

(1) Number of pages _____

(2) Date of repair _____

(3) Initials of the Referencer _____

MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No. 3258	Press
262-265	Mis.
Dated 14 - 11	1864.

Not to be folded or roughly handled

*Proceedings of Madras Government, Public Works Department,
14th November 1861.*

Read the following papers:—

No. 262. - From Captain J. MULLINS, R. E., Consulting Engineer for Irrigation and Canal Company, to Colonel C. A. ORR, R. E., Secretary to Government, Department of Public Works, dated Madras, 13th October 1861, No. 122.

SIR,

1. In their Order of the 4th instant, No. 2,859, the Government stated it to be their opinion, with reference to the question raised by the Agent, Irrigation and Canal Company, as to their competency under the Contract, to withhold sanction to estimates submitted for approval, that section 16 of the Contract conferred the necessary power. Since then, I have received the enclosed letter* from Mr. Henslowe, with its accompaniment from the Chief Engineer, on the same subject, and these I have now the honor to lay before Government, with such information on the question of the probable cost of the works between Soonkasala and the sea, as the records of this Office and the information obtained during my recent inspection of the works and country afford.

* Letter No. 1,312, dated 26th September 1861.

2. I should mention in the first place that just before the Order of Government, No. 2,859 of the 4th instant, was received, Mr. Henslowe came to my Office, and I pointed out to him that clause 16 had apparently been overlooked by him when he wrote his letter based upon the wording of clause 5; and paragraphs 2 to 4 of the present letter are intended to show, that to suppose clause 16 to give the Government the power of withholding sanction to estimates, or, as in the present case, of postponing sanction of a particular section of the works, is inconsistent with clause 5, which provides that the Company shall cause the plans and estimates of such portions of the Toombuddra project as it may deem it expedient to execute, and that these plans and estimates shall be returned to the Company, either approved or with such reasonable alterations, omissions or additions, as may be considered necessary or desirable makes the two clauses utterly inconsistent. They are not necessarily inconsistent however, unless they be read independently instead of together, and as a Contract must be read as a whole, it follows that if this be done, and if it be remembered, that in order to exercise such control over the expenditure of the guaranteed million, as might be necessary to ensure its advantageous outlay, provision was made in clause 17 for the exercise of a right of veto on all proceedings at Boards of the Directors, except proceedings for the purpose of communicating with the legal advisers of the Company, it seems clear that with and for the object of securing the expenditure of the million to the best advantage, the Government has under clause 16, the power to postpone the execution of any particular section of the works, until such time as it may appear to be expedient or advisable, with reference to the requirements of other portions of the work, to carry them out. It might be stated further, that it would not be desirable or advisable to commence works, the cost of which is likely to exceed the guaranteed capital, until the requisite funds have been subscribed, and it would appear, moreover, to be a reasonable exercise of the powers conferred by clause 16, for the Government to decline to allow detached sections of the work to be proceeded with, in preference to its continuous completion, if it be considered that by so doing the returns of the works would be postponed, and the duration of the payments on account of guaranteed interest prolonged.

3. The Agent in the 5th and following paragraphs proceeds to show, that the Board of Directors desire that the whole of the works between Soonkasala and the sea, excepting however the Cuddapah three sections (10, 11, and 12), being the part between the out-fall of the canal on the north side of the Pennair at Adamapilly, and the commencement of the Nellore Division at the Somaswaram Anicut, and also those works which are exclusively designed for navigation only, should be carried out first. In paragraph 6 it is stated, that this course will be of most advantage to all concerned, by securing benefits to the country as early as possible, and also early returns. I am not quite sure whether Mr. Henslowe means by the postponement of works intended for navigation only, to put off not only the completion of the parts of the canal which

are not intended to carry water for irrigation, as for instance the 70th to the 91st miles, or whether in addition to this, it be intended to put a stop to the construction of locks on other sections, which will, as regards all other descriptions of works, become available for navigation so soon as they have been completed sufficiently to allow of their carrying the full quantity of irrigation water. It would be a matter of regret, that the 6th section or that part of it between the 70th and 91st miles, should be postponed, and a break thus created in the navigation, but looking to the amount of labor available, I am of opinion that it would be very desirable to leave this portion alone, until at least the portion above the 70th mile has been completed, and the distribution works up to that point nearly, if not entirely, finished, and after this has been done also. I consider it would be of great advantage to the country, to utilize the waters thrown in by the Cauze and Kunlar from the 72nd mile, by pushing forward the 7th, 8th and 9th sections of the canal, and the distribution works connected therewith, rather than to employ the labor available in completing the canal from the upper sections consecutively for thorough irrigation. On the other hand, all sections of the canal, which for irrigation purposes must be completed to full width, should not be left without the needful conveniences for navigation, and I would say, that while, where all the work cannot be completed at once, a slight priority might be given to irrigation, it should be expected that each section should be completed for navigation, by at latest the season following its opening for irrigation, and that the requisite distribution of labor to admit of this should be required.

4. In paragraph 7, Mr. Henslowe gives an estimate of the cost of carrying out the works which the Board desire to see completed as early as possible. The amounts mentioned I cannot check, because I do not know in what manner they have been obtained, nor am I aware what works as belonging to navigation only have been omitted. I suppose that the 12th item, management in England and in India, Rupees 3,00,000, provides only for control, and not for the Executive Establishment, but if not, it would require to be multiplied by about seven at least. The total estimated cost of these works, according to the Agent's calculation, is £222,250, and as upon the details of this calculation I could not offer an opinion, I have prepared a general statement of the cost of the whole of the works required between Sookasala and the sea, and this statement is based, for a large portion, on the amounts of original and supplemental estimates, and for the rest upon the best judgment I could form. For the Nellore canal it will be seen, that the Agent allows 16,35,600* Rupees, and in the Memorandum the allowance is

16,91,975* Rupees, but perhaps Mr. Henslowe includes permanent establishment, whereas I have made a separate charge on this account. The approximate amount to the supplemental estimates which will be required for the 2nd and 3rd sections of the Main Canal, was obtained from the Chief Engineer by telegraph.

4. The allowance for cost of distribution is based upon the supposition that 1 Rupee an acre, the originally estimated cost, will not be exceeded. There are no local data for this item of the estimate, and so it seemed useless to make any alteration. If however Rupees 4 represented the correct cost at rates prevailing prior to 1850, Rupees 6 would be the proper allowance now, and this would necessitate an addition of 10 lacs to the grand total.

5. Colonel Sir A. T. Cotton, in his rough estimate, appears to have made no allowance for the distribution of irrigation water below Kurnool. That estimate for the works between the

* Kurnool Anicut and the sea, was 56 lacs, viz:—
Anicut across Tombuddra and the Kistna (corresponding to the Sookasala

Anicut	...	...	...	...	2	Lacs.
Canal thence to coast	...	...	...	...	44	"
Storage 2,000 millions cubic yards	...	...	...	...	10	"
					56	"

to which if 20 lacs be added for distribution at Sir Arthur Cotton's own rate, 76 lacs would be the total. One very great cause of difference is, that he supposed 20 miles of canal would carry the water from the Kurnool Anicut to the water shed, at a cost of 3 lacs, with 1 lac more for the deep cutting, whereas the canal required and under construction is 72 miles long, and its cost will be about 40 lacs, or ten times the amount supposed necessary. There are also in the Memorandum many items which Sir Arthur Cotton did not take into account.

6. The storage has been entered at the quantity and amount allowed in Sir Arthur Cotton's rough estimate, because there is no information upon which to base any revised calculation.

7. The Electric Telegraph allowance is the same as the Chief Engineer considered requisite, and as the length will be about 250 miles, and Rupees 400 a mile are the cost at which efficient lines have been constructed, it will probably suffice, though if iron posts be used, the outlay would be nearly doubled.

8. Navigation plant is an item which does not appear to have been taken into account in previous estimates, 5 lacs have been allowed, which would probably pay for 10 or 12 steamers and 150 cargo boats, perhaps the smallest stock that would suffice to carry on navigation until the people learn to build and provide boats for a part of the traffic themselves.

