will suit me best from climatic considerations and because the place is easily accessible and a good supply of calves is available all the year round.

I propose also to make the depot the head-quarters of one Deputy Sanitary Commissioner who will be in charge of the Depot in addition to his other duties, and accordingly provision is included for a bungalow, out-houses, office, and quarters for his office staff.

I have asked the Executive Engineer, Ranchi, to have a provisional plan and estimate drawn up in consultation with me, but before this is done, I would strongly recommend that a

lump sum of Rs. 2,00,000, be provided by Government as an approximate and rough estimate of the total cost of the scheme.

W. C. Ross.

The Sanitary Commissioner's unofficial notes and his official letter explains the necessity for the establishment of a Vaccine Depot for this Province at an estimated initial cost of nearly two lakhs and a maximum annual recurring charge of Rs. 12,500. The question of establishing a Vaccine Depot at Ranchi was raised in the year 1907 and has since been pending. It is for consideration whether funds can be provided for the scheme. The scheme is indispensable, and if the state of the provincial finance does not permit its execution, perhaps we might go up to India for help. The balance of the Sanitary Improvement grant for 1912-13 now stands thus:—

Balance in hand—

			Rs.
I. Urban Sanitation	...	...	3,50,281
II. Rural Sanitation	...	...	1,48,352

Submitted through the Financial Department.

A. C. P.—11-11-1912.

J. N. S.—11-11-1912.

Administrative approval may be given and details of the recurring expenditure asked for. The scheme should go before the Finance Committee in connection with the allotment of funds.

2. It appears that the land has already been acquired and the item of Rs. 27,219 should perhaps go out. The total cost will then be reduced to Rs. 1,57,809.

K. C. B.—15-11-1912.

The Sanitation grants may perhaps be utilised for the establishment of the Vaccine Depot, the charges on account of which are debitable to Sanitation and Vaccination under 24.—Medical.

H. S. M.—15-11-1912.

Hon'ble Mr. Gait—

I am not prepared to submit this scheme in its present form for administrative approval. While fully agreeing that we should have a Vaccine Depot of our own, there is so much to be justified in the details of the proposals now made that it would be necessary for me to discuss them with the Sanitary Commissioner before sanction be given.

As the land belongs to Government the cost should be excluded from the estimate and it is by no means clear why so large an area as 219 acres (involving an expenditure of Rs. 10,000 in fencing) is necessary, although the office staff will apparently consist of two clerks only, four office and two record-rooms are included in the main building at a cost, I calculate roughly, of something like Rs. 20,000. The type of quarters for vaccinators, clerks and coolies (Rs. 25,171) is somewhat extravagant and here some reduction in cost might be possible. Rupees 20,000 for water-supply seems high (especially as a river is close by) and I do not see why an electric installation is necessary.

I have merely jotted down a few points which occur to me on glancing through the papers and I propose at the first opportunity to discuss the matter with the Sanitary Commissioner who would also be asked to furnish a more detailed estimates of recurring expenditure. *Prima facie* the initial cost should be reduced to about a lakh.

2. The immediate question is whether in framing next year's budget the Local Government should take this scheme into account (as being one fairly certain to be sanctioned) in making its provincial distribution of the amount entered as "unallotted expenditure," the scheme being placed before the Finance Committee either as a scheme provisionally selected or as an alternative scheme.

I am inclined to think that this should be done and (always provided that funds are available) enter anything up to Rs. 60,000 in the Public Works budget. The scheme would of course have to take its chance with those of other Departments when the time comes to distribute our surplus.

L. J. KERSHAW--16-11-1912.

I agree throughout. We must have a depot but the present proposals appear most extravagant. We might ask Bengal what the initial outlay was on the Ghoom Depot, and whether they have a resident Deputy Sanitary Commissioner there?

E. A. GAIT—18-11-1912.

Sanitary Commissioner, unofficially—

If you will be in Ranchi during the next fortnight I would like to discuss this case with you. If not, will you kindly give me a rough revised estimate of the initial cost by the light of the above notes with further details of the recurring expenditure involved. You might also ascertain direct from the Sanitary Commissioner, Bengal, the cost of the Ghoom Depot and whether there is a resident Deputy Sanitary Commissioner there. I imagine not, but I take it that you propose to locate a Deputy Sanitary Commissioner at the Depot rather as a matter of convenience and that he would only partly be employed in supervising its working. If so, the cost of his residence is not really part of this scheme and should come out.

2. For the purpose of throwing the proposal in the form required for the Finance Committee I would like to have a brief account of the present arrangements for supplying lymph to this province. Why it is desirable to alter present arrangements, what lymph now costs us (or local authorities) and (if this can be foreseen) at what price the new depôt would turn it out. A very brief description of the proposed arrangements for distribution might be given.

L. J. KERSHAW—22-11-1912.

The Hon'ble Mr. Gait—

I spent two hours yesterday with Captain Ross discussing the details of this scheme and I have prepared a statement of this case to be submitted to the Finance Committee which I place below. Should it be decided to make provision in next year's budget, the Sanitary Commissioner would submit in February or March a detailed scheme which would be dealt with in the ordinary way before administrative approval were given. As it has already been accepted by the Hon'ble Member that we must have a depôt of our own, we are at present only concerned with forecasting the probable total initial and recurring cost and, although no doubt the Sanitary Commissioner in sending up his proposals would keep within the rough total now calculated, it would of course be open to Government to reduce the cost if, on a further examination of the details of the scheme, it were found to be extravagant in any respect.

