M.R. O. 1—32,000—16-10-29.

MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No.	3057	Press ~~Mis.~~
98-96 Dated	8-12-~~19~~ 1858	

Not to be folded or roughly handled

Proceedings of the Madras Government, Revenue Department, 8th December 1868.

No. 95. Read the following Proceedings of the Madras Government in the Public Works Department:—

Passing orders on the letter from the Superintending Engineer of the 6th Division, reporting on the works required to complete the canal between Negapatam and Vedarniem, Tanjore District. (Here enter 26th November 1868, No. 3,703.)

No. 96. ORDER THEREON, 8th December 1868, No. 3,057.

Irrigation, No. 4.

Communicated to the Board of Revenue.

(True Extract.)

(Signed) F. BRANDT,
Under Secretary to Government.

To the Board of Revenue, with Proceedings Public Works Department, No. 3,703.

Exd. G. A. Turton

No. 565. Read the following letter from the Superintending Engineer, 6th Division, to the Secretary to Government, Public Works Department, dated Tanjore, 21st October 1868, No. 750 :—

1. I have the honor to submit estimates, to the amount of Rupees 32,070, on account of the work required to complete the canal between Negapatam and Vedarniem, adverted to in my letter, No. 1,050, dated 15th October 1867.

6 Abstract Estimates.
6 Plans.
1 Sketch.
G O., No. 3,471, dated 8th November.

2. The expenditure on the original estimate up to the end of last year, inclusive of a sum paid to the Tahsildar of Tritrapundi, for work executed by him, amounted to Rupees 55,486, the balance required to complete the works provided for in the original estimate was then Rs. 4,066, leaving a balance of Rs. 10,858 available from the original estimate, instead of Rupees 12,500, as estimated in October last; the difference is chiefly due to a larger amount having to be paid to the Tahsildar than was anticipated. Deducting this balance from the estimate now forwarded, it will be observed that a sum of Rupees 21,212* is required to complete the work, instead of Rupees 28,750; the difference is due in a great measure to the fact that I have not provided for the bridge between the Velliyaur and Cuddavyaur, an estimate for which amounts to Rupees 9,550. Ramps have been provided for the crossing, and cattle have no difficulty now in crossing, while for the passage of villagers two catamarans are provided; it is only for two small villages that the crossing is required, and Rupees 9,550 appears to be an unnecessarily large outlay for their accommodation.

Rs.	
55,486	
4,066	
59,552	
70,410	
10,858	

Rs.	
* 32,070	
10,858	
21,212	

3. The only items in the estimate which appear to require remark are Nos. 4, 5, 6, and 1.

No. 4 provides for a head sluice just below the syphon, by which the Chendranuddi crosses the canal, in lieu of the separate syphon sluices which burst last year; this sluice has been built and answers its purpose. To command the lands supplied by it, it was necessary to raise the basin walls of the Chendranuddi syphon nine inches, and the surplus dam of the Chendranuddi has been raised two feet and the vent in it one and a quarter feet. No water has yet passed over the dam this season, but all has been passed by the syphon sluice.

Rupees 470.

No. 5.—In widening the canal it is necessary to weight such portions of the crowns of the Poyoor and Karoovalungaday syphon sluices as will be deprived of the weight of earth now over them; when the works were originally built only the centre portions of the syphon sluices were weighted, the earth over them elsewhere being sufficiently heavy to counterbalance the upward thrust of the water.

Rupees 320.

Govt. Oriental Mss. Library.

REVENUE.

THE BOARD OF REVENUE.

Dated December, 68.

Recd. Encl.

G. O., 8th December 1868, No. 3,027.

DECEMBER.
Nos. 95-96.

Negapatam and Vedarnium Canal.—Order on the works required to complete it, communicated to Revenue Board.

No. 6 provides for raising the centre arch of the bridge over the canal on road No. 36. The rise of the arch is only six feet, and tidal high water is up to springing line, while during inland floods the surface level of the water is from two to three feet higher, or from four to three feet below intrados at the crown; it is proposed to raise the arch six feet, or to give it a rise of twelve feet, leaving from nine to ten feet clear above high water during inland floods, which are of short duration.

Rupees 2,000.

No. 1 provides for widening and sloping the sides of the artificial portions of the canal only, and not for any improvement to the Ramanaden and Paupan Voikals; the former, though narrow near its head, preserves its section well, and has no tendency to silt, owing to erosion of the sides or slopes, and there is not room to widen it without removing the banks and taking up valuable land; half a mile below its head the channel is thirty feet wide and upwards at low water level, and this is sufficient.

Rupees 28,200.

