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Vol - II

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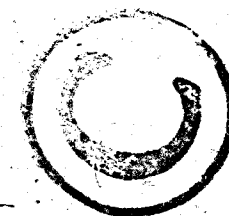
CONNECTED WITH THE

CAUVERY RESERVOIR PROJECT

VOLUME II

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CAUVERY RESERVOIR PROJECT

VOLUME II

TABLE OF CONTENTS

PART I.

	PAGES
Lists of survey and bench marks, Head Works	3-5
Do. do. Distribution System	6-15
Statement of rates	16-18
Lists of plans accompanying estimates	19-25

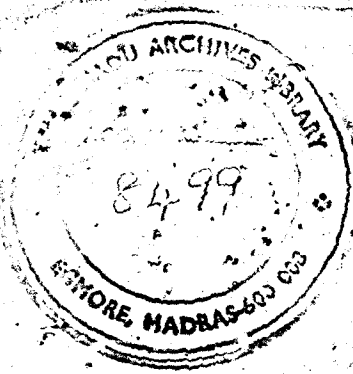
PART II.

ABSTRACTS OF ESTIMATES.

(1) Head Works	...	...	...	...	...	...	...	29-34
(2) Main Canals and Branches—								
Grand Ancient canal—								
A. Preliminary expenses	...	...	...	...	...	...	...	35
B. Land	...	...	...	...	...	...	...	35
D. Regulators	...	...	...	...	...	...	...	36-39
F. Cross drainage works	...	...	...	...	...	...	...	40-151
G. Bridges	...	...	...	...	...	...	...	151-176
H. Escapes	...	...	...	...	...	...	...	176-178
K. Buildings	...	...	...	...	...	...	...	178
L. Earthwork	...	...	...	...	...	...	...	178-180
M. Plantations	...	...	...	...	...	...	...	180
O. Miscellaneous	...	...	...	...	...	...	...	180-207
P. Maintenance	...	...	...	...	...	...	...	207
Kalianodai Branch Canal	...	...	...	...	...	...	...	207-220
Vadakkadu "	...	...	...	...	...	...	...	221-230
Rajamadam "	...	...	...	...	...	...	...	231-239
Pudupatnam "	...	...	...	...	...	...	...	239-243
Vadavar System—								
Vadavar and Vadavar Extension	...	...	...	...	...	...	...	244-261
(8) Distributaries—								
Vadavar System—								
Pithur channel	...	...	...	...	...	...	...	262-269
" No. 1 channel	...	...	...	...	...	...	...	269-271
" " 2 "	...	...	...	...	...	...	...	271-273
" " 3 "	...	...	...	...	...	...	...	273-280
" " 4 "	...	...	...	...	...	...	...	280, 281
" " 5 "	...	...	...	...	...	...	...	282-284
Chettibatram channel	...	...	...	...	...	...	...	285-289
" No. 1 channel	...	...	...	...	...	...	...	289-291
" " 2 "	...	...	...	...	...	...	...	291-293
Irupudi channel	...	...	...	...	...	...	...	293-296
Muvanalur channel	...	...	...	...	...	...	...	297-300
" No. 1 channel	...	...	...	...	...	...	...	300-302
" " 2 "	...	...	...	...	...	...	...	302-305

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நிதிமன்றம் 199
செப்பனியூவதற்காக எடுத்தல்

செ.காளையப்பன் நான்
 நான் 19
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சைலியாப்பம்.

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உதவியாளர்
தொடர்பு

TABLE OF CONTENTS

(3) Distributaries—cont.		PAGES
Vadavar System—cont.		
Mannargudi channel	...	305—311
" No. 1 channel	...	311, 312
" " 2	...	312, 313
" " 3	...	313—315
" " 4	...	315, 316
" " 5	...	316—318
" " 6	...	318—321
" " 7	...	321—323
Vadavar No. 1 channel	...	323—328
" Extension channel	...	328—336
" No. 2 channel	...	337, 338
" " 3	...	338—340
" " 4	...	340—343
" " 5	...	343—345
" " 6	...	345—347
" " 7	...	347, 348
" " 8	...	348—350
" " 9	...	350—352
" " 10	...	352—354
" " 11	...	354, 355
" " 12	...	356, 357
Palaiyur channel	...	358—364
" No. 1 channel	...	364—366
" " 2	...	366—368
" " 3	...	368—372
Maharajapuram channel	...	372—374
" No. 1 channel	...	375, 376
" " 2	...	376—378
" " 3	...	379—381

PART III.

CLASSIFIED ABSTRACTS OF ESTIMATED COST.

Condensed abstract of cost	... ..	385
Classified abstract of cost of Head Works	... ..	386
Condensed abstract of cost of Main Canals and branches, Grand Anicut canal system	... ..	387
<i>Classified Abstracts of Estimates—</i>		
Grand Anicut canal	... ..	388—394
Kalianodai branch canal	... ..	394—396
Vadakadu „	... ..	396, 397
Rajamadam „	... ..	397, 398
Pudupatnam „	... ..	398, 399
Condensed abstract of cost, Main canals and branches, Vadavar system	... ..	400
<i>Classified abstract of estimates—</i>		
Vadavar and Vadavar Extension	... ..	401—403
<i>Distributaries—</i>		
Vadavar System—		
Classified abstract of cost	... ..	401—423

PART IV.

TABULAR STATEMENTS OF WORKS.

<i>Grand Anicut canal system—</i>								
Grand Anicut canal	...	...	...	...	...	...	...	426—435
Kalianodai branch canal	...	...	...	...	...	...	...	436—439
Vadakkadu "	...	...	...	...	...	...	...	438—441
Rajamadam "	...	...	...	...	...	...	...	440, 441
Pudupatnam "	...	...	...	...	...	...	...	440, 441

	PAGES
<i>Vadavar System—</i>	
Vadavar and Vadavar Extension	442—445
<i>Distributaries—</i>	
Puthur channels	446—449
Chettichatram channels	448—451
Iluppudi channels	450—453
Muvanallur „	452—455
Mannargudi „	454—459
Vadavar „	458—469
Palaiyur „	468—471
Maharajapuram channels	472, 473.

APPENDICES.

APPENDIX I—		
Tabular statement of particulars regarding cross drainage works—		
Grand Anicut canal	... ..	476—481
APPENDIX II—		
List of bridges on Main and Branch canals	... ..	482, 483
APPENDIX III—		
Stability, pressure and hydraulic calculations in connexion with the Head Works—		
Stability and pressure calculations—		
Main dam	... ..	484—497 and 513—524
Supply sluices	... ..	497—502
Buttresses	... ..	502—508
Sluice wells	... ..	508—510
Hydraulic calculations—		
Sluice discharges	... ..	511, 512
APPENDIX IV—		
Calculations in connexion with hydraulic particulars of canal system	... ..	525—535
APPENDIX V—		
Note on the probable critical velocity of the Cauvery river	... ..	536—538

PART I.

LISTS OF SURVEY MARKS AND BENCH MARKS, STATEMENT OF RATES
AND LIST OF PLANS ACCOMPANYING ESTIMATES.

CAUVERY RESERVOIR PROJECT.

PART I.

Lists of Survey Marks and Bench Marks.

A.—HEAD WORKS.

SURVEY MARKS.

Main Dam Line.

A line called Metur Base Line has been set out on the ground and is described below. It is shown on the plan of the Dam Site.

The east end of the line is on the left side of the river, just over "Benton's Bluff" on the Chettamalais marked by a roughstone plastered masonry pillar 3' 0" x 3' 0", marked "0" projecting 1' 0" above ground. The bearing of the line (from the east end westwards) is 293°. On the right margin of the river in survey No. 130 of Sampalli village, about 75 feet from the edge, is another similar pillar marked "20". This is 1,320 feet from the east end and the number on the pillar denotes the number of 66 feet chains along the line from east end. There are also two marks (x) chiselled on rock in the river-bed at 549 feet and 773 feet along the line.

The line passing through these four points passes over the small knoll, survey No. 131, just east of the Bhavani-Cauveripuram road, and the highest point on this knoll through which the line passes is the turning point of the line. This point is 2,094 feet from the east end of the line.

The western part of the line passes from this point to the extreme west end at a bearing of 290° and is identified by the following permanent marks:—

(1) Masonry pillar marked "40" in survey No. 97 of Sampalli village at 2,640 feet from east end.

(2) Survey mark as noted in margin chiselled on the top of a rock (on Campbell's Hill), the point being 4,019 feet from the extreme east end.

(3) Masonry block marked "70" in Field Survey No. 133 at 4,920 feet.

(4) Masonry blocks marked "80" and "90" in the unsurveyed portion of Sampalli village at 5,280 feet and 5,940 feet, respectively, of the line.

(5) B. M. 5. 822.52. Chiselled on rock at the extreme west end of the line at 6,180 feet from the extreme east end.

Main Surplusing Saddle.

The central line of the saddle runs from south to north and is 1,320 feet long. It is marked by four masonry pillars 3' 0" x 3' 0", projecting 1' 0" above ground, numbered "0," "6," "18" and "20," the numbers denoting the number of chains of 66 feet from the south end of the line.

BENCH MARKS.

Main Dam.

The following are the permanent Bench Marks on Metur Dam Site. They are all cut into solid rock (large boulders or bed rocky). The rock has been benched

over, to a space of 1' 0" x 1' 0" and the number of Bench Marks and the value of the same have been chiselled in the benched portion and the sunk letters have been painted black:—

Number of Bench Marks.	Description of position of Bench Marks.	Value of Bench Marks.
B. M. No. 1.	Chiselled on a rock 300 feet from the east end and 185 feet on the downstream side of the Metur line.	633.70
B. M. No. 2.	24 feet, upstream side of the Metur Line, and 1,118 feet from east end	629.21
B. M. No. 3.	On Metur Line in Campbell's Hill at 3,912.5 feet from east end	735.21
B. M. No. 4.	13 feet, upstream side of Metur Line at 5,214 feet from east end	756.56
B. M. No. 5.	At end of Metur Line at 6,180 feet	822.52
B. M. No. 6.	72.5 feet upstream side of Metur Line at 4,779 feet from east end	720.41
B. M. No. 7.	66 feet, downstream side of Metur Line at 5,626.5 feet from east end	744.20
<i>Main Surplusing Saddle.</i>		
B. M. No. 2.	At 594 feet, along the central line from south end	778.48
B. M. No. 3.	At 1,254 feet, along the central line from south end.	785.54

Statement of Bench Marks in the waterspread area of the Cauvery Reservoir above Metur Site.