2. I now deal briefly with the details of the proposal which I should point out is not merely one for the establishment of a Vaccine Depôt but also for the construction of an office building for the Deputy Sanitary Commissioner and of residence and quarters for himself and his staff. After taking the advice of Mr. Munnings it is quite certain that, apart from the question of accommodation, the cost of the main building can be reduced as the design is faulty and excessive—verandah space has been provided. The plinth area rate (Rs. 4) also appears to be on the extravagant side. The rooms in the plan which purport to be intended for clerks and records are really meant, I find, partly for packing the tubes and partly as a laboratory. We can decide the plinth area necessary when the detailed proposals are received but meanwhile I would reduce the cost of the building from Rs. 50,380 to Rs. 36,000, assigning Rs. 27,500 to the depôt and Rs. 8,500 to the Deputy Sanitary Commissioner's Office.

In estimating the cost of a residence for the Deputy Sanitary Commissioner at Rs. 20,333 the idea, I find, was that the Indian Medical Service Deputy Sanitary Commissioner should be stationed at Ranchi. I doubt whether we can allow this as the work at Patna is so much more important and proceeding on the assumption that the Deputy Sanitary Commissioner at Ranchi will be one of the new recruits, I would reduce the cost of the residence to Rs. 17,500.

The cost of the depôt shed and grain godown has been taken in lump at Rs. 15,000. After going into details with Captain Ross I doubt whether more than Rs. 10,000 will be required. The amount set down for quarters for the Assistant Surgeon may stand but after taking Mr. Munnings' advice I think that some reduction will be possible in the cost of quarters for vaccinators, clerks and coolies. Against Rs. 25,000 (roughly estimated) I doubt whether more than Rs. 19,000 will be necessary and of this Rs. 15,000 would represent expenditure on quarters for the depôt staff and Rs. 4,000 on quarters for the Deputy Sanitary Commissioner's staff. I omit the cost of land as it already belongs to Government. The provision of Rs. 2,000 for roads may stand but the cost of fencing I would reduce from Rs. 10,000 to Rs. 5,000. The estimate, I find, was based on the assumption that a mile of fencing would cost Rs. 4,000. I see, however, from Leslie's catalogue that the cost in Calcutta is only about a thousand rupees per mile. Adding freight and cost of erection Rs. 5,000 should be ample.

I have omitted the provision of Rs. 10,000 for an electric installation but would provisionally allow Rs. 20,000 to stand for water-supply. A well supply would, I think, be out of the question and as in the process of manufacture a great deal of water is constantly required for cleaning the premises and washing calves, it would be necessary to pump water from the river to an overhead tank distributing it to the buildings and stables.

3. Reducing the estimate shown at page 4 of the file in this manner, I find that the depôt buildings would cost at an outside figure Rs. 90,000 and that the cost of the Deputy Sanitary Commissioner's Office, residence and quarters would amount to Rs. 30,000. Adding Rs. 10,000 for equipment and furniture the total cost may be taken at Rs. 1,30,000.

4. Captain Ross also showed me an estimate of recurring charges which appears *prima facie* to be moderate and may be provisionally accepted. It includes Rs. 5,724 for establishment charges—an Assistant Surgeon with an allowance, 4 vaccinators and 24 coolies—while contingencies have been taken at Rs. 5,000, a figure which I should say is, if anything, too low as it represents the cost of tubes, lanoline (or glycerine), packing and postage charges (which will be heavy) and the loss on calves. For the purposes of the statement prepared for the Finance Committee I have taken the recurring charges at Rs. 11,000.

5. Captain Ross informs me that the Ghoom Depôt has been abolished and that it was never a satisfactory institution nor does he model his present proposals on the Depôt at Entally, where a private house has been converted into a depôt. He has shown me the plans of the

Punjab Depot at Lahore. They are certainly very elaborate and must, I think, have cost a great deal more than the amount now set down.

L. J. KERSHAW—6-12-1912.

We may take the amount proposed by Financial Secretary as the sum to be asked for, but the items will, of course, be carefully examined later on. The only one which *prima facie* strikes me as doubtful is Rs. 20,000 for water-supply.

E. A. GAIT—6-12-1912.

Proof very urgently.

L. J. KERSHAW—7-12-1912.

The file may now be sent to the Public Works Department with reference to Hon'ble Mr. Gait's orders on the margin of the note sheets.

A. C. P.—11-12-1912.

To Public Works Department.

B. N.—11-12-1912.

Under-Secretary—

The supply from wells was found insufficient in experiments made for the proposed Sibpur College on this site. It will be necessary to pump the supply from a well sunk in the river. The estimate might be reduced to 12,000 but a detailed estimate would be more satisfactory.

H. WARDLE—12-12-1912.

Secretary, Financial Department—

See Mr. Wardle's note above. We went into the question of well supply on the College site in detail under the advice of the Sanitary Engineer, Bengal, and decided it to be impracticable. I think we shall have to pump from the river, presumably the supply will have to be filtered and I doubt if the sum entered Rs. 20,000 will be excessive.

E. R. GARDINER—14-12-1912.

Secretary—

S. B. DHAVLE—17-12-1912.

Let Sanitary Commissioner see the file unofficially. He will, I hope submit the whole scheme to Government shortly with full explanations, plans and estimates.

L. J. KERSHAW—18-12-1912.

Financial Secretary—

I learn that no provision has been made in the Vaccine Depot Scheme for cold storage, and I am writing to say that I consider this to be an essential part of the scheme, which cannot be omitted without breaking it up.

Modern practice requires the sterilization of vaccine. This may be done in two ways, either by treating it with chloroform or by placing it in a chamber at a temperature just below freezing point for a period of some months. This latter practice is considered by most modern authorities to be far preferable and is the one adopted by the Local Government Board at the Hendon Depot. The chloroform process is not well suited to Indian conditions.

