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MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Revenue

DEPARTMENT.

G.O. No.

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Mis.

Dated

29. 10. 1875 196 .

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*Proceedings of the Madras Government, Public Works Department,
1st October 1875.*

Read the following papers:—

No. 1,106.

No. 11. *Note by the Chief Engineer for Irrigation.*

IN Proceedings of Madras Government, No. 1,339, of the 20th May 1874, general approval was given to the proposals for the improvement of the Kristamraz channel in connection with the Kondakirla Ava Project, for which an approximate estimate amounting to Rupees 25,280 had been submitted, and those Proceedings were communicated to the Revenue Department in order that it might be determined how the expenditure required to make this channel efficient was to be distributed between the Government and the proprietary estates interested, and also that as reliable an estimate as possible might be given of the land compensation to be paid.

2. Since that date no orders in the Revenue Department have been communicated to this office.

3. The regular estimate for the improvement of the channel has since been submitted by the Officiating District Engineer, and it amounts to Rupees 27,760. In a list marked B forming one of the accompaniments it is shown that the shares of expenditure would be as follow:—

	RS.
Ankapilly proprietor	15,150
Cassinkotta do.	6,625
Government	5,985

And from this paper and list A it will be seen that there are certain portions of the work which are considered to belong entirely to the proprietors, leaving other portions to be divided equally between the proprietors and Government. In the absence of a report by the Revenue Officers, it remains doubtful how far the foregoing distribution of cost can be accepted as reliable.

4. In the estimate a provision of Rupees 7,200 has been made for land compensation, but it is stated that this amount has not been fixed by the Revenue Officers, and that after the requisite information shall have been received from them any alteration in the amount which may be shown to be necessary will be made. Want of information as to the area of land irrigated by each branch channel has obliged the District Engineer to enter an approximate sum for sluices to regulate the supply to these channels, as detailed designs cannot be prepared until the acreage to be supplied is known. Mr. Brickwell, the Officer who has prepared the estimates, appears to have done all in his power to ascertain the several component parts of the cost of the improvements contemplated, and it is not known in this office what has prevented the Revenue Department from furnishing the information, without which a definite and reliable estimate cannot be framed.

5. The object of the improvements has been stated in the Range Officer's letter as per margin, and is—

No. 625, 26th August 1874.

1st.—To secure to the Government ryots of Aripollem and other villages their fair share of the supply of water drawn from the Saradanuddy by means of the head works of the Kristamraz channel.

2ndly.—To secure a fair share of water to the different Zemindary or proprietary lands adjacent to the channel, so that the practice of damming it near the heads of the various branches may be put a stop to.

3rdly.—To provide for the better disposal of the drainage of the Ankapilly Ava, which crosses the line of the Kristamraz channel near Munagapaka, by passing it under instead of into the channel, by which means the two calingulahs in the right bank of the channel will be no longer required, and floods at certain seasons will be prevented, as also the waste of much valuable river water, which is now lost at these surplus works, the regulation of which is difficult.

4thly.—The improvement of the channel will render it possible by means of subsidiary works under the Kondakirla Ava to extend the irrigation from that reservoir to an additional area of Government lands which now derive a precarious supply from river channels, thus obviating remissions of revenue.

6. At present the bed fall of the Kristamraz channel is irregular and excessive, and, as a consequence, the branch channels can be supplied only by the construction of dams which are very objectionable, because they act prejudicially to the interests of the villages relatively remote from the head of the channel, render a fair distribution of the water impracticable, and frequently divert water down the unregulated branches in excess both of the actual requirements of the lands under these and of the proper shares of the supply available. It is proposed, therefore, to give the channel a uniform bed and surface fall of 2.02 feet per mile, and to give the channel such a cross section as will suffice to convey with this slope the water required. This fall has been determined by the requirements of the works for passing the Ankapilly Ava surplus in the 3rd mile, and is to be continued down to 3 miles 43 chains, where an existing temporary dam, the Patacuttu is to be superseded by a masonry work, the water surface is then to be dropped 3 feet, the same depth of water 4 feet being maintained, but the fall increased down to the Kondakirla Ava to 3 feet a mile. The section of the channel, drawing No. 2, shows the arrangements proposed, which are in accordance with those suggested in this office memorandum,

Proceedings of Madras Government, 12th No. 716 B, of the 8th October 1873. It may be noticed that the present bed being

in the first reach of 3 miles 43 chains much below the revised bed level, it will be necessary in order to maintain the proper surface level to construct bars at intervals. The first of these may conveniently be placed at the head of the Kusba channel in the 1st mile; there should be another about half-way between this point and the aqueduct in the 3rd mile, and then probably the spaces below revised bed level will gradually silt up, and a sufficiently close approximation to the intended velocity of the water will be secured. The water drawn off by the several branches will be regulated by sluices and, with the much higher level of the water than now obtains, there will be no difficulty in managing this. The capacity of the several channels with certain depths at their heads in rear of the head sluices being calculated, the proper depth of water at the head corresponding to given depths in the Kristamraz channel will be readily determinable, with reference to the shares of water to which they may be severally entitled.

