

MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No. 2879

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Dated

4-12-1867.

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*Proceedings of the Madras Government, Revenue Department,
4th December 1867.*

No. 48. Read the following Proceedings of the Madras Government in the
Public Works Department:—

Passing orders on letter from Government of
India regarding the modification and enlarge-
ment of the irrigating channels on the east } (Here enter 27th November 1867, No. 3,684.)
bank of the Kistna river.

No. 49. ORDER THEREON, 4th December 1867, No. 2,879.

Irrigation, No. 2.

Communicated to the Revenue Board.

(True Extract.)

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

To the Board of Revenue, with Proceedings Public Works Department, No. 3,684.

Exd. F. R. Bantleman.

*Proceedings of the Madras Government, Public Works Department,
27th November 1867.*

No. 603. Read the following letter from the Secretary to the Government of India, Public Works Department, (Irrigation,) to the Secretary to the Government of Madras, in the Public Works Department, dated Simla, 25th October 1867, No. 163 I.

1. I am directed to acknowledge receipt of your letter, No. 2,544 of 20th August last, submitting estimates, Four lakhs six thousand one hundred and ten amounting to Rupees 4,06,110, for Rupees. modifying and enlarging the irrigating channels on the east bank of the Kistna river, being part of a scheme in contemplation for the general enlargement of the Kistna system of irrigation.

2. This project, like the one relating to the Pennair irrigation in Nellore, noticed in my letter No. 147 I., of 18th September last, is submitted in a shape which does not properly admit of the responsible Officers of the Government of India forming an independent judgment regarding it. In the present case, however, the presumptions are so far in favor of the project having been duly considered, and being likely to prove fairly remunerative, that the Governor General in Council will not withhold his sanction from the estimate; but His Excellency in Council, at the same time, directs me to express a hope that all such projects will in future be submitted in the complete form prescribed in the letter above quoted.

3. There are one or two points in connection with the project under consideration, to which it is considered desirable that the attention of the Government of Madras should be drawn, and these I am now briefly to notice.

4. The regulating sluice bridge at the head of the new cut is not adapted for navigation, which is perhaps not necessary, as the old canal is available. But the waterway being broken up into 6-foot openings, it is not clear why a bridge with 40 feet spans should be constructed. Such a bridge may possibly be cheaper than one with smaller openings, but this is not likely, and the matter may, with advantage, be re-considered.

5. The five arch bridge over Ryves' channel for the Ellore road has 20 feet arches, which probably are considerably cheaper than 40 feet arches, but if arrangements are made for the navigation of any part of this channel, it is not evident why this bridge should not be adapted for navigation as well as others. This remark applies also to the Komatigoonta calingulah. Probably the expense of a lock is considered uncalled for, but as the drop at this calingulah is only about $2\frac{1}{2}$ feet, the cost would not be great. Again, if Ryves' channel is to be made navigable throughout, either the old head sluice, or the one at the head of the new cut, should apparently be modified.

6. It is also necessary to notice that no allusion is made to what is intended to be done at the main anicut head sluice. If an increased supply of water is to be sent down Ryves' channel, it must come into the main channel somehow. It is not said whether the existing sluices are sufficient, but it is thought that they are not, and that an enlargement will be needed. Some remarks are made in Colonel Anderson's letter on this point, but they do not admit of any exact conclusions being come to regarding them.

7. Further, I am to notice that no reference is made to the general scope of the extension that it is proposed to give to these works eventually, nor whether what

is now projected may fairly be regarded as a final measure so far as the particular canals now dealt with are concerned. In past years, because of the difficulty of obtaining funds to carry out costly works, it might have been advantageous to break up such projects, and deal with them in fractions. But even then it was obviously very undesirable to attempt to *design* such works in a fragmentary manner. Now, when the difficulty in regard to the provision of funds no longer exists, there is still less reason why this course should be adopted. On this point I am to draw attention to paragraphs 4 to 6 of Public Works Department letter, No. 2,708, dated 16th July 1862, and to repeat the request that steps may be taken for the preparation of a complete project for the whole system of works for the Kistna Delta, based on a comprehensive view of the available water-supply and of the lands that can be irrigated by that water.

8. The sanction accorded in this letter has been registered as No. 9 I of 1867-68.

9. The plans received with your letter under reply are returned.

NOTE BY CHIEF ENGINEER, IRRIGATION DEPARTMENT.

1. I believe I have it in my power to furnish a satisfactory explanation on the points in connection with the project to which the attention of the Government has been drawn.

