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## MADRAS RECORD OFFICE.

Government of Madras.

*Public Works* DEPARTMENT.

|              |                 |
|--------------|-----------------|
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| Dated 23 3   | 18 66.          |

Not to be folded or roughly handled

Read the following letter from the Consulting Engineer for Irrigation and Canal Company, to the Secretary to Government, Department Public Works, dated Madras, 5th March 1866, No. 156 :—

1. My last report on the operations of the Madras Irrigation and Canal Company in the Nellore Division was made in a letter No. 220, of the 7th March 1865. I have just returned from Nellore, and have ascertained from the Executive Engineer what progress has been made in selecting the line for a canal below Somaiswaram, and estimating its cost. The enclosed tracing from the Atlas sheet, No. 77, will help to render clear the few remarks I have to make on the work done during the last twelve months.

2. I did not visit Somaiswaram as the works at the anicut site were stopped in June last, and very little work has been done since my last visit.

3. The line upon which the Executive Engineer is now working coincides, for the upper 10 miles, with that originally chosen, with the modifications, however, at the Thalagarayapuram tank, &c., mentioned in paragraph 7 of the previous report; then at the 10 $\frac{1}{4}$  miles, instead of dropping, the high level is retained, and the line is carried round the Nulla Vagu valley, a *detour* of 21 miles.\* On quitting this valley the northern slopes of the Chajerla hills are followed, and the general direction of the line is thence south-easterly, but with many considerable bends, caused by the numerous spurs which run in a northerly direction from the watershed, which lies nearly due east and west.

4. The line of canal has been selected and plotted for 45 miles, and nearly so up to 53 miles, and very shortly an additional 10 miles, which will bring the line to the water shed near Puddulcoor, will be completed.

5. The system which the Executive Engineer has adopted is, first, to run a rough contour line; second, to lay down base lines approximating to the contour, and, thirdly, from these base lines to run off sett levels sufficiently close together, and of a sufficient length to afford a clear view of the peculiarities of the ground. The line for the canal is then laid down upon the successive survey sheets, after considering the comparative advantages and disadvantages of a more or less close adherence to the standard level at each point, and which level would give 2 $\frac{1}{2}$  feet of cutting on the centre line. By this arrangement, without repeating the operations of levelling in the field, it becomes practicable to adjust the line of canal to an altered gradient, should it appear advisable to make any change; but there would still be the re-casting of estimates, designs for masonry works, &c., and these would entail much labor, though not any great additional expense.

6. From the water-shed near Puddulcoor to the Kistapatam backwater, a distance of 25 miles in a direct line, the investigations requisite for the selection of the best line for the canal have yet to be made. This section, however, will run much straighter than that above the water-shed, because the canal will have a great command\* of level, and almost

\* Its sole at the water-shed will be upwards of 200 feet above mean tide.

the only causes of diversion will be for the purpose of obtaining favorable positions for falls. In addition to this line a considerable branch channel will be required

*The line now working coincides, for the upper 10 miles,*

from the water-shed in a south-westerly direction, to water the lands in the valley of the Kundleru.

7. The selection of the line up to the water-shed has been made by the Executive Engineer, with a view to the future use of the canal for navigation purposes, and he has, therefore, allowed only four inches a mile fall as a rule, with an increase to nine inches a mile for cuttings in very hard soil. With this arrangement of gradients, the cutting a short distance above the water-shed is 16 feet as a maximum; were the fall increased to seven inches a mile the maximum cutting at this point would be  $32\frac{1}{2}$  feet, and a nine inch fall would give  $43\frac{1}{2}$  feet cutting. It would have taken some time and labor to have ascertained what fall would afford the cheapest irrigation canal, and there are some very important data wanting to the proper settlement or selection of the best arrangements.

8. The canal is intended to carry 1,20,000 cubic yards an hour as a maximum, with a depth of six feet, and a bottom width of 79 feet, provision being however made for widening it hereafter so as to carry 2,40,000 cubic yards an hour. There is no doubt whatever of land for the consumption of even a much larger quantity being available, for between Somaiswaram and the water-shed 125 square miles will be commanded, and half this area would give 40,000 acres: beyond the water-shed the area is practically only limited by the supply of water.