7. The present cross section of the channel is extremely irregular, and all that is intended to be done to it is to form banks 3 feet above the proposed maximum depth of 4 feet of water to confine the water to, as nearly as circumstances will allow, the required area. The depth in the channel necessary to supply the 3,344 acres under it, for which about 10,000 cubic yards an hour will be needed, will be under $1\frac{1}{2}$ feet, and when the Kondakirla nuddy can supply more water it will be passed down for storage in the Kondakirla Ava for distribution ultimately to the 8,142 acres now indifferently supplied by river channels below the Godary anicut, and to such additional lands as may be found to be available. Investigations to ascertain how the Ava water may best be turned to account are in progress, but whatever may be the results of these there can be no doubt of the advantage on independent grounds of making the Kristamraz channel fairly efficient.

8. The arrangements for passing the Ankapilly Ava surplus across the channel are shown on the site plan, drawing No. 6; there are—

1st.—Regulating dams on the Pokamanu channel and the drainage channel from the Ava. These dams are probably required in connection with the irrigation in the proprietary estate of Ankapilly, but their object has not been explained, neither has it been shown how the levels have been determined. The design for the Pokamanu dam is manifestly inappropriate; whatever the proper crest level, that of the apron should be the same as for the Ava drainage channel. Maximum water level above the dams should have been noted in each case on the plan. These and other matters requiring attention have been noticed in remarks on the drawing No. 5.

2nd.—Aqueduct to pass drainage under Kristamraz channel.

The information given in connection with this work is altogether insufficient to allow of the design being approved.

(a.) The drainage area above it and the maximum estimated discharge through it have not been stated.

(b.) The maximum water levels above and below corresponding to such discharge have not been shown on the plan, drawing No. 4.

(c.) The slopes in connection with the wings where they are to be joined to embankments have not been plotted, and though the lengths of the wings appear to be sufficient, it is always necessary to put the details on paper so that it may be seen that the arrangements are appropriate.

(d.) The nature of the soil on which the foundations are to be placed has not been stated.

The following additions and modifications will be required:—

I.—A rough stone apron 12 feet wide on the upper side to prevent scour; this apron must be continued along the face of the connecting wall up to the existing bridge pier.

II.—On the lower side a retaining wall should be carried from the wings at about 9 feet from the face of the abutments right across, the flooring being extended thereto, and outside this there should be a rough stone apron 12 feet wide. It is easier to prevent damage by scour than to repair it, and this aqueduct, even if its waterway be sufficient, will at times discharge with a very considerable velocity.

III.—The left side wall need not be more than 7 feet wide at top instead of 9 feet, and the bridle path will need the protection of an iron railing on the outside. Some masonry may be saved and the work lightened in appearance by carrying the bridle path over all arches.

IV.—Bridge over drainage channel on Pudimadaka road. The lineal waterway of this bridge is 30 feet against 36 feet of the aqueduct. The design would do very well if the velocity of the water be always very moderate, but its approval must depend upon information above referred to as required. The existing bridge, under which the drainage passed a few yards up the channel to reach the two calingulahs, has 72 feet of waterway. If one span of 30 feet be sufficient, probably a rough stone apron on the upper side will be requisite, and an extension of the flooring to 9 feet beyond the bridge face with a retaining wall and 12 feet of rough stone apron on the lower side.

9. Inlet sluices for drainages to be admitted to the channel. Three of these are provided for, but no indication has been given of the data on which their dimensions have been fixed. The appropriate arrangements depend somewhat upon ground level or level of drains coming to the sluices. At 1 mile 12 chains the ground level does not differ much from M. W. L.: consequently, if a low level floor be allowed throughout, a drop wall will be required at the upper end. A more suitable design at this place would be an under tunnel with a drop wall at the upper end having its top at or about the level of the ground, the other end of the tunnel being flush with the canal slope. No self-acting shutters are necessary where ground level at a short distance is above M. W. L.

10. Drop weir at 3 miles 43 chains on channel. The same design as that for the regulating dam on the Pokamanu channel, drawing No. 5, has been provided. It is inappropriate, as has already been mentioned, for the latter, and it is not suitable for the former. In the first place the depth of water in the upper reach being 4 feet wings 5 feet above bed leave an insufficient margin, and an additional foot should be allowed. In the next place the channel above will carry as a maximum about 455 cubic feet a second, and the proper length of crest of a drop weir having its crest flush with the channel bed would be 17 feet instead of 30 feet. Were the crest placed 1 foot above channel bed level, the length would be 26 feet, and at 18 inches above that level 34 feet. Probably for the benefit of the channel taking off just above, it will be advisable to place the crest a few inches, say 9, above bed level, and then the proper length will be 23 feet. For unwatering the upper reach a sluice vent 3 or 4 feet wide and 9 inches deep, closed by a shutter, should be inserted.

11. Some revision of details not materially affecting the total of the estimate, but possibly raising it to Rupees 30,000 will, it will be seen from the above remarks, be necessary; but, until orders are passed in the Revenue Department on the several important points which must be settled therein, the estimates cannot be disposed of, and consequently it appears to be useless to give this work a place in the Budget of

1876-77. From papers recently submitted to Government it will be noticed also that the arrangement of running water to waste from the Kondakirla Ava, in order to allow of dalwa cultivation in its bed, has been revived or is intended to be revived with the approval of the Board of Revenue, and, if this plan be followed, it would appear to be almost useless to attempt any improvement of this small system of irrigation.

OOTACAMUND, (Signed) JOHN MULLINS, Lieut.-Colonel, R.E.,
24th September 1875. Chief Engineer for Irrigation.

