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MADRAS RECORD OFFICE.

Government of Madras.

Public works DEPARTMENT.

G.O. No. 3703	Press
565-66	~~Mis.~~
Dated 26. 11.	1868.

Not to be folded or roughly handled

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

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

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

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

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

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.

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.

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.

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No. 6 provides for raising the centre arch of the bridge over the canal at
Rupees 2,669.

road No. 33. The rise of the arch is only six feet, and tidal high water is 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 nine to ten feet clear above high water during inland floods, which are of short duration.

No. 1 provides for widening and sloping the sides of the artificial portion of the canal only, and not for any improvement to the Ramanaden and Paupan channels; 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 room to widen it without removing the banks and taking up valuable land; and a mile below its head the channel is thirty feet wide and upwards at low water level, and this is sufficient.

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; 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 canal, for there 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.

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 Velliya channel is taken advantage of to form a portion of the canal, and this, chiefly, opposite to a

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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

* Valie = 6.6 acres.

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

† 20.5 feet.
‡ 23 "

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.

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 2.3 Vents. Area 22 square-feet.

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.

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 it 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

175 × 20 = 3,500.

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.

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The works required are—

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 Paspan channel 4,600
5. Excavating Channel Z Y M Q R 2,430

Total ... 12,770

* $9,120 \times 10 \times \frac{1}{4} = 15,200$ at 4 As. = 3,800.

Estimate referred to in paragraph 1 ... 37,970
Deduct saving or original estimate,
Rupees 71,410 10,553

Estimates referred to in paragraph 10 ... 21,212
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 valves on the east of the

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

21,212
3,800
25,012

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. 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.

12. The third section of the canal, or that from Vedarniem to the Adapur, 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 Adapur almost at right angles in the centre of a bend in the river, and its mouth, or point of junction, becomes shoaled only during discharge of inland drainage, but by the action of every tide: consequently 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

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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 $1\frac{1}{4}$, brick-in-chunam	125	$9\frac{1}{2}$ 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,

Clay	84
Water	62.4
	146.4
	$64 \times 3\frac{1}{2} = 224$
	77.6
	181.4
	103.8

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.

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

† Forming Ramps at Village cross-ings, 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

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.

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

from the Original

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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 Kcelapadugai 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 Hurrishendranuddy, 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 Hurrishendranuddy.

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

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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.

Exd. S. T. Augustin.

Cort. of 1868

PUBLIC WORKS.

To

THE SUPERINTENDING ENGINEER.

CH. L. B. 1868

&c. &c. &c.

Dated November, 26th.

Recd.

G. O., 26th November 1868, No. 503.

NOVEMBER
Nos. 503-506

— P. S. 2 orders on the 1st of Nov. 1868, for the purpose of the works on the canal between the Vedar and the Vedar.

No 750

Supr Eng's Office 6th D. 9th
Sanjiv 21st October 1868.
Despatched 24th.

From,
Capt. R. F. Baker R.E.
Supr Engineer 6th D.

To,
Colonel C. A. Orr R.E.
Secretary to Government.
D. P. W.

Sir,
I have the honor to submit
Estimates to the amount of Rs 32,070
on account of the work, required to
complete the Canal between Negapatam
and Vedarur, adjoined to my
Letter No 1050, dated 15th October 1867.
G.O. No 3471
of 8th November.

2 — The expenditure on the original
Estimate upto the end of last year
inclusive of a sum paid to the Lakh.
sildan of Litrappundi, for work executed
by him, amounted to Rs 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

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

of Rs. 12,500 as estimated in October last, the difference is chiefly due to a larger amount having to be paid to the Lachildan than was anticipated - deducting this balance from the Estimate now forwarded - it will be observed that a sum of Rs. 21,212 is required to complete the work instead of Rs. 28,750 the difference is due in a great measure to the fact that I have not provided for the Bridge between the Valliyann and Enoldaviyann, an Estimate for which amounts to Rs. 9,550.

32,070
10,858
21,212

Pumps have been provided for the Cropping and Cattle have no difficulty now in cropping while for the passage of Villagers 2 Catamarans are provided. it is only for 2 small Villagers that the Cropping is required and Rs. 9,550 appears to be an unnecessarily large outlay for their accommodation.