[These bench marks are cut-stones, generally 9" x 9", set in concrete and projecting 9" above the ground. The top and four sides have been dressed, and on the sides letters are cut as follows: P. W. D. — B. M. — $\frac{1}{1}$; generally a distinguishing number is also cut on the stone as shown in column 1 of the following statement.]

Number of Bench Marks.	Description of position of Bench Marks.	Value of Bench Marks.	Remarks.
(1)	(2)	(3)	(4)
<i>Ooimbatore side of the Cauvery.</i>			
P.W.D. B.M. 26	These stones have been set on the opposite side to the mile stones and bear the same number as these stones indicate miles.	653.11	All the values are Mr. Moss's values and the positions are marked in the water-spread maps except Nos. 32 to 35. The values have been checked and found to be correct.
Do. 27		680.22	
Do. 28		658.46	
Do. 29		675.13	
Do. 30		700.79	
Do. 31		755.30	
Do. 32		819.97	
Do. 33		858.81	
Do. 34		779.76	
Do. 35		747.88	
Do. 36		700.67	Mr. Moss's value + 700.39. The B.M. is just at the turning of the main road into the Cauveripuram village.
Do. 37	About one mile west of Cauveripuram (see water-spread map).	722.56	Mr. Moss's value + 722.47.
Do. 43	Fixed at the Palar confluence (see water-spread map).	747.39	Do. +747.64.
B.M. without number.	6" x 6" stone, not set in concrete, one mile west of Tirumangalam B.M. 2 close to the right margin of the Cauvery (see water-spread map).	680.76	
P.W.D. B.M. without number.	Fixed in dry cultivation 500 feet west of Tirumangalam.	685.44	
<i>Salem side of the Cauvery.</i>			
P.W.D. B.M. 28	Situated on the left bank, opposite the confluence of the Palar, close to the river margin (see water-spread map).	760.41	Mr. Moss's value, 759.39.
B.M. without number.	6" x 6" stone, not set in concrete, in Survey No. 124 of Nagabani village B.M. H (see water-spread map).	737.18	
P.W.D. B.M. 16	Situated east of Cholapaddi village on the bank of the Thoppiar, just above its confluence with the Cauvery.	676.91	Do. 677.66.
B.M. on top of mile stone.	Eighth mile stone of the Cholapaddi-Omaloor road.	748.35	

Number of Bench marks.	Description of position of Bench Marks.	Value of Bench Marks.	Remarks.
(1)	(2)	(3)	(4)
<i>Salem side of the Cauvery—cont.</i>			
P.W.D. B.M. 15	Survey No. 416 of No. 272, Cholapaddi village. The only footpath on the left margin of the Cauvery runs close to the B.M.	684.36	Mr. Moss's value, 685.58
Do. 14	Survey No. 800 of Konur village; a small hill (reserved forest) forming the bank of the river; the B.M. is on the footpath over the reserve line.	680.92	Do. 682.21
Do. 13	Do. do. do.	676.95	Do. 678.16
B.M. without number.	6" x 6" stones, not set in concrete, in Survey No. 903 of Konur village, close to the river margin, B.M. 224 (see waterspread map).	666.53	Do. 666.48
P.W.D. B.M. 9	Survey No. 378 of Pottaneri, Nallakavundanpatti village, about 600 feet east of the south trench in Ellis Saddle.	652.02	Do. 752.78
Do. 7	Survey No. 211 of Pottaneri Nallakavundanpatti village, about 1½ furlongs south of Thotilpatti village.	657.66	Do. 658.38

B.—DISTRIBUTION SYSTEM.

SURVEY MARKS

List of Survey marks along Grand Anicut Main Canal.

[These are 8" x 8" stones dressed one side and on top and set in concrete.]

Particulars of position and numbers cut on stones.	Nearest canal, R.D.	Forward bearing.	Distance in feet.	Remarks.
<i>From southern boundary of Ichankota up to Kiratur boundary.</i>				
C. P. No. 1 on south boundary of Ichankota	19/4,000			
C. P. " 2	19/5,200	221° 38'	1,148	Approximate.
C. P. " 3	19/7,250	196° 37'	2,033	Do.
C. P. " 4	19/9,500	227° 52'	2,475	Do.
C. P. " 5	20/0,750	180° 54'	1,203	
C. P. " 6	20/2,100	180° 54'	1,386	Approximate.
C. P. " 7 on right bank of drainage channel	20/3,250	179° 54'	1,400	Do.
C. P. " 8	20/4,750	179° 54'	1,696	
C. P. " 9 near east flank of Karuppadipati tank	20/6,250	217° 22'	1,696	
C. P. " 10 near west flank do.	20/8,000	217° 22'	1,670	Approximate.
C. P. " 11	20/9,000	218° 58'	977	Do.
C. P. " 12	21/0,700	218° 58'	1,775	Do.
C. P. " 13 at pond near Pachur	21/1,250	235° 51'	607	Do.
C. P. " 14	21/3,000	205° 10'	1,740	Do.
C. P. " 15	21/4,000	274° 12'	1,485	
C. P. " 16	21/5,750	274° 12'	1,603	Approximate.
C. P. " 17 at east flank of Attangarepatti tank	21/8,000	300° 58'	2,052	Do.
C. P. " 18 west of Kachakulam	22/2,000	219° 33'	3,207	Do.
C. P. " 19	22/4,000	198° 3'	1,762	Do.
<i>From boundary of Nedavasal Kilpadi to boundary of Mangadu village in the limits of Avanam, Periyarayakapuram and Pulichengadu shrotriems.</i>				
C. P. No. 1 north of boundary between Nedavasal Kilpadi and Periyarayakapuram	35/3,000			
C. P. " 2 south of above boundary	35/4,000	181° 46'	1,400	
C. P. " 3	35/4,500	110° 42'	1,100	
C. P. " 4 north of Periyarayakapuram	35/6,250	110° 42'	1,717	
C. P. " 5 west of pond to west of Periyarayakapuram	35/8,000	195° 58'	1,717	
C. P. " 6 east of Pattukota-Nagaram road	36/0,000	195° 58'	1,880	
C. P. " 7 do. do.	36/1,700	243° 37'	1,880	
C. P. " 8 west of do. do.	36/3,750	219° 37'	2,032	Approximate.
C. P. " 9	36/5,750	295° 33'	1,075	Do.
C. P. " 10	36/5,750	240° 42'	635	
C. P. " 11 east of boundary between Pulichengadu and Nagaram	36/7,500	240° 42'	1,805	
C. P. " 12 west of above boundary	36/9,250	287° 49'	1,805	
<i>From below Ambulur up to South Indian Railway line near Aiyangudi station.</i>				
C. P. No. 1 to east of bund of Periakulam of Nagaram	37/9,500			
C. P. " 2 to south of Periakulam	38/1,500	177° 58'	2,482	
C. P. " 3 east of cart-track	38/3,500	94° 20'	2,482	Approximate.
C. P. " 4	38/5,500	94° 20'	1,848	Do.
C. P. " 5 at side of Pattukota-Nagaram road	38/8,800	123° 36'	2,111	
C. P. " 6 west of cart-track	39/00	121° 36'	2,350	Do.
C. P. " 7 to east of boundary between Serianur (shrotriems) and Serianur (zamindari)	39/1,350	121° 36'	1,609	
C. P. " 8 east of same boundary		200° 23'	1,609	
C. P. " 9 south of boundary of Serianur (shrotriems) and Vembangudi	39/7,600	200° 23'	2,099	Approximate.
C. P. " 10	39/8,600	231° 25'	1,082	
C. P. " 11	40/750	231° 25'	1,976	
C. P. " 12	40/2,750	309° 11'	1,976	
C. P. " 13 south-east of Malayandakulam	40/4,500	309° 11'	1,808	Approximate.
C. P. " 14 west of Malayandakulam		309° 11'	1,840	
C. P. " 15 near foreshore of Chinnakodikulam	40/6,500	208° 18'	1,840	
C. P. " 16 near west end of bund of Periyakodikulam	40/8,000	208° 18'	1,655	Approximate.

List of Survey Marks along Grand Anicut Main Canal—cont.

[These are 8" x 8" stones dressed one side and on top and set in concrete.]

Particulars of position and numbers cut on stones.	Nearest canal R.D.	Forward bearing.	Distance in feet.	Remarks.
<i>From below Ambulur up to South Indian Railway line near Aiyangudi station.</i>				
C. P. No. 17 near foreshore of Periyakodikulam	40/9,000	226° 35'	976	
C. P. " 18	41/1,000	226° 35'	2,376	Approximate.
C. P. " 19	41/2,250	181° 0'	1,082	
C. P. " 20 east of Villanar of Periyakodikulam	41/4,300	181° 0'	1,953	Approximate.
C. P. " 21 west of do.		258° 38'	2,382	Do.
C. P. " 22	41/7,000	190° 39'	890	
C. P. " 23 north-west of Periyannur village	41/9,000	190° 39'	2,033	Approximate.
C. P. " 24 on L.B. drainage channel	42/1,500	176° 2'	2,587	Do.
C. P. " 25	42/3,350	235° 21'	1,821	Do.
C. P. " 26		235° 21'	2,315	
C. P. " 27	42/7,000	166° 13'	2,315	
C. P. " 28 south of boundary of Sariyanarayanapuram and Marudangudi	42/8,500	166° 13'	1,425	Approximate.
C. P. " 29	43/500	212° 49'	1,241	Do.
C. P. " 30	43/2,000	212° 49'	1,560	
C. P. " 31	43/3,800	218° 19'	1,560	
C. P. " 32 north of Mangadu village	43/6,000	248° 19'	2,165	Approximate.
C. P. " 33	43/8,500	239° 0'	2,402	Do.
C. P. " 34 south of Padukulam	44/00	270° 29'	1,307	Do.
C. P. " 35	44/1,000	270° 29'	2,037	
C. P. " 36 on north side of Marudangudi	44/2,000	179° 25'	2,035	
C. P. " 37 on south side of do.	44/3,250	179° 25'	1,690	Approximate.