From Captain J. W. HINDLE, Officiating District Engineer, Vizagapatam, to Lieut.-Colonel J. MULLINS, R.E., Chief Engineer for Irrigation, dated Vizianagram, 11th September 1874, No. 1 A.

WITH reference to your memorandum, No. 558, of 1st August 1874, I have the honor to submit, herewith, plans and estimates of masonry works, &c., for the Kristamraz channel, prepared by the Assistant Engineer of No. I. Range, in accordance with the instructions contained in your memorandum, No. 716 B, of 8th October 1873.

1. Plan of the Channel.
2. Longitudinal Section.
3. Cross Sections.
4. Plan of Aqueduct.
5. Design of Masonry Dams.
6. Site Plan of Aqueduct and Bridges, &c.
7. Design for a Bridge of 30 feet span.
8. Design for Sluices of outfall of the drainage channels.
9. Design for Screw shutters.
10. Abstract Estimate.
11. Report to accompany.
12. Explanation of Plans.
13. Copy of letter, No. 625, of 26th August 1874, from Mr. Brickwell.
14. Statements, A and B.

2. The estimate amounts to Rs. 27,760, but this sum will have to be revised after information has been obtained from the Revenue Department regarding the compensation for land to be taken up and the area of land cultivated under each of the branches of the Kristamraz channel. This latter information is required to enable the Range Officer to design and estimate for several irrigating sluices, for which an approximate amount has been provided in the estimate—*vide* Mr. Brickwell's note at the foot of the estimate.

3. Mr. Brickwell states that, in the absence of the regular survey map of the talug, the information called for in paragraph 10 of your memorandum, No. 716 B, of 8th October 1873, as to what parts of the proposed work are connected with the different estates, cannot be furnished.

4. The accompanying statements, A and B, show that, of the estimated cost, Rupees 21,775 are to be contributed by the proprietors of Ankapilly and Cassimkotta as detailed in the margin, leaving the balance, *viz.*, Rupees 5,985 to be met from Government funds.

5. Of the twenty plans noted in the margin of Mr. Brickwell's letter, No. 625, of 26th August 1874, copy of which is enclosed, nine are herewith submitted, and the rest will be despatched as soon as they are received from the Range Officer.

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From F. BRICKWELL, Esq., C.E., Officer in charge of No. I. or Golgondah Range, Vizagapatam District, to Captain J. W. HINDLE, Officiating District Engineer, Vizagapatam, dated Yellamunchelly, 26th August 1874, No. 625.

I HAVE the honor to forward, herewith, plans as per margin, and an estimate for the improvements of the Kristamraz channel which supplies the Kondakirila Ava in the Survasiddy taluq of the district.

1. Plan of the Channel.
 2. Longitudinal Section.
 3. Cross Sections.
 4. Plan of Aqueduct.
 5. Design of Masonry dams.
 6. Site Plan of Aqueduct and Bridge, &c.
 7. Design for a bridge of 30 feet span.
 8. Design for sluices of outfall of the drainage channels.
 9. Design for screw shutters.
 10. Small-scale plan.
 11. Longitudinal Sections, &c., of Cusba Calva.
 12. Do. of the Aravapalem channel.
 13. Do. of Geddavatala channel.
 14. Do. of Lecherla Meraca Madam Calva.
 15. Do. of Lecherla Pallapu Madam Calva.
 16. Do. of Patta Calva.
 17. Do. of Dibbadiparavu channel.
 18. Do. of Timmarazupetta channel.
 19. Design for head sluices of branch channels with rectangular wooden shutters.
 20. Do. for do. with circular plugged vents.
- These will follow.
1. Earthwork estimate.
 1. Detailed estimate.
 1. Abstract do.
 1. Report to accompany do.
 1. Explanation of plans.

2. This estimate was prepared in accordance with the instructions issued by the Chief Engineer for Irrigation, No. 716 B, dated Nursipatam, 8th October 1873, published with G. O., No. 2,994, dated 12th December 1873.

3. These instructions were issued after the Chief Engineer's personal inspection, and have been fully carried out in the accompanying plans, which are explained in a separate report attached.

4. The object of the works is, 1st, to recover and secure to the Government ryots of Aripollem and other villages their fair share of the supply of water drawn from the Saradanuddy

by means of the head works of the Kristamraz channel; 2nd, to secure a fair share of water to the different Zemindary lands adjacent to the Kristamraz channel, so that the practice of damming the channel near the heads of the various branches may be put a stop to; 3rd, to provide for the drainage of the Ankapilly Ava, which crosses the line of the Kristamraz near Munagapaka, by passing it under, instead of into, the Kristamraz channel; by which means the two calingulahs in the Kristamraz channel near this place may be dispensed with, thus both preventing floods at certain seasons of the year, and at others the waste of much valuable water over the calingulahs; 4th, the improved state of the Kristamraz channel will render it possible, by means of subsidiary works under the Kondakirila Ava, to extend the irrigation to an additional area of Government land, which now derives a precarious supply from river channels, thus obviating the necessity of remissions of revenue.

5. I have the honor to state that the enclosed estimate and plans have been framed for the purpose of securing the above objects, and that to the best of my knowledge the estimate provides for everything that is necessary, and that no supplementary estimate will hereafter be required, and I strongly recommend it for sanction.

6. The whole of the works may be executed in the official year 1875-76, and provision should be made in the Budget accordingly.

