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MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Revenue DEPARTMENT

G.O. No.	1720	Press
B.P. No.		Mis.
Dated	21-7-1966	196

Not to be folded or roughly handled

No. 14. Read the following letter from Lieutenant-Colonel R. F. OAKES, R.E.,
Superintending Engineer, Tanjore, to Major-General G. W. WALKER,
R.E., Secretary to Government, Public Works Department, dated Tanjore,
30th May 1876, No. 964:—

I HAVE the honor to inform you that in February last, I inspected the Vedarniem
canal, and having learnt that a survey of
Letter No. 682, of 10th March 1875, and one
plan sent separately.

• Public Works Department. I thought there would be no difficulty in
determining what should be done to improve the canal as suggested in the Collector's
letter embodied in G.O.,† No. 142-A, of
† Public Works Department. 18th September 1873, from the informa-

tion thus acquired. On examining the plan, however, I was not a little surprised to
find that beyond giving the mere outline of the canal and banks no information what-
ever was afforded by the plan relative to the land which appertains to the canal, and
even existing syphon sluices had been omitted, due, it is supposed, to the fact that
the syphon sluices were not visible from between the banks.

2. On examining the sections I found that the mean sea level was in some
sections shown to be below bed level, and in some above high tide level, and in others
in every intermediate stage between those levels; and on further examination I found
that every section had been plotted from a datum 25 feet below the level of the point
from which the cross section was taken, utterly regardless of the relative levels of these
points, and the mean sea level was marked throughout at 6.64 below these points.
Judging from Mr. Leggatt's letter, No. 682, of 10th March 1875, which I have since
discovered in the office, it appears that this method of plotting the cross sections was
approved, if not suggested by him. Having discovered the absurdity of the error made,
I endeavoured to rectify matters by having the cross sections plotted properly from
the actual level of the starting point as shown in the horizontal section, but here again
I found the mean sea level occupying impossible positions relative to H.W.L., and so
I resolved to have the datum of mean sea level checked, and found that an error of 2.24
had been made in fixing the level of the starting point from the mean sea level, obtained
from the Railway Department, and this in a distance of from 3 to 400 yards. I then
had the mean sea level put in at 4.4

† Crown of jetty at Negapatam.

instead of 6.64 below the starting point†

but with equally unhappy results; whereupon I came to the conclusion that the whole
of the levels were utterly untrustworthy, and that they are so I am no longer surprised,
for Mr. Phillips, the Surveyor, engaged upon the work, has lately been Municipal Over-
seer at Tanjore, and, in taking some levels for me in connection with Municipal work,
I found he was only 17 feet out in a mile; the fact is, he has not the smallest idea of
levelling, and should not have been employed, having been previously found to be
utterly inefficient on the Coleroon survey on which he was employed for a very short
time under Lieutenant Romilly.

3. As it is difficult to conceive that under the actual state of things Mr. Phillips
should have been recommended for a gratuity of an extra month's pay which he has
received under G.O., No. 76, of 11th May 1875, I forward the plan and sections of
the canal which I beg may be returned.

4. On discovering that the section was utterly useless, I purposed to employ Mr. Assistant Engineer Paul in taking cross sections and a line of levels down the canal, and this work he may be permitted to undertake on Lieutenant Romilly's return from privilege leave early in August; he is now in temporary charge of No. 3 Range. The work would occupy him about a month, and could be carried out with the aid of four Lascars in addition to his special establishment at a cost of Rupees 24. As benchmarks have been fixed, it could be well to know their value, but I am of opinion that no survey or levels of the canal were necessary for the preparation of an estimate for improving the existing canal.

5. The canal consists of a few artificial links connecting existing rivers, portions of which it follows, and for a great portion of its length the canal follows existing drainage channels, and being connected with the sea at three different points,* there are two well-defined points† at which the tides coming up the different streams meet, and the water level being influenced by the inland drainage and by the freshes during the monsoons, there are certain limits within which these waters will meet, and within such limits accumulations or deposits must take place, and these must from time to time be removed so as to maintain the minimum depth of water at low tide at such points. Under the circumstances represented, it is clear that the canal bed is not required to be maintained at a uniform level; all that is required is to maintain 3 feet of water at low tide, and this may be estimated for entirely independently of a survey and levels and with reference to low water only.