4. With the exception of plastering to some of the masonry works, and deepening below low water mark, the work provided for in the estimates has been nearly completed. Of the deepening below low water mark, only 800 yards have been fully completed; it has been found very difficult to get the work below low water mark done, and as yet the people are unable to use the spoon dredges; they may be useful to remove shoals when the canal is completed, but they are not suitable for the deepening required in widening the canal.

5. Last year the north-east monsoon was a light one, and appeared to have but little effect upon the artificial portions of the anal, for ethere was a depth of water of from two feet nine inches to three feet at low water when I examined the work in March last, and the slopes were but little affected; but on examining the canal on the 2nd instant, I was disappointed at finding only from two feet to two feet six inches of water at tidal low water in the deepest part of the canal, while at the sides the shoaling appeared to be even greater than six inches; some of this may perhaps be due to earth having found its way into the canal while the widening was being carried out, though every effort was made to prevent this; but some is undoubtedly due to deposit brought into the canal by a drainage channel.

6. It is much to be regretted that the width of the canal was not originally made twenty feet at bottom, as suggested in September 1865, and it is doubtful whether the widening below water will ever be effectually and thoroughly completed, unless the canal is run dry or nearly so, as it may be in February, March, and April. I would, therefore, suggest that the canal should be closed in those months in 1869, and that the work should be thoroughly and completely carried out. The Collector states that the canal may be closed from March to May without any detriment to the salt traffic, and unless the canal is closed it will not be possible to weight the syphon sluices.

Letter No. 960.

7. Of the northern section of the canal, from the head of the Ramanaden channel to Negapatam, the portion which is most shoaled is that where the Velliyaur is taken advantage of to form a portion of the canal, and this, chiefly, opposite to a

surplus stream. The only thing to be done here, is gradually to contract the waterway by means of small groynes, by planting grass, &c.; the bed of the river can only be recovered by degrees, and by constant attention on the part of the conservancy establishment.

8. Between the Ramanaden head and the Adapaur the canal is in very fair order, except where the Coopien, the Paupan, and the Checklien channels enter it at S M and R. The estimate provides for diverting the Checklien channel into the Hurrischendranuddi. The Paupan channel is a comparatively large surplus, which it is not proposed to divert. The Coopien channel, though a small stream, brings down a great deal of silt, and it would be well to take it across the canal at S; formerly the lands on the eastern side of the canal obtained a supplemental supply from all the drainages which fell into the Ramanaden channel, of this they are now deprived in a measure, though the syphon sluice already built at T, enables a portion of the drainage to find its way to the lands on the east of the canal, where there are 310 valies* of land uncultivated out of 440½ valies; much of the former is on the same level as the 130 valies which are now irrigated, and only requires water to admit of its being brought under cultivation. So far from the source of supply, the land depends for the most part on the drainage from the more western lands, and the supply is, therefore, precarious; it is therefore all the more desirable to prevent any water from being lost. On the western side of the canal there are 113½ valies which are uncultivated, these are shown in yellow in the accompanying plan, and it is proposed to supply these lands by placing a dam at L, one foot† above the bed of channel, with dam stones two and a half feet‡ high, and by a channel carried along L K Z Y X M N P Q R; at M this channel will be taken under the Paupan channel by a syphon sluice, and will eventually be discharged at R into the Checklien, which will itself be diverted into the Hurrischendranuddi.

* Valie = 6·6 acres.

† 20·5 feet.
‡ 23 ,,

9. A portion of the water which the Coopien channel receives will be conveyed across the canal at S, and in the basin wall on the upstream side there will be a vent or opening six feet long, provided with a dam stone, to admit of excess water being conveyed from S to T, where a syphon sluice already exists.

2·3 Vents. Area 22 square-feet.

10. As mentioned above, the supply by Coopien Voikal is precarious, and it is not possible to state, with any degree of accuracy, what number of valies may be brought under cultivation at once if the works proposed are executed; but supplemented as the supply on the coast is by rain during the north-east monsoon, it is probable that 100 valies on the east and seventy-five on the west of the canal could be brought under cultivation, and the revenue derived from them would be Rupees 3,500, and when the works for the regulation of the Cauvery and Vennaur are completed, the supply will be less precarious, and probably another 100 or 120 valies on the east could be supplied, and would yield a revenue of Rupees 2,000 or 2,400. These, however, are secondary advantages to be derived from the undermentioned works, the primary object of the diversion of the surplus waters from the canal is to render the canal less liable to become silted.

$175 \times 20 = 3{,}500.$

The works required are—

		Rs.
1.	Constructing Dam in Coopien channel at L	370
2.	Syphon Sluice for Coopien channel at S	4,800
3.	Excavating Channel from S to Syphon Sluice at T	570
4.	Syphon Sluice at M under Paupan channel	4,600
5.	Excavating Channel Z Y M Q R	2,430
	Total ...	12,770

* 9,120 × 10 × ¼ = 15,200' at 4 As. = 3,800.

