Archives I—10,006—16-8 77.

(1) Number of pages 32

(2) Date of repair 16/11/88

(3) Initials of the Referencer

TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

P.W. DEPARTMENT

G.O. No. ~~B.P. No.~~ 3021 Press. ~~Mis.~~

Dated 9-12-1886 ~~197~~.

[illegible] (10)

Not to be folded or roughly handled

9th December 1884, No. 3021 W., Public Works.

3021.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

General.
Account.

Read—the following despatch from the Right Honorable the Secretary of State for India, to His Excellency the Right Honorable the Governor in Council, Fort St. George, dated India Office, London, 30th October 1884, No. 1, Public Works (Stores):—

I have considered in Council your letter in the Public Works Department, No. 14/2015 W., dated 16th August 1884, forwarding an indent for stores required in the Madras Presidency, and have sanctioned compliance with the indent, with the exception of the four sets of artesian well-boring apparatus and 200 tons of foundry coke.

2. The indent states that the cost of the boring apparatus is unknown. From inquiries made in this country it has been ascertained that the cost will probably amount to about £8,000, as noted in the margin, and I have therefore suspended the supply of the four sets demanded, pending the receipt of a further communication from your Government, which might, if considered desirable, be sent by telegram.

		£
3″ apparatus about	... ...	1,670
4″ ,, ,,	... ...	1,700
5″ ,, ,,	... ...	2,130
6″ ,, ,,	... ...	2,500
		8,000

3. As 200 tons of coke are under supply in compliance with your telegram of the 11th August last, the 200 tons included in the indent will not be provided.

Order—dated 9th December 1884, No. 3021 W., Public Works.

Communicated to the Superintending Engineer, V Circle, with advertence to G.O., No. 2015, dated 16th August 1884.

2. The General Superintendent, Public Works Stores, will at once submit a revised indent on the Home Government, providing for one set of artesian well-boring apparatus similar in all respects to the apparatus supplied to the Government of the North-Western Provinces and Oudh, the cost of which is shown to be £1,951.

3. The following telegram will be despatched to the Secretary of State for India:—

> "Your letter No. 1, Public Works, of 30th October 1884.
> "Indent for artesian boring apparatus cancelled.
> "Revised indent follows."

(True Extract.)

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

To the Superintending Engineer, V Circle, with original letter and enclosures from Government of North-Western Provinces, No. 2200, dated 27th June 1884.

Exd. C. Howarth.
Spare Copies

GENERAL.
ACCOUNT.

Govt. of (1884) Madras.

PUBLIC WORKS

Dated December, 9th.

Recd.

Encl.

G.O., 9th Dec. 1884, No. 3021 W.

DECEMBER.

Boring Apparatus for Artesian Wells

Orders on despatch from the Secretary of State regarding supply of —.

19th December 1884, No. 3129 W., Public Works.

3021

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

Read—the following letter from LOUIS CORNET, Esq., to the Deputy Chief Engineer, Public Works Department, dated Madras, 15th December 1884.

In reply to your letter, No. 2069 C., dated the 13th instant, I have the honor to forward a statement of the terms on which I will agree to undertake an experimental artesian boring at Madras on the conditions mentioned in paragraph 2 of your letter.

2. The depth of the well not being given I have taken it at 120 metres or, say, 393 feet.

3. The tools and appliances, &c., required for the above-mentioned specification will cost about Rs. 12,500, as per details in the estimate and abstract appended hereto. Of this sum Rs. 11,000 are required for tools and appliances to be imported and Rs. 1,500 for masonry, staging and sheds to be erected on the spot.

4. The masonry, staging and shed require to be erected first. While the masonry is settling the staging and shed may be made. The whole can be made ready in one month.

5. After striking a gushing spring the site has to be cleared and a masonry basin constructed. The cost of this work is not included in the next paragraph.

6. The following five items are charges payable by Government :—

(*a*) I shall require payment of about Rs. 1,500 for the erection of masonry, staging and shed. This payment is to be made as soon as I receive orders to begin work. These works will be executed according to the data of the Public Works Department. I consider my estimate sufficient for the purpose. Any saving under this head will accrue to Government.