2. The Government of India question the propriety of the design for the head sluice at the head of the new channel from the Main Canal near Bezwadah. It consists of a series of small arched openings, arranged in front of a bridge of three arches, each 40 feet span. The height of the roadway of the bridge above the floor, or bed of the new channel, is to be 21 feet, which corresponds exactly with the actual depth of cutting. Whatever design might have been adopted, it was necessary to build it to this height, and as it is to be on the high road from Masulipatam to Hyderabad, on which there is a large traffic, it was essential that the arrangements for working the sluice should be kept clear of the roadway of the bridge.

3. The design for the bridge is much the same as it would have been had there been no sluice, except that the waterway is greater than would otherwise have been necessary, the width of the channel at sole being 100 feet, whereas the waterway allowed is 120 feet. A series of small arched openings, giving an aggregate width of waterway of 90 feet, has been planned for construction along the front of the bridge. Had the bridge been formed of these small openings throughout its whole width, it is evident that the superincumbent weight on the floor would have been largely increased, while the advantage that has been obtained of having the masonry floor of the bridge to break the force of the water after passing through the sluice, at times under a considerable head, (the maximum depth in the main channel being as high as 10 feet,) would have been lost. An additional flow in rear of the bridge, and a corresponding extension of the wing-walls would therefore have been necessary at a considerable extra expense. It may be added that the head sluice of the main channel at the south flank of the anicut is arranged in the manner suggested by the Government of India for the one under consideration;

but the circumstances of that sluice are very different from those of the latter, for it has to hold up a depth of water due to the maximum flood in the river, or considerably over 20 feet on the floor; and, as the depth in rear of the sluice would probably not be in excess of 10 feet, the whole of the body of the sluice was necessarily made of an extremely massive character, to enable it to withstand the pressure due to a head of 10 feet and upwards.

4. With reference to the remarks of the Government of India, to the effect that the works along the channels leading from the head sluice abovementioned do not appear to have been designed with a view to the requirements of navigation while at the same time they assume the probability of its being used for navigation at some future period, it has to be explained that there are strong reasons for not incurring the expense of locks and other works required to render it navigable. The channel joins the Pullairoo which passes within three quarters of a mile from the Masulipatam canal at the 30th mile from Bezwadah. There is to be a regulating bridge across the Pullairoo at a short distance above the cut which connects it with the Masulipatam canal. To make Ryves' canal navigable three locks would therefore be required, one at this regulator, another at the head sluice, and a third at the drop at the head of the Gudivada branch channel. There is also a lock on the cut abovementioned. Allowing that a considerable advantage would be gained by boats going down stream, owing to the high velocity of the current in Ryves' channel, a portion of it would again be lost by their having to pass through four locks instead of through two in the Masulipatam canal. There are no large villages along Ryves' channel and little local traffic is to be expected. It would be very difficult to arrange a lock at the head sluice which would not be constantly stopped by accumulations of silt. A similar drawback would apply to the second and third locks. Finally, without remodelling the whole of the design the navigation would only last for the several months during which the river yields a sufficient supply of water to keep the channel full.

5. Had the possibility of navigation being introduced been contemplated, the Superintending Engineer would doubtless have designed the bridge referred to in paragraph 5 of Colonel Dickens' letter with a height sufficient to allow boats of all classes to pass under it, that is, about 20 feet clear above the floor, instead of only 13 feet, the height given. The design of this work is not a neat one, and the Superintending Engineer will be requested to revise it, and to arrange for the openings having a total height of 16 feet, in order that in the event of there being any call for the use of small boats, either for traffic from village to village, or for the conveyance of stone or lime for the Government works, there may be no obstacle to their free passage.

6. As regards the sufficiency of the head sluice at Bezwadah to pass the supply for the channels in the Delta when enlarged to their ultimate capacity, I would beg to observe that there is a more than ample supply in the Kistna for the irrigation of the whole of the land under the command of the channels leading from the anicut. It was explained by the District Engineer in his report, dated 6th January 1863, that there would be a loss of head at the head sluice when the water in the river was at the standard level (paragraph 25), but that, in consequence of the enormous pressure which the sluice had to sustain during high freshes, it was necessary to restrict the aggregate dimensions of the openings. It was explained

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27th November 1867.*

that, with the channels enlarged to the full capacity, and with a depth on the head sluice floor (in front) of nine feet, there would be a loss of head of nine inches at the sluice itself, and three inches more at the bifurcation of the Ellore and Masulipatam canals, that is, close to the site of the new head to "Ryves' channel," the whole discharge being computed at the rate of 2 cubic yards per hour per acre for 2,70,000 acres. As the depth of water allowed for Ryves' channel is 7 feet, it is evident that so great a depth as that abovementioned would not be required at the main head sluice.

