M.R.O. 14—18,000—27-9-24

MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No. 2079 Press Mis.

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Proceedings of the Madras Government, Revenue Department,
2nd September 1865.

No. 44. Read the following Proceedings of the Madras Government in the Public Works Department:—

Requesting to direct the Collector of Kistna District to draw the attention of the Zemindar of Nuzid to the state of tanks in his Zemindary. } (Here enter 30th Aug. 1865, No. 2,529.)

No. 45. ORDER THEREON, 2nd September 1865, No. 2,079.

Miscellaneous.

Communicated to the Board of Revenue, who will instruct the Collector, Kistna District, to use his best endeavours to induce the Nuzid Zemindar to have his irrigation works in the Ramaliar valley put in good order, warning him that if damage ensues to Government works from his neglect he will be held responsible.

(True Extract.)

(Signed) J. GROSE,
Acting Under Secretary to Government.

To the Board of Revenue, with Proceedings Public Works Department, No. 2,529.

Exd. S. T. Augustin.

Proceedings of the Madras Government, Public Works Department,
30th August 1865.

No. 702. Read the following letter from Captain J. G. RYVES, R. E., Superintending Engineer, 1st Division, to Colonel C. A. ORR, R. E., Secretary to Government, Public Works Department, dated Waltair, 1st July 1865, No. 559 :—

SIR,

1. I have the honor to submit the estimates for the works proposed in my letter No. 1,051, dated 20th January last, of which the general arrangement and principles of design met with the approval of Government in Proceedings No. 484, dated 18th February 1865.

2. The delay which has occurred in the submission of these documents requires explanation, it is due (1) to my wishing to examine the sites of some of the proposed works again before preparing the detailed plans and estimates; this I did in March last, immediately after my return from Ganjam; (2) to the self-acting shutters (which I propose for some of the outlets) requiring much consideration and a good deal of calculation before deciding on the plan to be adopted; and (3) the large number of separate plans, estimates, and specifications to be prepared; these I may say have been very carefully considered and prepared; it must be remembered that Draughtsmen of the Public Works Department cannot draw from a specification and rough sketch, an accurately drawn copy to scale, with every detail that the fair copy is to show, has to be furnished them, and in anything at all out of the common, several failures may be expected before a drawing fit to submit to Government, is obtained.

3. The works, for which detailed plans and estimates are now submitted, are twenty-five in number; eleven of which are inlet openings through the bank on the upper side of the canal, eight are escapes on the opposite side, and four are sub-passages: the remaining two are the conversion of the Ellore aqueduct across the Toomoolair into an inlet and outlet, and a rough regulating work at the bifurcation of the Toomoolair.

4. The positions of these works are marked on the accompanying sketch map by red letters, which are the same as those marked on the respective estimates and drawings. The existing works for cross drainage are also marked in their proper places.

5. I have included in this sketch map the area of country of which the drainage is intercepted by the canal; this may, as I have done on the map, be divided into six catchment basins. These, with the proposed and existing works for passing the drainage from each across the canal, I describe in the following paragraphs.

6. First (commencing at the right hand) the narrow triangular tract of country between the Yerra Kalva water shed and the first eighteen miles of canal, with an area of only some 60 square miles, and a flat absorbent surface. The canal here is not liable to damage, it is well within soil, and its upper bank so strong and high that flood-water would escape over the water shed into the Yerra Kalva before it would be topped or breached, but for the sake of the country above I have deemed it proper to allow four small inlets and one 16 yards low level outlet, in addition to the three small under-tunnels already provided for this section.

7. Next come the two catchment basins above Kykaram and Bheemadole, where so much damage was done last November; the difficulty here is that, although there are two well defined hollows on the line of the canal, a breach in a tank higher up may turn half of what ought to be Kykaram drainage into the Bheemadole hollow or *vice versâ*. For each of these sections the estimates now submitted provide an under-tunnel of 250 square feet. At the 20th mile near Kykaram I propose also to construct an inlet 32 yards long with crest three feet above the canal bed and self-acting shutters, there is already a 20-yard escape in the opposite bank.