In Shillong some of the greatest difficulties we had to contend with was owing to the absence of a cold storage room, and to the impossibility of preparing vaccine during the hot weather and rains because the temperature was too high and the vaccine would not keep. We were driven to prepare it between October and March during the cold weather, and to issue it at once to the vaccinators. This procedure was most unsatisfactory. We were too dependent on the contractors who collected the calves (financially they had us under their control). The cattle had to be brought up from Gauhati and elsewhere in a hurry, and we were never certain of their arriving up to time. They had to be vaccinated and passed through the depot as quickly as possible to make room for others, and before they had time to recover from the effects of their journey. They were exceedingly liable to outbreaks of catarrh, diarrhoea, epidemic pneumonia and other diseases acquired on the road on the way up, or from the cold of Shillong to which they were unaccustomed. We never knew when we might not have to stop work and we were rarely able to collect a reserve stock of vaccine for issue in an emergency. All this trouble would have been very largely avoided had we had a cold storage room, which would have enabled us to work more leisurely during the hot weather and rains.

The whole of my proposals for working this new depot have been based on the assumption that cold storage would be provided, so that we shall be able to prepare the vaccine during the hot weather and rains. The work will not be hurried, we shall be more independent of contractors and we shall be able to give the cattle a rest after their journey, and to examine them more critically before they are operated on. And we shall also be able to mature the vaccine (It ought to be kept in cold storage at a temperature of about 1°C. for three or four months to properly eliminate the extraneous organisms) and to test the samples bacteriologically before they are issued, and we shall be able to keep a reserve supply to fall back upon in case of necessity. Under the circumstances I would ask for the case to be reconsidered.

I estimate the cost of a machine at about Rs. 20,000 and the annual cost of maintenance including a mechanic at about Rs. 100 a month.

Mr. Munnings is now drawing up the sketch plan of the buildings and I shall be glad if you can let me have a reply soon.

E. C. HARE—7-1-1913.

Secretary—

Sanitary Commissioner's note above about the provision of a cold storage machine for the Vaccine Depot.

If the scheme is approved the initial cost of Rs. 20,000 will have to be added to the budget. The recurring cost is too small to affect the figures that have been taken already.

S. B. DHAVLE—9-1-1913.

Hon'ble Mr. Gait—

Colonel Hare is probably quite right but it is annoying that no mention of cold storage was made in Captain Ross' scheme. We may authorize the Sanitary Commissioner to include cold storage in the plans and estimates now being prepared and, if it appears likely that more than one lakh can be spent next year, may ask the Finance Committee to provide an additional Rs. 20,000 out of the unallotted sum of two lakhs to be distributed. As matters stand, we have in the provincial selection of schemes allowed one lakh out of a total estimated initial cost of Rs. 1,30,000.

This new item would add something to the recurring charges but we need not perhaps, take this into account in dealing with the total limit of recurring cost involved in the lump provision of Rs. 24,73.

I need hardly say that although we may authorize the Sanitary Commissioner to provide for cold storage in his estimates this is entirely without prejudice to our examination of the scheme as a whole when it is submitted.

L. J. KERSHAW—10-1-1913.

We may authorise him to provide for it in his estimates, but I doubt if we need increase the provision in the budget for the coming year. If sanctioned, the money can be provided in 1914-15, and before sanctioning we should want to know whether cold storage has been adopted anywhere else in India for Vaccine Depôts; and, if so, with what results; if not, we should have to be satisfied that the system could be worked successfully in India and that the estimated cost would not be exceeded.

E. A. GAIT—10-1-1913.

Let Sanitary Commissioner see unofficially. He will no doubt in submitting plans and estimates deal fully with the question.

L. J. KERSHAW—11-1-1913.

E. C. HARE—13-1-1913.

Under-Secretary—

For perusal. We may await receipt of the plans and estimates.

J. M. G.—14-1-1913.

S. B. DHAVLE—15-1-1913.

[No. 2.] From the Sanitary Commissioner, Bihar and Orissa, No. 1501, dated the 14th March 1913.

Secretary—

Perusal.

S. B. DHAVLE—20-3-1913.

Before this letter was written I went into the scheme in all its details with Colonel Hare and he agreed to a number of reductions. I doubt whether it is possible to reduce further in the initial cost but the recurring charges are high. It will have to be considered whether the quarters are to be rent-free or not.

L. J. KERSHAW—23-3-1913.

Secretary—

S. B. DHAVLE—31-3-1913.

Hon'ble Member (Mr. Gait)—

The Sanitary Commissioner has now submitted the rough plans and estimates for the Ranchi Vaccine Depot. Before his letter and explanatory notes were written he brought the case to me and I discussed with him each item of the scheme in detail. Several reductions were made, especially in the matter of quarters, and I doubt whether it is possible to reduce the cost further. When the scheme was examined in

(Vide notes from pages 4-6.)

December last we contemplated a total expenditure of Rs. 1,30,000 but subsequently we authorised the Sanitary Commissioner to provide for cold storage in his estimate. This will cost Rs. 13,000 and as the total estimated cost is now Rs. 1,44,250 it will appear that the Sanitary Commissioner has adhered very closely to the limit laid down. At this stage it is unnecessary formally to sanction establishment or recurring charges but Colonel Hare has very properly made an estimate of these and although the total figure is much higher than that originally taken (Rs. 11,000), it does not appear to be excessive.

Until the Depot has been at work for some time it will of course be impossible to know what the contingent charges will be. Nor need we at present consider the question whether rent should be charged for the quarters. When the time comes to sanction the establishment this question will be taken up.