(*b*) I shall require payment of about Rs. 11,000 for cost of tools and appliances to be imported. This payment is to be made as soon as I deliver the tools and appliances on the works. The exact cost is to be determined by the amount of the manufacturer's invoice *plus* usual charges.

(*c*) I shall require monthly a payment of the sum of Rs. 400 for my salary.

(*d*) I shall require monthly a payment of a sum of about Rs. 150 for the wages of workmen. Savings under this head to accrue to Government.

(*e*) I shall require once for all a credit of Rs. 200 to be availed of as required to provide fuel, iron, steel and other materials for repairs.

7. With the tools specified I undertake to sink a well, to the depth stipulated, through any soil, however hard or difficult to work.

8. My service is to begin as soon as I join work under the orders of Government, and it is to cease on one month's notice, or as soon as the basin referred to in paragraph 5 is completed.

9. I am prepared to begin work as soon as I receive orders. The tools and appliances have to be imported. They are to be had ready made at Paris. They will probably be here within three months. In anticipation of their arrival the masonry, staging and shed may be erected.

10. I cannot stipulate for a fixed rate of progress, but I may mention what I can do in the several cases that may turn up :—

(a) *Through clay or through coarse river sand.*—Three to five metres daily according to the depth already attained.
(b) *Through pure gravel.*—About one metre daily.
(c) *Through rock.*—Progress variable according to hardness. No estimate possible.
(d) *Through fine movable sand, dry or in water-bearing stratum.*—Work may be considerably delayed through choking of pipe by continuous spouting up of a column of fine sand. No estimate of progress possible
(e) *Accidents as detailed in paragraph 2 of explanatory memorandum.*—No estimate of progress possible.

11. In cases (*d*) and (*e*) of the preceding paragraph, and also in case a gushing stream is struck, it will be necessary to work night and day without interruption. In such cases I shall give my personal extra labor free, but the workmen must be paid night work at double the rate for the day.

12. To give some idea of the total time taken in boring a well I may mention that at Pondicherry I have been engaged during periods varying from three weeks to four months on wells varying in depth from 28 metres to 100 metres.

13. The estimate for tools and appliances includes all the extra piping (120 metres) of small bore (21 centimetres) for the purpose mentioned in paragraph 3 of the explanatory memorandum attached hereto. For the reasons given there only 80 metres of 26 centimetres gauge are included with 120 metres of 21 centimetres gauge.

ENCLOSURES.

Approximate Estimate for Boring Tools, Nos. 0, 1, 2, 3, for a depth of 120 mètres with piping, &c., complete.

Number of Tools.	Description of Tools.	Diameter.	Weight in Kilog.	Price in Francs.	
1	Téte de soude, No. 3	..	10	30	
1	Clef de relevée, Nos. 1, 2, 3	..	37	111	
1	Clef de retenue, Nos. 1, 2, 3	..	18	45	
6	Tourne-à-gauche	..	55	110	
1	Grand manche de manœuvre, No. 3	..	22	38	
1	" " No. 1	..	21	63	
1	Moraillon pour la chaîne..	..	9	31	50
1	Chaîne cable de 2, 6 mètres de	25 n/m	370	444	
1	Poulie et son axe de	560 n/m	95	133	
1	Treuil, No. 1, complet pouvant être mû à bras ou actionné par une machine à vapeur avec ses pièces de rechange	..	2,000	2,800	
1	Esse à brides	..	10	20	
1	Poupée, No. 1, avec ferrures de levier ..	..	250	500	
1	Paire d'emmanchements, No. 0 de rechange de	..	50	150	
1	" No. 1	..	36	108	
1	" No. 2 " ..	..	28	84	
1	" Nos. 2 et 3 " ..	..	37	111	
1	Maîtresse tige, Nos. 0, 1, de 5 mètres ..	..	193	270	20
2	Tiges, No. 1, de 6 mètres	..	200	300	
1	Raccord, Nos. 1, 2, de 1 mètre	..	20	60	
1	Tige raccord, Nos. 1, 2, de 6 mètres	..	95	142	50
5	Tiges, No. 2, de 6 mètres	..	385	577	50
1	Raccord, Nos. 2, 3, de 1 mètre	..	15	45	
1	Tige raccord, Nos. 2, 3, de 6 mètres	..	74	111	
10	Tiges, No. 3, de 6 mètres	..	570	855	
1	Allonge, No. 3, de 4 mètres	..	40	72	
1	" " 3, de 3 "	..	32	64	