6. The depth of water in the various portions of the canal at L. W. in February were as follows:—

Distance.	River or Channel.	Depth.	Remarks.
Miles.			
2½	Cuddaviyaur river ...	...	Deep stream, a straight cut made upwards of 20 years ago.
2½ to 6	Artificial new cut to Velliya- yaur.	1' 2" to 2' 9"	
3½ to 5½		1' 2" to 1' 9"	
6½ to 8	Velliya- yaur river ...	2' 3" to 3'	Deep water.
8 to 8½	New cut to Korangunny ...	2' 3" to 3' 1"	
8½ to 10	Ramanaden Voikal ...	2' 6" to 3'	Old drainage channel.
10 to 12½	Paupan Voikal ...	2' 6" to 3' 2"	Do. do.
12½ to 16½	Kodichittiyaur ...	2' 5" to 3'	Do. do.
16½ to 20½	Adapaur ...	...	Broad deep river, a drainage.
8½	New cut ...	2' 7" to 3'	From Topethoray to Vedaramiem.
28½ to 32	New cut ...	2' 9" to 3' 6"	Extension in 1875; executed very satisfactorily by Salt Department.
32 to 35	New cut ...	...	

7. From the above table it will be observed that in the artificial cut between the Cuddaviyaur and Velliya-
yaur in the limits
3½ to 5½ miles.
within which the tidal and flood waters

meet; the canal is very shallow, but elsewhere the guaranteed depth (if it may be so called) of 3 feet at tidal L. W. is fairly maintained; this, however, is done with great difficulty in the link south of the Adapaur, though the side slope are not less than 6 to 1.

20½ to 23½.

8. It was hoped that the artificial link between the Cuddaviyaur and Velliya-
yaur would have become enlarged by the flood waters during the monsoons, as the Cuddaviyaur straight cut or the first 2½ miles of the canal have become, but hitherto there has been no action in this respect; between where the artificial cut enters a part of the old course of the Velliya-
yaur and the river itself, the channel is shallow, because the waters are not sufficiently confined and concentrated, but this may be remedied by narrowing the channel.

9. As will be observed from the sections, the narrowest part of the canal is that through the Ramanaden channel, but here a good navigable section is maintained, as the sides stand almost vertically consisting of stiff clay; if anywhere, here is where widening is chiefly required, but it could be carried out only at a great cost, for there is no margin within the artificial banks and wet cultivation, or a channel hugs the outer foot of the banks.

10. I would suggest that the artificial cut between the Velliya-
yaur should be cleared next year, the canal being closed for the purpose from 1st March to 31st May; the cost of clearing would be about Rupees 7,000, and while the canal was closed, two more syphon sluices might be built as indicated in pencil in the 11th and 13th miles for the improvement of the drainage on the west and of the supply on the east of the canal.

2½ to 6 miles.

11. In order, however, to obviate the necessity of constantly closing the canal for repair, I would suggest that either a steam or two hand-dredgers should be obtained for maintaining the canal. Messrs. Hunter and English of Bow, London, could, it appears, supply a ten horse steam-dredger capable of lifting 50 tons of sand and sludge per hour for £2,400, or if made with a non-condensing engine for £2,200 (including punt to support shoot spout), or a hand-dredger to lift 10 or 12 tons of sand and sludge per hour with handles for twenty-four men for £460, or with upper tumbler high enough to deliver the material elevated into a spout with punt, &c., for £700. The steam-dredger would be the more satisfactory, though the more costly, and could be worked, it is believed, with a maintenance allotment of about Rupees 10,000 per annum; the sum now expended on maintenance is Rupees 5,000; but, if the canal is not to be periodically closed and large extra sums expended from time to time on particular portions of the canal, the maintenance allowance must be doubled.