9. The per centage (25) of permanent establishment to expenditure on works, is perhaps rather lower than it probably will be, though it is much above the cost in the best worked Divisions. Up to July last the expenditure on works was Rupees 32,60,000, and the actual cost of establishment Rupees 10,91,057, or above 33 per cent.

10. In order to arrive at the probable cost, according to the enclosed Memorandum of the works included in paragraph 7 of the Agent's letter, all that is necessary is to deduct the allowance made for the Cuddapah Division 26½ lacs, and its share of establishment 6½ lacs or 33½ lacs,

Rupees	178,63,923
"	33,12,600
"	145,51,423

and this cost, including however the navigation works, which it is proposed to postpone, but the amount due to which I am unable to estimate, becomes 145½ lacs.

11. The Chief Engineer proposes also to postpone the construction of the 9th Section, and to take up the Nellore Division instead, and this would render a little over 8 lacs available.* It may be remarked however, that notwithstanding what is said in paragraph 10 of the Agent's letter, and paragraph 5 of Chief Engineer's letter,† No.

811, the canal project in the Nellore Division is very far from complete. Out of the 60 miles, the estimates of 4 miles only have been sent in, and at most those of the next eleven miles may be about ready by this time, and the surveys and levels for much of the line are not ready. If the extract from the instructions of the Board, attached to paragraph 11 of the Agent's letter be referred to moreover, it will be seen that they contemplate the completion of the surveys, plans, and estimates for the works in the Nellore District, and their views on a similar case in Cuddapah render it very doubtful, whether they would desire the vigorous prosecution of the Nellore works, before their total cost has been estimated and the lands to be irrigated have been at any rate roughly surveyed, so as to enable some idea of the returns that may be expected to be formed.

12. I do not at all share the Chief Engineer's opinion, that it would be more beneficial to the Company to be allowed to postpone the

9th Section, in order to go on with the Nellore works. I believe that as regards irrigation, the returns will be more considerable and more quickly realized, if the former work be carried out. As a link in the navigation it will certainly be more useful, and yield better returns, for one end of it will be in connection with the navigation above, and the other will be within eleven miles of Cuddapah; and within a couple of miles

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of the main road and the Railway, whereas the Somaishwaram end of the Nellore Division is inaccessible from above, and there is at present no proper terminus at the eastern or lower end.

13. I am not therefore at all disposed to recommend that the 2nd Section, which has been already sanctioned, should be postponed in favor of a detached section lower down, but I think it will be well to remedy the inconvenience and loss which will result from the Company having no sanctioned work in connection with the Somaishwaram Anicut, and I would suggest therefore, with a view to the useful employment of the work parties of the anicut, whenever the river is in fresh, and they cannot be employed thereupon, that sanction should be given to the extent of 30,000 Rupees, out of the estimates for the first section of the canal to Nellore; and by this arrangement all cause for complaint would be removed, and by the time that sum has been expended, the Chief Engineer may have matured his plans for the whole length of a few miles to the coast, and he may be able to show the probable cost of the work, and what extent of land will be available for irrigation, added to which, the Board of Directors will have had the opportunity of understanding clearly how the case stands, and of expressing their opinion upon it, and of showing also what they propose to do as regards the provision of funds for those sections of the work which will certainly not be executed out of guaranteed capital.

14. It is very possible also, that the Board may think it advisable to postpone operations in the Bellary District altogether, when they learn that the portion of the Toombuddra project below Sunkasala, is likely to cost more than 1½ millions, and, if the upper portions bear the same proportion to the rough estimate contained in the Memorandum, which is referred to in the preamble of the Contract, as determining the "Toombuddra project," the total capital required will be 4½ millions sterling, or more than twice the amount which the Company's Act authorizes them to raise.

15. As clause 5 has been referred to frequently of late, it may not be out of place to remark that this clause provides, that due regard is to be had to the storage of water, sufficient in quantity to maintain a continuous supply to the works proposed to be executed throughout the year if practicable, and that therefore there is direct obligation to do all that can be done to this end. If the Company can store 2,000 millions of cubic yards for 10 years, they certainly will make a most profitable investment of that sum, but, even should the cost be much greater, no time should be lost in commencing to provide this very important item of the "Toombuddra project."

No. 263.

MINUTE BY THE HONORABLE THE PRESIDENT.

1. I have gone carefully over the Contract of the Irrigation Company, in order to ascertain the extent to which it bears out the claim of the Agent, as explained in his letter of 5th October 1861. The Contract is loosely drawn up, and the wording of it is extremely vague, and the Company the right of executing the whole of the works as rapidly and fully as they are approved together by Sir Arthur Cotton in 1845, under the title of the "Toombuddra project," and which was apparently estimated to cost a million, whereas in point of fact it would, if fully carried out, cost upwards of ten millions.

2. I say the wording of the Contract would bear this interpretation, but it is evident that the intention of the Government was to limit the work to be executed for the guaranteed million to the canal from, at or near, Kurnool to the sea at Kattapattam, and this is clear enough from the fact that the Secretary of State did, in accordance with the advice of the Government, impose a narrower limit than this upon the work, and decided that the work to be executed for the million should comprise only the works from Sunkasala to Somaishwaram.

3. The present claim of the Agent is that in the Company's Estimates, and be granted the power of executing this work piecemeal, according to their own fancy, and they should be allowed to select for immediate completion detached portions of the scheme which has been

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sanctioned by the Government and the Secretary of State, postponing indefinitely those portions which, while they form an integral portion of this scheme, are not so likely to prove remunerative.

4. This claim the Agent supports by reference to an expression in clause 5 of the Contract, to the effect that the Company is to prepare "plans and estimates of such works comprehended in the Toombuddra project as the Company shall deem it expedient to execute," and he argues that the phrase "deem it expedient" gives to the Company full power to execute, or not to execute, the works for which capital has been subscribed, and for which capital the Government is paying interest. This is too absurd, for to use the Agent's own illustration, if the Company deems it inexpedient to carry out any particular work, it may deem it inexpedient to carry out all the scheme, and the Contract would be a nullity.

5. The fact is that the different clauses must be read together, and interpreted so as to give each party a wholesome check upon the proceedings of the other. Clause 5, according to the somewhat forced construction of the Agent, would seem to give to the Company unlimited power; but clause 16 neutralizes that, by giving to the Government power to "give orders and directions with reference to the works to be executed with the said sum of one million, and with reference to the manner and times of executing the same."

6. It is not to be supposed, as the Agent imagines in his letter, that the Government being anxious to carry out a given work, should put a stop to it, for no cause, and that any directions which it may give as to the "manner and times" of executing the work have for their object the injury of the Company; but it is to be supposed that the Government anxious to see the work for which it pays annually so large a sum should watch carefully the execution of the work, and should not allow the Company to carry out the easy portions and to shirk the difficult portions.

7. With reference then to the matters submitted for consideration, I am of opinion that with regard to these sections of the work from Sunkasala downwards, for which plans have been sent in and approved, the Company is bound to carry them out with as little delay as possible. I am also of opinion that policy would dictate to the Government the advisability of insisting upon the completion of a continuous line of works from Sunkasala downwards; for if the Company is once allowed to make a break in the line to suit its own convenience it is impossible to say when this break will be even completed.

8. It is perfectly clear that the estimated cost of the work will fall very far short of the actual expenditure, and it is nearly certain that the guaranteed capital of one million will not be sufficient to complete the work from Sunkasala to Somaishwaram. Whilst it is by no means certain that the Company will be able to raise any amount of unguaranteed capital. I should therefore be strongly inclined to insist upon the submission of plans for the whole of the works above Somaishwaram, as a preliminary to the consideration of those between that place and Kattapattam. Should it however be pleaded by the Engineers of the Company that the men employed upon the ancient section of four miles below the anicut might be carried on with advantage during that season and by these men, I would not object to allow the Company to carry out this work, upon the distinct understanding, however, that the plans and estimates of the whole of the work above Somaishwaram should be submitted without delay, and upon the supposition that such a course would be in accordance with the instructions given in the latter Despatches of the Secretary of State.