Note.—"Approximate" in the remarks column means that the distance was not actually measured on the ground but was taken by scale from the plan.

List of Survey Marks along Vadakadu Branch Canal.

Particulars.	Nearest channel, mileage.	Forward bearing.	Distance in feet.	Remarks.
C. P. No. 1 near Peria Kumilai	1/6,430	188° 6'		
C. P. " 2 near Ayyanarkovil	1/8,180	188° 6'	1,904	
C. P. " 2-A Papanad tank-bed	2/0,000	59° 16'	3,160	
C. P. " 3 east of Chinna Kumilai	2/1,800	59° 16'	3,332	
C. P. " 4	2/3,930	152° 34'	2,564	
C. P. " 5 near Papanad Parachery	2/7,300	159° 1'	3,768	
C. P. " 6 close to Papanad jungle	3/3,000	95° 13'	5,600	
C. P. " 7 in Ambalappattu limit	3/4,180	124° 13'	1,157	
C. P. " 8 do.	3/5,474	131° 29'	1,208	
C. P. " 9 do.	3/6,974	95° 30'	1,548	
C. P. " 10 do.	3/9,474	95° 30'	2,464	
C. P. " 11 do.	4/1,724	151° 2'	2,464	
C. P. " 12 near cart-track	4/3,974	150° 36'	2,356	
C. P. " 13	4/5,974	81° 22'	2,356	
C. P. " 14	4/7,224	134° 23'	1,183	
C. P. " 15 in Mulloorpattiladu limit	4/9,474	196° 50'	2,506	
C. P. " 16 do.	5/1,974	163° 56'	2,490	
C. P. " 17 Vadugankuttalai	5/3,474	174° 53'	1,380	
C. P. " 18 do.	5/5,224	132° 20'	1,800	

List of Survey Marks along Vadakadu Canal.

Particulars.	Nearest channel, mileage.	Forward bearing.	Distance in feet.	Remarks.
C. P. No. 19 Thanikota limit	M. 1 2,600	210° 57'		
C. P. " 20 close to boundary between Thanikota and Sorikarambai	2 0	172° 37'	2,950	Approximate.
C. P. " 21 Sorikarambai	2 2,700	133° 40'	2,850	
C. P. " 22 do.	2 4,650	182° 13'	1,950	
C. P. " 23 do.	3 650	161° 45'	1,380	
C. P. " 24 Nattusalai limit	3 2,800	94° 38'	2,350	
C. P. " 25 do.	4 0	204° 43'	2,850	

List of Survey Marks along Rajamadam Branch Canal.

Particulars.	Nearest canal, R.D.	Forward bearing.	Distance in feet.	Remarks
C.P. No. 1 in Gandarvakota limit	6,850	160° 47'	..	
C.P. " 2 do.	8,900	160° 5'	2,554	
C.P. " 3 in Gandarvakota limit	1/1,370	88° 27'	2,554	
C.P. " 4 do.	1/2,870	177° 41'	2,000	
C.P. " 5 do.	1/4,300	145° 45'	1,412	
C.P. " 6 do.	1/6,120	113° 11'	2,180	
C.P. " 7 near Vadakkikota	1/9,620	161° 10'	3,280	
C.P. " 8 do.	2/1,620	161° 34'	2,201	
C.P. " 9 do.	2/5,120	104° 29'	3,462	
C.P. " 10 do. west of village boundary	2/7,120	93° 12'	1,634	
C.P. " 11 in Papanad limit	2/8,120	142° 57'	1,076	
C.P. " 12 do.	2/9,870	200° 35'	1,853	
C.P. " 13 do. near Pennaiyur Parachery	3/0,870	158° 32'	937	
C.P. " 14 do.	3/3,870	202° 17'	2,988	

List of Survey Marks along Rajamadam Channel.

Particulars.	Nearest channels, mileage	Forward bearing	Distance in feet.	Remarks.
C.P. No. 15 near Pinnaiyur	m. 0	147° 49'	..	Approximate.
C.P. " 16	0	168° 28'	3,248	
C.P. " 17	1	138° 21'	2,620	
C.P. " 18 near Thennalur	1	187° 11'	2,540	
C.P. " 19	2	130° 51'	1,172	
C.P. " 20	2	182° 21'	1,218	
C.P. " 21	2	158° 51'	1,099	
C.P. " 22	2	158° 55'	2,100	
C.P. " 23	3	170° 57'	1,600	
C.P. " 24 east of Parachery	3	188° 37'	1,950	
C.P. " 25 east of Sankarnarkudikadu	3	201° 1'	1,881	
C.P. " 26 close to cart-track	4	217° 35'	1,312	
C.P. " 27 near Therkukota	4	131° 2'	2,186	
C.P. " 28 Solangarai Parachery	5	198° 42'	2,788	
C.P. " 29	5	150° 27'	1,792	
C.P. " 30	5	186° 57'	1,236	
C.P. " 31 near Kilamangalam	5	157° 39'	2,257	
C.P. " 32	6	194° 17'	987	
C.P. " 33	6	173° 1'	2,250	
C.P. " 34	7	180° 43'	2,450	
C.P. " 35 in Veppankadu limit close to boundary	7	177° 50'	2,800	
C.P. " 36 in Veppankadu limit	8	137° 10'	2,200	

BENCH MARKS.

List of Bench Marks, Grand Anicut Canal System.

[The datum of all levels in this list is that of the G.T.S.]

Serial No.	Position (nearest canal or channel mileage).	Description.	Value.	Remarks.
<i>Grand Anicut Canal.</i>				
1	R.D. 0/0-000	Cauvery Reservoir Project bench mark cut on platform above pier No. 1 south side, Vennar regulator.	208.97	
2	" 0/76-10	Bench mark tar marked on boundary stone north-east corner of survey No. 230 of Kiliyur village No. 45, Trichinopoly taluk.	192.38	
3	" 1/36-65	Bench mark tar marked on plal wall of mosque in Kiliyur village-site north of main canal line and north-east of Parachery, Kiliyur village.	195.77	
4	" 1/52-20	Bench mark tar marked on the north-east corner of plinth of temple north of main canal line in Rajampet hamlet, Kiliyur village.	192.54	
5	" 2/17-20	Oil of Indalur tank supply sluice from the Vennar	180.90	
6	" 2/22-20	Crest of weir of Peraiyeri, Indalur village, south-east corner of tank-bund No. 11, Indalur village, Tanjore taluk.	184.40	
7	" 2/67-20	Bench mark on crest of Pulampattu tank of Indalur village ..	188.52	
8	" 2/87-20	Bench mark tar marked on boundry stone north of main canal line and north-west corner of Veppangudi eri, Solagampatti village No. 12, Tanjore taluk.	184.69	
9	" 3/73-55	Bench mark tar marked on boundary stone north-east corner of survey No. 132, Solagampatti village, Tanjore taluk.	180.55	
10	" 4/14-20	G.T.S. bench mark on parapet of girder bridge, telegraph post 236	188.63	
11	" 4/22-75	Bench mark rear floor of Kangayampatti tank supply sluice in the westernmost corner of Kangayampatti Kadakkan eri tank-bund.	175.96	
12	" 4/77-20	Bench mark tar marked on khandam stone, north-east corner of survey No. 306, Kangayampatti village, Tanjore taluk.	182.17	
13	" 6/38-00	Bench mark tar marked on boundary stone, south of the north-east corner of survey No. 61, No. 195, Veeramarasampatti village, Tanjore taluk.	178.53	
14	" 6/85-50	Bench mark tar marked on boundary stone north-west corner of survey No. 635 of Budhalur village No. 35, Tanjore taluk.	180.85	
15	" 7/12-72	G.T.S. bench mark imbedded west of tank house, Budhalur station, South Indian Railway.	188.21	G.T.S.
16	" 8/17-47	Bench mark tar marked on khandam stone, south-east corner of survey No. 678 of Sittarakudi village No. 37, Tanjore taluk.	173.84	
17	" 8/47-47	Crest level of surplus weir of Periakulam north of main canal line.	169.72	
18	" 11/23-70	Bench mark tar marked on boundary stone south-west corner of survey No. 352 of Ramanadapuram village No. 25.	167.74	
19	" 12/55-69	G.T.S. bench mark on railway culvert opposite to telegraph post 222	181.76	
20	" 13/31-99	Bench mark tar marked on the north-west corner of bridge to Seppunayakan kulam across ditch.	182.64	
21	" 13/49-07	Bench mark tar marked on parapet of Vallam road after crossing ditch near Collector's office.	196.02	
22	" 14/01-50	Bench mark tar marked on parapet of road culvert north side Negapatam Trichinopoly road at the crossing of the main canal line.	172.93	
23	" 15/30-00	Bench mark in front parapet of sluice No. 1 of Kadamban eri of Vilarkasbathottam.	167.43	
24	" 15/77-50	Bench mark on boundary stone between Vilarkasbathottam and Kandudampatti.	163.54	
25	" 15/87-20	Bench mark on north parapet of the calingal of surplus channel from Uchiampatti eri at Kandudampatti boundary.	165.32	
26	" 17/32-50	Bench mark on forest limit division stone on north bank of Vari near boundary between Kattukurichi and Pudukur.	162.51	
27	" 17/95-03	Crest of weir of Serukadiyan tank of Naduvur	164.25	
28	" 17/95-00	On top of east wing of Serukadiyan tank at junction with upstream return.	168.18	
29	" 18/10-00	On boundary stone between Kurukkakotti and Naduvur ..	161.51	
30	" 19/20-00	G.T.S. bench mark near Panchanatha Aiyar's well in Ichankota limits.	175.54	G.T.S.
31	" 20/32-50	Bench mark on front step of Pillayar kovil	161.15	
32	" 20/65-00	Bench mark on north-west corner of the yard in front of Pillayar kovil, in front of Subrahmaniam kovil of Karipattipatti.	159.57	
33	" 21/15-00	On demarcation stone at western side of pond near Pachur (in Gandaravakota zamindari).	161.18	
34	" 21/85-00	On door sill of Siva temple on left bank of Kattar near Attangarapatti.	155.53	
35	" 23/30-00	On demarcation stone on left bank of Maharajasamudram ..	151.44	
36	"	G.T.S. bench mark embedded in front of Ganapathi temple of Karambakudi.	151.13	

List of Bench Marks, Grand Anicut Canal System—cont.

