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MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

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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 Kondakirala Aya 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
Cassimkotta 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.

No. 625, 26th August 1874.

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

To secure to the Government ryots of Aripellem 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.

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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 on small 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 calingulaks, 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

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1876-77. From papers recently submitted to Government it will be noticed also that the arrangement of running water to waste from the Kondakirila 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.

OORACAMUND, (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. 1 Range, in accordance with the instructions contained in your memorandum, No. 716 B, of 8th October 1873.

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 taluk, 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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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 4-00. 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 Padimalaka, 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 Managapaka, which is to pass the Ankappilly 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 Patoutta at 3 miles 43 chains—See drawing No. 2.

* In the Ankappilly 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 Managapaka.

Drawing No. VII. is a design for a bridge of 30 feet span to carry the Padimalaka road over the drainage channel in rear of the new aqueduct. It is of the ordinary plan and needs no remark—See drawing No. 8.

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 ament, 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 shaft of the screw is fitted with a small iron pin just above the handle by which the nut is turned, which takes in and out, and is intended to prevent the possibility of the screw being further turned after the shutter is home on the sill. The estimate has been framed upon data furnished by the Dowlaishweram Workshop. The timber shutter is framed of two thickness of teak of 1½ inches each set at right angles to one another as shown; there is to be a good layer of cotton and tar placed between the thickness of timber, which are to be nailed firmly together and bolted by means of the iron straps shown.

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

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

Drawing No. XI.—Longitudinal sections and cross sections at every two chains for the first half-mile of Casha Calva of Cassimkotta.

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

Drawing No. XIII.—The same of Geddavatala channel.

Drawing No. XIV.—The same of Locherla Merica Madum Calva.

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

Drawing No. XVI.—The same of Patta Calva.

Drawing No. XVII.—The same of Dibbadigaruvu channel.

Drawing No. XVIII.—The same of Timmarajupetta channel.

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

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

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

26th August 1874.

AGRICULTURAL.

ORDINARY.
ABSTRACT ESTIMATE.
Taluk, Survasiddy; District, Visagapatam.
Work.—Improving Kristamraz Channel.

CAPITAL.

Quantity or Number.	Description of Work.	Rate.	Per Unit.	Amount.	Total.
	<i>I.—Earthwork of embankments and cuttings.</i>				
94,352	Cubic yards of earthwork for raising the banks and widening the channel.	RS. A. P. 0 1 0	C. yd.	5,897 0 0	
6,717½	Square yards of turfing the inner side of the western high embankment from Vasanala Calva down to the Aripollem calingulah ...	0 0 6	Sqre.	209 14 8	
	Contingencies and superintendence...	7 8 0	Cent.	6,105 14 8	
	Total ...			453 1 4	6,560
	<i>II.—Aqueduct with connecting walls at Managapaka as per plan No. 4.</i>				
	<i>Aqueduct.</i>				
3,621	Cubic yards of excavating foundations	0 1 6	C. yd.	339 7 6	
532½	Do. of concrete work	1 12 0	"	932 8 10	
1,056½	Do. of rubble masonry in chunam ...	1 12 0	"	1,849 2 8	

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Work.—Improving Kristampaz Channel.—(Continued.)

Quantity or Number	Description of Work.	Rate	Per Item	Amount	Total
29	Cubic yards of brickwork in chunam.	Rs. A. P.		Rs. A. P.	Rs.
112½	Do. of brick archwork in do.	2 12 0	C. yd.	79 12 0	
4½	Do. of cutstone work to cut waters.	4 12 0	"	535 9 0	
54-23½	Squares of plastering with three coats of chunam	15 0 0	"	80 10 8	
19-57	Do. of asphalt ½ inch thick laid over arch and sides of parapets	3 5 0	Sqre.	179 10 5	
	Baling water, &c.	27 0 0	"	525 0 2	
	Contingencies and superintendence	7 8 0	Cent.	50 0 0	
				348 12 9	
	Connecting walls between the aqueduct and old bridge and retentions.			4,905 0 0	
110½	Cubic yards of concrete work below foundations				
255½	Do. of rubble masonry in chunam.	1 12 0	C. yd.	193 10 8	
210½	Do. of rough stone revetment laid dry	1 12 0	"	447 3 8	
16½	Do. of gravel at top	0 12 0	"	157 14 0	
	Excavating foundation and baling water	0 8 0	"	8 5 4	
				50 0 0	
	Contingencies and superintendence	7 8 0	Cent.	857 1 6	
	Total for connecting wall			62 14 6	
	Total for aqueduct and connecting wall			929 0 0	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 Padmadaka road as per plan No. 7.					
1,805½	Cubic yards of excavation for foundations				
667½	Do. of rubble masonry in foundations and superstructure	0 1 6	C. yd.	160 4 0	
40	Do. of brick archwork in chunam	1 12 0	"	1,167 15 8	
3½	Do. of concrete work over arches	4 13 0	"	192 8 0	
42-08	Squares of plastering with three coats of chunam	1 13 0	"	6 11 4	
196	Running feet of plain cornice work	3 4 0	Sqre.	136 11 1	
8	Guard stones	0 1 6	ft. ft.	15 6 0	
1	Centring	1 8 0	ft. ft.	12 0 0	
38½	Cubic yards of loose stone apron on lower side	60 0 0	"	60 0 0	
77½	Do. of graveling the road approaches	0 8 0	C. yd.	19 7 1	
	Baling water	0 8 0	"	28 14 2	
				40 0 0	
	Contingencies and superintendence	7 8 0	Cent.	1,561 13 4	
	Total for bridge			138 2 8	2,000