We may now give administrative approval to the project at Rs. 1,44,250 and direct that detailed plans and estimates should be prepared with the least possible delay in order that construction may be started at once.

His Honour should see.

L. J. KERSHAW—1-4-1913.

Some of the items strike me as somewhat generous, *e.g.*, the provision for 10,000 gallons of water a day.

On the basis of 100 human beings and 200 calves (a very liberal estimate) this works out to 33 gallons per head, including the calves. Need the water be pumped so high as 100 feet?

Has Financial Secretary satisfied himself that the installation of a cold storage plant will in the long run be more economical than the purchase of ice?

The cold room presumably would be a very small one.

I understand that the officers of this Province and Bengal who have been considering the question of a lunatic asylum are in favour of establishing it on this site. I presume there will be room for both that and the European asylum and for the Vaccine Depot?

E. A. GAIT—2-4-1913.

Sanitary Commissioner unofficially—

Will you kindly note on the points raised by the Hon'ble Member in his note above. As regards the site, I have ascertained from Mr. Gardiner that the Committee (which was composed of representatives of this Government and the Government of Bengal) will recommend the Lunatic Asylum should be erected on this site, but I gather that the small area (15 acres) required for the Vaccine Depot will not interfere with this arrangement. It might be well if you cleared up the point in personal discussion with Mr. Gardiner.

2. As regards the daily supply of water I understood from you that a large amount will be required as it will be necessary to wash down the buildings several times daily and as it is also necessary to wash the calves. You might, however, explain this part of the scheme more fully for the information of the Hon'ble Member.

3. Will you also set out in fuller detail the advantages of the cold storage system? Leaving out of account the pay of the engine driver as one will be required for the pumping engines, it appears that the annual cost of maintenance will be Rs. 1,256. Including depreciation on the capital cost of Rs. 15,000, you might examine how this would compare in point of cost with an arrangement under which the tubes would be packed in ice-boxes, the ice being renewed daily. This would of course necessitate a daily supply of ice from Calcutta as well as bringing it from the Railway station to the depot. With cold storage you obtain a temperature below freezing point and I am not certain whether the temperature obtained by ice-boxes would be sufficiently low.

L. J. KERSHAW—6-4-1913.

Secretary, unofficially—

1. *Water-supply.*—As regards the water-supply, I estimate that 12—15 gallons a head will be required daily for washing down the stables and calves and for household purposes, and I have provided a tank of sufficient capacity to hold 2—3 days reserve supply in case of a break down; because the depot is to be 4—5 miles away from Ranchi and there would be considerable delay in getting skilled assistance for repairs at short notice. I should probably have to apply to Calcutta for it. I consider it a better and more economical arrangement to provide a tank of sufficient capacity to begin with, than to run the risk of the supply running short and having to provide an additional tank afterwards. I do not consider the estimate excessive; but I can arrange to have the tank put up in sections, if necessary.

Messrs. Simpson & Co., the Engineers, who gave me the estimate of the water-supply scheme, say that the smallest steam pump on the market which is suitable for the present work is capable of pumping more water than we require, and the statement that 10,000 gallons of water are to be delivered in 8 hours, only means that pumps of that capacity are being provided. It does not of necessity imply that they will be always working at that rate. Probably 4—5 hours a day working will suffice.

Steam pumping is necessary on account of the height to which the water has to be raised. The site which has been selected for the depot is on a sloping hillside with a sudden drop of 30—40 feet at the river bank. The buildings farthest away from the river are estimated to be 80—90 feet up from the bed, and they will just be commanded by a reservoir 100 feet up on the top of the main block.

2. *Cold Storage.*—Major Clemesha has tried in Calcutta for some years past to keep vaccine in an ice chest and found he could not get the temperature sufficiently low to prevent its deterioration. If he could not succeed with any quantity of ice ready to his hand, it is extremely unlikely that we could do so at Ranchi, considering the uncertainty of the delivery

of the supply and the difficulty of bringing it every day from the Railway Station to the depot (a distance of 3—4 miles). But apart from this objection to using an ice-box, modern authorities consider it insufficient to keep the temperature merely at freezing point. They now reduce it to 8°C. This is the temperature at which Major Clemesha is actually storing his vaccine at the present time at the Medical College, and it is the temperature which I propose to use at Namkum. It cannot be obtained except by a refrigerating machine.

3. *Site*.—I have ascertained from Mr. Gardiner that the proposed site of the Vaccine Depot will not interfere with the Lunatic Asylum.

Secretary—

E. C. HARE—9-4-1913.

Hon'ble Member—

S. B. DHAVLE—10-4-1913.

The Sanitary Commissioner's replies to points raised by Hon'ble Member may be read. If it does not delay administrative sanction unduly I would suggest a reference to Public Works Department to see whether the oil engine (as installed at Sabour) for the purposes of pumping would not suffice. It gives, I believe, every satisfaction there and is economical.

E. L. L. HAMMOND—10-4-1913.

Yes. Please consult Public Works Department on this point.

E. A. GAIT—12-10-1913.

Secretary, Public Works Department—

Would you kindly advise whether a water-supply like that now in use at Sabour would cost less and be sufficient. Possibly the figures are on record in your office.

E. L. L. HAMMOND—12-4-1913.

Secretary—

The details of Sabour pumps are in File ^{4A}₃ of 1910.