8. There ought to be two sub-passages of the above waterway in the Bheemadole hollow: but the amount of the sanction will not cover the cost without reducing to a very small sum the share allowed for irrigation sluices and rajbuhas: I have, therefore, not included it in my revised estimate; nevertheless I recommend that the second additional under-tunnel for the Bheemadole hollow be built, and that the funds for extension of irrigation be provided for separately.

9. The works in the Kykaram section will discharge 600,000 cubic yards per hour, and the one under-tunnel in the Bheemadolo section 350,000, that is about 8,000 and 4,800 cubic yards per hour per square mile, respectively. I believe the discharge might be at a greater rate, *i. e.*, the flood level higher than that taken for my calculation of discharges, without damage to the canal: the figures above are the discharges without risk. If the second under-tunnel for the Bheemadole hollow, recommended above, be built, that section would be relieved of flood-water at the rate of 9,500 cubic yards per hour per square mile.

10. The fourth is what I will call the Dendaloor drainage. This has a catchment area of 175 square miles, and crosses the canal at several points between the 28th and 35th mile (measured from Nundamoor aqueduct): there is no well-defined stream of any capacity, the water in floods stands all over the flat plain at the back of the canal. The additional works provided for this section are two high level escapes, each 50 yards long with their corresponding inlets, each 32 yards in length; and an under-tunnel of 150 square feet water-way: these, with the two under-tunnels, one of 60 square feet, the other 90 square feet we have there already, will give us a discharging power (water surface being not more than 7½ feet above the canal bed) of about 875,000 cubic yards per hour, or 5,000 per square mile.

11. This is barely sufficient. It would probably be enough to prevent damage to the canal, but the country above would, I fear, be flooded more than it ought to be.

12. The next is the Toomoolair drainage, with a catchment area of about 450 square miles: at about six miles above the canal this torrent ceases to be a drainage, and from that point flows on a deltaic ridge; whence after heavy rains its flood water inundates the country from Dendaloor on the east to Gogulapad on the west. The stream bifurcates at about three miles above the canal; the east branch striking the line of canal immediately above the site of the lock, and the west branch crossing the canal three miles west of this on the other side of the town of Ellore.

13. The existing works in this section are the aqueduct for the main stream, and two small under-tunnels for the inundation water. These proved to be utterly inadequate to carry off the flood of last November, what I propose and under the sanction granted in G. O. No. 484, dated 18th February 1865, am carrying out, is as follows:—

(1.) To convert the aqueduct into an inlet and outlet by lowering its side walls and piercing its down stream wall with sand sluices.

(2.) To remove the bund at the bifurcation across the head of the eastern branch of the Toomoolair and allow the stream to flow down both branches, the discharge into each being regulated by a dividing dam of rough stone.

(3.) At the point where the eastern branch is blocked up by the canal, to construct a large inlet (96 yards long, sill 2; feet above canal bed) and outlet (64 yards long, sill 1; feet above canal bed) with self-acting shutters: part of the water flowing in by the inlet will escape by the 20-yard high level outlet already constructed at this point.

(4.) For the inundation water, I propose to have on the east or Dendaloor side a 48-yard low level escape with its opposite inlet, and on the Kistna side an under-tunnel of 166½ square feet water-way.

14. The works in the direct course of the stream will discharge at a safe level about two millions cubic yards per hour, and those to relieve the country of the inundation water about a million more, or in all three million cubic yards per hour; which, I believe, is about what comes down the Toomoolair after unusually heavy rain.

15. For the "impossible" floods which happen once every ten or twelve years, I propose to leave a hundred yards of bank* on both sides of the canal comparatively low and weak, which with a little assistance from half a dozen mamoties, would give way before such a flood, the ends of these low bits to be guarded by rough stone wings: the canal here is well within soil, and the Toomoolair bed is

* Opposite the old bed of Toomoolair's west branch, *i. e.*, about 150 yards west of the aqueduct.

about four feet higher than *its* bed, there would, therefore, be no risk of damage, but there would of course be a large deposit of sand and silt which we must put up with, happening as it would only every ten or twelve years.