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 Siphon by which the Chundramuddi crosses the Canal in lieu of the separate Siphon

Siphon Sluice which burst last year - this Sluice has been built and answers its purpose; to maintain the lands supplied by it, it was necessary to raise the basin walls of the Chundramuddi Siphon 9" & the surplus dam of the Chundramuddi has been raised 2' 8" the Vent in it 1 1/4". No water has yet passed over the dam this season but all has been passed by the Siphon Sluice.

No. 5 - In widening the Canal it is necessary to weight such portions of the Crocus of the Poyon & Karivalunipaday Siphon 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 Siphon Sluices were weighted, the earth over them elsewhere being sufficiently heavy to counterbalance the upward thrust of the water.

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 6' and tidal H.W. is up to springing line while during inland floods the surface level of the water is from 2 to 3' higher or from 4 to 3' below intrados at the Crown; it is proposed to raise the Arch 6 feet or to give it a rise of 12' leaving from 9 to 10' clear above high water during inland floods, which are of short duration.

No. 1 - provides for widening & sloping the sides of the Artificial Portions of the Canal only & not for any improvement to the Panamadu & Panpan Vokkalis. the former though

1,12,500

though narrow near its head presents its section well and has no tendency to silting to erosion of the sides or slopes and there is not room to widen it without removing the banks & taking up valuable land. $\frac{1}{2}$ a mile below its head the channel is 30' wide & upwards at L.W. level & this is sufficient.

4 — With the exception of plastering to some of the masonry works and deepening below L.W. Mark, the work provided for in the Estimates has been nearly completed. Of the deepening below L.W. Mark only 800 yards have been fully completed, it has been found very difficult to get the work below L.W. Mark done, & 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 N.E. monsoon was a light one & appeared to have but little effect upon the Artificial portions of the Canal, for there was a depth of water of from 2' 9" to 3' at L.W. when I examined the work in March

March last & the slopes were but little affected, but on examining the Canal on the 2^d Instant I was disappointed at finding only from 2' to 2 $\frac{1}{2}$ ' 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 6', 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 20' at bottom as suggested in September 1865, & it is doubted whether the widening below water will ever be effectually & 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 & 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 Wright the Siphon Sluices.

7 — Of the Northern Section of the Canal from the Head of the Pampa. Pampa Channel to Nejapatan the portion which is most shoaled is that where the Velliyam 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; the bed of the River can only be recovered by degrees & by constant attention on the part of the Conservancy Establishment.

8 — Between the Pampa and Head and the Adapaan the Canal is in very fair order except where the Coopiam, the Pampa, & the Cheklian channels enter it at S. M. & R. — The Estimate

Estimate provides for diverting the Cheklian Channel into the Pampa. Cheklian Channel. The Pampa Channel is a comparatively large surplus which it is not proposed to divert. The Coopiam Channel is though a small stream brings down a great deal of silt & it would 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 fall into the Pampa Channel. Of this they are now deprived in a measure though the Siphon 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 Taylies of land uncultivated out of 440 1/2 Taylies. Much of the former is on the same level as the 130 Taylies which are now irrigated, & only requires water to admit of its being brought under cultivation. — So far from the source of supply the land depends for

for the most part on the drainage from the more western lands & 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 $113 \frac{3}{4}$ Vaylies which are unattended, these are shown in yellow in the accompanying Plan, & it is proposed to supply these lands by placing a Dam at L 1' above the bed of the Channel with Dam Stones $2 \frac{1}{2}$ ' high, & by a Channel carried along L K Z Y X M N P Q R; at M this Channel will be taken under the Panpamby a Syphon Sluice and will eventually be discharged at R into the Checkians which will itself be diverted into the Durrischendanaddi-
9. A portion of the water which the Coopien Channel receives will be conveyed across the Canal at S & in the basin wall on the upstream side there will be a Vent or opening 6' long provided with a Dam Stone to admit of excess water being conveyed from S to T where a Syphon Sluice already exists.
20.5
23
2.3 'Thick Area 22 Square feet