Serial No.	Position (nearest canal or channel, mileage).	Description.	Value.	Remarks.	
Grand Anicut Canal—cont.					
37	R.D. 26/16-30 ..	On crest of body wall of weir of Kudikarambai eri (Karambavindudi).	144-60	G.T.S.	
38	" 26/41-30 ..	Bench mark on 21st mile stone on Senjipatti-Pattukottai road..	150-36		
39	" 27/39-28 ..	On khandam stone on south foreshore of Mevakulam ..	144-70		
40	" 30/14-35 ..	On top of guard stone at north end of west parapet of culvert (on Karambakudi-Padukkotta road) across supply channel to Kumarakulam tank.	140-97		
41	" 32/30-00 ..	G.T.S. bench mark on back of figure of bull in front of Ganapathi temple on Pattatikad tank-bund.	136-82		
42	" 34/30-00 ..	Bench mark on boundary stone between Neduvasal, Melpadi and Kilpadi.	133-91		
43	" 35/95-00 ..	Bench mark on 14th mile stone on Pattukkottai-Nagaram-Arantangi road.	132-59		
44	" 36/85-00 ..	Bench mark on boundary stone east of thick palmyrah tope between Mangadu and Pulichangadu.	131-41		
45	" 37/85-00 ..	On top of demarcation stone on right bank of Ambular and to west of M.C. line.	125-21		
46	" 38/25-00 ..	G.T.S. bench mark embedded near Pidari Devi's temple near Nagaram.	138-18		
47	" 38/75-00 ..	On 16 miles 4 furlong stone on road from Pattukota to Nagaram.	126-71		
48	" 39/70-00 ..	Bench mark on village boundary stone between Serianur shrotriyam and Serianar Paleyapattu.	126-81		
49	" 41/75-00 ..	Bench mark in boundary stone between Perialoor and Pandikudi in the burial-ground.	120-78		
50	" 44/55-00 ..	On S. pilaster of pier of railway culvert No. M. 584 opposite telegraph post ²⁷¹ / ₁₇ on Pattukkottai-Arantangi line.	121-14		
Kalianodai Branch Canal.					
51	R.D. 58-50 ..	On the top of 7th furlong stone 5 miles 7 furlongs, Tanjore-Pattukottai road.	152-78		G.T.S.
52	" 20-280 ..	On the top of 6th furlong stone 7 miles 6 furlongs of Tanjore-Pattukottai road.	144-48		
53	1,300 feet east of R.D. 27-000.	On the top right to parapet of culvert No. 25 near 9th mile stone.	139-96		
54	1,000 feet east of R.D. 27-000.	On the top of 9th mile stone	139-55		
55	1,000 feet east of 6 miles.	Do. 10th do.	131-64		
56	Close to 7 miles 2 furlongs.	Do. 11th do.	131-54		
57	1 furlong east of 6th mile.	Do. 12th do.	134-94		
58	6 furlongs east of 9th mile.	Do. 13th do.	127-16		
59	6 furlongs east of 10th mile.	Do. 14th do.	118-65		
60	1 mile east of 10th mile.	On top left parapet of culvert No. 34 near 15th mile ..	113-51		
61	2 furlongs north-east of 12 miles 4 furlongs.	On top of 16th mile stone	101-74		
62	R.D. 7/18-90 ..	Do. 17th do.	102-79		
63	" 7/37-00 ..	Do. boundary stone between Telangaikudikadu and Peikkarambankota villages close to the line.	96-08		
Vadakadu Branch Canal.					
64	R.D. 0/71-80 ..	On top of boundary offset stone between Telangaikudikadu and Pulavankadu villages close to the canal line.	104-63	G.T.S.	
65	" 1/6-80 ..	On top of 2nd furlong stone 18 miles 2 furlongs, Tanjore-Pattukottai road.	103-42		
66	" 1/56-80 ..	On top of 19th mile stone	95-03		
67	" 1/86-80 ..	Do. of 19th miles 4 furlongs	92-18		
68	" 3/26-80 ..	On top of boundary stone close to Papanad jungle near cart-track.	93-31		
69	" 4/09-74 ..	On south-east corner of a brick masonry square well close to the line.	82-11		
70	" 4/84-74 ..	On top of boundary stone close to the line at the boundary of Ambalapattu and Muloorpatikudikadu villages.	83-03		
71	" 5/59-74 ..	On top of 4th furlong stone 14 miles 4 furlongs Mannargudi-Pattukottai road near Alattur.	79-94		
Rajamadam Branch Canal.					
72	About ½ mile west of starting point.	G.T.S. bench mark near Panchanada Ayyar's well in Ichankota village limit west of Veeramandukudikadu.	175-54		G.T.S.
73	R.D. 0/45-9 ..	On top boundary offset stone at the boundaries of Ichankota and Gandarvakota close to the line.	140-26		
74	" 2/26-20 ..	On top of G.T.S. Pillartrestle station near Takkarakota ..	130-09		

List of Bench Marks, Grand Anicut Canal System—cont.

Serial No.	Position (nearest canal or channel, mileage).	Description.	Value.	Remarks.
Rajamadam Branch Canal—cont.				
75	R.D. 2/7200	On top of boundary offset stone in mango tope at the boundary of Ghandarvakota and Papanad boundaries.	119-56	
76	„ 3/2370	On centre of step in front of doorway of Ellayammankovil, south of Keelakota in Pinnayur.	123-89	
Maharajasamudram-Agniar Block.				
77	Road from Karambakudi to Tiruvonam.	Bench mark on west parapet of culvert No. 2 between 0/7 and 0/6 on the Karambakudi-Tiruvonam road.	151-67	
78		Bench mark on mile stone marked 11/0 at junction of Pattukkottai-Singipatti road with the Tiruvonam-Karambakudi road.	150-36	
79		Bench mark on south of parapet of culvert No. 43 between 13/5 and 13/6 on the Pattukkottai-Singipatti road.	124-34	
80		Bench mark on 24/0 mile stone from Singipatti 10/0 from Pattukkottai on the Singipatti, Pattukkottai road.	123-08	
81		Bench mark on south parapet of culvert No. 43 between 24/2 and 24/3 on the above road.	120-95	
82	Road from Pattukkottai to Singipatti.	Bench mark on 25/0 mile stone from Singipatti or 9/0 mile stone from Pattukkottai on the Singipatti-Pattukkottai road.	124-98	
83		Bench mark on 26/0 mile stone from Singipatti or 8/0 mile stone from Pattukkottai on the Pattukkottai-Singipatti road.	119-31	
84		Bench mark on south parapet of culvert No. 44 between 27/0 and 27/1 of the Pattukkottai-Singipatti road.	92-36	
85		Bench mark on south parapet of culvert No. 46 on the Pattukkottai-Singipatti road between 27/3 and 27/4.	83-43	
86		Bench mark on 28/0 mile stone on the Pattukkottai-Singipatti road.	83-11	
87		Bench mark in 4/0 mile stone on the Pattukkottai-Nagaram road.	69-48	
88		Bench mark on crest of surplus weir of tank close to 4/0 mile stone on the above road.	63-23	
89		Bench mark on top of V. B. stone in road opposite to Pillayar-koil at 2/6 on the Pattukkottai-Nagaram road.	78-98	
90	Road from Pattukkottai to Nagaram.	Bench mark on 2/0 mile stone on the Pattukkottai-Nagaram road.	72-71	
91		Bench mark on 1/0 mile stone on the Pattukkottai-Nagaram road.	62-38	
2		Bench mark on 0/4 mile stone on the Pattukkottai-Nagaram road.	76-73	
93		Bench mark on south parapet of culvert No. 48 in Pattukkottai bazaar at junction of Pattukkottai-Nagaram road with Pattukkottai-Singipatti road.	79-25	
Villuniar-Narasinga Cauvery Block.				
94		Bench mark on front of parapet of sluice Sattani tank of Nuvatalai village.	104-98	
95		Bench mark of railway limit stone between Telegraph Posts 267/13 and 267/14.	96-85	
96		Bench mark on B.V. stone at junction of Mangalavadu-Ramasubampuram and Arasarkulam.	68-30	
97		Bench mark on V.B. stone at junction of Vellalankadu-Kotakkudi and Rattavayal.	51-33	
98		Bench mark on southernmost upright stone fixed in the crest of surplus weir of Ariyavayal eri.	40-92	
99		Bench mark on north-east end of front wall of Ongulam tank sluice.	21-43	
100		Bench mark on centre of east of edge of front verandah of the travellers' bungalow for Europeans at Ammanichatram.	10-77	
101		Bench mark on centre of east parapet of culvert No. 45 between 22/3 and 22/4 of the Rajamadam-Kattumavadi road.	10-53	
102	Villuniar-Narasinga Cauvery block.	Bench mark on north end of west parapet of culvert between 25/2 and 25/3 on the Rajamadam-Kattumavadi road.	12-55	
103		Bench mark on 16/0 mile stone on the Kattumavadi-Arantangi road at its junction with the Rajamadam-Kattumavadi road.	11-59	
104		Bench mark on centre of east parapet of culvert No. 12, between 11/6 and 11/7 on the Pattukkottai-Avadayarkoil road.	73-90	
105		Bench mark on south-east corner of the laterite platform on which the big mud horse of the Ayanar Coil situated to the west of the Pattukkottai-Avadayarkoil road between 14/1 and 14/2 stands. Position of the staff is just in rear of the right hind leg of the mud horse.	83-91	
106		Bench mark on centre of west parapet of culvert No. 34 between 23/0 and 23/1 on the Ayingudi-Aranthangi road.	106-12	
107		Bench mark on 24/0 mile stone on the Ayingudi-Aranthangi road.	116-37	
108		Bench mark on centre of west parapet of culvert No. 35 between 24/3 and 24/3 F. stone on the Ayingudi-Aranthangi road.	116-74	

List of Bench Marks, Grand Anicut Canal System—cont.

