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Proceedings of the Madras Government, Public Works Department,
31st May 1875.

Read the following papers :—

No. 565. From Major J. O. HASTED, R.E., Superintending Engineer, 1st Division, Kistna, to Lieutenant-Colonel J. MULLINS, R.E., Chief Engineer for Irrigation, dated Masulipatam, 27th March 1875, No. 167 :—

I HAVE the honor to forward, herewith, plans and estimates, amounting to Rupees 19,000, for constructing an under-

- 1 Plan of under-tunnel.*
- 1 Site plan.*
- 1 Plan showing land drained.*
- 1 Detailed and Abstract Estimate with Specification Report for Rupees 19,000.†
- 1 Data of rates.†

- 5 Return requested when sanctioned.
 - * Per banghy parcel.
 - † Per separate cover.

tunnel under the Masulipatam Canal, and west side channel in the 29th mile, near the village of Inampudi.

2. This estimate was originally included in the 5th section of the delta completion project now being submitted, but as the work was considered emergent, to prevent damage recurring yearly to the

cultivation, the estimate has been submitted separately, and the work under your instructions has been put in hand.

3. The Masulipatam Canal follows the course of the old Pulleru from near Besorah to Kankipaud, from this point the canal was taken further to the south by a separate channel, which after a wide curve is brought back to very near the Pulleru at Pamarru. The space included in this loop between the Pulleru and Masulipatam Canal, about 31 square miles, could only be drained under the canal, and accordingly two under-tunnels, each of one vent 6 feet span, were constructed, one at Kommamur and one at Inampudi. The first named drained but a very small extent of country, and seems to have been intended only to carry off the water that might accumulate in the old course of the Bhimanadi, and the second had therefore to pass nearly all the drainage of 31 square miles.

4. It might be expected that, under these circumstances, the Masulipatam Canal would be breached whenever there was a heavy fall of rain; and this would be the case but that at nearly the widest part of the loop, from a little below Inampudi to near Capilashwarapuram tank, there is a large hollow in which the drainage water can accumulate, till it can be passed through the single vent of the tunnel. The capacity of this hollow is sufficient to prevent the water rising to such an extent as to breach the canal banks, and this is proved by the fact that from the time the tunnel was first constructed in the year 1858 to the present time, the canal has never been breached here (except in last year when the river water inundated the country and rose completely over the canal banks in many places), but it has been necessary to cut the canal bank to let off the water from the hollow, to save the crops and prevent damage to property. I intended to have submitted with this estimate levels of this hollow, but those which were taken formerly are not trustworthy, and others are now being taken.

5. Until lately this hollow has been a large swamp, with only a little cultivation along the edge; cultivation is, however, being extended rapidly, and unless additional waterway for the discharge of flood-water provided more and more wet cultivation will be submerged yearly, and there is every probability that the canal banks will be

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cut by the cultivators to save their crops. Complaints of flooding are now made every year, and it is essential that some measure of relief should be afforded.

6. The Pulleru, being an old inundation channel, runs on a ridge, and the water surface is now below the level of the country. The country to be drained therefore, while resembling the rest of the delta, inasmuch as flood water can be allowed to stand for a few days without damaging the crops, instead of its being necessary to discharge it as it falls, has this advantage that it is not liable to sudden floods from bursting of the supply-channel banks.

7. The discharge required, according to the formula $D=450 M. \frac{2}{3}$ reduced so as to run off the flood-water in six days, would be 917 cubic feet per second, and a tunnel of 150 square feet waterway would be sufficient for the purpose, but it has been considered advisable to allow a larger margin than usual, to keep the water as low as possible, and therefore the design is for a tunnel of five vents giving a waterway of 220 square feet. In addition to this the old tunnel will be thoroughly examined, and if it is found to be, as expected, in good order, it will be retained giving an additional waterway of 20.6 square feet.

8. The bed of the drainage channel above the tunnel is +13.83, and below the canal +6.5; at this level the drainage channel to the old Deyyapu Calwa, one of the principal drains between the Masulipatam Canal and the Kistna River, and which has been estimated for in the 5th section of the Eastern Delta Project, commences.

9. The Masulipatam Canal is brought in to the aqueduct on a straight line, and the width of the aqueduct, 35 feet, is the full width of the surface level of canal at full supply. The side channel, which in this reach has been formed by throwing up a bund in the old main canal, is thus brought into the aqueduct on rather an awkward curve, but ample stone revetment has been allowed to protect the banks.

10. The work is now in hand, corrections having been made in accordance with your suggestions after seeing the originally proposed plan, and it is believed that the work will be so far completed that the canal can be re-opened about the middle of June next.

No. 494.

Note by the Chief Engineer for Irrigation.

To the explanations given by the Superintending Engineer, Kistna, regarding the Inampudi under-tunnel, now under construction in anticipation of sanction, it is only necessary to add that a great deal of damage having been done to this part of the canal it was deemed advisable to carry out this improvement during the time of the closure of the canal this season for extensive repairs. The need of improved drainage arrangements has been clearly explained, and the fact that nearly 31 miles of drainage have at present no outlet but a tunnel of 20.6 square feet of waterway, sufficiently shows the need of a radical change.

2. This work forms an item of the 5th section of the Eastern Delta completion estimates, and it is recommended that the Government of India be asked to sanction the estimate, amounting to Rupees 19,000, in anticipation of the submission of the estimates for the entire section, and to allow the expenditure in the current year to be met by

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transfer from the provision for other Loan Fund works. If this arrangement be not approved, it will be necessary either to obtain a special grant under Ordinary, no funds being at present available for transfer, or to leave the expenditure to be adjusted out of savings at the end of the year. The charge will be debitable to Capital, Eastern Delta, Kistna, Masulipatam Canal.

3. The lower wings of the side channel do not fit in well with the channel, and a departure from the regular plan would have been desirable. The earth slopes at the wing returns will need re-adjustment.

OOTACAMUND, (Signed) JOHN MULLINS, Lieut.-Colonel, R.E.,
10th May 1875. Chief Engineer for Irrigation.

No. 567. ORDER THEREON, 31st May 1875, No. 1,496.

IRRIGATION, No. 68.

THE Honorable the Governor approves, under the circumstances reported, of the construction of an enlarged under-tunnel near Inampudi on the Masulipatam Canal for the relief of the lands above the canal. It has been explained that this work, the estimate for which amounts to Rupees 19,000, will form an item of the completion works of the 5th section, Eastern Delta, Kistna, completion estimates, shortly to be sent up for sanction, and the Government of India will be asked to sanction the under-tunnel estimate, and to allow the expenditure, which in the current year will amount to about 10,000 Rupees, some 8,000 Rupees having been spent in 1874-75, to be met by transfer from the allotments for other Loan Fund works in this or the adjacent delta, appropriations being made as soon as the Superintending Engineer reports what transfers can most conveniently be made.

(True Extract.)

J. S. Austin

Major, R.E.,

Offy. Joint Secretary to Government.

To the District Engineer, Kistna.

" Controller of Public Works Accounts.
" Chief Engineer for Irrigation.
" Revenue Department.

Exd. S. T. Austin.

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Board of Revenue
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