Approxi mate Estimate for Boring Tools Nos. 0, 1, 2, 3, for a depth of 120 mètres, &c.—*(Contd.)*

Number of Tools.	Description of Tools.	Diameter.	Weight in Kilog.	Price in Francs.	
1	Allonge, No. 3 de 2 mètres	..	23	52	90
1	" " 3 de 1 "	..	14	50	
2	Trépans 1 plat et 1 à gouges avec emmanchements, No. 0 de	250 n/m	170	595	
2	Trépans 1 plat et 1 à gouges avec emmanchements, No. 0 de	200 n/m	100	375	
1	Soupape à clapet, No. 1 de	240 n/m	160	262	50
1	" " 1 de	180 n/m	64	238	
1	Soupape à boulet, " 1 de	230 n/m	92	322	
1	" " 1 de	180 n/m	70	260	
1	Tarière ouverte, " 1 de	240 n/m	58	232	
1	" " 1 de	190 n/m	45	168	
1	Tarière rubannée, " 1 de	240 n/m	44	176	
1	Elargisseur, No. 1 de	260 n/m	65	480	
1	" " 1 de	210 n/m	56	351	
1	Caracole, Nos. 0, 1, 2, 3	..	28	84	
1	Cloche à vis, Nos. 0, 1, 2, 3	..	62	310	
1	Caisse à outils divers pour forgerons	..	..	110	
1	Poulie et son axe pour câble	..	95	133	
1	Câble en fil de fer de 200 mètres	18 n/m	235	304	58
1	Tête de soude, No. 2 à œil	..	8	24	
1	Moraillon pour câble en fil de fer	..	10	10	
1	Harpon " "	..	26	78	
	Total ..	..	6,087	11,889	68
	4 % pour caisses, emballage, et camionnage en gare	..	..	476	
	Total net en Francs ..	..	..	12,365	68

PIPES of 26 and 21 Centimètres with Appliances required to join them and to force them through the Soil.

Number of Tools.	Description of Tools.	Diameter.	Weight in Kilog.	Price in Francs.	
80	Mètres de tuyau de 260 n/m par bouts de 2 mètres (le mètre de tuyau pèse 24 kilogs. et coûte Fr. 31-20	..	1,920	2,496	
120	Mètres de tuyau de 210 n/m par bouts de 2 mètres (le mètre de tuyau pèse K. 19-50 et coûte Fr. 25-35	..	2,340	3,042	
100	Boulons de jonction de tuyaux	..	..	20	
1,000	Rivets d'assemblage de tuyaux à Fr. 6 le 100	..	..	60	
1	Rivoir pour tuyaux de 2 mètres avec manchons de 26 et 21 n/m	260 n/m 210 n/m	165	333	
1	Jeu de vis de pression complet avec têtes de tuyaux de 260 et 210 n/m	260 n/m 210 n/m	305	1,067	50
	Total ..	..	..	7,018	50
	4 % pour caisses, emballage et camionnage en gare	..	..	280	74
	Total net en Francs ..	..	4,730	7,299	24

Abstract of Cost.

	FRANCS.
Perforating tools	12365, 68
Piping with rivetting and forcing tools	7299, 24
	19664, 92
	RS.
At exchange of two francs per rupee	9,832
Freight, insurance, agent's commission, and charges interest, landing, cartage, &c.	1,168
	11,000
Masonry, staging and shed	1,500
	12,500

Explanatory Memorandum.