9. The question of water supply is the great difficulty. The Pennair cannot be depended upon for direct irrigation, without the assistance of tanks or reservoirs, and really the most important point for settlement is the manner in which the reserve, required to supplement the inconstant freshes of the Pennair, is to be made available. I think Toombuddra water may be left out of the question, for it is not at all likely that any will be to spare at the season of the year, September to January, when the principal crop in Nellore will be on the ground, added to which the first 73 miles of the main canal from Soonkasala will have to be modified, so as to carry 50 per cent. more water, before there will be any considerable surplus from the lands north of the Pennair. This latter river, however, carries every season far more water than will ever be utilized, but the freshes rise and fall rapidly, and the water must be stored. This can be done either above the canal head by constructing reservoirs on one or more of the affluents of the Pennair, and a project for a reservoir on the Chittravutty has been investigated and is before the Board of Directors: or below the head of the canal by the formation of tanks at sites commanded by the canal, and to some extent by the improvement of existing tanks.

10. Either of these plans can, it appears certain, be carried out, but until it is decided which plan is to be adopted, it is not possible to determine what the fall and dimensions of the canal should be, for, with the reservoirs above, the canal need never carry more than the maximum which the cultivation at any moment may require, but, with tanks below to be filled, the case is far otherwise, and the capacity must be such as will enable these tanks to be rapidly charged, so as to provide the reserve without which no part of the cultivation would be safe.

11. The choice of means depends much upon the extent of the scheme which the Company may desire to develop in Nellore. For every 50,000 acres of single

crop cultivation, 100 millions of cubic yards will probably have to be drawn off from the reserve, and so, allowing for evaporation and absorption, perhaps 150 millions would have to be stored. If the cultivation be limited, and if the wants of navigation be ignored, the storage can probably be provided without difficulty and at a moderate cost, by means of existing and new tanks below the canal. I should say 90,000 acres might be taken as the limit of cultivation with such a scheme. On the other hand, these tanks would certainly be dry for many months in the year, and nothing more than local navigation would be possible, nor could second crop cultivation be provided for to any considerable extent. This comparatively small project would be safe, but it would not admit of much expansion.

12. Supposing, however, 1,50,000 to 2,00,000 acres to be the area which it may be proposed ultimately to water in Nellore, and that navigation also is to be kept in view, then I think it would be worth while to construct a reservoir either on the Chittravutty or other affluents of the Pennair, above Somaiswaram; for then the quantity to be stored would be for irrigation alone some 600 millions of cubic yards, and accommodation for such a quantity could not be found in tanks below the canal. With navigation using wholly or partly the irrigation canal, it would be of much advantage financially to be able to carry on second crop cultivation, and so extend the period of usefulness of the works in each year. It might also be practicable to combine provision for the wants of cultivation and navigation in Nellore, with that for similar wants in Cuddapah south of the Pennair.

13. There is one important respect in which tanks below the canal would have an advantage over any single reservoir, and that is in the comparative certainty of their supply. The Pennair drains 13,000 square miles, and some part of this area is pretty sure to come within reach of rain-fall, but the limited areas of the catchment basins of particular affluents may not be so favored. On the other hand, the carriage of storage water by the canal itself will tend to silt it up considerably, and so increase the cost of annual maintenance, for in this case the amount of deposit would not be determined by the quantity of water carried during the year, but by the circumstances of its admission, and, with tanks below, it would be necessary to carry the largest quantities at the time the river water is most heavily laden with silt.

14. As arranged at present, the line of canal from Somaiswaram to the 15 miles would do very well as a permanent navigation line, and similarly from the 36th mile downwards it would also be very suitable, for its want of directness is more than compensated for by the entire absence of locks for 30 miles, and consequently of the delays dependent thereupon. The canal round the Nulla Vagu valley, 16 to 36 miles, would be a sufficiently good temporary line, but, should traffic be developed, it would become necessary to make a short cut across the gorge of the valley, whereby 18 or 19 miles would be saved out of 21 miles, and as there would be a supply for the drop and lift locks, there would be no difficulty in making such a junction.

15. So far as the information at present available has enabled me to form an opinion, the only alterations in the Executive Engineer's arrangements, which would be advisable, are:—

1st.—The increase of the *maximum* depth of water to be admitted into the

*engineer is now working coincides, for the upper 10 miles,*

canal, from 6 feet to 8 feet. The water is sure to be wanted, and the increased cost would be small.