7. In order not to prevent the use of the channel in the irrigation season of that year, I propose to commence the earthwork as soon as sanction is communicated, concurrently with which the collection of materials for masonry works should be put in hand. The masonry works should be executed after December 1875, and the whole completed by the end of the official year.

Report to accompany an Estimate for improving the Kristamraz channel supplying the Kondakirila Ava in Survasiddy Taluq, Vizagapatam District.

AN estimate for raising the bed of the Kristamraz channel from head sluice at Godary anicut down to the site of Patacuttu at 3 miles 43 chains, for embanking the channel so as to retain a maximum water level of 4 feet, for providing an aqueduct at 2 miles 56 chains to pass the surplus of the Ankapilly Ava under, instead of into, the Kristamraz channel, for providing a bridge connected with the said aqueduct by means of wing walls to carry the Pudimadaka road

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over the Kristamraz channel, for providing a masonry dam in lieu of the present rough stone one at 3 miles 43 chains, for providing seven head sluices to the various branch channels of the Kristamraz channel, and screw shutters to the head sluice and Aripollem calingulah sluice.

2. Amount of estimate, Rupees 27,760, comprising the following items:—

	RS.
94,315 Cubic yards of earthwork	6,330
6,717½ Square yards of turfing	230
Aqueduct and connecting walls...	5,825
Bridge ...	2,000
Regulating masonry dams	1,910
Drainage sluices ...	610
Irrigation do. ...	1,700
Screw shutters to the head sluice and Aripollem calingulah sluice.	1,185
Deepening drainage channels about the aqueduct	310
Deepening the Geddavatala channel	460
Compensation for land	7,200
Total	27,760

Present extent of cultivation under the channel,	
Government	159 46
Do. Kondakirila Ava	2,003 69
Cassimkotta proprietor	2,163 15
Ankapilly do.	1,310 0
Total	4,603 32

Yielding a revenue to Government of	RS. A. P.
Do. Kondakirila Ava	1,407 2 4
Cassimkotta proprietor	16,045 3 5
Ankapilly do.	17,452 5 9
Total	8,176 14 0
	12,667 3 9
	27,296 7 6

3. If the proposed work be carried out, the various ryots, both Government and proprietary, will be enabled to get their respective shares of water at all times without the necessity of erecting cross dams; flooding and waste of water at different seasons will be obviated by the proposed works at Munagapaka, and the improved state of the Kristamraz channel will render it possible by means of subsidiary works to extend the irrigation under the Kondakirila Ava which is supplied by the channel.

4. The channel is Government property, and receives its supply from Sarada river at Godary anicut near Cassimkotta.

(Signed) F. BRICKWELL, C.E.,
Assistant Engineer, Golgondah Range.

YELLAMUNCHELLY,
26th August 1874.

Explanation of Plans which accompany the Estimate for the improvements of the Kristamraz Channel.

DRAWING No. I. is a plan of the channel on a scale of 60 feet to the inch. The red dotted lines are the proposed limits of the improved channel. The proposed new embankments are colored green, the existing ones being burnt sienna. This drawing is best explained by a reference to No. 3. The cross section lines and positions of the B. M. stones with their heights are shown. The total length is 4 miles 60 chains (2).

Drawing No. II. is a longitudinal section of the channel. The revised bed is to have a regular fall of 2.02 per mile for 3 miles 43 chains, so as to gain head way for the aqueduct at Munagapaka at 2 miles 56 chains, and is continued on at this fall in order to cut the top of a rough-stone dam (Patacuttu) erected by the Ankapilly proprietor's people at 3 miles 43 chains.

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The bed has a drop of 3 feet at 3 miles 43 chains, and continues on thence with a fall of 3 feet per mile to the level of sill of sluice at Aripollem calingulah at 4—60. A maximum water level of 4 feet has been provided for, and the tops of the embankments are 3 feet higher throughout. The left bank stops off at 4 miles 14 chains or Vasanala Calva sluice, where it cuts the contour at calingulah crest level of the Ava. The heights figured on the drawing are referred to mean sea level as taken at Pudimadaka, which is 72.64 feet below head sluice floor. The heights of the various bench marks, heads of branch channels, sluice floors, &c., are all figured on this drawing, as also the heights of the existing bed at every chain, and references made to masonry works.

Drawing No. III. (fourteen sheets lettered from A to N) are cross sections taken at every two chains along the channel. The exact positions of these cross sections are shown on drawing No. I. The line of collimation is shown in blue, and its height in blue horizontal figures; vertical heights of existing channel are shown in black vertical figures above it. The revised bed level is shown by a red horizontal line and figures. All heights throughout refer to mean sea level in all the drawings. The necessary spoil cuttings, new embankments, widths of land required, and other horizontal measurements are shown in feet on this drawing, which when examined with Nos. 1 and 2 explain one another. The levels were taken and checked by the Range Officer and found closely correct. The field books are registered in the Range Office, Nos. 301 and 302.

Drawing No. IV. is the plan of aqueduct at Munagapaka, which is to pass the Ankapilly Ava surplus underneath the improved Kristamraz channel; it has been necessary to raise the channel bed as much as possible in order to get head way for this drainage water to pass. The heights of floor and bed level are shown. There are four arches of 9 feet span for the drainage with 5 feet height of piers. A gravelled bridle way is provided along one of the parapets for the purposes of inspection.