1. *Choice of tools.*—There is a great variety of tools used for boring artesian wells. In some spots specially favored the tools required (for narrow bores) and the process of boring are reduced to such simplicity that any intelligent foreman will in a few days acquire all the information necessary to bore a well with tools worth a few hundred rupees. Such is the case with most wells at Pondicherry. This however is far from being so in every locality. Most borings, particularly of large diameter, are impeded by difficulties which can be overcome by the use of proper tools in the hands of an operator who has had much experience. A few words will explain the disparity of circumstances under this head. Let us, for instance, take into consideration the wells, Nos. 8, 9, 11, and 13, mentioned in the Proceedings of the Sanitary Commissioner under No. 39, dated the 11th January 1883, and G.O., of 26th January 1883, No. 170, Financial. These wells being bored in modern alluvium and in tertiary soils, the simplest form of apparatus was sufficient. Well No. 14 bored at Bahour, and the well at Karikal having struck secondary rock, a choice assortment of tools was needed. The easy wells I refer to are 20 to 40 metres deep. The more difficult ones exceed 100 metres. One well is about 200 metres deep. Such deep wells cannot be sunk with cheap tools. Above all I may mention the well that I have sunk at Trivandrum, of which the last six feet were through solid gneiss found at a depth of 246 feet from the level of the ground.

2. *Accidents.*—In boring artesian wells the least foreseen of accidents might occur, and they require the display of the greatest ingenuity for the contrivance of special tools adapted to the peculiar circumstances of the case. I may mention the following cases:—

(*a*) Obstruction of the lower end of the bore by the fall of a broken piece of the boring tool.
(*b*) Wedging in of the boring tool between the pipe and some hard substance, causing the tool to become fixed and immovable.
(*c*) Deviation of the pipe from the vertical line brought about by neglect in testing sufficiently often the accuracy of the vertical. It is also brought about by the bending of bad material.
(*d*) The rupture of rivets connecting two successive pipes.
(*e*) The compression of the pipe by such pressure of the earth as to render it immovable.

Each of these cases includes thousands of varieties which if they be detailed would fill up volumes over volumes. Although it is impossible to indicate in a few words how all these cases are to be met, it may be said that with a proper assortment of tools in competent hands all difficulties may be overcome.

3. *Compression of pipe.*—Case (*e*) among accidents must be expected in great depths. In the trial boring of 10 inches at Madras the pressure at 80 metres will most likely arrest further progress of the 26 centimetres pipe. In that case a pipe of 21 centimetres must be introduced into the original pipe and the boring continued. Under these circumstances a great variety of cases may occur, which can all be met with the piping and tools specified.

4. *Inefficiency of cheap tools.*—Cheap tools bring about accidents. When such occur they are unfit to remedy them. Moreover no great depth can be attained and rock cannot be cut through with cheap tools. With such tools, particularly in the hands of amateurs, a small boulder is enough to arrest for ever the progress of a very promising well, or failure is due to some small accident which would be a trifle with good tools and material, but is insuperable with cheap tools. Should a trial be made at Madras with inefficient tools and failure ensue, the possibility of successfully boring an artesian well will be anything but tested, and yet the failure will act as a damper on further enterprise and arrest for a long while all search for artesian springs. In this as in all other matters the cheapest is to procure the best available material and tools. It is

3021

so specially in this case, when it is considered that the right tools once acquired all subsequent borings will be reduced in cost to a very low figure.

5. *Missing the spring.*—All artesian wells do not spout up to their best as soon as they are tapped. Owing to obstructions that are removable some of the best springs are often very lazy and require much coaxing before they begin to flow. A case of this sort may in incompetent hands be mistaken for a worthless spring. I have seen cases of this sort.

6. *Information on tools specified.*—These tools are exactly like those now used by the French Government at Pondicherry, and they are to be indented for from the same manufacturers, who supply also the requisite for wells of bigger and of smaller bore.

ORDER—dated 19th December 1884, No. 3129 W., Public Works.

This letter refers to a tender submitted by Mons. L. Cornet for sinking an artesian well at Madras to a depth of 393 feet (120 metres).

2. The tools and appliances are estimated to cost Rs. 12,500. Of this sum masonry and staging will cost Rs. 1,500. The latter will first be put in hand, and will be ready against the arrival of the apparatus for which it is proposed to telegraph. Mons. Cornet demands a salary of Rs. 400 per mensem, and approximately estimates the wages of workpeople at Rs. 150 per mensem.