2nd.—An alteration of the fall of the part of the canal in the Nulla Vagu valley from four inches to eight inches per mile, with a proportionate decrease of cross section. This would not bar temporary or local navigation, and it would be a permanent economy as regards irrigation. The line below the 36th mile would have to be placed seven feet lower down than at present, but the levels already taken would enable this to be done.

16. As the necessity of crossing the water-shed without too heavy a cutting obliges the upper 66 miles of the canal to be laid out with a small fall, it will probably be the best plan to combine navigation with irrigation on this part of the line, should the Company be disposed to provide for navigation at all: beyond the water-shed, however, the case will be different; the irrigation canal will require to be divided into two, if not three, principal branches, and it will be economical to construct these with as rapid a fall as the nature of the soil will allow, and none of the branches will then require to be of a size suitable for navigation, added to which the concentration of falls is the most advantageous for a navigation canal, and their distribution for one for irrigation purposes only. I should, therefore, recommend that, with the exception, of course, of the provision of a suitable site for the off-take of a navigation canal immediately below the water-shed cutting, the works from this point should be designed in the first instance for irrigation only, leaving investigations for a line of navigation to some future time.

17. The following is the Executive Engineer's approximate estimate for the canal works up to the water-shed near Puddulcoor, a length of 66 miles:—

|                                               | RS.      |
|-----------------------------------------------|----------|
| Anicut estimate .. .. .                       | 1,62,470 |
| Works at and above Head Sluice .. .. .        | 9,548    |
| Earthwork, 1st Section, about 4 miles .. .. . | 52,416   |
| Masonry works do. .... .                      | 37,160   |

*Amended earthworks Estimate.*

|                                                               |          |
|---------------------------------------------------------------|----------|
| 2nd Section up to 10 miles 21 chains from Somaiswaram .. .. . | 1,80,412 |
| Masonry works do. .... .                                      | 69,745   |

|                                                                                                                     |          |
|---------------------------------------------------------------------------------------------------------------------|----------|
| Deduct channel round lock at 4 miles... .. .                                                                        | 10,982   |
| Deduct for earthworks saved by forming a tank on waste land between 7 miles 60 chains and 8 miles 21 chains... .. . | 14,600   |
| Deduct for earthwork saved by going through Thalagarayapooram tank .. .. .                                          | 21,665   |
|                                                                                                                     | 47,247   |
|                                                                                                                     | 4,64,504 |

|                                                                   |           |
|-------------------------------------------------------------------|-----------|
| Earthworks from 10 miles 21 chains to 15 miles 21 chains ... .. . | 49,895    |
| Masonry and earthworks valley of Nullavagu, 21 miles. .... .      | 2,38,747  |
| Irrigation sluices, do. .... .                                    | 5,000     |
| Masonry and earthworks from Chajerla to Puddulcoor. .... .        | 3,98,404  |
| Irrigation sluices .. .. .                                        | 6,000     |
| Total to Puddulcoor... .. .                                       | 11,79,880 |

To this sum the Executive Engineer adds for the provision of tanks, commanded by the canal, to hold the reserve supply, Rupees 1,40,120, thereby increasing the total cost to Rupees 13,20,000. To this estimate it will, I think, be prudent to add 50,000 Rupees for probable further sanctions for the Somaiswaram Anicut, and distribution works have also to be provided for, and though the country is particularly favorable for these, perhaps four rupees an acre or two lacs for 50,000 acres will not be excessive, and the estimated cost of the works up to Puddulcoor for irrigation only would then be 15,70,000 Rupees.

18. For this amount probably the canal, even with the modifications suggested in paragraph 15 above, could be constructed. It is now necessary to endeavour to estimate the area which could be regularly irrigated. With the increased depth, the canal would carry about 1,55,000 cubic yards an hour, and this would secure the storage of the necessary reserve supply\* for 50,000 acres in 40 days, if entirely

\* 150 millions cubic yards. devoted to this purpose, or allowing 55,000 cubic yards an hour at the same time for 40,000 acres, there would be 1,00,000 cubic yards an hour for storage, and the 150 millions of cubic yards required would then be obtained in 63 days. The sill of the head sluice will be seven feet however below the crown of the anicut, and it may be considered that the Pennair is not likely to run one foot deep over the crown of the anicut for so long a period, and it will be safer, therefore, to assume seven feet as the average depth in the canal for the time under calculation. Then, after providing a little more than one cubic yard an hour per acre for the immediate wants of the cultivation, there will remain some 70,000 cubic yards an hour for storage, and about 90 days would be required to lay up the reserve necessary.