The Geddavatala channel which carries on the drainage from under the aqueduct is to be deepened to an average depth of 3 feet for a distance of half a mile to prevent the heading up of the water in rear of aqueduct.

Drawing No. V. is the design of masonry dams; one of 30 feet clear over crest is to be built in the Pokamanu channel 100 feet above the new aqueduct (drawing No. 4) where there is a drop, and a second one of the same pattern is to be built at the site of the Patacuttu at 3 miles 43 chains—See drawing No. 2.

* In the Ankapilly drainage channel.

The second pattern of 75 feet clear in the crest is to be built 100 feet above the new* aqueduct. See drawing Nos. 1 and 6.

Drawing No. VI. is a site plan of a aqueduct bridge and masonry dams to be built at Munagapaka.

Drawing No. VII. is a design for a bridge of 30 feet span to carry the Padimadaka road over the drainage channel in rear of the new aqueduct. It is of the ordinary plan and needs no remark—See drawing No. 6.

Drawing No. VIII.—Design for sluices at the out fall of the drainage channels which discharge into the Kristamraz channel.

One pattern has two vents of 2 feet 6 inches each; two of which are required, one at 1 mile 12 chains, and one at 1 mile 34 chains. The other pattern has four vents of 2 feet 6 inches each, and is intended to pass the drainage of two channels at once; one of which is at 2 miles 20 chains, and the other at 2 miles 28 chains, and which are connected by the spoil cutting excavated to form the new embankment. These sluices are provided with flat valves opening inwards to the channel to prevent any back-flow of water.

Drawing No. IX. is a design for screw shutters for the Godary head sluice and for the sluices in the Aripollem calingulah; five are required at Godary anicut, two at Aripollem. These vents are provided with cast iron framing for the wooden shutters to slide on. The outer face of these cast iron frames, as also the sill piece, are to be roughly planed, and are intended to prevent leakage by giving a more accurate fit than can be obtained by teakwood sliding upon cut-stone.

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The screw is fitted with a small iron pin just above the handle by which the nut is taken in and out, and is intended to prevent the possibility of the screw being after the shutter is home on the sill. The estimate has been framed upon data the Dowlaishweram Workshop. The timber shutter is framed of two thickness of plies each set at right angles to one another as shown; there is to be a good layer of r placed between the thickness of timber, which are to be nailed firmly together and ans of the iron straps shown.

so intended to prevent leakage between the joints, as by this means the space through an escape is reduced to a point, which will be well stopped by the cotton and tar.

No. X. is a small scale plan of the Kristamraz channel and its branches with their ations.

No. XI.—Longitudinal sections and cross sections at every two chains for the of Cusba Calva of Cassimkotta.

No. XII.—Longitudinal and cross sections as above of the Aravapalem channel of

No. XIII.—The same of Geddavatala channel.

No. XIV.—The same of Locherla Meraca Madum Calva.

No. XV.—The same of Locherla Pallapu Madum Calva.

No. XVI.—The same of Patta Calva.

No. XVII.—The same of Dibbadigaruvu channel.

No. XVIII.—The same of Timmarajupetta channel.

No. XIX. is the design for head sluice of branch channels with rectangular opening shutters.

No. XX. is the design for head sluices of branch channels with circular plugged

(Signed) F. BRICKWELL, C.E.,
Assistant Engineer, Golgondah Range.

1874.

TURAL.

ORDINARY.

CAPITAL.

ABSTRACT ESTIMATE.

Taluq, Survasiddy; District, Vizagapatam.
WORK.—Improving Kristamraz Channel.

Description of Work.	Rate.	Per Item.	Amount.	Total.
<i>I.—Earthwork of embankments and cuttings.</i>				
Cubic yards of earthwork for raising the banks and widening the channel.	RS. A. P. 0 1 0	C. yd.	RS. A. P. 5,897 0 0	RS.
square yards of turbing the inner side of the western high embankment from Vasanala Calva down to the Aripollem calingulah ...	0 0 6	Sqre.	209 14 8	
			6,106 14 8	
contingencies and superintendence...	7 8 0	Cent.	453 1 4	
Total ...	...	...	...	6,560
<i>II.—Aqueduct with connecting walls at Munagapaka as per plan No. 4.</i>				
<i>Aqueduct.</i>				
Cubic yards of excavating foundations	0 1 6	C. yd.	339 7 6	
Do. of concrete work ...	1 12 0	"	932 8 10	
Do. of rubble masonry in chunam ...	1 12 0	"	1,849 2 8	

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WORK.—Improving Kristamraz Channel.—(Continued.)