21st October 1861.

(Signed) W. T. DENISON.

No. 264. MINUTE BY THE HONORABLE MR. MALTYBY.

1. The question raised by the Agent is so important, and the affairs of the Irrigation Company are in so serious a position owing to the largeness of its expenditure in comparison with the amount of work hitherto completed, that these papers should be forwarded at once to the Secretary of State for orders in advertence to his Despatch of 8th August last.

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2. Meanwhile we should, as proposed by the President, "insist upon plans being submitted for the whole of the works above Somaishweram as a preliminary to the consideration of those between that place and Kistnapatam on the coast."

3. The Consulting Engineer suggests in paragraph 13 of his letter of 13th instant, that while the monsoon freshes impede operations at the Somaishweram Anicut, the Irrigation Company may be allowed to transfer their laborers for the sake of "useful employment" to the first portion of the canal below the anicut. I do not object to this suggestion, on the understanding that if the Company avail themselves of the permission instead of transferring the laborers to their works above the anicut, they are to do so at their own risk, and not to consider the permission as any guarantee that the Secretary of State will allow the Nellore section to be proceeded with until the works between Sunkasa's and Somaishweram have been completed.

4. I quite concur with the President in thinking that clause 16 of the Contract gives and was intended to give power to the Secretary of State to decide on the time, manner, and order of executing the works comprised within the guaranteed capital of £1,500,000. Such control was only a reasonable condition to guard the Government, which gave a guaranteed interest of 5 per cent, from undue loss and expense, such for instance as would be incurred if an unconnected series of works were suddenly thrown on the hands of Government in consequence of the Company proving unable to complete its undertaking.

24th October 1864.

(Signed) J. MALTBY.

No. 263.

ORDER THEREON, 14th November 1864, No. 3,239

1. The Consulting Engineer to the Madras Irrigation and Canal Company forwards letters from the Agent and the Chief Engineer, urging, under the conditions of the Contract entered into with the Secretary of State, the right which the Company possess to select for execution such portions of the scheme which they have in hand as they may deem it expedient to carry out, without reference to the continuity of the works.

2. This claim is supported by reference to an expression in clause 5 of the Contract to the effect that the Company are to prepare "plans and estimates of each of the works comprised" "banded in the Toombuddra project as the Company shall deem it expedient to execute," and it is argued that the phrase "deem it expedient" gives to the Company full power to select for execution such parts of the general project as they may consider it expedient to complete, and to defer others. This argument involves an absurdity for to suppose the Agent's own illustration, if the Company deem it expedient to carry out any particular work, they may deem it inexpedient to carry out all the scheme, and the Contract would be a nullity. In the opinion of the Government the different clauses must be read together, and interpreted so as to give each party a wholesome check upon the proceedings of the other. Clause 11 vests the Government with power to give "orders and directions with reference to the works to be" "executed with the said sum of one million pounds, and with reference to the manner and time" "of executing the same." Such control was only a reasonable condition to guard the Government, while guaranteeing interest at the rate of 5 per cent, from undue loss and expense, such for instance as would be incurred if an unconnected series of works were suddenly thrown on their hands in consequence of the Company proving unable to complete their undertaking. It certainly is not to be supposed that the Government would put a stop to the works for no reason, and that any directions which they may think fit to give as to the "manner and time" of executing them would have for their object the injury of the Company's interests, but rather that the Government would watch carefully the execution of the works for which a large sum is annually paid, and prevent the prosecution of detached portions which offer little or no difficulties of construction, while the more difficult sections, which never the less form an integral portion of the scheme, are indefinitely postponed.

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3. For these reasons the Government maintain that the Company are bound to carry out, with as little delay as possible, those sections of the work from Soonkasaba downwards for which plans have been sent in and approved, and they must insist upon the completion of a continuous line of works from the point indicated. They must further insist upon the submission of plans and estimates, not hitherto submitted, for the whole of the works above Somaishweram as a preliminary to the consideration of those between that place and Kistnapatam.

4. The Consulting Engineer in paragraph 13 of his letter suggests that while the monsoon freshes impede operations at the Somaishweram Anicut, the Irrigation Company may be allowed to transfer their laborers for the sake of "useful employment" to the first section of the canal extending four miles below the anicut. The Government will not object to this arrangement, on the understanding that if the Company avail themselves of the permission in preference to transferring the laborers to their works above the anicut, they are to do so at their own risk, and not to consider the permission as any guarantee that the Secretary of State will allow the Nellore Section to be proceeded with until the works between Soonkasala and Somaishweram have been completed.

(True Extract)

(Signed) CHARLES A. ORR, Colonel, R. E.,
Secretary to Government.

To the Consulting Engineer for Irrigation and Canal Company.
.. Manager for do. do.

Erd. S. T. Augustin.

Memorandum

N. 101.

1. The Main Canal from Sonotaxala has been designed to carry 40,000 cubic yards per hour.
2. The canal has been laid out with frequently varying rates of fall, the smallest being one inch for the mile and the greatest 30 inches. The total fall is 10.30 feet in the $17\frac{1}{4}$ miles from the Head sluice to the Hindu Agueduct.
3. The cross and longitudinal sections, in this office, are neither sufficiently accurate, nor detailed, the result of the calculations being made to show what the exact effect of the changes of fall will have on the depth of water in the several parts of the canal. The breadth of canal being fixed, and the discharge limited to the quantity admitted at the head sluice, this indicates that unless the cross sections have been very carefully arranged to keep the channel in train, the depths will vary.
4. It must also be remarked that a change affecting the hydraulic mean depth at any given depth, and consequently the velocity and discharge, have been made and, had the allowance of water may been very closely approximated, to what was necessary, the bends and turns, which in many cases are quite considerable enough materially to affect the effective cross section, would have had to be taken into account.
5. The intention is to maintain in the upper sections of the canal a uniform depth and that depth at

the maximum is to be 8 feet, the water being kept at this whenever the state of the Tombadorra will allow. The crown of the Tombadorra Amintas is 9 feet above the sill of the Head Line of the Main Canal, and therefore, whenever the river has as much water as is required for the maximum supply of the canal, and the leakage under the dam and through under sluices, the water will be readily made available. The information in this office as regards the river has been very defective. Application has recently been made to the Chief Engineer for copies of the registers which may have been kept.

The calculations which have been made, and which are subjoined, are founded on the cross and longitudinal section furnished to this office by the Chief Engineer, and they suppose the depth in the numerous parts to be the same, thus ignoring the fact of portions of the canal being of a section deeper than is requisite to carry the fixed quantity, viz. yards 50000, as however in each case the depth is more than sufficient, this may be considered of little consequence, and in fact, in some particular sections some very serious error has been committed, practically the water will adjust itself approximately to the standard depth.

Main Canal for 1 mile and 3/4 chains above the Sluice Aqueduct.

Full 8 ft. 6 in. to 8 ft. 6 in. per mile.
Bottom width 40 feet, slopes 1 to 1.
Wetted border $40 + 2 \times 100 = 240$ feet.
Area $40 \times 8 = 320$ square feet = $27 \frac{1}{2}$ square yards.
H.M.D. $240 \times 8 = 1920$ feet.
C = 2674

Discharge = $5021 \times 27 \frac{1}{2} = 437385$ cubic yards per hour.
2. Sluice Aqueduct.
Length of Aqueduct 675 feet.
Fall of floor = 0.25 = being a
Fall per mile = 1.95 =
Wetted border $70 + 21 = 99$ feet.
Area of waterway $82 \frac{1}{2} \times 94 \times 8 = 706$ square feet = $78 \frac{1}{2}$ square yards.
H.M.D. = $\frac{706}{99} = 7.13$.
C = 5627 yards.
Discharge $5627 \times 78 \frac{1}{2} = 441406$ cubic yards.
3. Main Canal below Aqueduct.
Length $4 \frac{1}{2}$ chains.
Fall in that distance 0.29 feet = 0.521 per mile.
Bottom width 235 feet - slopes $1 \frac{1}{2}$ to 1.
Wetted border $235 + 2 \times 144 \times 64 = 263.7$.
Area = $267 \times 8 = 219 \frac{1}{2}$ square yards.
H.M.D. $\frac{219 \frac{1}{2}}{263.7} = 7.49$.
C = 2710

Discharge $2710 \times 74 \frac{1}{2} = 630906$ cubic yards per hour.
In this part of the canal there are sharp S curves, and probably parts of the section will be occupied by water or return currents.