12. It is proposed to cut off the bend in the Adapaur, in which the 5th mile is marked by a straight cut, as boats are often detained in that reach for a tide or even for a day, as there is no towing path along the margin of the river. It ought to have been possible to have laid out this cut from Mr. Phillip's survey, but the bend has been again surveyed and levels have been taken for the new cut, and the estimate for it will shortly be submitted.

*Proceedings of the Madras Government, Public Works Department,
3rd July 1876. No. 1,670.*

From W. B. LEGGATT, Esq., A.I.C.E., Executive Engineer, No. 4 Range, Negapatam, to Lieutenant-Colonel R. F. OAKES, R.E., Superintending Engineer, Tanjore, dated Negapatam, 10th March 1875, No. 682.

I HAVE the honor to inform you that I have this day despatched by train to your address a tin case containing the survey plan, &c., of the Vadarniem canal, and I beg to enclose herein the railway receipt, together with a list

1 Survey plan sent separate.
1 Railway receipt.
1 List of bench-marks.

of bench-marks fixed in connection with the levels taken.

2. I have to explain that, as we were not aware what the mean sea level here was when the levels were taken, they were reduced to an assumed data of 25 feet below the first bench-mark on the jetty at Negapatam, where the levels were started from.

3. After the sections were plotted, however, to the assumed datum line, and the whole work completed, a list of bench-marks, in reference to mean sea level as fixed by the Railway Engineers, was furnished to this office, and you will observe how I have shown this mean sea level line on the sections in the plan. It was the only thing to be done, for otherwise to draw the sections over again would only be waste of time and money.

the sections over again would only be waste of time and money.

4. In consideration of this extra work and of the reasons given in my letters as per margin,* I beg you will kindly apply to the Chief Engineer for Irrigation to pass to the establishment concerned one month's pay as per margin beyond that estimated for.

* Letters, Nos. 485 and 457, of the 7th and 16th November 1874 respectively.

1 Surveyor	...	...	...	...	...	...	Rs.
1 Draftsman	...	...	...	...	...	...	78
							40

* Letters, Nos. 435 and 457, of the 7th and 16th November 1874 respectively.

1 Surveyor	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700	2800	2900	3000	3100	3200	3300	3400	3500	3600	3700	3800	3900	4000	4100	4200	4300	4400	4500	4600	4700	4800	4900	5000	5100	5200	5300	5400	5500	5600	5700	5800	5900	6000	6100	6200	6300	6400	6500	6600	6700	6800	6900	7000	7100	7200	7300	7400	7500	7600	7700	7800	7900	8000	8100	8200	8300	8400	8500	8600	8700	8800	8900	9000	9100	9200	9300	9400	9500	9600	9700	9800	9900	10000
1 Draftsman	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700	2800	2900	3000	3100	3200	3300	3400	3500	3600	3700	3800	3900	4000	4100	4200	4300	4400	4500	4600	4700	4800	4900	5000	5100	5200	5300	5400	5500	5600	5700	5800	5900	6000	6100	6200	6300	6400	6500	6600	6700	6800	6900	7000	7100	7200	7300	7400	7500	7600	7700	7800	7900	8000	8100	8200	8300	8400	8500	8600	8700	8800	8900	9000	9100	9200	9300	9400	9500	9600	9700	9800	9900	10000

No. 15. ORDER THEREON, 3rd July 1876, No. 1,670.
His Excellency

CIVIL WORKS, No. 1.

No. 15. ORDER THEREON, 3rd July 1876, No. 1,071.

CIVIL WORKS, No. 1.