	Rs.
Estimate referred to in paragraph 1 ...	34,070
Deduct saving or original estimate, Rupees 71,410	10,858
	21,212
Estimates referred to in paragraph 10...	12,770
	3,800
	37,782

If the canal is to be run dry, it would be well to remove all shoals and deposit thoroughly, and for this about Rupees 3,800* will probably be required. If Government approve of these works their cost must be added to that mentioned in paragraph 1, and the supplemental estimate requiring sanction will be Rupees 37,782.†

11. If Government do not approve of all the works suggested in the last paragraph, owing to the uncertainty of the supply received by the Coopien channel, I would recommend that Nos. 2 and 3, together with the sum of Rupees 3,800, required for removing shoals, should be sanctioned at once, particularly if the canal is to be run dry early in 1869 to admit of the clearing and widening below low water being properly executed; otherwise, the canal will have to be again run dry at some future date to admit of a syphon sluice being built at S, which must eventually be required to supply the 310 valies on the east of the canal. If only these works are sanctioned, in addition to the estimate referred to in paragraph 1, the supplemental estimate will become Rupees 30,382; but if the proposals made in paragraphs 10 and 11 are rejected, and only that regarding the thorough clearing of the canal is approved, the supplemental estimate will become Rupees 25,012.

	Rs.
	21,212
Nos. 2 and 3	5,370
	3,800
	30,382
	21,212
	3,800
	25,012

12. The third section of the canal, or that from Vedarniem to the Adapaur, is the most difficult to keep in order; it runs through very sandy soil, and is liable to be shoaled by drift sand; it joins the Adapaur almost at right angles in the centre of a bend in the river, and its mouth, or point of junction, becomes shoaled not only during discharge of inland drainage, but by the action of every tide: constant clearing is here necessary for a distance of about 100 yards. The widening of this portion of the canal under the enclosed estimate has not been carried out; when the work has been executed thoroughly and completely it may be determined whether the formation of a reservoir for scouring purposes is necessary.

13. Even by the ordinary river boats, which draw from two and a half to three and a half feet of water when loaded, 1,160 garce or 4,640 tons of salt were conveyed

from Vedarniem to Negapatam by 1,006 salt boats during the eight months, from 1st January to 31st August, and if the canal is improved in the manner suggested above, it is probable that the traffic will increase largely when boats after the Madras pattern are introduced, as has been proposed by the Salt Deputy Collector, and has been sanctioned by the Revenue Board.

14. With reference to paragraph 7 of G. O., No. 3,471, calling for a report, in detail, relative to the bursting of the syphon sluices of Karapadagay and Keelapadagay, I have the honor to report that the sluices hardly had a fair trial, for there were only nine inches of clay and one foot of water in the canal over them when they burst, instead of three and a half feet of water, the pressures above and below were as follow:—

For 1 foot of area weight.	lbs.	Upward thrust.
Arch 1¼, brick-in-chunam	125	9½ feet water
Laterite 1 foot...	150	at 62·4
Clay 9 inches	84	592·8
Water 1 foot	62·4	411·4
	411·4	181·4

or an upward thrust of 181·4 lbs. to be resisted by the tenacity of the mortar; supposing the canal had been open and had had three and a half feet of water over it, instead of one of water and nine inches of clay, the difference between the weight and upward thrust would have been only 103·8 lbs.; but when the Chendranuddi was in flood, the depth over the sill of the basin instead of being two and a half feet might have been five feet, or even more, and this brings the difference up to 260 lbs. or more. Even had the sluices escaped on the 8th October, they must have been destroyed later in the year.

Clay	84	
Water	62·4	
		146·4
64 × 3½ =	224	
		77·6
		181·4
		103·8

15. For the conservancy of the canal in 1868-69, I have passed an estimate of Rupees 7,000 from the allotment in the Budget of Rupees 11,863 for repairs to navigable canals. The estimate includes items as per margin,‡ which it appears should be charged to conservancy rather than to the original estimate. If it is considered that these items should be charged to the original work, Rupees 1,888 should be added to the estimate.

† Forming Ramps at Village crossings, three at Rupees 150 450
Two Catamarans for do. at Rupees 75 150
Constructing two Spoil Boats at Rupees 475 950
Do. twelve Spoon Dredges ... 338
1,888

No. 566. ORDER THEREON, 26th November 1868, No. 3,703.

IRRIGATION, No. 25.

1. In this letter the Superintending Engineer of the 6th Division reports on the works required to complete the canal between Negapatam and Vedarniem.