19. Unless other circumstances be taken into consideration, I should be disposed to think that a canal of the capacity indicated would prove insufficient, but it will be right to assume that there will be some local rain-fall, and that this will help to supply the tanks and to lessen the demands of the cultivation on the canal. Still, however, it will be safer to take 40 rather than 50 thousand acres as the area which can be irrigated for an estimate expenditure of Rupees 15,70,000, to which must be added 30 per cent. for establishments, controlling and executive, with charges for general plant, &c., and the total will then be 20,41,000 Rupees.

20. If the approximate accuracy of these calculations be admitted, it follows that the canal scheme up to Puddulcoor, on the scale supposed, and with the reserve storage provided below the canal head, would, with a water cess of Rupees 4 an

*ginneris now working coincide, for the upper 10 miles.*

• Allowing 1 Rupee an acre for maintenance and repairs including share of General Management.

21. I find from the plans shown me by the Executive Engineer, that a very large proportion of the length of canal, as yet planned, has been designed with a single bank only. So far as I can judge in the absence of details of the ground traversed, this arrangement is unobjectionable, as the water-spread is small and the land generally waste, but it appeared advisable to point out to the Executive Engineer that wherever cultivated land of any extent would thus be submerged, it would be better to provide a second bank, which on side-long ground would not be expensive, and he promised to keep this in view.

22. The Executive Engineer has carried on his investigations, it may be supposed, in accordance with the instructions he has received, and no exception can be taken to the care which he has evinced, but looking to the uncertain data at present alone available, and to the impossibility therefore, in the absence of a decision regarding position of storage and extent of scheme, of preparing a complete and perfect project; considering also that there is no likelihood of the works in this District being immediately undertaken, and that, therefore, any estimates now framed are liable to important modifications from variations in rates of labor, &c., I think that the time and labor expended upon, and consequently the cost of, the examinations which have been made have been unnecessarily great, and that all the information necessary to enable the Directors of the Company to decide upon the scheme might have been collected by an Officer, four Surveyors and a small office establishment in nine months at the most, or, say, at an outlay of Rupees 17,000. As it is, I find that the expenditure on establishments maintained in the Nellore Dis-

| From 1st May 1861. |     |     |     | RS.    | A. | P. |
|--------------------|-----|-----|-----|--------|----|----|
| Salaries...        | ... | ... | ... | 86,902 | 15 | 0  |
| Contingencies...   | ... | ... | ... | 7,047  | 6  | 10 |
| Stores...          | ... | ... | ... | 2,835  | 8  | 1  |
| Total...           |     |     |     | 96,785 | 13 | 11 |

Up to December 1865.

have been expended, and making the same allowance for the permanent establishment required for this outlay as has sufficed in other Divisions, viz., 11 per cent., the actual cost of the not-yet-complete investigation, of what cannot be considered a final scheme, for 66 miles of canal, has been Rupees 90,597.

acre, give a gross revenue of 7.84 per cent., and a net\* return of not less than 5.88 per cent., while a rate of 6 Rupees would yield a net return of 9.80 per cent.

trict amounted up to 31st October 1865, to Rupees 96,785-13-11, and there are yet a great many miles of canal to be selected; and the only other work supervised by this establishment has been the partial construction of the Somaiswaram Anicut, on which Rupees 56,256-8-7

Consulting Engineer's Office,  
Irrigation & Canal Company,  
Madras, 5th March 1866.

No. 156.

From, Captain J. Mullins R.E.  
Consulting Engineer for I.C.C.

To, The Secretary to Government  
Department of Pub. Works.

1. My last report on the operations of the Madras Irrigation and Canal Company in the Nellore Division was made in a letter No. 1220 of the 7th March 1865. I have just returned from Nellore, and have ascertained from the Executive Engineer what progress has been made in selecting the line for a canal below Somaiswaram and estimating its cost. The enclosed tracing from the Atlas sheet, No. 77, will help to render clear the few remarks I have to make on the work done during the last 12 months.