Serial No.	Position (nearest canal or channel, mileage).	Description.	Value.	Remarks.
<i>Pattukkottai Block.</i>				
109		On top of parapet of culvert No. 48 Tanjore-Pattukkottai road at the end of Pattukkottai Bazaar street.	79.25	
110		On top of 30th mile stone, Pattukkottai-Muthupet road.	78.16	
111		Do. 31/0	60.77	
112		Do. 32/0	54.90	
113	Pattukkottai-Muthupet road.	Do. 33/0	48.19	
114		On top of parapet of Kotar bridge between 32/5 and 32/4 ..	42.16	
115		On top of 34/0	59.69	
116		On top of culvert No. 63 near 30/4	19.08	
117		On top of 40/0	22.96	
118		On top of 40/5	19.22	
119		On top of 1st mile stone, Pattukkottai-Sethubavachatram road ..	57.57	
120		On top of 2nd mile stone, Pattukkottai-Sethubavachatram road ..	36.43	
121	Sethubavachatram road.	On west parapet of culvert No. 3 near 2/4	42.92	
122		On east of parapet of culvert No. 7 near 3/1	43.93	
123		On top of 4th mile stone	37.61	
124		On top of 1st mile stone, Pattukkottai-Madukur road	71.11	
125	Pattukkottai-Madukur road.	Do. 2nd mile stone	49.30	
126		Do. 3rd mile stone	76.02	
127		Do. 4th mile stone	65.75	
128		On top of 37 miles 4 furlongs, Madukur-Adirampatnam road ..	48.86	
129		On top of 38/4	45.56	
130		On top of 39th mile stone	41.00	
131		On top of culvert parapet No. 141 near 39/4	41.70	
132		On top of 40/0	52.45	
133		Do. 41/0	64.80	
134		Do. 41/4	64.65	
135	Mannargudi-Adirampatnam road.	Do. 42/0	54.05	
136		Do. 42/4	53.64	
137		Do. 43/0	43.88	
138		On culvert parapet No. 144 near 43/1	36.68	
139		On top of parapet of Kotar bridge near 43/7	31.47	
140		On top of 44th mile stone	26.45	
141		On top of parapet of culvert No. 146	28.02	
142		Do. No. 148	30.15	
143		On top of 46th mile stone	27.10	
144		On top of parapet of culvert No. 4 Adirampatnam-Muthupet road.	9.32	
145		On top of 8th mile stone, Muthupet-Adirampatnam road ..	8.94	
146		Do. 7th mile stone	7.95	
147	Muthupet-Adirampatnam road.	Do. 6th mile stone	9.31	
148		On top of boundary stone close to road near 5/3 at the junction of road to salt factory	8.42	
149		On top of 5th mile stone	14.18	
150		Do. 4th mile stone	15.94	
151		Do. 3rd mile stone	21.59	
152		Top of 19th mile stone in Tanjore to Pattukkottai road ..	95.03	
153		Do. 20th mile stone	93.22	
154		Do. 21st mile stone	90.06	
155		Left parapet of culvert No. 42	86.68	
156		Do. 22nd mile stone	100.19	
157		Do. 23rd mile stone	92.70	
158		Do. culvert No. 42	80.87	
159		Do. 24th mile stone	79.88	
160		Do. 25th mile stone	70.48	
161		Do. 26th mile stone	76.04	
162	Tanjore to Pattukkottai road.	Do. culvert No. 45	75.20	
		Do. 27th mile stone	78.06	

List of Bench Marks, Vadavar System.

[The datum of all levels is that of the G.T.S.]

Serial number.	Position.	Description.	Value.	Remarks.
<i>Vadavar and Vadavar Extension Canal.</i>				
1	R.D. 0/0000	In centre of top of platform of Vadavar Head sluice inscribed as 148-645.	149.49	
1	....	On top of 36th mile stone	140.22	
3	....	Do. of 37th do.	137.03	
4	....	Do. of 38/2 furlong stone	135.47	
5	R.D. 2/3100	Do. of west wing of Maravanapatti surplus weir	138.92	
6	....	Do. of 39/4 furlong stone	135.78	
7	....	Do. of 40/3 do.	131.80	
8	R.D. 3/1350	On centre of top of west parapet of bridge on Tiruvadi road ..	139.88	
9	" 4/1910	On top of west wing of Pulliampallam surplus	131.90	
10	....	Do. of platform of Pulliampallam surplus sluice	131.10	
11	....	On west of weir of do.	123.91	
12	R.D. 4/5540	On north parapet of girder bridge of railway line from Madras to Tuticorin across Vadavar	134.21	
13	" 5/0750	On plinth temple on left bank of Vadavar	130.75	
14	" 8/1510	G.T.S. bench mark on east end of south parapet of railway bridge at 229/6 on Tanjore-Negapatam branch.	126.53	
15	" 9/2400	Top of parapet of east cistern of Kambayanathan syphon sluice.	113.59	
16	" 10/39.50	On Public Works stone marked 0/4 on old central channel line.	107.58	
17	" 10/46.00	On 4th mile stone, Vadavar—Ammappet road	110.83	
18	" 11/15.40	On platform of Mannargudi Municipal channel head sluice ..	102.79	
19	" 11/52.00	On Public Works stone marked 2/4 on old central channel line.	99.97	
20	" 11/7810	Centre of east parapet of culvert No. 1 on Municipal channel ..	102.08	
21	" 11/9790	Do. " 2 on Mannargudi Municipal channel.	101.94	
22	" 12/2430	Centre of south parapet of culvert No. 22 across Municipal channel on Tanjore-Mannargudi road.	95.08	
23	" 12/6060	On Public Works stone marked 0 at head of Mannargudi Branch channel.	95.69	
24	" 12/8330	Public Works stone marked 4/4	94.35	
25	" 13/0363	Do. 5/0	89.16	
26	" 13/3000	Do. 5/4	86.87	
27	" 13/5640	Do. 5/0	86.14	
28	" 13/8280	Do. 6/4	90.45	
29	2 furlongs south of R.D. 14/1240.	Do. 7/0	95.24	
30	1 furlong south of R.D. 14/4540.	Do. 7/4	93.63	
<i>Vadavar Extension Channel</i>				
1	660 feet.	Public Works stone marked 8/0	90.72	
2	3,300 "	Do. 8/4	90.69	
3	1 mile 600 feet.	Do. 9/0	87.30	
4	1 " 3,300 "	Do. 9/4	89.52	
5	2 miles 660 "	Do. 10/0	83.65	
6	1/2 furlongs north of 2 miles 3,300 feet.	Do. 10/4	86.71	
7	North of 3 miles 660 feet.	Do. 11/0	88.95	
8	3 miles 4 furlongs ..	Do. 11/4	82.00	
9	4 " 0 " ..	Do. 12/0	80.57	
10	4 " 4 " ..	Do. 12/4	78.80	
11	5 " 0 " ..	Do. 13/0	74.33	
12	5 " 4 " ..	Do. 13/4	79.95	
13	6 " 0 " ..	Do. 14/0	70.71	
14	South of 6 miles 4 furlongs.	Do. 14/4	72.33	
15	South of 8 " miles 0 furlong.	Do. 15/0	15.67	
16	8 miles 4 furlongs ..	Do. 16/4	70.31	
17	8 " 4,620 feet ..	Do. 16/0	61.46	
18	9 " 1,980 " ..	Do. 16/4	64.53	
19	9 " 4,620 " ..	Do. 17/0	56.83	
20	10 " 1,980 " ..	Do. 17/4	55.16	
21	10 " 4,620 " ..	Do. 18/0	49.50	
22	11 " 650 " ..	Do. 18/4	44.11	
23	South of 11 miles 3,300 feet.	Do. 19/0	44.76	
24	12 " 660 feet ..	Do. 19/4	38.78	
25	12 " 3,300 " ..	Do. 20/0	4.64	
26	12 " 660 " ..	Do. 20/4	34.90	
27	13 " 3,300 " ..	Do. 21/0	30.85	
28	13 " 660 " ..	Do. 21/4	26.02	

List of Bench Marks, Vadavar System—cont.