Quantity or Number	Description of Work.	Rate.	Per Item.	Amount.	Total.
		RS. A. P.		RS. A. P.	RS.
29	Cubic yards of brickwork in chunam.	2 12 0	C. yd.	79 12 0	
112½	Do. of brick archwork in do. ...	4 12 0	"	535 9 0	
4½	Do. of outstone work to cut waters.	15 0 0	"	66 10 8	
54-23½	Squares of plastering with three coats of chunam ...	3 5 0	Sqre.	179 10 5	
19-57	Do. of asphalt ½ inch thick laid over arch and sides of parapets ...	27 0 0	"	528 6 2	
	Baling water, &c. ...	7 8 0	Cent.	50 0 0	
	Contingencies and superintendence...			343 12 9	
				4,905 0 0	
	Connecting walls between the aqueduct and old bridge and revetments.				
110½	Cubic yards of concrete work below foundations...	1 12 0	C. yd.	193 10 8	
255½	Do. of rubble masonry in chunam.	1 12 0	"	447 3 6	
210½	Do. of rough stone revetment laid dry ...	0 12 0	"	157 14 0	
16½	Do. of gravel at top ...	0 8 0	"	8 5 4	
	Excavating foundation and baling water ...			50 0 0	
				857 1 6	
	Contingencies and superintendence...	7 8 0	Cent.	62 14 6	
	Total for connecting wall ...			920 0 0	
	Total for aqueduct and connecting wall ...				5,825
	III.—Bridge of one arch of 30 feet span, height of abutments 6½ feet and rise of arch 7½ feet at the crossing of the Pudimadaka road as per plan No. 7.				
1,805½	Cubic yards of excavation for foundations ...	0 1 6	C. yd.	169 4 0	
667½	Do. of rubble masonry in foundations and superstructure ...	1 12 0	"	1,167 15 8	
40	Do. of brick archwork in chunam...	4 13 0	"	192 8 0	
3½	Do. of concrete work over arches ...	1 12 0	"	6 11 4	
42-06	Squares of plastering with three coats of chunam ...	3 4 0	Sqre.	136 11 1	
196	Running feet of plain cornice work...	0 1 6	R. ft.	18 6 0	
8	Guard stones ...	1 8 0	Each.	12 0 0	
1	Centring ...	60 0 0	"	60 0 0	
38½	Cubic yards of loose stone apron on lower side ...	0 8 0	C. yd.	19 7 1	
77½	Do. of gravelling the road approaches ...	0 8 0	"	38 14 2	
	Baling water ...			40 0 0	
				1,861 13 4	
	Contingencies and superintendence...	7 8 0	Cent.	138 2 8	
	Total for bridge ...				2,000

Proceedings of the Madras Government, Public Works Department,
1st October 1875.

WORK.—Improving Kristamraz Channel.—(Continued.)

Quantity Number.	Description of Work.	Rate.	Per Item.	Amount.	Total.
		RS. A. P.		RS. A. P.	RS.
	IV.—Regulating masonry dam in the drainage channel of the Ankapilly Ada at 120 feet above the aqueduct as per plan No. 5, Fig. II.				
745½	Cubic yards of excavation for foundations...	0 1 3	C. yd.	58 4 1	
104½	Do. of concrete work below foundations ...	1 12 0	"	182 14 0	
270½	Do. of rubble masonry in chunam in foundations and superstructure ...	1 12 0	"	473 1 4	
71½	Do. of loose stone apron on lower side ...	0 8 0	"	35 8 10	
262½	Cubic feet of outstone covering to top of body wall pinned together with iron ...	0 2 0	C. ft.	196 14 0	
15-46½	Squares of plastering with three coats of chunam ...	3 5 0	Sqre.	51 3 10	
	Baling water ...			30 0 0	
				1,027 14 1	
	Contingencies and superintendence ...	7 8 0	Cent.	82 1 11	
	Total ...				1,110
	V.—Regulating masonry dam in the Pokamannu channel at 100 feet below Munagapaka bridge, as per plan No. 5, Fig. I.				
46½	Cubic yards of concrete work below foundations...	1 12 0	C. yd.	81 8 7	
92½	Do. of rubble masonry in foundation and superstructure ...	1 12 0	"	161 14 0	
22½	Do. of loose stone apron on lower side.	0 8 0	"	11 5 4	
82½	Cubic feet of outstone covering to top of body wall pinned together with iron ...	0 12 0	C. ft.	61 14 0	
8-92½	Squares of plastering with three coats of chunam ...	3 4 0	Sqre.	28 15 11	
	Excavating foundation and baling water ...			25 0 0	
				370 9 10	
	Contingencies and superintendence ...	7 8 0	Cent.	29 6 2	
	Total ...				400
	VI.—Regulating masonry dam at the site of the Patacuttu, as per plan No. 5, Fig. I.				
46½	Cubic yards of concrete work below foundation ...	1 12 0	C. yd.	81 8 7	
92½	Do. of rubble masonry in foundation and superstructure ...	1 12 0	"	161 14 0	
22½	Do. of loose stone apron on lower side.	0 8 0	"	11 5 4	
82½	Cubic feet of out stone covering to top body wall pinned together with iron ...	0 12 0	C. ft.	61 14 0	
8-92½	Squares of plastering with three coats of chunam ...	3 4 0	Sqre.	28 15 11	

Proceedings of the Madras Government, Public Works Department,
1st October 1875.

WORK.—Improving Kristamraz Channel.—(Continued.)