3. The approximate cost of the well will be as follows :—

	RS.
Apparatus	11,000
Masonry, staging, &c.	1,500
Salary of Engineer for four and-a-half months	1,800
Pay of workpeople for do. do.	675
Masonry cistern to hold supply	300
Fuel, iron and steel for repairs, &c.	200
Total ...	15,475

4. This rough estimate is based on the assumption that the apparatus will arrive from Paris within six weeks, and that it will take three months to sink the well 393 feet. The latter period will however depend entirely on the nature of the strata to be penetrated. If much rock be encountered the work may occupy a longer time, but if nothing but clay and sand be traversed the well will probably be sunk in six weeks.

5. It is understood that, if water of good quality or of sufficient quantity be not tapped at a depth of 393 feet, the necessary tubes for lining the bore, should it have to be carried further down, can be made up quickly and cheaply at Madras.

6. It is observed that apparatus, other than tubing, valued at about Rs. 6,000 will, on completion of the well now proposed, be available for similar wells elsewhere.

7. His Excellency the Governor in Council considers that it is in every way desirable to make the experiment, and accordingly resolves to accept Mons. Cornet's offer.

8. The site of the experiment will be fixed by the Chief Engineer, Public Works Department.

9. The question of an allotment of funds will be considered in the Financial Department.

(True Extract.)

(Signed) J. SHAW-STEWART, Colonel, R.E.,
Secretary to Govt., P.W.D.

To Mons. L. Cornet.
To the Financial Department.
" Superintending Engineer, V Circle.
" Examiner, Public Works Accounts.

Exd. C. Howarth.
Spare Copies

4

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1884} Madras.

PUBLIC WORKS.

Dated December, 19th.

Recd. *Encl.*

G.O., 19th Dec. 1884, No. 3129 W.

DECEMBER.

Artesian Well at Madras

Orders on Monsieur Cornet's tender for sinking an —.

3021

Please call for it at once. CW

D.W.

I have obtained it from the S.E.'s office, which had not yet passed it on to P.W. Stores.

CC
17.12.84

S.A.W.

action is not to be taken regarding the indent until further orders are issued. CW

Saw

I do not see on the file the Estimate sent in by the Govt. of Bengal. What has become of it?

CY

Dw.

It was sent to the Genl. Supt. P.W. Stores, to enable him to prepare an indent for a similar set for Madras.

Cu
17.12.84

3021

Dw.

Office note to S.S. II submitted for approval.

Also a draft despatch to the S. of State, which it may be considered desirable to send now.

In telegram of 8.12.84, a revised indent was promised, but this will probably not go for some time

6

if at all, & some explanation will be awaited at the India Office.

Ch
17.12.84

3021

S.a.w.

I have passed the draft order to S.E.V. The proposed despatch to S. of S. had better lie over until the question of the artesian well to be sunk by Mons. Cornet has been discussed in Council tomorrow.

Ch.
17.12.84

HC

Please have the office note issued.

The draft despatch & file can then L.O. for the present.

Ch
17.12.84

+ Issued. BP
17/12/84

LO

Resubd. 19/12

DW. Draft despatch resubmitted. Ch
19.12.84

C.N° 9732 — In Circ: 2/12

3021

C.A.W.

It seems to me unnecessary to make this proposed reference to S. of S., as it will be for W. to decide whether one set only will be sufficient, or whether we must indent for more. The cost of a set cannot be reduced, and reduction can only be effected, it seems to me, by being satisfied with one or two sets in the first instance. Possibly an indent for one set, similar to that applied for by Bengal, costing £1916 + £24 for extra appliances, will meet the case.

This would be the time to try what can be done by Artesian Wells in Madras. The question must be laid before W. on his return.

C.S.

25-11-84

To W/

Submitted

R.S.

25-11-84

3071 W

6

6

3021

W.

The Bengal Indent provided for the apparatus to sink an artesian boring 11" diam. at top tapering to 4" at bottom.

The aggregate length of tubes was 2800 ft. and cost £1916, including a boiler & steam winch and all necessary appliances. The boring would therefore be 2800 ft. deep.

Our indent was for 4 sets to bore to a depth of 900 ft. each. One set to be 3 inch, one 4 inch, one 5 inch, one 6 inch, that is the diam: at bottom to be 3", 4", 5", & 6" respectively.

The difference in diameters does not account for the difference in cost between our sets and that applied for by Bengal.

Perhaps we might apply for a set similar in every respect to that indented for by Bengal — or rather by the N.W. Provinces. This would be a simple solution.