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Work.—Improving Kristampaz Channel.—(Continued.)

Quantity or Number	Description of Work	Rate	Per Item	Amount	Total
	IV.—Regulating masonry dam in the drainage channel of the Ankapilly Ava at 120 feet above the aqueduct as per plan No. 5, Fig. II.	Rs. A. P.		Rs. A. P.	Rs.
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 cutstone 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	
	Contingencies and superintendence	7 8 0	Cent.	1,027 14 1	
				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.					
461½	Cubic yards of concrete work below foundations	1 12 0	C. yd.	81 8 7	
92½	Do. of rubble masonry in foundations 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 cutstone 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	
	Contingencies and superintendence	7 8 0	Cent.	370 9 10	
				29 6 2	
	Total				400
VI.—Regulating masonry dam at the site of the Patavutti, as per plan No. 5, Fig. I.					
461½	Cubic yards of concrete work below foundation	1 12 0	C. yd.	81 8 7	
92½	Do. of rubble masonry in foundations 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 cut 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	

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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>					
	Excavating foundations and baling water ...	Rs. A. P.		Rs. A. P.	Rs.
	...	...	...	25 0 0	
	Contingencies and superintendence ...	7 8 0 Cent.		370 9 10	
	...	...	...	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	Sqra.	33 9 1	
90	Running feet of covering stones (3½×½) ...	0 6 0	R. ft.	33 12 0	
20½	Cubic feet of cutstone 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	
	Contingencies and superintendence ...	7 8 0 Cent.		253 8 10	
	...	...	...	11 7 2	
	Total ...	...	...	...	370
<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	Sqra.	19 5 4	
45	Running feet of covering slabs ...	0 6 0	R. ft.	16 11 0	
14½	Cubic feet of cutstone 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	
	Contingencies and superintendence ...	7 8 0 Cent.		153 3 5	
	...	...	...	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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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 amicut and providing new screw shutters, as per plan No. 9.</i>					
<i>For one vent.</i>					
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	
1½	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	Sqra.	3 4 0	
	Removing the lower cross stone and refixing it at 4 feet above the sill level ...	...	...	1 0 0	
	Contingencies and superintendence ...	7 8 0 Cent.		131 11 3	
	...	...	...	8 4 9	
	Centage at 25 per cent. and carriage from Dowlaishweram ...	...	...	140 0 0	
	...	...	...	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 Kondakirla Ava calin-gulak, 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	

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Work.—Improving Kristamraz Channel.—(Contd. P. I.)

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	Sqrs.	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	Cont.	118 14 10	
	Cartage at 25 per cent. and carriage from Dowlaishweram ...	...	...	6 1 2	
	Total for one vent ...	...	...	125 0 0	
	Total for one more vent ...	...	...	50 0 0	
	Total ...	...	...	175 0 0	310
	XI.—Deepening the drainage channels about the aqueduct and regulating dams and cutting a new channel in substitution to the Locheria High Land Channel.				
3,840	Cubic yards of excavating earth in the drainage channels ...	0 1 0	C. Yds.	210 0 0	
99	Do. of rough stone revetment and apron at the old bridge and the new connecting wall ...	0 8 0	...	40 8 0	
	Contingencies and superintendence ...	7 8 0	Cont.	280 3 0	
	Total ...	...	...	20 8 0	310
	XII.—Additional Sluices.				
2	Irrigating sluices with rectangular openings and wooden shutters ...	150 0 0	Each.	200 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 ...	...	...	400 0 0	400
	Total ...	...	...	...	
	XIV.—Compensation for land.				
24	Acres of land to be taken up for the proposed improvements ...	300 0 0	Acres.	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. 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.