2. I did not visit Somaiswaram as the works at the Anicut side were stopped in June last and very little work has been done since my last visit.

3. The line upon which the Executive Engineer is now working coincides, for the upper 10 miles,

10 miles, with that originally chosen, with the modifications however at the Chalagayapuram Sante, I<sup>st</sup>, mentioned in para. 7 of the previous report; then at the 10 $\frac{3}{4}$  miles, instead of dropping, the high level is retained, and the line is carried round the Villa Vagu valley, a detour of 21 miles. On quitting this valley the northern slopes of the Chalagay hills are followed, and the general direction of the line is thence South Easterly, but with many considerable bends, caused by the numerous spurs which run in a northerly direction from the watershed, which lies nearly due East and West.

4. The line of canal has been selected and plotted for 115 miles, and nearly so up to 53 miles - and very shortly an additional 10 miles, which will bring the line to the watershed near Pudduloor, will be completed.

5. The system which the Executive Engineer has adopted is 1<sup>st</sup> to run a <sup>rough</sup> contour line, 2<sup>nd</sup> to lay down base lines approximating to the contour, and 3<sup>rd</sup> from these base lines to run offset levels sufficiently close together, and of a sufficient length, to afford a clear view of the peculiarities of the ground. The line for the canal is then laid down upon the successive survey sheets, after considering the comparative advantages and disadvantages of

a more or less close adherence to the standard level at each point, and which level would give 2 $\frac{1}{2}$  feet of cutting on the centre line. By this arrangement without repeating the operations of levelling in the field, it becomes practicable to adjust the line of canal to an altered gradient, should it appear advisable to make any change, but there would still be the recasting of estimates, designs for masonry works, I<sup>st</sup>, and there would entail much labor, though not any great additional expense. b. From the watershed near Pudduloor to the Kistapattam backwater, a distance of 26 miles in a direct line, the investigation requisite for the selection of the best line for the Canal have yet to be made. This section however will run much straighter than that above the watershed, because the

<sup>\*The vol. at the water canal will have a great command of level, and almost the only source of diversion will be for the purpose of obtaining favorable positions for falls. In addition to this line a considerable branch channel will be required from the watershed in a South Westerly direction to water the lands in the valley of the Kumbleru.</sup>  
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7. The selection of the line up to the watershed has been made by the Executive Engineer with a view to the future use of the Canal for

for navigation purposes, and he has therefore  
allowed only 5 inches a mile fall as a rule,  
with an increase to 9 inches a mile for cuttings  
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11. The choice of means depends much upon the extent of the scheme which the Company may desire to develop in Keltore. For every 50,000 acres of single crop cultivation, 100 millions of cubic yards will probably have to be drawn off from the reserve, and so, allowing for evaporation and absorption, perhaps 150 millions would have to be stored. If the cultivation is limited, and if the wants of navigation be ignored, the storage can probably be provided without difficulty and at a moderate cost by means of existing and new tanks below the canal. I should say 90,000 acres might be taken as the limit of cultivation with such a scheme. On the other hand these tanks would

would certainly be dry for many months in the year, and nothing more than local navigation would be possible, nor could 2<sup>nd</sup> crop cultivation be provided for to any considerable extent. This comparatively small project would be safe, but it would not admit of much expansion.

12. Supposing however 150,000 to 200,000 acres to be the area which it may be proposed ultimately to water in Keltore, and that navigation also is to be kept in view, then I think it would be worth while to construct a reservoir either on the Chittravathi, or other affluents of the Pennair, a lower one is in view, for then the quantity to be stored would be for irrigation alone, and accommodation for such a quantity could not be found in Tanks below the canal. With navigation being wholly or partly the irrigation canal, it would be of much advantage financially to be able to carry on 2<sup>nd</sup> crop cultivation, and so extend the period of usefulness of the works in each year. It might also be practicable to combine provision for the wants of cultivation and navigation in Keltore, with that for similar wants in Cuddapah south of the Pennair.

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17. The following is the Executive Engineer's approximate estimate for the Canal works up to the watershed near Poddulcor, a length of 66 miles.