His Excellency the Governor in Council has read with much interest this practical paper in which Lieutenant-Colonel Oakes has given a clear description of the nature and condition of the Vedarni canal. He regrets to learn that these surveys, for which an estimate of Rupees 1,280 was sanctioned in G.O.,* No. 521, of 1st May 1874, and an additional payment of Rupees 110 made by Order No. 76, of 11th May 1875, on recommendation of Mr. Leggatt, are very imperfect as to plan, and incorrect, and therefore useless as to relative levels. They appear to have been prepared by Mr. Phillips, a Surveyor, working under the orders of Mr. W. B. Leggatt, Executive Engineer, 2nd Grade, who was in charge of the Negapatam Range from July 1874 to April 1875. Mr. Leggatt failed either to instruct the Surveyor as to the details necessary to make his work intelligible and useful, to check it while in progress, or to detect its manifold imperfections after completion, although from his letter of 10th March 1875, submitting the papers that he at least pretended to have examined it. Mr. Leggatt will be called upon for an immediate explanation of the part he has taken in the matter, and to show cause why he should not refund the bonus granted for bad work on his recommendation. The further employment of Mr. Phillips on any survey or other work connected with the Public Works Department is hereby prohibited. Lieutenant-Colonel Oakes has not explained how Mr. Phillips, having been turned off the Coleroon survey for incompetence was re-employed on survey work in another range of the same district. The District Engineer of Tanjore is directed to forward the necessary explanation.

*Proceedings of the Madras Government, Public Works Department,
3rd July 1876. No. 1,670.*

2. The canal for the first $2\frac{1}{4}$ miles of its course from north to south is a portion of the Cuddaviyaur river, a straight and deep stream which an artificial cut of 4 miles then connects with Velliyaar river, another deep stream, whose course is followed for $2\frac{1}{4}$ miles. A similar cut of $1\frac{1}{2}$ miles leads into a series of three old drainage channels $2\frac{1}{2}$ to 3 feet in depth, whose course is followed for a distance of $10\frac{1}{4}$ miles; to the Adapaur river navigation of $8\frac{1}{4}$ miles; at the end of which occur two new cuts to and beyond Vadarniem, of which the latter was made only last year, totalling $6\frac{1}{2}$ miles in length, and of good depth. Out of the whole distance of 35 miles, $12\frac{1}{2}$ are river navigation, all but half a mile in deep water. And of the remaining $22\frac{1}{2}$ miles of canal and drainage channel, the 4 miles between the Cuddaviyaur and Velliyaar alone are objectionably shallow.

3. The suggestion in paragraph 10 of Lieutenant-Colonel Oakes' report, that this latter section shall be specially taken in hand and cleared next March, April, and May is approved; and a sum of Rupees 7,000 will be held at the District Engineer's disposal in the Salt Budget of 1877-78. The syphon sluices alluded to will, it is presumed, be constructed from Irrigation Funds.

4. In the present state of finances, and looking to the nature and requirements of navigation, His Excellency the Governor in Council is not prepared at present to sanction the cost of the use and maintenance of steam-dredges for this work. But he desires to be furnished with all details regarding the hand-dredges supplied by Messrs. Hunter and English, also with the reasons why spoon dredging should not succeed in such shallow water, and with particulars of the extent to which spoon dredging has been actually tried on the canal.

(True Extract.)

W. Mason Colonel,
Offg. Under Secy. to Govt., P.W.D.

To the District Engineer, Tanjore.

" Chief Engineer for Irrigation.

" Examiner of Public Works Accounts.

Revenue Department.

Exd. A. Grubert.

10 Spare Copies

N^o 2913
Revenue 1875 Department
Govt. of 1876 Madras.
PUBLIC WORKS.

✓

To

THE DISTRICT ENGINEER,

TANJORE.

&c., &c., &c.

Dated July 3rd.

Issued

Sanctified *CI*

Recd.

17 July 1876

Encl.

G. O., 3rd July 1876, No. 1,679.

JULY.

Nos. 14-15.

③

Des. 1876

Vedarnem Canal, Tanjore District.—Pass-
ing orders on the report of Lieutenant-
Colonel Oakes on the —.

As 1720
Communicated to the Secy of Govt.

21 July 1876

VCA 4542/77

14 Ed. O. 1876 Oakes on 1st July