Quantity or Number.	Description of Work.	Rate.	Per Item.	Amount.	Total.
	<i>VI.—Regulating masonry dam at the site, &c.—(Concluded.)</i>	RS. A. P.		RS. A. P.	RS.
	Excavating foundations and baling water	...	...	25 0 0	
				370 9 10	
	Contingencies and superintendence ...	7 8 0	Cent.	29 6 2	
	Total ...	...	...	...	400
	<i>VII.—Sluice of four vents of 2½ feet span at the outfall of the drainage channel at 2 miles and 20 chains, as per plan No. 8, Fig. II.</i>				
76½	Cubic yards of rubble masonry in foundation and superstructure ...	1 12 0	C. yd.	134 5 9	
10-33	Squares of plastering with three coats of chunam	3 4 0	Sqre.	39 9 1	
90	Running feet of covering stones (3½ × ½)	0 6 0	R. ft.	33 12 0	
29½	Cubic feet of outstone laid in chunam for beam stone and frames of the valve shutters	0 8 0	C. ft.	14 14 0	
4	Teakwood valve shutters with iron hinges and crooks leaded into the beam stone	8 0 0	Each.	32 0 0	
	Excavating foundation	...	...	4 0 0	
				258 8 10	
	Contingencies and superintendence ...	7 8 0	Cent.	11 7 2	
	Total ...	...	...	...	270
	<i>VIII.—Two sluices of two vents each of 2½ feet span at the outfall of the drainage channel at 1 mile and 12 chains and 1 mile and 34 chains, as per plan No. 8, Fig. I.</i>				
53½	Cubic yards of rubble masonry for foundation and superstructure ...	1 12 0	C. yd.	92 15 1	
5-95	Squares of plastering with three coats of chunam	3 4 0	Sqre.	19 5 4	
45	Running feet of covering slabs	0 6 0	R. ft.	16 14 0	
14½	Cubic feet of outstone work laid in chunam for beam stones and frame work of the shutters	0 8 0	C. ft.	7 7 0	
2	Teakwood valve shutters with iron hinges and crooks leaded into the beam stones	8 0 0	Each.	16 0 0	
	Excavating foundations	...	...	3 0 0	
				155 9 5	
	Contingencies and superintendence ...	7 8 0	Cent.	14 6 7	
	Total ...	...	...	170 0 0	
	Do. for a similar sluice at 1 mile and 34 chains	...	...	170 0 0	
	Total ...	...	...	...	340

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1st October 1875.

WORK.—Improving Kristamraz Channel.—(Continued.)

Quantity or Number.	Description of Work.	Rate.	Per Item.	Amount.	Total.
	<i>IX.—Alterations to the head sluices of the Godary anicul and providing new screw shutters, as per plan No. 9.</i>				
	<i>For one vent.</i>	RS. A. P.		RS. A. P.	RS.
85	lbs. of wrought iron for shaft and female screw work, single thread ...	0 5 0	lb.	26 9 0	
83½	lbs. of wrought iron for straps and bolts	0 2 0	"	10 7 6	
972	lbs. of cast iron for top plates and frame work round the shutters ...	0 1 3	"	75 15 0	
4	Cubic feet of teakwood for shutters of double thickness of 1½ inches teak boards placed at an angle of 45 degrees to the shaft, and good thickness of cotton and tar between them	2 10 0	C. ft.	10 10 0	
1-½	Cubic yards of brickwork in chunam for raising parapets and blocking up vents	2 12 0	C. yd.	3 13 9	
1	Square of plastering with three coats of chunam	3 4 0	Sqre.	3 4 0	
	Removing the lower cross stone and refixing it at 4 feet above the sill level	...	"	1 0 0	
				131 11 3	
	Contingencies and superintendence ...	7 8 0	Cent.	8 4 9	
				140 0 0	
	Centage at 25 per cent. and carriage from Dowlaisweram	...	...	35 0 0	
	Total for one vent	...	...	175 0 0	
	Do. four more similar vents ...	...	...	700 0 0	
	Total for head sluice ...	...	...	...	875
	<i>X.—Providing screw shutters to the sluices of the Kondakirila Ava calingulah, as per plan No. 9.</i>				
61½	lbs. of wrought iron for shaft and female screw work	0 5 0	lb.	19 3 6	
83½	lbs. of wrought iron for straps and bolts, &c.	0 2 0	"	10 7 6	
948	lbs. of cast iron work for top plates and frame work round the shutters	0 1 3	"	74 1 0	
3	Cubic feet of teakwood for shutters of double thickness of 1½ inches teak boards placed at an angle of 45 degrees to the shaft, and good thickness of cotton and tar between them	2 10 0	C. ft.	7 14 0	
1½	Cubic yards of brickwork in chunam for raising parapets and blocking up vents	2 12 0	C. yd.	3 0 10	

Proceedings of the Madras Government, Public Works Department,
1st October 1875.

Work.—Improving Kristamraz Channel.—(Concluded.)

Quantity or Number.	Description of Work.	Rate.	Per Item.	Amount.	Total.
		RS. A. P.		RS. A. P.	RS.
1	Square of plastering with three coats of chunam	3 4 0	Sqre.	3 4 0	
	Removing lower cross stones and refixing them at 4 feet above the sill level	...	...	1 0 0	
	Contingencies and superintendence...	7 8 0	Cent.	118 14 10 6 1 2	
	Centage at 25 per cent. and carriage from Dowlaishweram	...	...	125 0 0 30 0 0	
	Total for one vent	...	...	155 0 0	
	Total for one more vent	...	...	155 0 0	
	Total	...	...	...	310
	XI.—Deepening the drainage channels about the aqueduct and regulating dams and cutting a new channel in substitution to the Locherla High Land Channel.				
3,840	Cubic yards of excavating earth in the drainage channels	0 1 0	C. yd.	240 0 0	
99	Do. of rough stone revetment and apron at the old bridge and the new connecting wall	0 8 0	"	49 8 0	
	Contingencies and superintendence.	7 8 0	Cent.	289 8 0 20 8 0	
	Total	...	...	...	310
	XII.—Additional Sluices.				
2	Irrigating sluices with rectangular openings and wooden shutters ...	150 0 0	Each.	300 0 0	
10	Irrigating sluices with circular plugged vents	140 0 0	"	1,400 0 0	
	Total	...	...	...	1,700
	XIII.—Deepening the Geddavatala Channel.				
	Excavating earth in the Geddavatala channel	...	...	460 0 0	
	Total	...	...	...	460
	XIV.—Compensation for land.				
24	Acres of land to be taken up for the proposed improvements	300 0 0	Acre.	7,200 0 0	
	Total	...	...	...	7,200
	Grand Total	...	...	...	27,760