4. Main Canal from commencement of 19 mile for a length of $2 \frac{1}{4}$ chains.

A. Deep part.

Wetted border $89 + (2 \times 8) = 105$

Area = $89 \times 8 = 712 = 79 \frac{1}{2}$ square yards.

H.M.D. $\frac{712}{105} = 6.78$ feet.

C = 4960

Discharge = $79 \frac{1}{2} \times 4960 = 392391$ cubic yards per hour.

B. Shallow over berms

Wetted border $214 + 2 \times 13 = 221.20$

Area = $217 \times 2 = 436$ square feet = $48 \frac{1}{2}$ square yards.

H.M.D. $\frac{436}{221.20} = 1.96$ feet.

C = 2674

Discharge $2674 \times 48 \frac{1}{2} = 128946$.

Whole discharge at B = 392391 + 123746
= 516137 cubic yards per hour.

The available acreage within the first 15 miles of the canal is estimated at 10,000 and the total up to the Metacoudal Cut 50,000 acres. This area has not been surveyed and it has been, it is believed, estimated from the printed atlas sheets. The Chief Engineer in a recent report would seem to put an area of 10,000 acres up to this point, but he does not give any details and perhaps he means to include much of the land below the cut. The allowance made by Colonel Cotton is 1 cubic yard per acre per hour, but this is too small a quantity, if the many sources of loss and inevitable waste are taken in to account. It is in fact only 2160 cubic yards of water for a day on the crop, and this is very much below what is provided for lands under Government irrigation, which 1 cubic yard per acre per hour would be a safe estimate. But for the purposes of the present memorandum, it may be assumed that $1\frac{1}{2}$ cubic yards will, on the careful management, suffice to provide on the average for the wants of each acre. With 50,000 acres the quantity of water above the cut will then be 75,000 cubic yards.

Below the Metacoudal Cut the main canal will carry irrigation water, to the extent of 45,000 cubic yards per hour only, for lands under the branch channel which take taken off from the right bank at the lower end of the 70 miles.

While the rest of the water will be turned into the Pannar and the first take off from that river will be at the head of the 9th section in the 90 miles, and the canal there will carry, as laid out, 100,000 cubic yards.

Representative
of the
total

75000

45000

100000

50000

The next take off will be at the Rajahy Ament at the head of the 9th section in the 140th mile. The allowances of water for this part of the canal being 50,000 cubic yards per hour. The Rajahy Ament is the last point at which fresh water is thrown into the part of the Main Canal lying to the north of the Pannar.

10. These several supplies amount altogether to 270,000 cubic yards per hour, leaving a balance of 240,000 cubic yards of Pombuddini water to pass the Rajahy Ament on the Kumbhar and fall into the Pannar, but it must be remembered that the last 195,000 cubic yards are supposed to represent the same number of acres and, as in the former case (para. 7) it will be necessary to add 50 per cent to the quantity supposed the area named to be fully cultivated, and this alteration will raise the 195,000 cubic yards to 292,500, and the total quantity used north of the Pannar to 367,500 leaving 32,500 cubic yards only to fall into the Pannar. Probably however, with the canals cut as they have been designed, they will not be able to carry the full amount needed for the acreage intended at the rate of $1\frac{1}{2}$ cubic yards per acre per hour, for though the draught through the irrigation sluices can be used to increase the surface fall up to a certain point it is not possible that this will be effective to the full extent required, for, to take the 9th section as an example, the surface fall of the water would have to be about 8° per mile against 3° per mile, the fall of the bed, in order to increase the discharge from 50 to 75 thousand cubic yards per hour and the distance through which such a difference could be effective

effective is necessarily very small, seeing that the
 decreasing depth would very soon reach to the
 discharge, and under these circumstances therefore
 can without widening of the canals it may be safe to
 assume that a minimum of 25 to 30 thousand
 square yards of Bombardier water will be discharged
 into the Pennine, whenever the Main Canal is raising
 its head at Louth. 40,000 cubic yards per
 second, unless under the area of land above the
 tail-race of the Cut has been greatly increased, and
 the of course increase of area there can be supplied
 alone whereas lower down the channels are of limited
 this capacity. - In what periods the full supply of water
 does. It may be expected that the full supply of water
 this action in this office does not take place when the
 man have been taken to the same place for a long time.
 It may also be noted that the information re-
 garding irrigable areas is likely to be much
 but more reliable than are the rough data which have
 may be referred to in this memorandum. The survey
 now for distribution of channels are in progress, and the
 and will give tolerably clear boundary lines of irrigable
 low tracts, reducing the probable error to a few
 acres or defect in the allowance made for land left
 unwatered.

increasing
 depth of water

to Colonel's Office, *W. D. D. D. D.*
 and *W. D. D. D. D.*
 1863. 23rd Sept. 1863
W. D. D. D. D.
W. D. D. D. D.

Consulting Engineer's Office,
Irrigation & Canal Company
Madras, 13 October 1864.

N^o 122.

Sir,

Captain J. Mullins R.E.
Contractor for I.C.C.

The Secretary to Government
Department of Public Works.

Sir,

1. In the order of the 11th Instant
N^o 2859, the Government states it takes their
opinion, with reference to the question raised by
the Agent, Irrigation and Canal Company, as to their
competency under the Contract, to withhold some
tion to estimates submitted for approval, that
section 16 of the Contract conferred the necessary
power. Since then, I have received the enclosed
letter from Mr. Stenelowe, with its accompaniment
from the Chief Engineer, on the same subject and
these I have now the honor to lay before Govern-
ment with such information on the question
of the probable cost of the works between Som-
kacala and the sea, as the records of this office
and the information obtained during my recent
inspection of the works and country afford.

2. I should mention in the first place that
just before the order of Government N^o 2859 of
the 11th Instant was received, Mr. Stenelowe
came to my office, and I pointed out to him that
clause 16 had apparently been overlooked by him
while

Order N^o 1312 of 26th
September 1864

Copy in a letter to Eng?
of 25th Nov. 1864.

13. 11/10/64.
The Contract Officer.
to the Secy to Govt. P.W.D.

Order N^o 2859
11/10/64.

Enclosed
presented by the Con-
tracting Engineer's Office,
I.C.C., in ac-
cance with in-
struction from the
Governor, to the
quantity of land
the assigned to the
contract with the
and how much work
will be awarded to
him from that sum in the

when he wrote his letter based upon the wording of
clause 8, and para 2 of the present letter are
intended to show, that to suppose clause 16 to give
the Government the power of withholding execution
of estimates, or as in the present case of postponing
execution of a particular section of the works, is
inconsistent with clause 8, which provides that
the Company shall cause the plans and estimates
of each portion of the Coombodra project as it
may deem it expedient to execute, and that these
plans and estimates shall be returned to the Com-
pany, either approved or with such reasonable
alterations, omissions or additions, as may be
considered necessary or desirable. ^{makes the two clauses utterly inconsistent.} They are not
necessarily inconsistent however, unless they
be read independently instead of together, and
as a contrast must be read as a whole, it follows
that if this be done, and if it be remembered, that
in order to exercise such control over the expen-
diture of the guaranteed million, as might be
necessary to ensure its advantageous outlay, -
provision was made in clause 8, for the device
of a right of veto on all proceedings at Boards of
the Directors, except proceedings for the purpose
of communicating with the legal advisers of the
Company, it seems clear that in the end for the
object of securing the expenditure of the million
to the best advantage, the Government has under
clause 16, the power to postpone the execution of
any particular section of the works, until such
time, as it may appear to be expedient or advisable,
with reference to the requirements of other portions
of the work, bearing them in mind. It might be stated
further, that it would not be desirable or advisable

to commence works, the cost of which is likely to
exceed the guaranteed capital, until the requisite
funds have been subscribed, and it would appear
moreover to be a reasonable exercise of the
powers conferred by clause 16, for the Government
to decline to allow detached sections of the
work to be proceeded with, in preference to the con-
tinuous completion, if it be considered that by
adding the returns of the works would be post-
poned, and the duration of the payments on ac-
count of guaranteed interest prolonged.