The cost—

					Rs.
Engine with pump	बिहार ...	सरकार ...	...	...	5,880
Engine House	...	...	...	...	2,657
Tanks	मंत्रिमंडल ...	सचिवालय विभाग ...	...	...	8,630
Piping	...	...	...	...	5,115
(बिहार राज्य अभिलेखागार निदेशावली)				Total	22,282
Against Messrs. Simpson's estimate—					
Pumps, filter, tanks and piping	...	...	...	...	13,500
Well and Engine shed	...	...	...	...	2,000
				Total	15,500

The minimum height to be pumped at Sabour is $144 - 71 = 73$ feet from high water level to level of bottom of tanks. The pumps would, therefore, probably be capable of pumping the 100 ft. required at Namkum. The actual cost of pumps cannot be compared, as Simpson's figures are not in detail.

H. WARDLE—18-4-1913.

Secretary, Financial Department—

The figures above. Direct comparison is no value for the supply estimated for differs largely, for Sabour it was 24,000 gallons in 6 hours, in this case it is 10,000 gallons in 8 hours. The real point is whether it would not be more economical to drive the plant by means of an oil engine than by a steam engine. I believe that in the matter of recurring charges the oil engine will be more economical and the point is one that ought to be enquired into in detail when the estimates are being framed. But this need not stand in the way of administrative approval to the scheme.

E. R. GARDINER—21-4-1913.

Secretary—

S. B. DHAVLE—22-4-1913.

Hon'ble Mr. Gait—

The exact details could be worked out after administrative sanction has been given.

The detailed plans and estimates should be prepared as quickly as may be, if we are to utilise this year's provision.

Yes. Please impress this on Sanitary Commissioner.

His Honour should see.

E. L. L. HAMMOND—23-4-1913.

Administrative sanction may be given.

To His Honour.

E. A. GAIT—24-4-1913.

E. L. L. HAMMOND—25-4-1913.

C. S. B[AYLEY]—26-4-1913.

Convey administrative sanction and emphasize the need for speedy preparation of plans and estimates.

E. L. L. HAMMOND—27-4-1913.

Draft submitted for approval.

A. C. P.—28-4-1913.

J. G.—28-4-1913.

[Nos. 3 & 4.] To the Sanitary Commissioner, Bihar and Orissa, No. 4340M., dated the 29th April 1913, and endorsement to the Public Works Department, No. 4341, dated the 29th April 1913.

Send file unofficially to Sanitary Commissioner for perusal of Chief Engineer's note on page 9.

S. B. DHAVLE—29-5-1913.

I will enquire into the comparative cost of an oil engine and a steam engine.

E. C. HARE—1-6-1913.

Under-Secretary—

J. N. S.—4-6-1913.

S. B. DHAVLE—4-6-1913.

बिहार सरकार

मंत्रिमंडल सचिवालय विभाग
(बिहार राज्य अभिलेखागार निदेशालय)

...
...
...
...

MUNICIPAL DEPARTMENT.

SANITATION. 12

S
FILE No. — OF 1913.
63

Establishment of a Vaccine Depôt at Namkum in Ranchi.

[No. 1.]

No. 2979, dated Camp Bankipore, the 4th November 1912.

From—CAPT. W. C. ROSS, I.M.S., Offg. Sanitary Commissioner for Bihar and Orissa,

To—The Secretary to the Government of Bihar and Orissa, Municipal Department.

I have the honour to forward for the administrative approval of Government a scheme for the establishment of a Vaccine Depôt in this Province.

2. The total cost of the scheme amounts to Rs. 1,95,000 for capital expenditure, as shown in the detailed estimates attached, and including Rs. 10,000 for equipment and furnishing and to Rs. 10,000 (ultimately Rs. 12,500) for recurring expenditure for establishment and contingencies.

3. Provisional plans and an approximate estimate for the land and buildings are forwarded herewith.

(Total cost Rs. 1,85,000).

4. The scheme includes offices, a bungalow, and quarters, for the office staff for a Deputy Sanitary Commissioner, whose head-quarters I propose to establish here in order that he may supervise the depôt in addition to his other duties. The approximate cost of this part of the scheme is Rs. 36,000.

5. A depôt is absolutely necessary for the manufacture and supply of vaccine for this Province which only obtains its supply at present from Calcutta as a temporary arrangement with the Bengal Government.

6. The most suitable site for a depôt is near Ranchi, as land is available at Namkum (the original site selected for the abandoned Technical College scheme), and cattle are plentiful and cheap, and also for climatic reasons.

7. I have accordingly selected this as a provisional site and propose to take up an area of 219 acres in order to have plenty land for the segregation of various batches of calves, and for grazing, and fodder growing.

As the land is cheap the large area is not expensive.

8. I consider this scheme a very important one and I would urge its sanction by Government at as early a date as possible.

[No. 2.]

No. 1501, dated Ranchi, the 14th March 1913.

From—LIEUT.-COL. E. C. HARE, I.M.S., Sanitary Commissioner, Bihar and Orissa,

To—The Secretary to the Government of Bihar and Orissa, Municipal Department.

I have the honour to forward for administrative approval the rough plans and estimates of a Vaccine Depôt for this Province.

The estimated cost is Rs. 1,44,250, which is Rs. 14,000 over the present budget provision. I have carefully scrutinised every item and I do not consider that any material reduction can be made in the cost of the buildings without affecting the quality of the work. And in considering the subject it should be borne in mind that I have had to provide quarters for an Engineer which were not at first considered necessary, at a cost of Rs. 3,240 and also for the cold storage plant which was subsequently agreed to. If these two items are excluded, the cost Rs. 1,28,000 will be well within the budget provision.

[A.—Enclosure to No. 2.]

The plan.

[B.—Enclosure to No. 2.]

Abstract of Cost of Approximate Estimate of Vaccine Depôt at Ranchi.