N.B.—Item No. XII. has been obtained from drawings prepared upon information obtained by this department which has not yet been verified by the Revenue Department; consequently the exact size of vents has not yet been fixed. Plans, &c., will be forwarded when the above information has been verified.
Item No. XIV., compensation, has not yet been fixed by the Revenue Department. A revised abstract will be submitted when the above information is received.

Proceedings of the Madras Government, Public Works Department,
1st October 1875.

STATEMENT A.

List of works which are to be executed at the sole Expense of the Proprietors in connection with the Kristamraz Channel improvements.

	RS.
Total amount of the estimate for improving Kristamraz channel	27,760
Ankapilly Proprietor's Works.	
Aqueduct at Munagapaka with connecting walls	5,825
Regulating masonry dam in the drainage channel of the Ankapilly Awa	1,110
Regulating masonry dam in the Pokamanu channel	400
Deepening the drainage channels about the aqueduct and regulating dams and cutting a new channel in substitution to the Locherla high land channel	310
Deepening Geddavatala channel	460
Head sluices to various branches of the Kristamraz channel	1,060
Total of the works for which the proprietor of Ankapilly should contribute the whole cost	9,165
Cassimkotta Proprietor's Works.	
Head sluices to various branches of the Kristamraz channel	640
Total amount of works to be executed at the expense of the Cassimkotta and Ankapilly proprietors to be deducted from the amount of the estimate for improving the Kristamraz channel before fixing the amount to be contributed by each proprietor	9,805

STATEMENT B.

List showing what amount of the estimated Cost for improving the Kristamraz channel is to be contributed by each Proprietor.

	RS.
Total amount of the estimate for improving the Kristamraz channel	27,760
Deduct amount of the works as per list B of which the proprietor of Ankapilly is liable solely	Rs. 9,165
Do. do. for Cassimkotta proprietor	640
Balance...	17,955

Net amount to be equally contributed by Government and the proprietors of Ankapilly and Cassimkotta.

	RS.
Shares.	
Amount of $\frac{1}{2}$ share of Government $\frac{17,955}{2} =$	5,985
Do. do. of Ankapilly proprietor " =	5,985
Do. do. of Cassimkotta do. " =	5,985
Total	17,955
Total contribution due from Ankapilly proprietor... ..	9,165 + 5,985 15,150
Do. do. from Cassimkotta proprietor	640 + 5,985 6,625
Do. do. from Government	5,985
Amount of estimate	27,760

YELLAMUNCHELLY,
2nd September 1874.

(Signed) F. BRICKWELL, C.E.,
Assistant Engineer.

*Proceedings of the Madras Government, Public Works Department,
1st October 1875.*

No. 12. ORDER THEREON, 1st October 1875, No. 2,833.

IRRIGATION, No. 3.

No orders can be passed on the estimate for the improvement of the Kristamraz channel until the several points which have to be determined in the Revenue Department have been settled, and these Proceedings will be communicated to that Department with a view to an early decision being come to.

1st.—As to the share of the outlay to be borne by Government and the proprietary estates respectively.

2nd.—As to the compensation to be paid for the land requisite in connection with the contemplated improvements.

3rd.—As to whether the Kondakirla Ava is to be maintained as a reservoir, or its capabilities subordinated to the cultivation of Dalwa crops in its bed.

4th.—As to remissions of Government revenue in past years.

2. The remarks of the Chief Engineer for Irrigation on some of the details of the proposed works should be attended to by the District Engineer, and such revision of the estimate as may be necessary should be made.

(True Extract.)

Linnaeus Major-General, R.E.,
Secretary to Government.

To the Revenue Department.

„ Chief Engineer for Irrigation.

„ District Engineer, Vizagapatam.

Erd. E. C. Shunker.

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L. O 30 May/74 N^o 27. Mr
29 July 232

Revenue 1875 Sept

N^o 4133

Govt of (1875) Madras.

PUBLIC WORKS.

To

THE REVENUE DEPARTMENT.

&c. &c. &c.

N^o 2310

Communicated
to the Board of Madras
in continuation
of L. O. 29th Sept 75
N^o 1435 L. O.

Dated October 1st.

Issued

Recd. — 22nd

First

G. O., 1st October 1875, No. 2,888.

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OCTOBER.

Nos. 11-12

29. Oct/75

15. To the Board of Madras
on 22nd Oct

Improvement of the Kristamraz Channel,
Vizagapatam District.—Intimating that no
orders can be passed on the estimate for the
— until the several points which have to be
determined in the Revenue Department
have been settled, and that these Proceedings
will be communicated to that Department
with a view to an early decision being come
to.

With order

No 2310. 29 October 1875