$175 \times 20 = 3500$

10. As mentioned above the supply by the Coopien Vokhal is precarious & it is not possible to state with any degree of accuracy what number of Vaylies 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 N.E. Monsoon it is probable that 100 Vaylies on the East & 75 on the West of the Canal could be brought under cultivation & the Revenue derived from them would be Rs 3500, & when the works for the regulation of the Canals & Dam are completed the supply will be less precarious & probably another 100 or 120 Vaylies on the East could be supplied and would yield a Revenue of Rs 2000 or 2400 - 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 prevent the Canal bed liable to become silted. The works required are -

Constructing

1. Constructing Dam in Coopers Channel at L ----- } Rs 370.
2. Siphon Sluice for Coopers Channel at S ----- } 4800.
3. Excavating Channel from S to Siphon Sluice at T - } 570.
4. Siphon Sluice at M under Panpan Channel ----- } 4600.
5. Excavating Channel ZYMER - 2430

Total Rs - 12770.

If the Canal is to be run dry, it would be well to remove all shoals & deposit thoroughly & for this about Rs 3800 will probably be required.

If Government approve of these works their cost must be added to that mentioned in para 1 and the Supplemental Estimate requiring sanction will be Rs 37782. -

11 - If Government do not approve of all the works suggested in the last para owing to the uncertainty of the supply received by the Coopers Channel, I would recommend that for 2 & 3 together with the sum of Rs 3800 required for removing shoals should be sanctioned at

$$9/120 \times 10 \times \frac{1}{8} = 15.27$$

$$\text{@ } 4 \text{ a/c} = 3800.$$

Est. referred to para I 32070

38th Savings or Original Est. Rs 47400 - 10858 = 21212

Est. referred to in para 10 - 12770 + 3800 = 35570

$$21212.$$

$$12770 + 3800 = 5370.$$

$$3800.$$

$$30382$$

$$21212.$$

$$3800.$$

$$25012.$$

at once particularly if the Canal is to be run dry early in 1889 to admit of the clearing & widening below L.W. being properly & suited; otherwise the Canal will have to be again run dry at some future date to admit of a Siphon Sluice being built at S which must eventually be required to supply the 310 Daylies on the East of the Canal. If only these works are sanctioned in addition to the Estimate referred to in para 1 the Supplemental Estimate will become Rs 30382, but if the proposals made in paras 10 & 11 are rejected and only that regarding the thorough clearing of the Canal is approved the Supplemental Estimate will become Rs 25012 -

12 - The third Section of the Canal or that from Vadaruiem to the Ada, paan is the most difficult to keep in order - it runs through very sandy soil & is liable to be shoaled by drift sand - it joins the Adapaan almost at right angles in the centre of a bend in the River & 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 & completely it may be determined whether the formation of a Reservoir for securing purposes is necessary.

13 — Even by the ordinary River boats which draw from $2\frac{1}{2}'$ to $3\frac{1}{2}'$ of water when loaded 1160 farsas or 4640 tons of Salt were conveyed from Vadarniam to Nagapatan by 1006 Salt Boats during the 8 months from 1st January to 31st August, & 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.

Wille

14 — With reference to para 7 of G.O. No 3471 calling for a report in detail relative to the bursting of the Siphon sluices of Karapadagay & Keela Padagay, I have the honor to report that the sluices hardly had a fair trial for there was only 9" of Clay & 1' of water in the Canal over them when they burst. instead of $3\frac{1}{2}'$ of water the pressures above & below were as follows:—

For 1' of Area weight.	Upward thrust
Arch $1\frac{1}{4}$ Brick in Chumam....	125
Lutite 1'.....	150
Clay - 9".....	84
Water - 1'.....	62.4
	<u>411.4</u>
	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 & had had $3\frac{1}{2}'$ of water over it instead of one of water & 9" clay the difference between the weight & upward thrust would have been only 103.8 lbs but when the Chandramuddi was in flood the depth

84
62.4
146.4
103.8

over the sill of the basin instead of being $2\frac{1}{2}$ might have been for even more & 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 -

15 - For the Conservancy of the Canal in 1868/69, I have prepared an Estimate of Rs 7,000 from the allotment in the Budget of Rs 11,863 for repairs to the 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 Rs 1,888 should be added to the Estimate.