	Rs.
1 & 2. Depôt and Deputy Sanitary Commissioner's Office ...	33,900
3. Deputy Sanitary Commissioner's Residence ...	17,000
4. Depôt sheds and godowns ...	23,250
5. Assistant Surgeon's quarters ...	4,150
6. Engineer's quarters ...	3,240
7. Quarters for 4 loaders and 2 clerks ...	14,840
8. Menials' quarters ...	5,100
9. Roads ...	1,320
10. Drains ...	2,250
11. Fencing ...	700
12. Latrine ...	500
13. Water-supply ...	15,500
14. Cold storage ...	13,000
15. Equipment and furniture ...	10,000
Grand Total ...	1,44,250

[C.—Enclosure to No. 2.]

Note on the Estimates of the Provincial Vaccine Depôt.

Site.—The site selected is about $3\frac{1}{2}$ miles from Ranchi on the road to Purulia. It is a portion of the ground at Namkum on which it was originally intended to build the Engineering Training College. The land already belongs to Government so no provision has been made for it in the estimates. About 15 acres have been taken up on a sloping well-drained area close to the road, the river and the railway line. The site is suitable in every respect except in altitude; but this defect can be overcome by the use of a cold storage chamber in which to mature the vaccine, and when a flag station on the Railway and a combined post and telegraph office have been arranged, easy communication with the plains and with Ranchi will be established. This is essential for the economical collection of material and for the rapid distribution of vaccine to all parts of the Province. The proximity of the site to the river also enables provision to be made for an economical and liberal supply of water.

Buildings.—The ground plan shows the general arrangement of the buildings on the site. Their position has been carefully thought out with reference to the work.

The *main block* which faces the river comprises the office of the Depôt and of the Deputy Sanitary Commissioner of the Chota Nagpur Circle, who will have his head-quarters here, also the operating room and the rooms for the preparation of the animals and the vaccine. The cost of this block is Rs. 33,900 and sufficient space has been allowed for the development which may be expected to take place within the next 10 or 15 years.

Farther back behind this block, *three stables* have been placed to hold 60 calves. They will be used for the animals while they are under preliminary observation or under vaccination. Still farther in the rear, in a central position, the *grain godown* will be placed, and on either side of it the stacks of fodder will be arranged.

Behind this again it is proposed to place *two stables* to hold 80 calves (40 in each) while they are awaiting operation or recovering from it and a manure platform. The estimated cost of these buildings is Rs. 23,250.

On either side of the main block and the stables, it is proposed to place the *residential quarters* of the staff. In front, facing the river on either side of the offices will be the Deputy Sanitary Commissioner's bungalow on the east and the residence of the Assistant Surgeon, who will be in charge of the Depôt, on the west. Farther back again on either side behind these will be the Deputy Sanitary Commissioner's clerks' quarters, the Engineer's quarters, and the loaders quarters, and still farther back on either side of the waiting calves' stables will be the menials' quarters.

The estimated cost of these buildings is Rs. 43,830, Rs. 17,000 of which is allotted to the Deputy Sanitary Commissioner's residence.

Roads.—The estimated cost of the roads is Rs. 1,320. It is not proposed to metal any of them at present, as the surface of the ground is sufficiently hard to stand the traffic when it has been covered over with a layer of gravel.

Drainage.—Rs. 2,250 has been provided for drainage. The soil is liable to be cut away rapidly in heavy rain, and it is essential to have masonry drains to carry off the water from the buildings and sides of the roads.

Water-Supply.—A liberal supply of filtered water (both hot and cold) is required for the Depôt for washing the operating rooms and the stables and for watering the calves and for household purposes. I estimate there will be about 100 human beings and 200 calves to be provided for.

Under instructions from the Sanitary Engineer, Messrs. Simpson & Co. have drawn up a scheme to provide 10,000 gallons in 8 hours by pumping from a well sunk in the bed of the Subanrikha. The water is to be filtered and to be lifted about 100 feet into a Reservoir which is to be placed on the top of the main buildings. From this point it will be distributed over the Depôt by pipes.

A rough estimate of the cost is:—

	Rs.
Pumps, filter, tank, and distribution piping delivered and erected	13,500
Well and engine-sheds	2,000
Total ...	15,500

Cold Storage.—Storage of vaccine below a temperature of 32°F. for a period of six months is considered by all modern authorities on the subject to be the best way of maturing it and removing the foreign organisms. It is practised at the Local Government Board Vaccine Depôt in England, and at the King Institute in Madras. A cold storage plant either has been or soon will be erected at the United Provinces Depôt at Naini Tal and at the Bombay Depôt at Belgaum. It is also used in Calcutta. In the Namkum Depôt it is essential to the preparation of first class vaccine and the maintenance of a reserve stock. It will also tend to economise the cost of the calves, which is one of the most expensive items in the annual expenditure, by enabling the work to be carried on throughout the year.

On the recommendation of the Sanitary Engineer I arranged with Mr. Wilcox, a well known Refrigerating Engineer, to show me some of the ice-making plants which he had erected in Calcutta and to give me an estimate of the cost of a suitable machine for the depôt, and the note which I wrote on the subject after my inspection will be found below.

The cost of a suitable plant worked by an oil engine is estimated at Rs. 12,422 to which Rs. 600 is added for brick work. I propose to place it in a room in the main block.

Equipment and Furniture.—The details of this item are not yet complete, so a sum of Rs. 10,000 is provided.