Amount

|                                                       |         |
|-------------------------------------------------------|---------|
| Amount estimate                                       | 162,470 |
| Works at and above the line                           | 9,548   |
| Earthwork 1st Section about 4 miles                   | 52,416  |
| Masonry work mounds                                   | 37,160  |
| Amended earthwork estimate                            |         |
| 2nd Section up to 10 miles 21 chains from Sambarwaran | 180,412 |
| Masonry work mounds                                   | 69,745  |
|                                                       | 511,751 |

|                                                                                   |         |
|-----------------------------------------------------------------------------------|---------|
| Amount to be paid, round lock at 4 miles                                          | 10,982  |
| Amount for earthworks saved by forming a dyke on water land between 7.60 and 8.21 | 14,600  |
| Amount for earthwork saved by going through Thalagaraya from Sambarwaran          | 21,665  |
|                                                                                   | 47,247  |
|                                                                                   | 464,504 |
|                                                                                   | 49,895  |

|                                                       |          |
|-------------------------------------------------------|----------|
| Earthworks from 10.21 to 15.21                        |          |
| Masonry and earthworks, valley of Nulla rays 21 miles | 238,747  |
| Irrigation sluices                                    | 5,000    |
| Masonry and earthworks from Chajera to Poddulcor      | 398,404  |
| Irrigation sluices                                    | 6,000    |
|                                                       | 1179,000 |

To this sum the Executive Engineer adds for the provision of boats, commanded by the Canal, to hold the reserve supply, Rupees 1,01,200 thereby increasing the total cost to Rupees 13,20,000. To this estimate it will, I think, be prudent to add 50,000 Rupees for probable further emendations for the Sambarwaran and further distribution works have also to be provided for, and though the country is particularly favorable for these, perhaps 4 Rs. an acre or 2 lacs for 50,000 acres will not be excessive.

expenses and the estimated cost of the works up to Puddalore for irrigation only would then be 15,70,000 Rupees.

18. For this amount probably the canal, even with the modifications suggested in para: 15 above, could be constructed. It is now necessary to endeavour to estimate the area which could be regularly irrigated. With the increased depth, the canal would carry about 155,000 cubic yards an hour, and this would secure the storage of the necessary reserve supply for 50,000 acres in 110 days if <sup>\*150 millions cyp</sup> entirely devoted to this purpose or allowing 55,000 cubic yards an hour at the same time for 40,000 acres, there would be 100,000 cubic yards an hour for storage and the 150 millions of cubic yards required would then be obtained in 63 days. The sill of the Head Sluice will be 7 feet higher below the crown of the Anicut, and it may be considered that the Pannair is not likely to run 1 foot deep over the crown of the Anicut for so long a period, and it will be safe therefore to assume 7 feet as the average depth in the canal for the time under calculation. Then, after providing a little more than 1 cubic yard an hour per acre for the immediate wants of the cultivation, there will remain some 70,000 cubic yards an hour for storage, and about 90 days

90 days would be required to lay up the reserve necessary. 19

19. Unless other circumstances be taken into consideration, I should be disposed to think that a canal of the capacity indicated would prove insufficient, but it will be right to assume that there will be some local rainfall, & that this will help to supply the Pannair and to lessen the demands of the cultivation on the canal. Still however it will be safer to take 40 rather than 50 thousand acres as the area which can be irrigated for an estimate expenditure of Rupees 15,70,000, to which must be added 30 per cent for Establishment, Controlling and Executive, with charges for General Plant &c., and the total will then be 20,41,000 Rupees.

20. If the approximate accuracy of these calculations be admitted, it follows that the canal as here up to Puddalore, on the scale supposed and with the reserve storage provided below the canal head, would, with a water rate of Rupees 4 an acre, give a gross Revenue of 7.84 per cent, and a net return of not less than 5.88 per cent, while a rate of 6 Rupees would yield a net return of 9.80 per cent.

21. I find from the plans shown me by the Executive Engineer, that a very large proportion of the length of canal, as yet planned, has been designed

\* allowing 1 Rupee an acre for maintenance & repairs including share of Genl. Manager's interest.

21 designed with a single bank only - as far as I can judge in the absence of details of the ground traversed, this arrangement is unobjectionable, as the water spread is small and the land generally smooth, but it appeared advisable to point out to the Executive Engineer that whenever cultivated portions of any extent would thus be submerged, it would be better to provide a second bank which on side-long ground would not be expensive, and as he promised to keep this in view.