16. I have not noticed the little triangular spaces of about 25 square miles each on either side of the Deltaic portion of the Toomoolair; the drainage from these crosses the canal at the same places as the Toomoolair inundation water, and will pass away with it through the same works.

17. The last section is that across which the Ramilair drainage passes, at present there are here two under-tunnels: one of 90, the other of 60 square feet. I have provided two outlets with their opposite inlets; near Pooncole an inlet of 24 and outlet of 16 yards both low level with self-acting shutters, and near the Ramilair under-tunnel an inlet of 48 yards and outlet of 80 yards the crown of the latter at the ordinary canal water level: these with the existing tunnels will discharge between 8 and 900,000 cubic yards per hour or about 6,500 cubic yards per hour per square mile, which I think will be found sufficient.

18. Besides the escapes and sub-passages for drainage in the canal itself, measures ought to be taken for preventing, as far as possible, the unmanageable floods caused by breaches in tanks above the canal; by putting their bunds into good order and constructing for each a calingulah of sufficient length and with its crest at the proper level.

19. The upper part of the Toomoolair valley* is in the Hyderabad Territory, and the greater part of the Ramilair valley belongs to the Noojeed Zemindar; I believe that many of the tanks in those tracts as well as of those in our own limits, are in bad order, and that very few of them are provided with proper escape calingulahs. The consequence is that they breach just when a flood is at its worst, and the accumulated water comes down upon the canal just at the time when its escapes for cross drainage are already tried to their utmost.

* Where there are according to the Ordnance map, many large tanks.

20. As far as the means at my disposal will admit I will have the tanks in my limits put into proper order, I will also request the Superintending Engineer, 2nd Division, to do what he can in the Ramilair valley; and I beg to submit, for the consideration of Government, the advisability of addressing the Hyderabad authorities on the subject of the tanks in the upper part of the Toomoolair valley within their limits.

21. The particulars detailed in paragraphs 6 to 16 I have arranged in a tabular form for easy reference and use with the sketch, this table is on a separate sheet.

The capacity for discharge of all the existing works is by this table shown to be rather more than one million cubic yards per hour, of which about half is for the Toomoolair drainage; the proposed works will bring the total discharging power up to six millions, of which three millions is for the Toomoolair.

22. This is in the main the same as what I proposed last January: the principal difference is in (1) the increased size of the escapes for the east Toomoolair, which I have about doubled; (2) the omission of the additional inlet and outlet for the west Toomoolair ordinary floods; and (3) the number of inlets and outlets on the Kistna side which I have reduced, substituting an under-tunnel for the large inlet and escape I originally proposed at the 35th mile on that side. In consequence of the obstruction caused by the aqueduct across the western branch of the Toomoolair, I propose to construct the dividing dam at the bifurcation so that three fifths of the stream will flow down the eastern branch and not more than two-fifths down the western; the above alterations in my scheme are intended to meet this altered state of things.

23. The cost of these works will according to the detailed estimates be 88,000 Rupees, which is very nearly the amount stated in my previous report: the following

is the re-distribution of the sums sanctioned by the Government of India on the 22nd October* and 1st November† 1864, amounting together to Rupees 1,10,284 compared with the distribution in the original estimate.

* No. 3,037.
† ,, 3,135.

		Original.	Now submitted.	Including the additional tunnel. *Vide* paragraph 8.
		Rs.	Rs.	Rs.
Drainage ...	Masonry and Tail Races for cross drainage	79,147	88,000	1,02,000
	Strengthening banks	7,370	2,000	2,000
Irrigation ...	Sluices	15,241	10,000	2,000
	Rajbuhas	8,584	10,284	4,284
	Total.....	1,10,342	1,10,284	1,10,284

The estimate now submitted, the totals of which, under the heads Drainage and Irrigation, are shewn in the 2nd column of the above, will leave a sufficient sum for irrigation to the full extent provided for in the original estimate; but if the second additional tunnel for the Bheemadole hollow be built, as recommended in paragraph 8 *supra* there will, as shown in the 3rd column, be left for irrigation only some 6,000 Rupees, which will probably be enough for constructing sluices and cutting channels for existing irrigation, leaving however nothing for its extension.