Recurring charges—

	Rs.
1 Assistant Surgeon grade pay	100
Local Allowance Rs. 75	2,100
3 Loaders on Rs. 25 each	900
1 Loader on Rs. 30	360
1 Engineer on Rs. 100 to Rs. 125	1,344
3 Khalasis on Rs. 10 each	360
12 Menials on Rs. 8 each	1,152
	6,216
Allowance to clerks Rs. 10	120
Total ...	6,336

Contingencies—

Water-supply	1,680
Cold storage	1,256
Purchase of calves	4,600
Purchase of fodder	1,135
Purchase of tubes, etc.	7,500
Fuel and lighting	100
Correspondence	1,500
Total ...	17,171

Establishment.—The Deputy Sanitary Commissioner, Chota Nagpur Circle, will superintend the Depôt and be responsible for the work and the expenditure. Under him an officer must be appointed to supervise the daily routine and the making of the vaccine. In the Shillong

Depôt there was a Sub-Assistant Surgeon who undertook this work on Rs. 127-8 a month including allowances. In the Calcutta Depôt the post is held by an Assistant Surgeon on Rs. 200 a month. In this Depôt I propose to appoint an Assistant Surgeon on grade pay plus a local allowance of Rs. 75 and I have provided for a 3rd grade officer.

The Engineer is required to look after the water works, pumps and the refrigerator and three Khalasis have been provided to work under him.

The menial establishment includes 2 peons, 2 sweepers, 1 barber, 2 calf-feeders, 1 dhobi and 4 general coolies.

One of the Deputy Sanitary Commissioner's clerks will act as despatching clerk to the Depôt and will do the correspondence and keep the records. I propose to give him an allowance of Rs. 10 a month.

Purchase of calves.—The number of calves to be purchased depends on the population to be provided for, the number of operations to be performed, the quantity of vaccine to be made and the system of vaccination adopted. I propose to introduce the system which was in force in Eastern Bengal and Assam with some modifications. It is preferable in many respects to the Bengal system. Reckoning on the basis of the population I find that in Eastern Bengal and Assam in 1910-11, 875 calves were used for a population of 30,961,000 so that for this province with a population of 34,290,000 we shall require 790. Again, by assuming that each calf will yield 400 grains of crude pulp, which is sufficient for 1,600 operations, we shall require about 822 calves for 1,316,000 operations, which was the number performed in this province in 1910-11. We may therefore consider that between 850 and 900 calves will be required annually for vaccination for the next few years and in addition to this provision must be made for a reserve stock and for the increase in the number of operations which may be expected (vaccination in the Native States is still undeveloped) so I propose to purchase about 1,000 calves annually. They will be collected by contractors from the villages in the district and from Purulia, and I expect to have to pay Rs. 3-8-0 to Rs. 4 a piece for them. (In Shillong the price was Rs. 7 to Rs. 8.) Advances will be given to the contractors on the security of house property or land to purchase the calves, and after vaccination the animals will be given to them for their own property and they in return for this will take all risks of loss in transit, or from epidemics, sickness or from the operation. This arrangement, is, I consider, a fair one.

Purchase of Fodder.—I propose that all the animals shall be stall-fed and assuming that 1,000 calves will be passed through the Depôt annually and that each calf will remain in the Depôt for about 18 days, and assuming that each calf will eat one tarapa of rice straw and 4 chittacks of oil-cake a day we shall require annually:—

Rice straw	...	...	225 kahuns.
Oil-cake	...	...	94 maunds.

The straw will be purchased at the harvest and it will be obtained in Purulia and will be brought to the Depôt either by cart or rail. It will be stacked in the open on *machans* on either side of the grain godown. It is estimated to cost Rs. 4 a kahun. The oil-cake will be purchased in Calcutta every six months and it will cost about Rs. 2-8-0 a maund.

				Rs.
225 kahuns of rice straw at Rs. 4	...	...	...	900
94 maunds of oil-cake at Rs. 2-8-0	...	...	...	235
				<hr/> 1,135

or a little over Re. 1 per calf.

Purchase of Tubes.—I have estimated the cost of this item to be Rs. 7,500, which is based on the average expenditure of the Shillong Depôt for the last three years. I hope to be able to reduce it considerably by introducing a new system of storage; but I do not consider it safe to do so until I have gained some experience in its working.

Correspondence.—Rs. 1,500 has been allowed. It includes the making of wooden boxes in which to pack the vaccine, and the cost of postage. The figure is based on the expenditure in Eastern Bengal and Assam.

Routine work of the Depôt.—There are to be two approaches to the Depôt marked A and B on the tracing both crossing the Railway by level-crossings. The road at A will be used for all cart traffic and it is also proposed to have a flag station here which will enable passengers and small packages to be landed on the spot without the trouble and expense of fetching them from Ranchi station and a combined telegraph and Post Office for the receipt and despatch of correspondence.

The route marked B is only a foot-path through the river, but as it is $\frac{1}{2}$ a mile nearer Ranchi, it will be utilized to a great extent by the menials. All calves entering the Depôt will also pass by this route and up the road to the west of the Depôt to the "waiting" stalls where they will stay for a few days (average about 6) to recover from the journey. Accommodation has been provided for 80 cattle in two stables. It is improbable that we shall have more than 60 in the Depôt at a time, but extra space must be allowed to enable one of

the sheds to be cleared out in the event of an epidemic. From the "waiting" stables 3 to 5 animals a day will be chosen, according to the demand for vaccine and the season of the year, and will be removed to the special stalls inside the Depot close to the operating room. Here they will be placed under special observation for 3 days more to ensure that they are not suffering from any febrile or intestinal disease or anything which may affect the quality of the vaccine and at the end of that time they will be vaccinated. The pocks take 6 days to mature, the vaccine is then collected and the animal is returned again to the other stables for a few days to recover before he is discharged and removed by the contractor. Forty-five calves will be in the special observation and operating sheds at a time. Fifteen under observation and 30 under operation. I have allowed for 60 stalls in three sheds which gives a margin in case one of the sheds has to be vacated, and also allows an interval for cleansing between the times they are occupied by the calves. I have also made provision for a third "waiting" shed for 40 animals, as it is desirable to keep the calves which have undergone vaccination apart from the others while they are recovering and I shall also require room for a couple of bullocks and a cart.