22. The Executive Engineer has carried on his investigations, it may be supposed, in accordance with the instructions he has received, and no exception can be taken to the care which he has evinced, but looking to the uncertain data at present alone available, and to the impossibility therefore, in the absence of a decision regarding position of storage and extent of scheme, of preparing a complete and perfect project, considering also that there is no likelihood of the works in this District being immediately undertaken, and that therefore any estimates now framed are liable to important modifications from variations in rates of labor, &c., I think that the time and labor expended upon, and consequently the cost of, the examinations which have been made have been unnecessarily great, and that all the information necessary to enable the Directors of the Company to decide upon the scheme might have

From 1st May 1861.  
Salaries Rs. 86,902-15-0  
Conty Rs. 70,476-10-0  
Stores Rs. 28,350-0-1  
Total Rs. 96,785-13-11

up to Dec 1865.

have been collected by an officer, & surveyors and a small office establishment in 9 months at the most, or say at an outlay of Rupees 17,000 - it is I find that the expenditure on establishments maintained in the Kellow District amounted up to 31st October 1865 Rs. 96,785-13-11, and there are yet a great many miles of canal to be selected, and the only other work supervised by this establishment has been the partial construction of the Samra-maram Amirkhon which Rupees 56,256-8-7 have been expended, and making the same allowance for the permanent establishment required for this outlay, as has been sufficient in other divisions, viz. 11 per cent, the actual cost of the not yet complete investigation, of what cannot be considered a final scheme, for 66 miles of canal has been Rupees 90,597-.

I have the honor to be,  
Sir,  
Your most obedt servant,  
Colonel Munier Captain, R.E.  
Comd. Eng. for East H. Compy.

Ed. M. B.

Civil Works Public Works Office

No 936  
Proceedings of the Madras Government

Under date the 23rd March 1866  
Read the following

From the Consulting Engineer  
H. C. Comp. (Presented 5th March 1866)

The foregoing report, which will be communicated to the Right Honorable the Secretary of State for India, calls for no remark from Government beyond an expression of their concurrence in the opinion of the Consulting Engineer that it was a mistake to incur ~~such~~ so large an outlay as Rs. 95,785 in the investigation of the project for a Canal below Sonaivaram at a time

*[Signature]*

*[Signature]*

Copy in a letter to Secy  
of 24th March 1866

To the Secretary to Government  
The Consulting Engineer  
H. C. Comp.

Order 5  
24th March 1866

Encl. Enc.

Report on the progress made in selecting the line for a Canal below Sonaivaram and estimating its cost.

24th March 1866

No 936-230 March 1866

1. The first part of the document is a list of names and dates, which appears to be a record of some kind. The names are written in a cursive script, and the dates are in a more formal, printed style. The list is organized into columns, with names in the first column and dates in the second column.

2. The second part of the document is a series of handwritten notes or entries. These are written in a cursive script and are organized into a list format. The notes are written on a piece of paper that has been folded or crumpled, and the ink is somewhat faded.

3. The third part of the document is a series of handwritten notes or entries. These are written in a cursive script and are organized into a list format. The notes are written on a piece of paper that has been folded or crumpled, and the ink is somewhat faded.

4. The fourth part of the document is a series of handwritten notes or entries. These are written in a cursive script and are organized into a list format. The notes are written on a piece of paper that has been folded or crumpled, and the ink is somewhat faded.

5. The fifth part of the document is a series of handwritten notes or entries. These are written in a cursive script and are organized into a list format. The notes are written on a piece of paper that has been folded or crumpled, and the ink is somewhat faded.

To  
The Congress. U.S. &c  
Manager. do✓

Sept. 24<sup>th</sup> March

15-

3

Copy in a letter to England.  
of 24<sup>th</sup> April A. 25 of 1866.

J. H. 1866 Dept.  
Pro. of Govt. for March  
A. 936.  
Pro. of the Madras Govt.  
of 23<sup>rd</sup> March/66.

Report of the Comdg. Genl.  
on the project for Madras  
Navigation Company's Canal  
at Somaiswarum, Comma-  
ndated by the Home Govt.

A. 496 497.

16<sup>th</sup> March 1866, A. 2012