Serial number.	Position.	Description.	Value.	Remarks.
<i>Puthur Channel.</i>				
1	Opposite to 3,800 feet.	G.T.S. bench mark near goods shed of Saliyamangalam Railway Station.	120.56	
2	2 miles 1,820 feet ..	On top of Public Works stone marked 2/0	109.78	
3	.....	Do. do. 3/0	107.03	
4	Opposite to 4 miles 1,320 feet and close to road.	Do. do. 4/0	107.69	
5	3 miles 3,960 feet ..	Do. do. 3/4	103.45	
6	4 " 4,620 " ..	Do. do. 4/4	105.63	
7	5 " 1,980 " ..	Do. do. 5/0	102.56	
8	5 " 4,620 " ..	Do. do. 5/4	99.17	
9	6 " 1,650 " ..	Do. do. 6/0	96.83	
10	6 " 4,950 " ..	Do. do. 6/4	92.27	
11	7 " 2,310 " ..	Do. do. 7/0	91.89	
12	7 " 4,750 " ..	Do. do. 7/4	88.99	
13	.....	Do. do. 8/0	84.53	
14	.....	Do. do. 8/4	27.35	
<i>Chettichatram Channel.</i>				
1	.....	Public Works stone 0 on margin of Vadavar	114.11	
2	1,000 feet north-east of head of canal.	Do. 0/4	119.87	
3	2 furlongs north of 3,960 feet	Do. 1/0	114.57	
4	4 furlongs north of 1 mile 1,320 feet.	Do. 1/4	115.81	
5	2½ furlongs north of 1 mile 4,620 feet.	Do. 2/0	115.25	
6	1½ furlongs north of 2 miles 1,980 feet.	Do. 2/4	110.22	
7	1 furlong north of 2 miles 4,620 feet.	Do. 3/0	106.53	
8	3 " 1,980 feet ..	Do. 3/4	104.91	
9	3 " 4,620 " ..	Do. 4/0	102.51	
10	4 " 1,980 " ..	Do. 4/4	98.62	
11	4 " 4,620 " ..	Do. 5/0	99.21	
12	Near Ayyampet village.	Do. 5/4	90.89	
<i>Iluppadi Channel.</i>				
1	South of—	Public Works stone marked 1/0	106.99	
2	1 mile 1,320 feet ..	Do. 2/0	97.36	
3	2 miles 1,980 feet ..	Do. 3/0	92.81	
4	3 " 1,980 " ..	Do. 3/4	88.62	
5	4 " 4,620 " ..	Do. 4/0	86.35	
6	4 " 1,650 " ..	Do. 4/4	82.91	
7	5 " 4,290 " ..	Do. 5/0	80.28	
8	5 " 1,650 " ..	Do. 5/4	75.04	
9	.....	Do. 6/0	67.53	
<i>Muvanallur Channel.</i>				
1	½ furlong north of the channel present head.	Public Works stone marked 0 at old head of channel	103.68	
2	1,650 feet ..	On top of 6th mile stone of Ammapet-Vaduvur road	104.87	
3	1 mile 660 feet ..	Public Works stone marked 1/0	100.27	
4	1 " 3,300 " ..	Do. 1/4	93.21	
5	2 miles 660 " ..	Do. 2/0	92.44	
6	3 " 660 " ..	Do. 3/0	86.03	
7	3 " 3,300 " ..	Do. 3/4	82.34	
8	4 " 660 " ..	Do. 4/0	84.55	
9	5 " 660 " ..	Do. 5/0	73.21	
<i>Mannargudi Channel.</i>				
1	Old head of channel.	Public Works stone marked 0	95.69	
2	.....	On 8th mile stone on Mannargudi Municipal channel	94.65	
3	1 mile 4,290 feet ..	On Public Works stone marked 0	91.76	
4	.....	On centre of south parapet of culvert No. 28 of Tanjore-Mannargudi road.	87.30	
5	3 miles 4 furlongs ..	On Public Works stone marked 3/4	89.23	
6	4 " 0 furlong ..	Do. 4/0	86.78	
7	4 " 2,310 feet ..	Do. 4/4	87.94	
8	1,000 feet north of 5 miles.	Do. 5/0	87.79	
9	1 furlong north of 6 miles.	Do. 6/0	87.27	
10	.....	On boundary stone between Muvanallur and Mannargudi	85.77	
	.....	On Public Works stone at end of canal	73.82	

List of Bench Marks, Vadavar System—cont.

Serial number.	Position.	Description.	Value.	Remarks.
<i>Vadavar No. 1 Channel (old Edaymatham Channel).</i>				
1	.....	Public Works stone marked 0 at head of canal	90.85	
2	3 furlongs south of 4 furlongs of channel line.	Do. 0/4	94.87	
3	2 furlongs south of 1 mile 660 feet.	Do. 1/0	92.68	
4	1 mile 2,970 " ..	Do. 1/4	85.57	
5	2 miles 330 " ..	Do. 2/0	75.74	
6	2 " 2,970 " ..	Do. 2/4	80.02	
7	3 " 330 " ..	Do. 3/0	73.49	
8	3 " 2,970 " ..	Do. 3/4	74.03	
9	4 " 330 " ..	Do. 4/0	72.88	
10	4 " 2,970 " ..	Do. 4/4	67.60	
11	5 " 330 " ..	Do. 5/0	76.24	
12	South of 5 miles 2,640 feet.	Do. 5/4	73.98	
13	North of 6 miles 660 feet.	Do. 6/0	66.51	
14	North of 6 miles 3,300 feet.	Do. 6/4	62.04	
<i>Palaiyur Channel.</i>				
1	.....	Public Works stone marked 0 at head of old channel	89.74	
2	1 furlong north 2,000 feet.	Do. 0/4	87.73	
3	4,620 feet ..	Do. 1/0	75.29	
4	1 mile 1,980 feet ..	Do. 1/4	77.94	
5	1 " 4,620 " ..	Do. 2/0	66.78	
6	1 furlong south of 2 miles 1,650 feet.	Do. 2/4	65.45	
7	.....	Do. 3/0	71.16	
8	3 miles 4,620 feet ..	Do. 3/4	63.67	
9	4 " 1,980 " ..	Do. 4/0	60.78	
10	1½ furlongs north of 4 miles 4,620 feet.	Do. 4/4	52.10	
11	3½ furlongs north of 5 miles 2,640 feet.	Do. 5/0	48.78	
12	6 miles 660 feet.	Do. 6/0	49.27	
13	7 " 1,650 " ..	Do. 7/0	47.77	
14	8 " 1,320 " ..	Do. 8/0	42.83	
<i>Maharajapuram Channel.</i>				
1	0 mile 3,300 feet ..	On top of boundary stone close to Madukur-Adirampatnam road at the boundary of Kilakurichi and Avikota.	64.57	
2	1 " 3,960 " ..	On top of khandam stone between I. Nos. 35 and 25 of Melanatham close to channel line.	61.15	
<i>Maharajapuram No. 3 Channel.</i>				
3	0 mile 3,300 feet ..	On top of boundary stone close to the line at the boundary of Melanatham and Tirumakkota villages.	44.50	
4	1 " 660 " ..	On top of khandam stone right of line between S. Nos. 304 and 380 of Tirumakkota village.	44.45	
5	2 miles 0 foot ..	On top of boundary offset stone near Perumal temple at the boundary of Tirumakkota and Maharajapuram villages.	41.97	

Statement of Rates. HEADWORKS AT METUR.

Nature of work.	Rate.
RS. A. P.	
<i>Materials.</i>	
Charnockite or Gneiss rough stone quarried and stacked per 100 c. ft. (stack measurement allowing 12 per cent interstices).	4 8 0
Concrete stone of above	7 12 0
Firewood (at site of work per ton)	10 0 0
Country bricks (for surki), 9" x 4 1/2" x 2" per 1,000	5 12 0
Lime slaked and screened and delivered at mortar mills per 100 c. ft.	19 10 0
Surki slaked and screened and delivered at mortar mills per 100 c. ft.	16 8 0
<i>Complete works.</i>	
Benching founds for dam per 100 sq. ft.	25 0 0
Excavation founds of dam—	
Hard rock including removal of materials 1,000 c. ft.	80 0 0
Soft rock exclusive of leading away materials from deep founds	25 0 0
Earth do.	10 0 0
Random rubble facing (in surki mortar, 1 : 1 : 1) 100 c. ft.	26 4 0
Do. hearting do.	24 4 0
Concrete in surki mortar, 100 c. ft.	24 4 0
Rubble facing in cement, do.	50 0 0
Wedge stone in cement do.	80 0 0
Cutstone archwork in cement per cubic foot	1 10 0
Do. square work per cubic foot in flooring side walls, etc.	1 4 0
Do. fine work in copings, etc.	1 6 0
Pointing with cement, 100 sq. ft.	4 0 0
Do. upstream face of dam, 100 sq. ft.	15 0 0
Do. downstream, 100 sq. ft.	10 0 0

STATEMENT OF RATES—CANAL SYSTEM.

Materials.
(Figures in thick type give prices including cost of carriage to site.)

Nature of work.	Schedule rate, District Board Engineer, Tanjore.	Vennar or Cauvery Division, Public Works Department.	Project rate, "Main canal and branches."	Project rate, "Distributaries."
(1)	(2)	(3)	(4)	(5)
Table moulded stock bricks, 9 x 4 1/2 x 2 1/2 per 1,000	8 12 0	8 12 0	10 0 0	9 0 0
Platform moulded bricks, 9 x 4 1/2 x 2 1/2	7 0 0	7 0 0	8 0 0	6 0 0
Native bricks, 9" x 4" x 2"	5 0 0	5 0 0	5 8 0	6 0 0
Brick jelly, vitrified and broken, for concrete and backing	100 c. ft.	8 8 0	10 0 0	10 0 0
Cuddapah slabs 2" thick, at Tanjore	100 sq. ft.	18 12 0	18 0 0	18 0 0
Do. 4" do.	100 "	36 0 0		
Cut granite stone or gneiss dressed square and true and delivered at site	C. ft.	1 10 0	1 8 0	1 12 0
Cut granite stone or gneiss fine dressed or special shapes	C. ft.	2 0 0	2 0 0	2 8 0
Rough stone broken for concrete, 2" gauge	100 "	2 0 0	5 8 0	
Lime stone burnt and delivered	100 "	21 14 0	18 15 0	20 0 0
Laterite meta! broken to 3 inches	100 "	0 13 0	1 12 0	22 0 0
Laterite gravel screen and stacked	100 "	0 11 6	1 0 0	1 0 0
Gravel	100 "	0 11 6	1 0 0	1 0 0
Rough stone quarrying and stacking when the stone can be removed with crowbar	100 "	2 8 0	3 8 0	
Rough stone quarrying and stacking when blasting is required	100 "	5 0 0	7 0 0	7 0 0
Laterite, roughly squared	100 "		7 8 0	
Laterite blocks squared and ready for building	100 "	11 0 0	12 0 0	
Laterite rough rubble	100 "		5 0 0	
Quarrying and breaking metal from boulders to 1 1/2" ring.			4 0 0	4 0 0
Digging and breaking quartz or moorum or laterite to 1 1/2"			3 0 0	3 0 0
Collecting off surface of fields and breaking quartz, pebbles or other stones, 1 1/2"			2 8 0	2 8 0
			3 0 0	3 0 0

STATEMENT OF RATES—CANAL SYSTEM—cont.

Complete works.

(Figures in thick type give prices including cost of carriage to site.)