3. The objection in the 5th and following para-
graphs to show, that the Board of Directors
deem that the whole of the works between
Santakala and the sea, excepting however
the Cuddalore 3 sections (10-11-12) being the
part between the outfall of the canal on the
north side of the Pennair at Adamajilly,
and the commencement of the Kellor division
at the Somasaram Amint, and also those
works which are exclusively designed for
navigation only, should be carried out first.
In para 6 it is stated, that this course will
be of most advantage to all concerned, by
securing benefits to the country as early as
possible, and also early returns. I am not
quite sure, whether Mr. Henkelow means
by the postponement of works intended for
navigation only, to put off not only the com-
pletion of the parts of the canal which
are

are not intended to carry water for irrigation,
as for instance the 7th to the 9th miles, or where
then in addition to this, it is intended to put
a stop to the construction of locks on
either sections which will, as regards all
other descriptions of works, become avail-
able for navigation as soon as they have
been completed sufficiently to allow of
their carrying the full quantity of ir-
rigation water. It would be a matter
of regret, that the 6th section, or that
part of it between the 7th and 9th miles,
should be postponed, and a break thus
created in the navigation, but looking
to the amount of labor available,
I am of opinion that it would be
very desirable to leave this portion
alone, until at least the portion
above the 7th mile has been complet-
ed, and the distribution works up
to that point nearly, if not entirely,
finished, and after this has been
done also, I consider it would be
of

of greater advantage to the country,
to utilize the waters thrown into
the canal and Hindar from the
7th mile, by pushing forward
the 7th-8th and 9th sections of the canal,
and the distribution works con-
nected therewith, rather than to
employ the labor available in com-
pleting the canal from the upper
sections successively for thorough
navigation. - On the other hand, all
sections of the canal, which for
irrigation purposes must be com-
pleted to full width, should not be
left without the needed conveni-
ences for navigation, and I would say,
that while, where all the work cannot
be completed at once, a slight priority
might be given to irrigation, it should
be expected that each section should
be completed for navigation, by at
latest the season following its
opening

opening for irrigation, and that the requisite distribution of labor to advantage of this should be required.

In para 7 Mr. Henclame gives an estimate of the cost of carrying out the works which the Board desire to see completed as early as possible. The amounts mentioned I cannot check, because I do not know in what manner they have been obtained, nor am I aware what works as belonging to navigations only have been omitted. I suppose that the 12th item - management in England and in India. Paper 360,000 provides only for control, and not for the Executive Establishment, but if not, it would require to be multiplied by about 7 at least. The total estimated cost of these works, according to the Agent's calculation, is 92,22,250, and,

as

* not including
Distribution

18643 Miles

12
as upon the details of this calculation I could not offer an opinion, I have prepared a general statement of the cost of the whole of the works required between Sookasala and the Sea, and this statement is based, for a large portion, on the amounts of original and supplemental Estimates, and for the rest upon the best judgment I could form. For the Nellore Canals it will be seen, that the Agent allows 16,35,600, and in the Memorandum the allowance is 16,94,978. * but perhaps Mr. Henclame includes permanent Establishment, whereas I have made a separate charge on this account. The approximate amount of the supplemental Estimate which will be required for the 2nd and 3rd sections of the Main Canal, was obtained from the Chief Engineer by Telegraph. -

The allowance for cost of distribution is based upon the supposition that 14. Papers on area, the originally estimated ^{cost} will not be exceeded. There are no local data for this item of the Estimate and so it seemed useless to make any alteration. If however Dupessé represented the correct cost, at a rate

prevailing prior to 1861, but because of the
the proper allowance now and then
would necessitate an addition of 10 lacs.
to the Grand total.

Colonel Sir A. Cotton, whose rough Estimate, appears to have made ^{large of the amount}
no allowance for the distribution of ^{communication}
irrigation water below Kurnool. That ^{the P. & O. 27 6.8 miles}
Estimate for the works between the ^{1859 & 1861.}
Kurnool Anicut and the sea, was obtained by

Anicut, across Sambuddra and
the Kistnah (corresponding
to the Sonhasala Anicut). 2 lacs
Canal thence to Coast. 44-
Storage 2000 Millions (subsidy) 10-
56-

to which if 20 lacs be added for distri-
bution at Sir Arthur Cotton's own rate,
46 lacs would be the total. One very
great cause of difference is, that his
supposed 20 Miles of Canal would
carry the water from the Kurnool
Anicut to the watershed, at a cost of
lacs, with 1 lac more for the deep-
cutting, whereas the Canal required
and under construction is 72 Miles
long, and its cost will be about 40 lacs,
10 times the amount supposed
necessary. There are also in the
Memorandum many items which

Sir Arthur Cotton did not take into
account.

13
6. The Storage has been entered
at the quantity and amount allowed
in Sir Arthur Cotton's rough Estimate,
because there is no information upon
which to base any revised calculation.

7. The Electric Telegraph
allowance is the same as the Chief
Engineer considered requisite, and
as the length will be about 250 Miles,
and at Rs. 400 a mile as the cost at
which efficient lines have been
constructed, it will probably suffice,
though if iron posts be used,
the outlay would be nearly doubled.

8. Navigation plant is an item
which does not appear to have been
taken into account in previous Estimates.
5 lacs have been allowed, which would
probably pay for 10 or 12 steamers and
150 Cargo boats, perhaps the smallest
stock that would suffice to carry
on navigation, until the people
learn to build and provide boats
for a part of the traffic themselves.

9. The percentage of perma-
nent Establishment to expenditure
on works, is perhaps rather lower than

it probably will be, though it is much above
 the cost in the best worked Division.
 Upto July last, the expenditure on works
 was Rspees 32,60,000, and the actual cost
 of Establishment Rspees 10,91,057 or about
 33 per Cent.

The order to arrive at the probable
 cost according to the enclosed Memorandum,
 of the works included in para 9 of the
 Agent's letter, all that is necessary is
 to deduct the allowance made for the
 Hyderabad Division 2 1/2 lacs and charge
 of Establishment 6 1/2 lacs or 33 1/2 lacs,
 and this cost including however other
 navigation works, which it is proposed
 to postpone, but the amount due to which
 is unobtainable to estimate, becomes 14,54,233

The Chief Engineer proposes
 also to postpone the construction of the
 9th Section, and to take up the Nellore
 Division instead, and this would
 render a little over 8 lacs available. It
 may be remarked however, that
 notwithstanding what is said in para
 10 of the Agent's letter, and para 5 of Chief
 Engineer's letter No 801, the Canal project
 in the Nellore Division is very far from
 completed. Out of the 60 miles, the estimate
 of 4 miles only have been submitted, and
 at

almost none of the next 11 miles may be
 about ready by this time, and then
 surveys and levels for much of the line
 are not ready. If the Extract from the
 instructions of the Board, attached
 to para 11 of the Agent's letter be referred
 moreover, it will be seen that they
 contemplate the completion of the
 surveys, Plans, and Estimates for the
 works in the Nellore District, and
 their views on a similar case in
 Cuddalore render it very doubtful
 whether they would desire the vigorous
 prosecution of the Nellore works, before
 their total cost has been estimated,
 and the lands to be irrigated have been
 at any rate roughly surveyed, so as
 to enable some idea of the returns
 that may be expected to be formed.