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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
Ankappilly Proprietor's Works.	
Aqueduct at Munagapaka with connecting walls ...	5,825
Regulating masonry dam in the drainage channel of the Ankappilly Ave ...	1,110
Regulating masonry dam in the Pokamasu channel ...	400
Deepening the drainage channels about the aqueduct and regulating dams and cutting a new channel in substitution to the Locheria 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 Ankappilly 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 Ankappilly 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 Ankappilly is liable solely ...	9,165
Do. do. for Cassimkotta proprietor ...	640
Balance ...	17,955

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

	Shares.	RS.
Amount of $\frac{1}{2}$ share of Government $\frac{17,955}{2} =$...	...	8,977 10
Do. do. of Ankappilly proprietor ...	...	5,985
Do. do. of Cassimkotta do. ...	...	5,985
Total ...	...	17,955
Total contribution due from Ankappilly 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

Y. B. LAMUNNELLY,
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 Kristanaray 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 required in connection with the contemplated improvements.
 - 3rd.—As to whether the Kondakula Awa is to be maintained as a reservoir, or its capabilities subordinated to the cultivation of Delta crops in its bed.
 - 4th.—As to remissions of Government revenue in past years.
2. The remarks of the Chief Engineer for Irrigation on each of the details of the proposed works should be attended to by the District Engineer, and such portion of the estimate as may be necessary should be made.

(True Extract.)

Major-General. R. S.
Secretary to Government.

To the Revenue Department.
" Chief Engineer for Irrigation.
" District Engineer, Vengalpetam.

Exd. E. C. Shankar.
Spara Copies

121106

Note by the Chief Engineer for Irrigation.
In Pro: Madras Govt. No. 1337 of the 20th May 1874 general approval was given to the proposals for the improvement of the Kristanaray channel in connection with the Kondakula Awa project, for which an approximate estimate amounting to Rs. 25,230 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. Some sketch marked B forming one of the accompanying documents it is shown that the share of expenditure would be as follows.

Sub-Rajally Proprietors	Rupees 15,150
Cassimkotta do	" 6,630
Government	" 5,980

and from this paper and sketch 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

221f
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 formed.

5. The object of the improvements has

been stated in the Range officer's letter as
per margin and is

Sept 25-26

And 1/4

1st to secure to the Government right of
Kripollam and other villages their fair
share of the supply of water drawn from
the Saradanuddy by means of the head
works of the Kristamudy channel.

2^{ndly} 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 to stop to

3rd to provide for the better disposal of
the drainage of the Putrapilly Area, which
crosses the line of the Kristamudy channel
near Munagapattinam, by passing it under
instead of into the channel; by which
means the two Calingulams in the right
bank of the Channel will be no longer
injured, and floods at certain seasons
will be prevented, as also the waste
of much valuable river water, which
is

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is now lost at these surplus works,
the regulation of which is difficult.

4^{thly} the improvement of the Channel
will render it possible, by means of
subsidiary works under the Kondakila
Ara to extend the irrigation from that
reservoir to an additional area of
Govt. lands which now derive a prece-
dious supply from river channels,
thus obviating remissions of revenue.

b. At present the bed fall of the
Kristamudy 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 preju-
dicially 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 them

and of the proper slopes of the supply
available. It is proposed therefore to give
the channel a uniform bed and surface
fall of 3.02 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 Andrapally across surface
in the 3rd mile, and is to be continued down
to 3 miles 4.3 chains, where an existing
temporary dam, the Palanattu, is to be
superseated by a masonry work, the water
surface is then to be dropped 3 feet, the
same depth of water, 1 foot, being main-
tained, but the full increased down
to the Koudakishan down to 3 feet a mile.
The sections of the channel, drawings, &c.,
show the arrangements proposed, which
are in accordance with those suggested
in this office memorandum of 11th of the
8th October 1943. It may be noted that
the present bed being in the first reach

P.M. 4.12
Scrip 143
8.2.14

425H
of 6 miles 4.3 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 Kucha
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 approxima-
tion to the intended velocity of the water
will be secured. The water drawn off
by the several branches will be regu-
lated 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.