‡ B. C. D. H. M. W.

§ P. V.

‖ K. Z.

¶ E. N. R.

** F. G. L. U.

24. The works proposed are of five kinds, the high level inlet,‡ which I adopt when the canal is more than 3 feet in soil; the low level inlet§ with self-acting shutters, for cases where the canal bed is less than 3 feet below the ground, (it will be observed that there is in each case an under-tunnel near, by which leakage water will be carried away); the high level escape,‖ the principal advantage of which is that it does not require a bridge; the low level escape¶ with self-acting shutters, which gives great discharging power with a moderate length of crest, but which requires bridging for the convenience of towing coolies and the ordinary traffic along the canal banks; and the under-tunnel** where the canal crosses streams, or drainage receiving hollows, at a level which precludes the adoption of the cheaper and better methods above specified.

25. I have appended a Memorandum to the self-acting shutters' specification with diagrams to explain its action. I think it will answer well.

26. There remains to be considered the bridging the low level outlets: towing coolies could pass along their crests, but the water would be up to their waists, or if they passed by the rear there would be risk of the tow rope fouling the shutter. It happens, however, that the 64-yard and 48-yard escapes are the former quite close and the latter not far from the Ellore lock, and where the canal has no current, in the former case indeed the towing party would take care to be on the opposite bank of the canal, and in the latter, they would be taken on board and the boat poled across to the other side without risk, the same thing could be done at the two smaller escapes.

27. Of course when the escapes are discharging the tow rope must be on the opposite side whether the escapes are bridged or not.

Miles from Beyrnda.	Miles from Nundamoor Aqueduct.	Drainage. Name.	Drainage. Sq. miles.	Existing works.	Proposed works.	Their discharge in floods.	Additional discharge by proposed works.	Total discharge of cross drainage in floods.	Total discharge per sq. mile, drained.
				Commencing from Nundamoor Aqueduct.	I Escape 8 yards. (0').				
	XVIII.		60	XII. Under Tunnel, 30 sq. feet.	IV. Inlet, 12 yards. (+5½').	100,000	380,000	420,000	7,000
				XIV. Escape, 139 (+3')	VI. Do. do. (+5½') x 2.				
				XVI. Under Tunnel 30, sq. feet.	VIII. Do., 16 yards (+5')				
				XVII. Do. do. 30 sq. feet.	XVI. Do. 24 do. (+4½')				
					Out let 16 do. (+2½')				
	XXIV.	Kykaram.	75	XXII. Escape, 20 yds. (+3.)	XX. Inlet, 32 yards (+3 ft.)	100,000	550,000	650,000	8,800
				XXII. Under Tunnel, 90 sq. feet.	XXI. Under Tunnel, 250 sq. ft.				
	XXVII.	Bheemadole.	75	XXV. Escape, 13 yds. (+3'.)	XXVI. U. Tunnel, 250 sq. ft.	.....	350,000	350,000	4,800
	XXV.	Dendaloor.	175	XXIX. U. Tunnel, 60 sq. feet.	XXVIII. {Inlet 32 yds. (+4½')	66,000	8,000,000	866,000	5,000
					Outlet 50 do. (+5') x2.				
					XXXI. { Do. do. x2.				
					Do. do. x2.				
					XXXIV. U. Tunnel, 150 sq. ft.				
	XXIX.	Tow roolair.	450	XXXV. U. Tunnel, 90 sq. feet.	XXXVI. {Inlet 64 yds. (+4')	100,000	750,000	2,050,000	4,800
				XXXVIII. Escape, 13 yds. (+3.)	Outlet 48 do. (+1½')				
				Ellore Lock.	XXXVIII. Inlet, 32 do. (+4')				
				XXXIX. Escape, 20 yds. (+4½'.)	XXXIX. {Inlet 96 yds. (+2½')	400,000	1,500,000		
				XXXVIII. U. Tunnel, 30 sq. ft.	Outlet 64 do. (+1½')				
				XXXVII. Aqueduct.	Bifurcation Dam r.				
					XXXVI. Aqueduct alterations. s.				
	XXX.			XXXII. U. Tunnel, 60 sq. feet.	XXXV. U. Tunnel, 166½ sq. ft.	75,000	225,000		
	XXV.	Ramilair.	130	XXIX. U. Tunnel, 60 sq. feet.	XXXII. {Inlet 24 yds. (+2½')	200,000	650,000	850,000	6,500
				XXVII. Do. 90 sq. feet.	Outlet 16 do. (+1½) x2.				
					XXVII. {Inlet 48 yds. (+3½')				
					Outlet 80 do. (+4½')				

(Signed) J. G. RYVES, Captain, R. E.,
Superintending Engineer, 1st Division.