I have the honor to be
Sir
Yours most obed^t Serv^t

W. F. A. Captain R.
Superintendent of D.

Communication Palisair District New Work
Negapatam and Pithapandy Taluqs
Abstract Estimate
Works - Estimate for Widening & Improving the
Canal between Negapatam & Padaranimala of
Masonry Works Connected with it.

Quantity	Description of Work	Rate	Per	Amount	Amount of each part
<u>Excavation</u>					
<u>Northern Section</u>					
89180½	Cuttings Widening East side at	1 10	0 p	10218 9 7	
44812½	Do Do West side at	1 8	do	4567 15 6	
11470½	Do Deepening at	4	do	2367 10	1775 4 3 1
<u>Junction Canal</u>					
30844½	Cuttings Widening East side at	1 10	do	3534 4 3	
5946½	Do Do West side	1 8	do	619 6 10	
2409½	Do Deepening at	4	do	6025	4756 1
<u>Topothoray Section</u>					
20919½	Cuttings Widening East side at	2	do	2614 15	
20914	Do Do West side at	1 10	do	2296 6 4	
1855	Do Deepening at	4	do	463 12	5475 1 4
	Sundries & Contingencies				214 11 6
					28200
<u>Diverting Tail of Chukklia</u>					
<u>Vai Kal from Kodichottam</u>					
<u>into the Herrikundrahady</u>					
3628	Cuttings Cutting at	1 1	0 p	24570 1	
	Sundries & Contingencies			458	250
<u>Constructing a sluice</u>					
<u>for Drainage into Chundrahady</u>					
<u>diversion below the Lingah</u>					
	Carried over				28150

communication Estimate No. of 1868/9
Tanjore District.
Karapadai and Tritrapondy Taluqs.

3 for cutting an irrigating channel from the Tirumangudi
 by channel through the Karapadai waste lands from T. to R
 in Plan.

Measurement	No.	Rate	Description of Work	Per	Rate	Amount
$4\frac{3}{4}$	$\frac{1}{2}$	4353 $\frac{3}{8}$	From Tirumangudi channel marked at T to G.			
$4\frac{15}{16}$	$\frac{5}{8}$	3289 $\frac{9}{16}$	From G to X at a bend in Paper Vittal			
$5\frac{1}{8}$	$\frac{3}{4}$	2948 $\frac{5}{32}$	From bend at X to M at site of proposed under sluice.			
$5\frac{1}{8}$	$\frac{3}{4}$	5765 $\frac{5}{8}$	From M to P			
$5\frac{5}{16}$	$\frac{7}{8}$	2231 $\frac{1}{2}$	From P to R via Q			
		38669 $\frac{1}{4}$	Total Cubic Yard of Earthwork R.C.G.	1.	2416	13 3
			Sundries		13	2 9
			Total Estimate R.C.		2430	-

The above excavation to be 4 yards wide at bottom with
 a slope of $1\frac{1}{2}$ to 1. The spoil to be thrown up in the form of a
 bank on the west side only 4 yards away from the edge of the cutting

Signed / W. H. Donaghy
 Supervisor D.P.W.

Supt. Engineer 6th Div.
 21 October 1868

W. H. Donaghy Captain R.E.
 Supt. Engineer 6th Div.

Estimated for cutting
 & deepening the Canal
 between the Karapadai
 & Tirumangudi - a length
 of about 2000
 fathoms with it.

1868/9

Estimated in a
 1868/9

1868/9

Communication Estimate No. 91868/9.
 Tanjore District.
 Nagapattanam and Tirutrapomde Taluqs.

Work - For cutting a surplus channel from the Coopers Tankel
 at site of proposed under sluice to Papan Tankel along
 West bank of Ramanadsw.