Sd/-
 4th September

I do not at all share
 the Chief Engineer's opinion, that it
 would be more beneficial to the Company
 to be allowed to postpone the 9th Section
 in order to go on with the Nellore works.
 I believe that as regards irrigation,
 the returns will be more considerable
 and more quickly realized, if the former
 work be carried out, as a link in the
 navigation, it will certainly be more
 useful, and yield better returns, for one

end of it will be in connection with the
navigation channel, and the other will be
within 11 miles of the old apak, and within
a couple of miles of the River road
and the Railway, whereas the former is
in command of the Nilean Division,
is inaccessible from above, and there
is no proper determination of
the extent of lower end.

13 I am not therefore at all
disposed to recommend that the
provisions, which have been already
sanctioned, should be postponed *Sept 28 1877*
in favor of a detached section lower
down, but I think it will be well
to remedy the inconvenience and loss
which will result from the Company
having no sanctioned work in con-
nection with the Nilean Division
presently, and I would suggest, therefore,
with a view to the successful employment
of the work parties of the British
whenever the river is in fresh, and
they cannot be employed elsewhere,
that sanction should be given
to the extent of 30,000 Rs. per year, out of the
Estimate for the first section of the
Canaal in Nallur, and by this arrange-
ment all cause for complaint would
be removed, and by this time that

15 sum has been expended, the Chief
Engineer may have matured his
plans for the whole length of 60 miles
to the coast, and he may be able
to show the probable cost of the work,
and what extent of land will be
available for irrigation, added to which,
the Board of Directors will have
had the opportunity of understanding
clearly how the case stands, and of
expressing their opinion upon it, and
showing also what they propose to do
as regards the provision of funds
for those sections of the work which
will certainly not be executed out of
Government Capital.

14 It is very possible also, that
the Board may think it advisable
to postpone operations in the Dellar
Division altogether, when they learn
that the portion of the Loombuddra
project below Loombuddra, is likely
to cost more than 12 millions, and
if the upper portions bear the same
proportion to the rough estimate
contained in the Memorandum,
which is referred to in the preamble
of the Contract, as determining the
"Loombuddra project", the total Capital
required will be 4 1/4 millions sterling.

on or more than twice the amount which
the Company's Act authorizes them to incur.

10.15
11. The Company's Act has been referred to
12. frequently of late, it may not be out
13. of place to remark that the clause
14. provides that due regard is to be had
15. to the storage of water, sufficient
16. in quantity to maintain a continuous
17. supply to the works proposed to be
18. executed throughout the year if
19. practicable, and that therefore there
20. is direct obligation to do all that can
21. be done to this end. If the Company
22. in case of £2,000 millions of capital
23. do for what they certainly will make
24. to most profitable investment of that
25. amount, but even should the cost be
26. much greater, no time should be
27. in losing commencing to provide this
28. very important item of the Foundation
29. of the
30. when
31. they are
32. that
33. to the
34. better
35. Canal
36. ment
37. person

I have the honor to be
Sir,
Yours most obedient servant
John Lubbock
Secretary to the Committee

1880.

Chief Engineer's Office
 London 28th Sept/64.
 I have just received the Gov. Order
 regarding a despatch from the Chief Engineer
 to the Plate & Estimate of
 the 18th Section of the Bellard Works.
 The grounds of the order appear to be
 the cost of the finished work exceeding the
 Estimate and the conclusion that
 the entire scheme from Bankers to the Sea
 will exceed the Quarantine Bill.
 The arrangement proposed by
 the Board of Directors for meeting this
 extraordinary charge is very different from
 that made by the Secretary of State.
 The former involves the loss to the Corporation
 but delay. While the latter throws the
 scheme into confusion & a second time
 sets off the work in itself reproductive &
 finally an integral portion of the work of the
 Corporation. I cannot imagine that the Secretary
 of State has ordered this with the knowledge
 that there are other parts of the work which
 can be deferred without serious injury.

Copy to Mr. W. L. M. 2
 of 23rd March 1857 of 1864

Chief Engineer's Office
 London 28th Sept/64.
 I have just received the Gov. Order
 regarding a despatch from the Chief Engineer
 to the Plate & Estimate of
 the 18th Section of the Bellard Works.

Chief Engineer's Office
 London 28th Sept/64.

Chief Engineer's Office
 London 28th Sept/64.

Chief Engineer's Office
 London 28th Sept/64.

under orders.

Re-circulated

Chief Engineer's Office
 London 28th Sept/64.

Chief Engineer's Office
 London 28th Sept/64.

Re-circulated for the
 orders of Government, with
 Memo: from the Chief Engineer.

Chief Engineer's Office
 London 28th Sept/64.

Chief Engineer's Office
 London 28th Sept/64.

the Company, while the stoppage of their
works are an immediate & most serious
injury. The conclusion of the 6th para B
the deep ditch shows clearly the reason why
this section is proposed to be abandoned,
viz. as liable after the whole of the ground
local Capital shall have been exhausted
to be left unfinished for want of additional
funds, supposing that the former section
are necessarily there to be last finished.
But this is not the case, as the
Ancient at Lomaxwara has been sum-
moned and is in progress on the 11th of
the Pannain are already available in the
season to supply the Channel, & by its means
Tank is raised & then all supplied by local
means & there are no more to be had
which leads through the water shed of
Mittabadi. Hence the natural river
to Lomaxwara, and there is the proper
ly of the Company, & leading into the
Channel, which they are now proposing to
construct with Government Capital, &
further representation you will
be able to induce the Government to
rather to refuse sanction to the 9th Sec-
tion now before them, & allow the whole
section to be proceeded with.

5. If you lay before the Government
my last suggestion to meet the case of the
pancarter all being extended, while the
value of the Million Shales & the consequences
of the inefficiency of the original

inefficiency of the original generalizations
and propose the alternative of deferring the
navigation works to the 9th section. I should
hope that sanction might be given to the
Stollne section on which great expense has
been incurred, and which if completed
will be of most important advantage to the
Company.

6. The abandonment of the Ancient
at Lomaxwara in the midst of its con-
struction will be a most serious loss & it
of course needs without the Channel when
the 9th section head is not commenced
and the navigation works all through
can be deferred.

7. I hope earnestly that you will be
able to negotiate the alternative with
the Government, every thing is going on
well towards delivery of Lomaxwara
water in the Koonchaun valley, & by
that River into the Pannain in full head.
When the water would be of very great
value in the Stollne District. And the
rapid completion of some a Channel of
small capacity would be turned to account
to the advantage of the Company, & not to
the advantage of the District. In fact any
portion of the unfinished work could be better
spread than this.

I have the honor to
be, Sir,
Yours faithfully,
W. L. Fortman.
Chief Engineer.
To: Herbert Kemble
C. S. & Co. Secy.

copy in a letter to Sir?
23: Nov. 2. 1857 of 1864.

Enclosure in a letter to
the Secretary of the
of 18: 2. 1857 from the office

10/11/46 18/64

Graves showing the
estimated & purchased
costs of the portion of
the "Loom and road" Pro.
"feet" between
Loom and road & Loom

copy in a letter to Sir?
23: Nov. 2. 1857 of 1864.

copy in a letter to Sir?

90

12

Memorandum showing the estimated and probable cost of the "Tombudoo project" between Pandasola and the sea.