Nature of work.	Schedule rate, District Board Engineer, Tanjore.	Vennar or Cauvery Division, Public Works Department.	Project rate, "Main canal and branches."	Project rate, "Distributaries."
(1)	(2)	(3)	(4)	(5)
<i>Earthwork.</i>				
Excavating in sand 1,000 c. ft.	2 0 0	2 0 0	2 12 0	2 12 0
Do. and filling do.	3 0 0	3 7 6	4 0 0	4 0 0
Do. in ordinary loam, alluvial or black soil. do.	2 5 0	2 5 0	3 12 0	3 12 0
Do. hard clay with gravel do.	3 0 0		5 0 0	5 0 0
Do. hard gravel do.	3 8 0		6 0 0	
Do. soft rock do.	5 0 0		Rs. 6 to 18	
Do. Tanjore laterite sand stone do.			9 0 0	
Each increment of 10 yards lead or 1 yard list or part of these per do.	0 3 0	0 3 1	0 4 6	0 4 6
Leading earthwork, etc., by tram line in trucks, including repairs and laying and shifting lines but exclusive of tools and plant or by bullock cart per 1,000 c. ft., including loading and unloading, up to 1,000 ft.			6 0 0	
Leading earthwork, etc., by tram line in trucks, including repairs and laying and shifting lines but exclusive of tools and plant or by bullock cart per 1,000 c. ft., including loading and unloading, for each additional do.			1 8 0	
Blasting rock (measured in the solid) 100 c. ft.			7 0 0	7 0 0
<i>Concrete.</i>				
Broken vitrified brick in chunam 100 c. ft.	14 0 0	13 8 0	17 0 0	19 0 0
Do. stone in lime mortar do.			14 0 0	16 0 0
Do. vitrified brick in surki mortar do.	16 0 0	16 0 0	18 8 0	21 0 0
Do. stone in surki mortar do.			15 8 0	
<i>Brickwork.</i>				
Table moulded brick in lime mortar (9 x 4 1/2 x 2 1/2)	22 0 0	19 8 0	22 8 0	
Do. flat or circular arch work			23 8 0	
Ground moulded country brickwork in clay	12 8 0		14 8 0	16 0 0
Platform moulded brick in chunam	19 0 0	16 8 0	20 0 0	21 8 0
Do. flat archwork in chunam		18 0 0	21 0 0	22 8 0
Do. circular or segmental in chunam			21 0 0	22 8 0
Add to above for surki mortar for brickwork			1 0 0	1 8 0
Add for surki to concrete or rubble		1 8 0	1 8 0	2 0 0
Laterite block in course in chunam			20 6 0	
Note.—Laterite archwork not to be used.				
Cutstone built into work in chunam			1 12 0	
<i>Rvetment.</i>				
Rough stone (boulders)			5 12 0	
Blasted stone			9 4 0	
Laterite blocks, rough	10 0 0		9 12 0	
Do. fine			14 4 0	
Laterite rubble			4 12 0	
Concrete blocks	18 0 0		19 12 0	
Platform moulded brick laid dry per 100 c. ft.			16 0 0	17 5 0
9" brick laid as headers (platform moulded) per 100 sq. ft.				13 0 0
<i>Plastering.</i>				
Plastering with chunam and smoother over one coat	1 12 0	1 12 0	2 0 0	2 0 0
Do. do. two coats	2 8 0	2 12 0	3 0 0	3 0 0
Do. with Portland cement, 1/2" thick, 1 cement 2 sand or 3/4" thick, 1 cement 3 sand	6 0 0	7 9 0	6 12 0	6 12 0
Do. do. 1/2" thick, 1 cement 2 sand	7 9 0	10 2 0	8 4 0	8 4 0
Plastering with surki mortar, one coat	1 14 0	2 0 0	2 4 0	2 4 0
Do. do. two coats	2 14 0	3 4 0	3 4 0	3 4 0
<i>Pointing.</i>				
Pointing walls with chunam (brickwork)	1 8 0	1 11 0	2 8 0	2 8 0
Do. with Portland cement, 1 to 1 1/2	3 8 0	3 9 0	3 8 0	3 8 0
Grouting aprons with surki concrete and surki mortar plaster joints 100 sq. ft.		4 0 0	4 0 0	

Rates—Conveyance of material by cart.—The basis of Rs. 1-4-0 per day per cart is taken the load of a cart being taken as $12\frac{1}{2}$ cubic feet of concrete stone or rough stone.

The bricks required for a unit (100 cubic feet of brickwork) or a unit of brick jelly concrete are taken as lighter than stone in proportion between $\frac{3}{4}$ and $\frac{7}{8}$.

Rates for conveyance of lime taken as $\frac{1}{2}$ those for rough stone. The labour of loading bricks and unloading is more than that of loading and unloading rough stone and a small allowance is made to cover this :—

Lead.	Rate for rough stone or concrete stone for one unit work.			Rate for bricks or concrete brick jelly or backing for one unit work.		
	RS.	A.	P.	RS.	A.	P.
Up to and including $\frac{1}{2}$ mile, 10 trips daily	0	14	0	0	12	0
Over $\frac{1}{2}$ mile and up to 1 mile, 7 trips „	1	8	0	1	4	0
Over 1 mile and up to $1\frac{1}{2}$ miles, 5 trips „	2	0	0	1	10	0
Over $1\frac{1}{2}$ miles and up to 2 miles, 4 trips „	2	8	0	2	1	0
	For every added $\frac{1}{2}$ mile or part of $\frac{1}{2}$ mile add As. 8.			For every added $\frac{1}{2}$ mile or part of $\frac{1}{2}$ mile add As. 7.		
	Rates for conveyance lime (slaked) $\frac{1}{2}$ those in above column.			Rates for surki as in above column.		

List of plans accompanying estimates.

LIST OF PLANS—HEAD WORKS.

Particulars.	Number of sheets.	Plan numbers given.
Waterspread area	2	H-1 (a) & (b) }
Site survey head works	1	H-2 }
<i>Portfolio No. 1.</i>		
Site survey enlarged dam-site	1	H-3
Longitudinal section dam-site	1	H-4
Profile of dam	1	H-5
Construction sluices	2	H-6 & 7
Buttress No. I	1	H-8
Deep supply sluices	2	H-9 & 10
Sections of "Run of" channel from deep supply sluices.	1	H-11
Central supply sluices	1	H-12
Right supply sluices	1	H-13
Site survey main surplus sluices	1	H-14
Cross sections of site do.	2	H-15 & 16
Main surplus sluices	2	H-17 & 18
Survey of bed of the Cauvery in the vicinity of dam.	1	H-19†

LIST OF PLANS—GRAND ANICUT CANAL SYSTEM.

<i>Portfolio No. 2.</i>		
General contour map of the area proposed to be irrigated.	3	G-1 to G-3*
Longitudinal sections	31	G-4 to G-34
Section of alternative line at Budalur—R.D. 6/62 20 to R.D. 7/72 47.	1	G-35
Survey and section of alternative line at Tanjore—R.D. 11/97 19 to R.D. 14/43 55.	1	G-36
Section of alternative line at Karambakudi—R.D. 26/64 28 to R.D. 31/14 35.	1	G-37
Section of alternative line across Agniar—R.D. 30/01 55 to R.D. 30/95 60.	1	G-38
Survey of alternative line across Agniar—R.D. 30/01 55 to R.D. 30/95 60.	1	G-39
Section of alternative line across Nagaram Ridge—R.D. 38/00 00 to R.D. 39/11 00.	1	G-40
<i>Portfolio No. 3.</i>		
Quarry map	1	G-41
Drainage map	1	G-42
Plan of head regulator	1	G-43
Site survey of head regulator	1	G-44
Regulator at R.D. 15/99 40	1	G-45
Do. R.D. 19/25 80	1	G-46
Do. R.D. 26/94 28	1	G-47
Do. R.D. 33/66 00	1	G-48
Do. R.D. 41/35 00	1	G-49
Irrigation culvert across old Vennar diversion.	1	G-50
Syphon culvert across drain at 2/39 10	1	G-51
Syphon aqueduct at 2/39 60	1	G-52
Do. at 4/07 84	1	G-53
Do. at 4/75 62	1	G-54
Do. at 5/97 50	1	G-55
Do. at 8/62 47	1	G-56
Do. at 10/00 49	1	G-57

* In a roll.

† In above roll.

LIST OF PLANS—GRAND ANICUT CANAL SYSTEM—cont.