Measurement	Description of Work	Per	Rate	Amount
S. N. H. Cubic				
3666 $4\frac{3}{4}$ $\frac{1}{2}$ 8763 $\frac{3}{4}$	Cubic Yards excavating channel -	Cps	1	544.29
	Surveys			25.13.3
	Total Estimate Rs.			570.00

The above excavation to be 4 yards wide at bottom side slopes
 $1\frac{1}{2}$ to 1 to be cut 4 yards from foot of Canal bank and the spoil
 to be thrown up in the form of a bank with its inner slope 4 yards
 from the edge of the cutting.

Signed/ W. H. Donaghy
 Supervisor D.P.W.

Sup. Engrs Office -
 Tanjore 21 October 1868

W. H. Donaghy Captain R.E.
 Sup. Engineer 6th Div.

Estimated for
 cutting an existing
 channel from the
 Coopers Tankel
 Channel through the
 Coopers Tankel
 lands from 2 to 4 in
 Plan - Rs. 2430 -

Sanctioned by
 the Secretary to
 Government
 21st Oct 1868/50

Communication

Abstract Estimate No. of 1868/69
Tanjore District.

Nagapattinam and Tritrapondy Taluqs.

Work — Constructing an under sluice for the Coopers Tank at S. to discharge drainage east of the Canal.

Quantity	Description of Work	Per	Rate	Amount
1774 1/4	C ft. of Brick in Chumam	Cft.	26	2772 1/4
5815	Square feet of Plastering	Sq	28	145 6
682 1/2	Cft. of Laterite stone	Cft.	12	511 14
3240	C yds of Excavation	C yds	19	354 6
3240	D. — filling		1	202 8
	Centering each Arch R ^d 17 1/2			35
	Baling			450
	Embankments			250
				4721 3 1
				78 12 11
	Sundries			
	Total Estimate R ^d			4800

Signed / H. F. Donaghue.
Supervisor D.P.W.

Sup. Engr. Office C-2
Tanjore 21 October 1868

H. F. Gates Captain R.E.
Sup. Engineer Division

Estimated for cutting
a surplus channel
from the Coopers Tank
at side of proposed
under sluice to tank
which along with
bank of Coopers
Rd 570-

In a letter from the
Supt. Engr. C-2
dated 21st October 1868.
To the Secretary to
Government D.P.W.
P. G. H. 199/68

Communication

Abstract Estimate

Tanjore District

Negapatam and Chitampandy Taluqs.

Work - for constructing a Kelingulak across Coopers Vokkal below the Chirmangudi Channel

Quantity	Description of Work	Rs.	Pais.	Annas.
174 ³¹ / ₃₂	Cub. ft. of Brick in Churnam	Cf.	26	272 57
705 ¹ / ₂	Sq. ft. of Plastering	Sq.	28	17 10 2
13 ¹ / ₂	Cub. ft. of Cut Stone	Cf.	18	20 4
313	Cy. of Earthwork		16	29 5 60
	Filling & forming back abut wings			15 . . .
				356 9 3
				15 6 9
	Sandies & contingencies			
	<u>Total Estimate Rs.</u>			<u>370 . . .</u>

Signed/ H. F. Donaghe.
Supervisor S.M.

Suff. Engr. Office D.
Tanjore 21 October 1868

W. T. Keed Captain R.E.
Suff. Engr. Office D.

Estimated for
Constructing one
Under sluice for the
Coopers Vokkal at V.
to discharge drainage
East of sluice.
Rs. 4,800 -
Rs. 570 -

Enclosed -
In a letter from the
Supt. Engr. to the Division
dated 21st October 1868
to the Secretary to
Government S.M.
C.P.M. 199/68

Communications

Metric Estimate No. 11868/69
Major District

Nagapattanam and Pithampore Taluqs.

Work. — Constructing an under drain for the Papan Thicket at N. N. in Survey No. 1 of the Karapada lands.

Quantity	Description of Work	Per	Rate	Amount	18/
1624 1/2	Cft. Brick in Churnam	Cft.	2 6	2537 11 9	
5243 1/2	Sq. ft. of Plaster	Sq. ft.	2 12	144 3 2	
1040	Cft. of Lateral	Cft.	12	780	
2400	Cft. of Excavation	Cft.	1 6	225	
2400	— Digging —		1 3	187 8	
	Centering 20 ft. each end			400	
	Palings			200	
	Embanking			45 14 6 11	
				85 9 1	
	Sundries			4600	
	<u>Total Estimate No. 11868/69</u>				

Signed / H. F. Donaghy
 Supervisor D.P.W.