Various Particulars of Estimate	Estimated		Probable	Total of		Remarks
	Original Estimate	Amended		Estimated	Amended	
6 th Section Original	3 rd July 1885	2,350,950	121,525	10,41,294		
Supplemental for Leaks	2 nd July 1887	76,500				
— do —	2 nd July 1887	27,660				
7 th Section Original	3 rd July 1885	2,350	20.	76,500	1,56,325	
Supplemental for Leaks	2 nd July 1887	1,06,500				
— do —	2 nd July 1887	5,300				
8 th Section Original	15 th July 1887	96,800	20.	1,71,700	2,53,000	* after deduction of 11,250 on account of modification.
Supplemental	15 th July 1887	4,07,100	20.	87,452	5,24,392	
9 th Section Original	25 th July 1887	5,05,750			5,05,750	
10 th Section Original	25 th July 1887	5,05,750			5,54,070	
11 th & 12 th Mat. Estimate	25 th July 1887	1,51,800	15	72,270	2,18,200	* i.e. 265 tons left for 13 tons left for 10' section. Para 38 of letter 11. 165.5 tons. 25 th July - 7 Sept 84.
13 th Section Original	12 th July 1887	1,00,000	25	4,66,170	2,03,057	
14 th Section Original	12 th July 1887	27,450	10.	4,65	1,459	Estimate in this Office
15 th Section Original	12 th July 1887	1,00,000	5	5,715	119,975	
16 th Section	12 th July 1887	114,200			275,000	At 25000 ft a mile
17 th Section	12 th July 1887				9,00,000	At 20000 ft a mile
18 th Section	12 th July 1887					
19 th Section	12 th July 1887					
20 th Section	12 th July 1887					
21 st Section	12 th July 1887					
22 nd Section	12 th July 1887					
23 rd Section	12 th July 1887					
24 th Section	12 th July 1887					
25 th Section	12 th July 1887					
26 th Section	12 th July 1887					
27 th Section	12 th July 1887					
28 th Section	12 th July 1887					
29 th Section	12 th July 1887					
30 th Section	12 th July 1887					
31 st Section	12 th July 1887					
32 nd Section	12 th July 1887					
33 rd Section	12 th July 1887					
34 th Section	12 th July 1887					
35 th Section	12 th July 1887					
36 th Section	12 th July 1887					
37 th Section	12 th July 1887					
38 th Section	12 th July 1887					
39 th Section	12 th July 1887					
40 th Section	12 th July 1887					
41 st Section	12 th July 1887					
42 nd Section	12 th July 1887					
43 rd Section	12 th July 1887					
44 th Section	12 th July 1887					
45 th Section	12 th July 1887					
46 th Section	12 th July 1887					
47 th Section	12 th July 1887					
48 th Section	12 th July 1887					
49 th Section	12 th July 1887					
50 th Section	12 th July 1887					
51 st Section	12 th July 1887					
52 nd Section	12 th July 1887					
53 rd Section	12 th July 1887					
54 th Section	12 th July 1887					
55 th Section	12 th July 1887					
56 th Section	12 th July 1887					
57 th Section	12 th July 1887					
58 th Section	12 th July 1887					
59 th Section	12 th July 1887					
60 th Section	12 th July 1887					
61 st Section	12 th July 1887					
62 nd Section	12 th July 1887					
63 rd Section	12 th July 1887					
64 th Section	12 th July 1887					
65 th Section	12 th July 1887					
66 th Section	12 th July 1887					
67 th Section	12 th July 1887					
68 th Section	12 th July 1887					
69 th Section	12 th July 1887					
70 th Section	12 th July 1887					
71 st Section	12 th July 1887					
72 nd Section	12 th July 1887					
73 rd Section	12 th July 1887					
74 th Section	12 th July 1887					
75 th Section	12 th July 1887					
76 th Section	12 th July 1887					
77 th Section	12 th July 1887					
78 th Section	12 th July 1887					
79 th Section	12 th July 1887					
80 th Section	12 th July 1887					
81 st Section	12 th July 1887					
82 nd Section	12 th July 1887					
83 rd Section	12 th July 1887					
84 th Section	12 th July 1887					
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86 th Section	12 th July 1887					
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88 th Section	12 th July 1887					
89 th Section	12 th July 1887					
90 th Section	12 th July 1887					
91 st Section	12 th July 1887					
92 nd Section	12 th July 1887					
93 rd Section	12 th July 1887					
94 th Section	12 th July 1887					
95 th Section	12 th July 1887					
96 th Section	12 th July 1887					
97 th Section	12 th July 1887					
98 th Section	12 th July 1887					
99 th Section	12 th July 1887					
100 th Section	12 th July 1887					

Memorandum showing the Estimated and probable cost of the Port of the "Tombudien project" between Pondicherry and the Sea.

Estimated

Original Cost
Deducting
Estimated

Divisions Particulars of Estimate Amounts

Probable

Cost probably for
contingencies as estimated
Deducting 50% of probable cost

Prob. Amount

Total of

Estimated and
supposed actual
cost

Remarks

Distribution 4,00,000 Acres to be distributed
do. 1,00,000 do. below - do.
Storage 2000 Millions Cwt. & 100,000
Cotton's Allowances -
Electricity 250 Miles at 100 Rs.
Navigation plant. Steam & Cargo boats.

Brought Over.

7,14,001

4,51,931

33,53,200

1,12,91,135

at 4 Rs. per acre
do - do -

7,14,001
Permanent

4,51,931

33,53,200

1,12,91,135

Establishment at 25% per cent

35,72,755

Total Rs. 1,75,63,933

Chief Engg. Office.
Suez Canal Company,
Mediterranean, 13 October 1862

Voluntarily signed,
Suez Canal Company

1862

Minute

v3 4

I have gone carefully over the
conduct of the Migration
Company, in order to as-
certain the extent to which
it has met the claims of
the spirit as explained in
his letter of 5 Feb. 50. —
The contract is barely drawn
up, and the working part
is sufficient to give the
Company the right of ex-
ecuting the whole of the
work as named, and
locally appointed together
by the British Cotton in
1850 under the title of the
"Loomhudda project" and
which was apparently es-
timated to cost a million
sterling, in fact it
would be fully carried out,
cost upwards of ten millions.
The working of the con-
tract would leave the
entire retention, but it is
evident that the intention
of the Govt was to limit
the work to be executed
for the present million
to the Canal from, at or
near Kurnool to the sea
at Kibnapatnam, and

There is clear evidence from
the fact that the Director
of State did, in accordance
with the advice of the Govt
impose a narrower limit
than that upon the work,
and decided that the work
to be executed for the
Million should comprise
only the work from
Lankasala to Komatik:
- we can -

The present claim of the
Agent is that the com-
pany's officers have been
deprived the power of
executing the work
piecemeal according
to their own powers, that
they should be allowed
to select for immediate
completion detached
portions of the scheme
which have been sanctioned
by the Govt & the Act of
State, postponing unde-
finitely those portions
which, while they form
an integral portion of
the scheme, are not so
likely to prove successful
- nature -

This claim the Agent sub-
stantiates by reference to an

24
Exposition in clause 5 of the
Contract, to the effect that
the Company is to prepare
Plans & Estimates of such
work comprehending
the Lankasala project
as the company shall deem
it expedient to execute -
and he argues that the
phrase "deem it expe-
"dient" gives to the Com-
pany full power to
execute, or not to exe-
cute, the work for which
Capital has been sub-
scribed, and for which
Capital the Govt is paying
interest - This is too ab-
surd, for to use the
Agent's own illustration,
if the Company deem it
expedient to carry out
any particular work, it
may deem it inexpedient
to carry out all the scheme
and the contract would
be a nullity -
The fact is that the different
clauses must be read
together, and interpreted
so as to give each party
a wholesome check upon
the proceedings of the other.