Proceedings of the Madras Government, Public Works Department, 30th August 1865.

No. 703. ORDER THEREON, 30th August 1865, No. 2,529.

CIVIL WORKS, No. 97.

1. Early in the current year, the Superintending Engineer of the 1st Division laid before* Government a report upon the condition of the Ellore Canal, mentioning in detail the damage which it had sustained during the great flood in November 1864, and stating generally the arrangements which he proposed for carrying the local drainage across the canal, so as to secure it, as far as possible, from injury on the occurrence of any similar inundation.

* In letter No. 1,501, 20th January 1865.

2. To those proposals the Government gave† a general approval: and with the letter recorded at the head of these Proceedings, Captain Ryves submits plans and estimates for the works in question.

† G. O. No. 484, 18th February 1865.

3. The total sum sanctioned by the Government of India for completing that portion of the Ellore Canal which lies within the first Division, between Nundamoor and Perikeed, was Rupees 1,10,342, of which sum the works for conveying the drainage across the canal amounted to Rupees 86,517, and those for irrigation purposes to Rupees 23,825. The inundation of last year having proved the inadequacy of the works intended to provide for the cross drainage, Captain Ryves now proposes to allot to the works‡ under this head the sum of Rs. 1,04,000, thus leaving for irrigation works only Rupees 6,342, which however he deems sufficient to supply water to all the land now irrigated. In this case separate provision will have to be made for any extension of irrigation.

‡ Including the second tunnel at Beemadole.

4. The Governor in Council approves of the plans submitted by Captain Ryves, and the estimates now before Government, amounting to Rupees 1,04,000, including a sum of Rupees 2,000 for strengthening the banks of the canal are herewith sanctioned. A sum of Rupees 12,000 has been already§ granted for the execution of these works, and, if possible, a further allotment will be made in the Budget for 1866-67.

§ G. O. No. 1,251, dated 9th May 1865.

5. The Superintending Engineer will submit a separate report upon the irrigation works, specifying those which he proposes to execute from the available balance of Rupees 6,342, and furnishing estimates for the additional works which the probable extension of the system of irrigation will render necessary.

6. Application will be made to His Highness the Nizam, through the Resident at Hyderabad, with a view to insure the timely and effectual repair of the tanks in the upper part of the Toomoolair valley; and the Collector of the Kistna District will be requested to draw the attention of the Noojeed Zemindar to the state of the tanks in his Zemindary.

Ordered that the following letter be sent:—

(Here enter No. 2,530, dated 30th August 1865.)

(True Extract.)

Colonel, R. E.,
Secretary to Government.

To the Superintending Engineer, 1st Division.
" Controller of Public Works Accounts.
" Revenue Department, with reference to paragraph 6.
" Accountant General.

Encl. S. T. Augustin.

2-2079 Comm.d to the Bd of Rev. who will instruct the Coll.r Kistna Distt to use his best endeavours to induce the Mujid Zemindar to have his irregation works in the Ramalian valley put in good order - warning him that if damage ensues to Govt works from his neglect he will be held responsible [illegible]

2-Letter/65.

Pers. 1865 - Départ.
No. of Govt. Reports
No. 2418

Proceedings of the Mad.
ras Govt. in the
P. W. Départ.

Dated 30th Augt.
Recd 31st " 1865.

No. 2529.

Requesting to
direct the Colls of Kistna
& to draw the attention
of the Zemindars of Nos-
-jeed to the state of tanks
in his Zemindary.

No. 44 & 45.

No. 2079. 2d Sept.

Wittorder Q