4. 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 1/2 feet, and when the Sarcadunuddy can supply more water it will be passed down for storage in the Koudakila. As for distribution ultimately to the 9,142 acres now indifferently supplied by river channels below the Kodary Anicut, and to such additional lands as may be

Normal section
30 feet bottom
width, 43 feet
at water surface

Survey of Sarcadunuddy
by H. B. and
statement
in P. M. No. 1337-20 May 1874

found to be available. Investigations to ascertain how the Awa 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 advantages and independent grounds of making the Kristamraz channel fairly efficient.

5. The arrangements for passing the Sukafilly Awa surplus across the channel are shown on the site plan, in Drawing No. 6. They are

1st regulating dams on the Pokamannu channel and the drainage channel from the Awa. These dams are probably required in connection with the irrigation in the Proprietary estate of Sukafilly, but their object has not been explained, neither has it been shown how the levels have been determined. The design for the Pokamannu dam is manifestly inappropriate, whatever the proper crest level, that of the Awa should be

be the same as for the Awa drainage channel. Maximum water level above the dam should have been noted in each case on the plan. Several other matters requiring attention have been noticed in remarks on the Drawing, p. 5.

2nd Aqueduct to pass drainage under Kristumaly 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, p. 5.

(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.

1. 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.
2. On the lower side a retaining wall should be carried from the wing at about 7 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 with at times discharge with a very considerable velocity.
3. The left side wall need not be more

than 4 feet wide at top instead of 7 feet,
and the bridge path will need the protec-
-tion of an iron railing on the out side.
Some masonry may be saved, and the
work lightened in appearance by cov-
-ering the bridge path over small arches.

3. Bridge over drainage channel on
Pudimadaka road. The lineal water-
-way 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 informa-
-tion above referred to as required. The
existing bridge, under which the drainage
passed a few yards up the channel
to reach the two calingulaks has 42 feet
of waterway. If one span of 30 feet
be sufficient probably a rough stone
apron on the upper side will be requi-
-site, and an extension of the flooring
to 4 feet beyond the bridge face with
a retaining wall and 12 feet of rough
stone

stone apron on the lower side. 731 ft
4. Inlet sluices for drainage 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 some-
-what upon ground level, or level of
drains coming to the sluices. At ^{side shown} 1-13
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 regulation 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 minus 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 maxi-

-mum about 4,55 C.F. a second, and the proper length of crest of a drop weir having its crest flush with the channel bed would be 14 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 now - making the upper reach a sluice vent 3 or 4 feet wide and 7 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 30,000 Rupees 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. Some papers recently submitted to Govt. it will be noticed also that the arrangement of running water to waste from the Konda Kila River in order to allow of Dalwa cultivation in its bed

has

To The Secy: of Government

Q. 2833

Feb. 23

Proceedings of the Grand Jury.
Under date the 1st of Sept. 1875
Read the following:-

The Ch. Sags for J. H. E. No. 1106 of 24. Sept. 1912

No orders can be
passed on the estimate
for the improvement
of the Kristamraz chan-
nel until the several
points which have been
determined in the Revenue
Depart^t have been settled,
and those 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 Govt~~

and the Proprietary estates
respectively

2nd as to the compensation
to be paid for the land requi-
-site in connection with the
contemplated improvements.

3rd as to whether the Kunda
Kunda Area is to be maintained
as a reservoir or its capa-
-bilities subordinated to the
cultivation of Dalarna crops
in its bed.

4th as to remission 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 Dis-
-trict Engineer, and such
revision of the estimate
as may be necessary
should be made.

May 27/9

Depd = 21-10-75

Per. Dept — 21
Chdng for long X 5
or by inspection 4

x mth 7 Encl
Enclosure.

#11-12

6331

Govt. of 1875: 29/125.

PUBLIC WORKS.

Notice: Sept.

and the Proprietary estates
respectively

2nd as to the compensation
to be paid for the land requir-
ed in connection with the
contemplated improvements.

3rd as to whether the Banda
Kila Area is to be maintained
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11/2/9

11/2/9

x mlt 7 Gzlb
Enclosures.

1 Oct. 1875, No. 2823

Nov. 11-12

Improvement of the
main channel,
upstream of the

that no orders
be issued until the
land has been
settled in the Revenue
Department, and
the decision being