CY.
29-11-84

Yes - I agree ~~to that~~.

29-11-84

C.A.W.

I think a Revised Indent based on the exact information recd. from the N.W. Provinces will have to be prepared & sent to S. of S. in supersession of the previous one.

CY
1.12

CAW

GOVT. OF MADRAS. } 188 . { P. W. DEPT.

SECRETARY.

Chepauk, 17th December 188 .

OFFICE NOTE. 3021

To
S.E. V

Please instruct the Genl Supdt, P.W. Stores to take no action, pending further orders, on G.O. No. 3021 W. dd 9-12-84, directing the submission of a revised indent for a set of Artesian Well boring apparatus.

The enclosure to G.O., which has been recalled from your office, will be retained here for the present.

/ J. J. C. B.
O. W.

9

10

P. W. Dept.

3021

Telegram.

From Governor To Secretary
From Madras To London

Clusos one
Your letter number

Subegi stores
Public Works

Fortem Boring
20th October 1884 ×

apparatus Frahea
The indent may be cancelled ×

Clamor
A despatch on the subject will follow ×

Despatch 8/12/84.

10

11

1894.

India Office,
London 30th October, 1884.

3021

Public Works (Stores).

No. 1.

Sir,

1. I have considered in Council your Letter in the Public Works Department No. 14/2015 W, dated 16th August, 1884, forwarding an Indent for Stores required in the Madras Presidency, and have sanctioned compliance with the Indent, with the exception of the 4 Sets of Artesian Well Boring Apparatus, and 200 Tons of Foundry Coke.

2. The Indent states that the cost of the Boring Apparatus is unknown. From enquiries made in this Country it has been ascertained that the cost will probably amount to about £8.000, as

13

12

11

His Excellency,
The Right Honorable,
The Governor in Council,
Fort St. George.

3021

as noted in the margin, and I have therefore suspended the supply of the 4 sets demanded, pending the receipt of a further communication from your Government, which might, if considered desirable be sent by Telegram.

		£
3" Apparatus	about	1.670
4"	"	" 1.700
5"	"	" 2.130
6"	"	" 2.500
		£ 8.000

3. As 200 Tons of Coke are under supply in compliance with your Telegram of the 11th August last, the 200 Tons included in the Indent will not be provided.

I have the honor to be,

Sir,

Your most obedient,

humble Servant.

Kimberley

No. 5

No. 1967 Wd/ 11. 8. 84
" 461 Ed/ 12. 8. "
" 462 Ed/ 12. 8. "
" 2814 Wd/ 10. 11. 84
2015 Wd/ $\frac{14}{2015}$ Wd/ 16. 8. 84 (Origl)

Public Works
(Stores)
30 October 1884

The
Letter to Fort St George
No. 1

A
Circ

No. 3021. W

Genl
Acct

PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 9th December /84

READ the following

3021

Despatch from the Secretary of State for India – Public Works & Stores) } H. E. No. 1 dd 30th October /84

Communicated to the Supdg Engineer V Circle with advertence to G.O. No. 2015 dd 16th August '84

2 The Genl: Supdt: P. W. Stores will at once submit a revised indent on the Home Govt., providing for one set of Artesian Well boring apparatus similar

14

in

in all respects to the apparatus supplied to the Government of the N. W. Provinces and Oudh, the cost of which is shown to be £1951/-

3. The following telegram will be despatched to the Secretary of State for India.

"

Your letter No 1 Public Works of 30th October 1884.

"

Indent for

3021

Artesian boring apparatus cancelled—

"Revised indent follows—

Despd. 8/12/84

C.S.
1.12.84

2.12.84

3021
76

15

[illegible]
13/12/84

7
33

To
The Supdg Engineer V Circle

With original letter + Enclosures from Govt. of N. W. Provinces No 2200 d/ 27th June 1884

3021
16

97/52

Govt. of (1884) Madras.

PUBLIC WORKS.

Immediate

Dated 11/12/84

Recd.

17 W

Encl. (17)

G.O., 9 Decr. 1884, No. 3021-W

Boring apparatus for Artesian Wells

Orders on despatch from the Secretary of State regarding supply of ——

40/2

Adv. 10

Jd 10/12