2. In October 1867 Captain Oakes submitted an approximate estimate of Rupees 41,250, for giving proper side slopes to the entirely artificial portions of

the canal, and for increasing the bottom width of those portion from ten to twenty feet. The estimate included sums of Rupees 5,750 and Rupees 1,750, respectively, for the construction of a bridge across the canal between the Velliyaur and Cuddavyaur, and for certain masonry works which it was proposed to build owing to the destruction of the syphon sluices provided for the Keelapadugai and Karapadugai channels. To meet the cost of these works Rupees 12,500 were stated to be available at that time from the original estimate of Rupees 70,410 for the project.

3. In passing orders on the subject the Government, after deducting the former of the two last named amounts from the approximate estimate of Rupees 41,250 referred to above, directed that provision should be made in the current year's Budget for the balance of Rupees 28,750.

4. It now appears that, as the works included in the original estimate of Rupees 70,410 have proceeded, it has been found that a saving of only Rupees 10,858, instead of Rupees 12,500 will be effected. The cost of the works now proposed to be undertaken is estimated at Rupees 32,070, from which deducting Rupees 10,858, the balance to be provided is Rupees 21,212, or Rupees 7,538 less than the sum ordered to be entered in the current year's Budget. The difference is stated to be due chiefly to the bridge across the canal between the Velliyaur and Cuddavyaur not being allowed for on account of its unnecessarily excessive cost.

5. The nature and object of the works included in the present estimate, the chief of which is the widening and sloping of the banks of the canal at a cost of Rupees 28,200, are fully explained in paragraph 3 of the Superintending Engineer's letter, and it appears that, with but some trifling exceptions, they have been nearly completed. Describing the present condition of the artificial portions of the canal, and remarking on the mistake made in not having given to it a bottom width of twenty feet in the first instance, Captain Oakes proceeds to notice its state between the head of the Ramanaden channel and the Adypaur, which he represents as being very fair with the exception of the portions where the Coopien, the Paupan, and the Checklien channels intersect it. He proposes to divert the last named channel into the Hurrischendranuddy, and, by means of a dam to be constructed at a certain point across the Coopien channel, to turn its waters into a new channel to be excavated to the west of the canal for the purpose of supplying irrigation to lands lying in that locality. The new channel will be taken under the Paupan by means of a syphon sluice, and will be made to discharge itself eventually into the Checklien which, as above stated, will be diverted into the Hurrischendranuddy.

6. A portion of the water of the Coopien channel below the bund will be conveyed across the canal for the supply of the lands situated to the east of the latter, provision being made for the diversion of the excess water into the Ramanaden channel. The Paupan channel, which is comparatively a large surplus stream, will be left untouched.

7. By the diversion of the waters of the Checklien and Coopien channels in the manner proposed the liability of the canal to become silted will be diminished, and an increase of revenue to the extent of Rupees 3,500 will, it is anticipated, be secured by the irrigation of about 175 valies of land which will probably be brought under cultivation. The cost of the works projected to secure these results

Proceedings of the Madras Government, Public Works Department,
26th November 1868.

is estimated at Rupees 12,770 which, being added to Rupees 21,212 referred to in paragraph 1 of these Proceedings, and Rupees 3,800 stated to be required for the removal of shoals and deposit from the canal, will amount to Rupees 37,782, which the Government sanction.

8. With a view to carry out thoroughly and completely the work connected with the widening of the canal, the Superintending Engineer suggests that the canal should be closed from February to April, while the Collector, it appears, is of opinion that it may be kept closed between the months of March and May without detriment to the salt traffic. This may be settled and the requisite steps be taken by communication between the Superintending Engineer and the Collector.

9. The cost of the works referred to in paragraph 15 may be charged as proposed.

(True Extract.)

Colonel, R. E.,
Secretary to Government.

To the Superintending Engineer, 6th Division.
" Controller of Public Works Accounts.
" Accountant General.
" Revenue Department.
" Chief Engineer for Irrigation.

W. 3057.
Communicated to the Board of Revenue
8th Dec 68.

Exd. S. T. Augustin.

Revenue Dept.

W. 3715.

Govt. of {1868} Madras.

PUBLIC WORKS.

To

THE SUPERINTENDING ENGINEER,

6TH DIVISION.

&c., &c., &c.

Dated November, 26th.

Recd. 27th. *Inst.*

G. O., 26th November 1868, *No.* 3,793.

NOVEMBER

Nos. 565-566

No 3057 8 Dec

Canal.—Passing orders on the letter from the Superintending Engineer of the 6th Division reporting on the works required to complete the canal between Negapatam and Vedarnieni, Tanjore District.

With Order

No. 95-96.