E. C. HARE, *Lieut.-Col., I.M.S.*,
Sanitary Commissioner, Bihar and Orissa.

Note on Refrigerating Chambers.

I made an appointment with Mr. Wilcox, who was recommended to me by the Sanitary Engineer, Bihar and Orissa, to show me the installations he had erected in Calcutta and to give me the information required to form an estimate of what I should require for an installation at the Vaccine Depot. In this note I embody the information I obtained.

Ice is made commercially on two principles. Either by the expansion of carbonic acid gas from its solid to its gaseous form or by the expansion of liquid ammonia. The former process is the more expensive and is not practiced in India at present. The latter has been used for years and the machinery for making it has been reduced to such a simple type that the process can be carried on by an ordinary mechanical engineer who requires no special technical knowledge.

The two sketches attached to this note show the style of the machine. They can, either of them, be worked by steam, oil or electricity. The chief difference between them is that in No. I the condenser is underneath the machine and requires 8 gallons of water a minute while working, while in No. II the condenser is placed separately on the outside of the building, and can be worked with 100 gallons of water in 12 hours.

The principle on which the machines are worked is the same and the cost is the same, Rs. 4,577. In addition to the machine and the engine for driving it, no other apparatus is required except the chambers, which consists of two rooms, an outer and an inner. The walls of the latter are carefully lined with cork and other non-conducting material. The construction of this inner room is considered one of the most important items to be attended to, as upon its efficient insulation the successful working of the machine depends. A plan showing the arrangement of the rooms is attached.

Mr. Wilcox took me to see four machines in work in Calcutta, which he had put up and which were working under his supervision.

1. At the Medical College Hospital which has been running for over four years and which is used for scientific purposes including amongst other items the storage of some of the vaccine which is used by the Sanitary Commissioner of Bengal.

2. At the General Hospital. This has been running for four months and is used for kitchen purposes, and for the storage of provisions.

The other two installations were in connection with the manufacture of ice for commercial purposes.

Major Robertson, the Sanitary Commissioner with the Government of India, saw these installations with me and we were both of us thoroughly satisfied with them. Machines of type II were in use at the General Hospital and at the Medical College Hospital.

In addition to the installations which I saw, Mr. Wilcox has erected some others in Northern India, including the Refrigerator at the Viceregal Lodge at Delhi, and the chamber of the Refrigerator at Government House in Calcutta.

The estimate attached to this note which has been drawn up by Mr. Wilcox shows the initial cost to be about Rs. 12,422, including—

	Rs.
Machine	4,577
Condenser and Tubes	2,545
Oil Engine	1,575
Cold Chambers and fittings	3,725
Brick work, etc., say	2,500
	<hr/> 14,922 <hr/>

or roughly Rs. 15,000.

The annual cost of maintenance :—

	Rs.
1. Lubricating oil and fuel for kerosine oil engine Rs. 1-8 for 6 hours—say 250 hours a month Rs. 63 a month $\times 12$...	756
2. Pure	200
3. Sealing oil	80
4. Annual repairs	100
5. Coolie Rs. 10 a month	120
	<hr/>
	1,256

If the installation is properly erected in the first instance 6 hours work a day will suffice to keep the temperature of the chamber below freezing for 24 hours following.

The pay of the supervising engineer to be charged to the water works establishment.

Quarters to be provided for the coolie.

Mr. Wileox undertakes to put up the plant and to find a man to work it.

E. C. HARE, *Lieut.-Col., I.M.S.*,

Sanitary Commissioner, Bihar and Orissa.

[No. 3.]

No. 4340-M., dated the 29th April 1913.

From—S. B. DHAVLE, Esq., *I.C.S.*, Under-Secretary to the Government of Bihar and Orissa, Municipal Department,

To—The Sanitary Commissioner, Bihar and Orissa.

With reference to your letter No. 1501, dated the 14th March 1913, I am directed to convey the administrative approval of Government to the establishment of a Vaccine Dépôt for this Province at an estimated cost of Rs. 1,44,250. I am to say that the detailed plans and estimates should now be prepared with the least possible delay in order that the provision of Rs. 1,00,000 in the Budget for the current year may be utilised.

2. The rough plans and estimates received with your letter under reply have been forwarded to the Public Works Department of this Government for necessary action.

[No. 4.]

No. 4341-M., dated 29th April 1913.

Memo. by—The Under-Secretary to the Government of Bihar and Orissa, Municipal Department.

Copy, with the plans and estimates in original, forwarded to the Public Works Department of this Government for information, and necessary action.

REFERENCES TO FORMER CASES.

Bengal Sanitation, B, February 1908, Nos. 71-72 (File S $\frac{I-V}{5}$).

19

बिहार सरकार

मंत्रिमंडल सचिवालय विभाग
(बिहार राज्य अभिलेखागार निदेशालय)

REFERENCES TO LATER CASES.

$\frac{S}{200}$ / 20. Sav. B. Let. 2582/60.

$\frac{S}{27}$ / 21. B. March = 226-229.

Mis $\frac{DA}{5}$ / 26 L.S.G.B. Brit Jan/27 nos. 66-89.

Mis $\frac{DR}{27}$ / 26 11 B Jan/27 = 162-68

KEEP-WITH.

Office notes—(printed).