Clause 5. According to the
somewhat forced con-
struction of the Agent,
would seem to give to
the Company unlimited
power - but Clause 16
neutralizes that by giving
to the Gov^t power to give
"orders & directions" with
reference to the work to
be executed with the land
sum of one million, and
with reference to the
manner & times of exe-
cuting the same -
It is not to be supposed,
as the Agent imagines
in his letter, that the Gov^t
being anxious to carry
out a piece of work, should
put a stop to it for no
cause - and that any
directions which it may
give as to the "manner
and times" of executing
the work have for their
object the injury of
the company - but it
is to be supposed that the
Gov^t anxious to see
the work for which it
pays annually, so large

25

a sum should watch
carefully the execution
of the work and should
whatsoever the Company
to carry out the easy
portions & to shift the
difficult portions. -
It is reference then to the
matters submitted for
consideration I am of
opinion that with
regard to the sections of
the works from Lunka
= down wards, the
proposed plans have been
sent in and approved,
the Company is bound to
carry them out with as
little delay as possible -
I am also of opinion that
they would desire to
the Gov^t the advantage
of insisting upon
the completion of the
work down wards
from Lunka down
wards; for if the com-
pany is not allowed
to make a break in the
work

in the latter despatches
of Mr. Lee & others -

Memorandum

21 Oct 64

P.W. 1864, 22 Sept

19th Oct

Minute by the
Honble the Secy

date 1st
P.W. 1864, 22 Sept

Copy in addition to England
8/23? Nov 24 87 of 1864.

Noting that the
works of the
should be
not the
should be
not the

they should
submitted
should be
preliminary
have been
the

2621

263

26325-16 22 Sept 1864

- The question raised by
the Agent is so important
and the affairs of the
Suez Canal Company are in
so serious a position owing
to the large amount of its
expenditure in compari-
-son with the amount
of work hitherto comple-
ted, that these papers
should be forwarded
at once to the Secretary
of State for orders in ad-
-vance to his Despatch of 24th Aug 64.

2 - Meanwhile we should
as proposed by the President
insist upon plans being
submitted for the whole
of the works above so-
-maishware as a
preliminary to the consi-
deration of those between
that place & Tientsin
on the coast.

in the latter despatches

- 3 - The Consulting Engineer suggests in P 13 of his letter of 13th Inst, that while the Monsoon fishes impede operations at the Somai-
- hwarem Ancient, the Iri-
- fation Company may be allowed to transfer their labourers for the sake of "useful employment" to the first portion of the Canal below the Ancient.
- I do not object to this suggestion ^{on} the under-
- standing that if the Company avail them-
- self of the permission instead of transferring the labourers to the work above the Ancient, they are to do so at their own risk, & not to consider the permission as any guarantee that the Secretary of State will allow the Iri-

20/13
Section to be proceeded with until the works between Tankasala and Somai-hwarem have been completed -

- 4 - I quite concur with the President in thinking that Clause 16 of the Contract gives & was intended to give power to the Secretary of State to decide on the time, manner & order of ex-
- ecuting the works com-
- prised ^{within the guaranteed} Capital of £1,000,000.
- Such control was only a reasonable condition to guard the Govt. which gave ~~the~~ a guaranteed interest of 5 Per Cent from sundry loss and expense ^{for instance} such as would be in-
- curred if an uncon-
- nected series of works was suddenly thrown

in the hands of Govt in
consequence of the
Company proving unable
to complete its intended
undertaking. -

24 Oct-1864

J M Atty

Copy in a letter to England
D/23: Nov. 1864.

W. 1864 Sept 16
of the of Govt for the
4638

Minute by the Honble
Mr. Hallby.

Date of the
14th Oct 64

2253255-11/7/64 1864.

The consideration of
those between that place
& Calicut in the
District.

No 264

Suggesting that the ques-
tion raised by the Agent
of Irrigation & Canal Com-
pany regarding the com-
petency of Govt to withhold
sanction to the estimates sub-
mitted for their approval,
should be referred to the same
Govt for orders, & agreeing with
the Honble the President that
Govt should insist upon the same
being submitted for the sanction
of the Honble the President.

30
Public Works Dept

No 3258

Proceedings of the Madras Government

Under date the 14th Oct 1864.

Read the following papers

From the Honble the Agent

Submits with remonstros letters
from the Agent and the Govt
on the subject of the probable cost
of the works between Sionhalla
and the sea with respect to the
question raised by the Agent
as to the competency of Govt
to withhold sanction to the estimates
submitted for their approval.

N. 8. 13th Oct/64 No 122

Minute by the Honble the President — N. 8. 21 Oct/64 No. —
do by — Mr. Hallby — 24th —

Mr

Mr

The Consulting
Engineer to the Madras
Irrigation & Canal Company
forwards letters from

the

the Agent and the Chief Engineer, urging, under the conditions of the Contract entered into with the Secretary of State, the right which the Company propose to select for execution such portions of the scheme which they have in hand as they may deem it expedient to carry out, with-
out reference to the continuity of the works;

2 This claim is supported by reference to an expression in Clause 5 of the Contract, to the effect that the Company are to prepare "Plans and estimates of such of the works comprehended in the Construction project as the Company shall deem

* select for execution such parts of the general project as they may consider it expedient to complete, and to defer others.

31
deem it expedient to execute, and it is argued that the phrase "deem it expedient" gives to the Company full power to ~~execute or not to execute the works~~.
This argument involves an absurdity; for to read the Agents' own illustration, if the Company deem it expedient to carry out any particular work, they may deem it inexpedient to carry out all the scheme, and the Contract would be a nullity. In the opinion of the Govt the different clauses must be read together, and interpreted so as to give each part

the a wholesome check upon
give the proceedings of the
one other. Clause 16, puts
into the Government with
her power to give orders
right and direction with
ref. reference to the works
sues "to be executed with
the" the said sum of one
million pounds and
out "with reference to the
manner and times
of executing the same."
Such control was only
a reasonable conclusion
to guard the Government
while ~~the~~ guaranteeing
interest of 5 percent,
from undue loss and
expense, such for instance
as would be incurred
if an unconnected series
of

32
of works were suddenly
thrown on their hands.
in consequence of the
Company proving unable
to complete the under-
taking. It certainly
is not to be supposed
that the Government
would put a stop to
the works for no cause,
and that any directions
which they may think
fit to give as to the
"manner and times"
of executing them would
have for their object
the injury of the
Company's interests;
but rather that the
Government which
paid

the ~~very~~ ~~immensely~~ ~~large~~
-gr ~~sums~~, would
con watch carefully the execution
in for which so large a sum is annually paid,
of the works and pre-
sent the prosecution of
reg detached portions which
no offer little or no diffi-
su- ties of construction while
at the more difficult sections,
pe which never the less form
or an integral portion of
con the scheme, are indefinitely
2 postponed.

to 3. For these reasons
5 the Government main-
tains that the Company
are bound to carry out
as with as little delay as
possible those sections of
the work from Dookhah
downwards

33 / 1
downwards for which Plans
have been sent in and
approved, and they
must insist upon the
completion of a conti-
-nuous line of works
from the point indicated.
(They must further
insist upon the sub-
-mission of plans and
estimates, not hitherto
submitted, for the
whole of the works
above Sonairahwan
as a preliminary to
the consideration of
those between that place
and Nisthapatam.
4. The Consulting
Engineer in Para 13
of

of his letter suggests that while
the Monsoon freshes im-
-ports operations at the
Somaithuram Ancient,
the Irrigation Company
may be allowed to transfer
their laborers for the sake
of useful employment
to the first section of
the Canal extending
4 miles below the
Ancient. The Government
will not object to this
arrangement, on the
understanding that if
the Company avail
themselves of the permission
in preference to trans-
ferring the laborers to
their works above the
Ancient, they are to do
so at their own risk,
and

24
and not to consider the
permission as any guar-
-antee that the Gov-
-ernment of State will
allow the Kellore
Section to be proceeded
with until the works
between Sunkasalep
and Somaithuram
have been completed.

Ad.

23
3

11
The 11th day 1800 S. D. H. S. Letter
S. D. H. S. S. V.

15th November

Copy in a Letter to England.
8/23^d November 1861.

to Visb. D. 100
Pro. of Cont. for hon.

7:2258
Pro. of the Al. 100
28/10/1861

of 100/10/1861

I have received the
right of the 100/10/1861
that in question the
position of the 100/10/1861
which they have in
hand as they may have
it is not to be
in the 100/10/1861
to the 100/10/1861
100/10/1861.

100/10/1861