7. But even allowing 9 feet on the floor to be the standard level required eventually for the full supply of the canals, the only means that are required to obtain it are certain appliances for raising the surface of the water in the river after the close of the freshes in the month of October. The present level of the crest of the anicut is $5\frac{1}{2}$ feet above the main head sluice floor. The average level of the surface water during October is $3\frac{3}{4}$ feet, and during the first half of November $2\frac{1}{4}$ feet above the crest. It would be quite possible to raise the surface to the required standard by means of iron posts and planking, but it is not desirable that such an expedient should be had recourse to until it can be determined for certain whether the desired end cannot be accomplished by the construction of a rough stone dam along the crest of the anicut at the expiration of the freshes of each season. The latter plan is by far the most economical that could be adopted, and it has the advantage of furnishing a supply of material for the annual repair of the work, and of practically lengthening the working season.

8. With reference to Colonel Dickens' remark that no explanation has been given as to the general scope of the extension which it is proposed to give to the works eventually, nor whether "what is now projected may fairly be regarded as "a final measure so far as the particular canals now dealt with are concerned," I would point out that the general design of the extension required for the completion of all the Delta system was fully described in the District Engineer's letter, dated 6th January 1863, and that, so far as the scope of the extension is concerned,

Dated 9th December 1864, No. 33.

the proposed arrangements appear to have met with the full approval of the Secretary of State.

9. The Superintending Engineer has on the present occasion submitted detailed estimates of one section of the general scheme, and in complete accordance with it. He will now be called upon, in conformity with the instructions of the Government of India, to submit plans and estimates for the remaining sections. The design of the whole project has already been drawn out, though not apparently in so comprehensive a manner as the Government of India require, and it will therefore be revised and amplified. Full information will be afforded regarding the quantity of water that can confidently be relied on for the supply of the Delta channels, the means by which the delivery of the supply from the river is to be secured, and the area of the lands available for the utilization of that supply.

(Signed) J. C. ANDERSON, Lieut.-Colonel, R. E.,
Chief Engineer for Irrigation.

*Proceedings of the Madras Government, Public Works Department,
27th November 1867.*

No. 604. ORDER THEREON, 27th November 1867, No. 3,684.

IRRIGATION, No. 34.

1. Forwarded to the Superintending Engineer of the 2nd Division, with an intimation that the questions raised in paragraphs 3, 4, 5, and 6, will be replied to by this Government.

2. In accordance with the instructions of the Government of India, Colonel Winscom will prepare plans and estimates for the completion of the whole Kistna project, and submit with them a report showing, in a full and comprehensive manner the quantity of water that can confidently be relied on for the supply of the channels, the means by which the delivery of the supply from the river is to be secured, and the area of the lands available for the utilization of that supply. He will also revise the scheme which was submitted with the late District Engineer's letter dated 6th January 1863, and allow for the construction of any additional works which further experience may have shown to be necessary, particularly as regards the provision of outlets for the free discharge of surplus or drainage water both at ordinary times, and on occasions, when, from an extraordinary fall of rain or from other causes, the channels may have drawn from the river a larger supply than it may be possible to use.

3. The Revenue authorities should be consulted both as to the number and sites of additional bridges which may be required for the accommodation of traffic along thoroughfares.

4. The design for a bridge of five arches of twenty feet span across Ryves' channel is not a neat one, and an improved design should be substituted, if it can be done without any material increase of cost, and with a view to its not interfering with the occasional passage of punts or other boats.

5. The plans which accompany the estimates for the project now sanctioned are retained for record, but if required by the Superintending Engineer, they will be returned after being copied.

Ordered that the following letter be sent:—

(Here enter No. 3,685, dated 27th November 1867.)

(True Extract.)



Colonel, R. E.,
Secretary to Government.

To the Superintending Engineer, 2nd Division.
" Revenue Department.
" Controller of Public Works Accounts.
" Accountant General.

Exd. S. T. Augustin.

Permanence 1867-8
100 of your 1st Dec
1871-3245.

Proceedings of the
P. M. O. of the

Dated 27th 3rd Nov
Received 29th 1867.

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On 27th Nov 1867
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27th Nov 1867

With order

27th Nov 1867

Committed to the
House of Lords

27th Nov 1867

100 Copies of the 1867-8. On 27th Nov 1867. Dated 27th Nov

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