Signed / J. P. Bates Captain R.E.
 Super. Engineer 6th Div.

Supy. Engr's Office 6th Div.
 Dated 21 October 1868

Enclosed

In a letter from the
 Supy. Engrs. 6th Div.
 dated 21st October 1868
 to the Secretary to
 Government D.P.W.

Oct. 4 1869 / 68

Estimate for con-
 structing a Culivela
 across the Division
 below the Division
 and Channel —
 No. 370 —

№ 3703

21st Oct/88/

her 167 Captⁿ.

an approx

o. for giving

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cial portion

for
and increasing

their

of the Cana

22/5/199/68

Redivivus for
Crested Kinglet on
under House for the
Dorchester, Dorset at
W. H. in January 1893
of the Dorchester
House of B. 4600.

Public Works Department

No 3703

Proceedings of the Madras Government
Under date the 26th November 1868

Read the following

Chepauk 38

7th November 1868

No 7502/21st Oct/68

I shall feel much
obliged by your kind
letting me have for
Colonel Macneil's information
the following documents.

In this letter the Super-
tending Engineer of the
Low reports on the work
required to complete
canal between
gapatham and Vadar-
am.

A sketch or survey plan
of the gapatham and
Vadaricium Canal
in the Tanjore District
submitted to Genl by the
Sup Engineer to the
Govt in letter No 968
of 15th Sept 1865 printed

In October 1867 Capt.
has submitted an approxi-
mate estimate of Rs 41250 for giving
proper side slopes to the
entirely artificial portions
of the canal, and increasing
their

27th 1868 Dept.
From the Chief Engineer
The Super Engineer
6th
To The Secy to Govt.
P.W.D.

Dated 21st
Recd 28th Oct 1868

No 3703-26th Nov/68
No 750.

Enclosures - 13.

Report upon the
Vedaricium Canal
and submitting Estimates
on account of work
required to complete
the same -

No 565

C. 54 Nov 1868 D. 13

10-11-73

W. H. in January 1869
of the Vedaricium
Canal No 4600

No 3703

Proceedings of the Madras Government
Under date the 26th November 1868
Read the following

From The Sup^r Engineer
of the G^o } A.C. No 7502/21st Oct/68/

In this letter the Super-
intending Engineer of the
6th Div reports on the work
required to complete
the canal between
Kegapattam and Vadar-
niam. In October 1867 Captⁿ
Baker submitted an approxi-
mate estimate of Rs. 41250 for giving
proper side slopes to the
entirely artificial portions
of the canal, and increasing
their

N.
W.R.

A/A

From The Sup^r Engineer
of the G^o } A.C. No 2247
To The Secy to Govt
of the G^o } A.C. No 8101 of 19th
of the 1865.
In the letter No 750
of the 1860, printed
p. 6. O. No 3703
of the 1860.
I remain
Yours very truly
The Sup^r Engineer

+ Plan Supplied - 10-11-73

to 565

C. 55 Nov 1868 Or 13-

10-11-73

W. H. in January 1869
of the Government
of the G^o No 4600

their bottom-width from 10
to 20 feet. The estimate
included sums of Rs 5750
and Rs 1750 respectively
for the construction of a
bridge across the canal
between the Velliyar and
Cuddaryar and for certain
masonry works which it
was proposed to build
owing to the destruction
of the siphon sluices
provided for the Keelapa-
dugai and Karapadugai
channels. To meet the
cost of these works,
Rs 12,500 were stated to
be available at that
time from the original
estimate

estimate of Rs 70,410 for
the project.

In passing orders
on the subject, the Govt
after deducting the for-
-mer of the two last-
named amounts from
the approximate esti-
-mate of Rs 41,250 refer-
-red to above, directed
that provision should
be made in the current
year's Budget for the
balance of Rs 28,750.

It now appears that,
as the works included in
the original estimate of
Rs 70,410 have proceeded,
it has been found that a
saving of only Rs 10,858,
instead

instead of Rs. 12,000 will
be effected. The cost
of the works now proposed
to be undertaken is
estimated at Rs. 32,070,
from which deducting
Rs. 10,858, the balance to
be provided is Rs. 21,212,
or Rs. 7538 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
Cuddaryaur not being
allowed for on account
of its unnecessarily excessive
cost.

The

The nature and
object of the works in-
cluded in the present es-
timate, the chief of
which is the widening and
closing of the banks of
the canal at a cost of
Rs. 28,200, are fully ex-
plained in para 3 of
the Superintending Eng^r's
letter, and it appears
that, with but some
trifling exceptions, they
have been nearly com-
pleted. Describing
the present condition
of the artificial por-
tions of the canal, and
remarking on the mistake
made

made in not having
given to it a bottom width
of 20 feet in the first in-
stance, Capt. Aakes
proceeds to notice its
situation between the head
of the Ramanaden Chan-
nel and the Adypam,
which he represents
as being very fair, with
the exception of the portions
where the Coopen, the
Qanpan, and the Check-
lin channels intersect.
He proposes to divert the
last named channel into
the Hurischedranuddy,
and, by means of a dam
to be constructed at a
certain

47
certain point across the
Coopen channel, to turn
its waters into a new
channel to be excavated
to the west of the canal
for the purpose of sup-
plying irrigation to lands
lying in that locality. The
new channel will be
taken under the Panpan
by means of a siphon
thence, and will be made
to discharge itself
eventually into the
Checklin which, as
above stated, will be
diverted into the Hur-
ischedranuddy.
A portion of the
water

water of the Coopien chan-
nel 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.

By the diversion
of the waters of the
Cheklien and Coopien
Channels in the man-
ner proposed, the
viability of the canal
to

to become silted will be
diminished, and an increase
of revenue to the extent of
Rs. 3500 will, it is anticipated,
be secured by the irri-
gation of about 175 acres
of land, which will pro-
bably be brought
under cultivation. The
cost of the works projected
to secure these results
is estimated at Rs. 12,777
which, being added to
Rs. 21,212 referred to in
para 1 of these Proceedings,
and Rs. 3800 stated to
be required for the main-
tenance of shoals and de-
posit from the canal
will

will amount to Rs 37,782,
which the Government
sanction

With a view to
carry out thoroughly
and completely the work
connected with the widening
of the canal, the Super-
intending Eng^r 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 detri-
ment to the salt
traffic

and the requisite steps be taken traffic. This may be settled
by communication between
the Superintending Engineer
and the Collector.

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

APB

To
The Suptg Engr 6th Div ✓
" Conty ✓
" Secy Genl ✓
" Revy Secy ✓
" Chief Engr for Engrs ✓

Recd 27/10/88

(1)

Handwritten notes in the top left corner, possibly describing a list or series of items.

Handwritten notes in the top right corner, possibly a date or reference.

Main body of handwritten notes on the left side of the page, organized in a list-like structure.

Main body of handwritten notes on the right side of the page, continuing the list-like structure.

Cue 4779
Govt. of 1868 Madras.

PUBLIC WORKS.

To the Superintending Engineer
1st Division

do. do. do.

Dist. 1 do.

Recd. 12

G. O. 26th Decr 1868. No 2732

Further to 2791 of 16.5.71
Mr. P. B. S. S. S. S.

Nos. 15-16

Further to 2791 of 13.2.71

Order Passing orders on the letter
from the Sub. Engr of the 1st Div
reporting on the works required
to complete the canal be-
tween Nagapattam and Vadu-
manim, Tanjore Dist.

Dec 4/77
Govt. of 1868 Madras.

PUBLIC WORKS.

1. The Superintendent Engr.
1. 5. 1877

Further Dec 4/77 2/16. 3. 77
Mr. P. C. 149 2/24

Do. do. do.
Recd. 12
G. O. 26 Dec 1868, No 2723

Nos. 365-366
Further Dec 55 2/13-2. 77

Canal Piping orders on the letter
from the Sub. Engr. of the 1. 5. 77
reporting on the works required
to complete the canal be-
tween Negapatam and Vadu-
raim, Tanjore Dt.