Particulars.	Number of sheets.	Plan numbers given.
<i>Portfolio No. 3—cont.</i>		
Syphon aqueduct at 11/2430 ...	1	G—58
Do. at 12/5569 ...	1	G—59
Superpassage at 13/1719 ...	1	G—60
Inlet at 13/6850 ...	1	G—61
Surplus sluice at 13/6850 ...	1	G—62
Inlet at 14/0090 ...	1	G—63
Syphon aqueduct at 14/2096 ...	1	G—64
Do. at 14/6200 ...	1	G—65
Do. at 15/5250 ...	1	G—66
Canal syphon at 15/8750 ...	1	G—67
Syphon aqueduct at 21/8750 ...	1	G—68
Do. at 23/6000 ...	1	G—69
Do. at 25/3560 ...	1	G—70
Irrigation drainage tunnel at 29/0135	1	G—71
Under tunnel at 30/2135 ...	1	G—72
Syphon aqueduct at 30/7835 ...	1	G—73
Do. at 32/6400 ...	1	G—74
Do. at 33/8334 ...	1	G—75
Do. at 35/3750 ...	1	G—76
Do. at 36/1570 ...	1	G—77
Do. at 37/0800 ...	1	G—78
Do. at 37/8300 ...	1	G—79
Do. at 39/8300 ...	1	G—80
Do. at 42/1400 ...	1	G—81
Do. at 42/6400 ...	1	G—82
<i>Portfolio No. 3-A.</i>		
Type plan of B class bridge ...	1	G—83
Do. C do. ...	1	G—84
Type cross section of road bridges ...	1	G—85
Type plan of foot-bridge ...	1	G—86
C. class bridge at 1/3610 ...	1	G—87
Railway girder bridge at 4/1404 ...	1	G—88
Site plan of do. ...	1	G—89
Railway bridge at 12/3450 ...	1	G—90
Site plan of do. ...	1	G—91
Special class bridge at 13/1907 ...	1	G—92
Do. at 3/6768 ...	1	G—93
Railway bridge at 14/0740 ...	1	G—94
Site plan of do. ...	1	G—95
Surplus sluice at 15/9050 ...	1	G—96
Do. at 26/7428 ...	1	G—97
Do. at 36/2000 ...	1	G—98
General plan of inspection bungalow	1	G—99
Out-houses to do. ...	1	G—100
General plan of lascar's huts ...	1	G—101
Extension of Toger irrigation syphon at R.D. 0/1390.	1	G—102
Tank supply sluice at 2/1580 ...	1	G—103
Irrigation syphon at 2/4200 ...	1	G—104
Tank supply sluice at 2/7600 ...	1	G—105
Do. at 1/6721 ...	1	G—106
Irrigation pipe sluice at 5/0520 ...	1	G—107
Tank supply sluice at 5/2900 ...	1	G—108
Irrigation syphon at 5/6220 ...	1	G—109
Tank supply sluice at 17/4900 ...	1	G—110
Do. at 22/9000 ...	1	G—111
Irrigation syphon at 23/7130 ...	1	G—112
Do. sluice at 24/5780 ...	1	G—113
Do. sluice at 27/9428 ...	1	G—114
Tank supply sluice at 31/6000 ...	1	G—115
Irrigation pipe sluice at 32/0500 ...	1	G—116
Do. syphon at 32/7500 ...	1	G—117
Do. sluice at 37/5000 ...	1	G—118
Tank supply sluice at 38/9000 ...	1	G—119

LIST OF PLANS—GRAND ANICUT CANAL SYSTEM—cont.

Particulars.	Number of sheets.	Plan numbers given.
<i>Portfolio No. 4.</i>		
Site survey at cross drainage at 2/3910 ...	1	G—120
Do. do. at 4/0784 ...	1	G—121
Do. do. at 4/7562 ...	1	G—122
Do. do. at 5/5070 ...	1	G—123
Do. do. at 5/9750 ...	1	G—124
Do. do. at 8/6247 ...	1	G—125
Do. do. at 10/0049 ...	1	G—126
Do. do. at 11/2430 ...	1	G—127
Do. do. at 12/4079 ...	1	G—128
Do. do. at 12/5569 ...	1	G—129
Do. do. at 13/1719 ...	1	G—130
Do. do. at 13/6850 ...	1	G—131
Do. do. at 14/0090 ...	1	G—132
Do. do. at 14/3930 ...	1	G—133
Do. do. at 14/6200 ...	1	G—134
Do. do. at 15/5250 ...	1	G—135
Do. do. at 15/8750 ...	1	G—136
Do. do. at 16/0540 ...	1	G—137
Do. do. at 17/3200 ...	1	G—138
Do. do. at 18/0980 ...	1	G—139
Do. do. at 18/6450 ...	1	G—140
Do. do. at 19/3165 ...	1	G—141
Do. do. at 19/9150 ...	1	G—142
Do. do. at 20/7600 ...	1	G—143
Do. do. at 21/8750 ...	1	G—144
Do. do. at 23/3360 ...	1	G—145
Do. do. at 23/6000 ...	1	G—146
Do. do. at 25/3560 and 24/6430 ...	1	G—147
Do. do. at 25/9530 ...	1	G—148
Do. do. at 26/8428 ...	1	G—149
Do. do. at 28/2135 ...	1	G—150
Do. do. at 28/9500 ...	1	G—151
Do. do. at 30/2135 ...	1	G—152
Do. do. at 30/2685 ...	1	G—153
Do. do. at 30/7835 ...	1	G—154
Do. do. at 32/6400 ...	1	G—155
Do. do. at 33/8334 ...	1	G—156
Do. do. at 34/2400 ...	1	G—157
Do. do. at 34/6250 ...	1	G—158
Do. do. at 35/3750 ...	1	G—159
Do. do. at 36/1570 and 36/3100 ...	1	G—160
Do. do. at 37/0800 ...	1	G—161
Do. do. at 37/8300 ...	1	G—162
Do. do. at 38/7800 ...	1	G—163
Do. do. at 39/8300 ...	1	G—164
Do. do. at 41/6000 ...	1	G—165
Do. do. at 42/1400 ...	1	G—166
Do. do. at 42/5400 and 42/6400 ...	1	G—167
Do. do. at 43/3500 ...	1	G—168
Do. do. at 44/2600 ...	1	G—169

*Portfolio No. 5.**Kalianodai Branch—*

Survey and sections of Kalianodai branch ...	7	G—169 to G—175
Typical cross sections of do. ...	1	G—176
Plan of Head Sluice ...	1	G—177
3' Drop at R. D. 0/1730 ...	1	G—178
B. class bridge with 3' Drop at R.D. 0/5855 ...	1	G—179
6' drop at R.D. 2/9450 ...	1	G—180
4' drop at R.D. 4/9250 ...	1	G—181
2' drop at R.D. 5/3210 ...	1	G—182

LIST OF PLANS—GRAND ANICUT CANAL SYSTEM—cont.

Particulars.	Number of sheets.	Plan number given.
<i>Portfolio No. 5—cont.</i>		
<i>Kalianodai Branch—cont.</i>		
Pipe sluice at R.D. 5/8820 ...	1	G—183
Regulator with 3' Drop at R.D. 6/7830 ...	1	G—184
4' drop at R.D. 7/0370 ...	1	G—185
2' drop at R.D. 7/3340 ...	1	G—186
<i>Vadakadu Branch—</i>		
Survey and sections of Vadakadu branch ...	4	G—187 to G—190
Plan of Regulator at Head ...	1	G—191
1' drop at R.D. 4/1474 ...	1	G—192
Regulator and Bridge at R.D. 5/6200 ...	1	G—193
<i>Rajamadam Branch—</i>		
Survey and Sections of Rajamadam branch ...	3	G—194 to G—196
Head sluice with 4' drop ...	1	G—197
10' drop at R.D. 0/1320 ...	1	G—198
Undertunnel at R.D. 0/4000 ...	1	G—199
3' drop at R.D. 1/2370 ...	1	G—200
Bridge with 4' drop at R.D. 1/5120 ...	1	G—201
6' drop at R.D. 2/0120 ...	1	G—202
Surplus sluice at R.D. 2/8620 ...	1	G—203
Regulator with 6' drop at R.D. 3/4795 ...	1	G—204
Pipe sluice at 2/9120 ...	1	G—205
<i>Pudupatnam Branch Canal—</i>		
Survey and sections of Pudupatnam branch ...	1	G—206
Head sluice with 3' drop ...	1	G—207
6' drop at R.D. 0/660 ...	1	G—208
<i>Portfolio No. 6.</i>		
C.S. of old Vennar diversion ...	1	G—208A
C.S. of G. A. canal from R.D. 0/0890 to R.D. 1/9720 ...	7	G—209 to G—215
Do. do. R.D. 12/0219 to R.D. 13/7640 ...	6	G—216 to G—221
Typical cross sections ...	1	G—222

LIST OF PLANS—VADAVAR SYSTEM.

Particulars.	Number of sheets.	Numbers given.
<i>Portfolio No. 7.</i>		
<i>Main Canal and Branches.</i>		
<i>The Vadavar and Vadavar Extension Canal—</i>		
Survey and longitudinal sections sheets ...	10	V—1 to V—10
Cross sections of the Mannargudi municipal channel ...	6	V—11 to V—16
Typical cross section sheet ...	1	V—17
Survey of the Muthalaimuthu Vari diversion and flood banks ...	1	V—18
Longitudinal sections of the above ...	2	V—19 to V—20
Supplemental head sluice ...	1	V—21
Site survey of the above ...	1	V—22
Regulator at R.D. 10/8300 ...	1	V—23
Drop 3' at R.D. 0/7920 ...	1	V—24
Drop 2' at R.D. 1/6500 ...	1	V—25
Drop 3' at R.D. 8/2170 combined with foot bridge ...	1	V—26
Drop 3' at R.D. 9/1080 ...	1	V—27
Drop 4' at R.D. 11/4180 ...	1	V—28
Drainage map ...	1	V—29
Super-passage for the Muthalaimuthu Vari diversion ...	1	V—30
Aqueduct at R.D. 12/9855 ...	1	V—31
Aqueduct at R.D. 13/8980 ...	1	V—32
Surplus sluice No. 1 ...	1	V—33
Surplus sluice No. 2 ...	1	V—34
Site survey of the above ...	1	V—35
Improvements to the Puliyampallem surplus. ...	1	V—36
Site survey of the above ...	1	V—37
Surplus sluice No. 4 ...	1	V—38
Site survey of the above ...	1	V—39
Irrigation-syphon under the Muthalaimuthu Vari diversion ...	1	V—40
Design for pipe sluices ...	1	V—41
<i>Portfolio No. 8.</i>		
Cross sections of the Vadavar ...	50	V—42 to V—91
<i>Distributaries—</i>		
General 8" Irrigation map ...	5	V—92 to V—96
<i>Portfolio No. 9.</i>		
Index-map showing the proposed distributaries ...	1	V—97
Type-plan of masonry bridge 12' span ...	1	V—98
Do. do. 10' and 8' spans ...	1	V—99
Do. do. 6' and 4' spans ...	1	V—100
Type-plan for pipe sluices for depths not exceeding 1'75' with and without shutter, and ...	1	V—101
Type-plan for pipe sluices for depths of 2' and 2'25' without shutter ...	1	V—102
Type-plan for pipe sluices for depths of 2' and 2'25' with shutter ...		
Type-plan for pipe sluices for depths of 2'5' and 2'75' with and without shutter ...	1	V—103
Type-plan for depths of 3' and 3'25' with and without shutter ...		
Type-plan for depths 3'5' and 3'75' with shutter ...	1	V—104
Type-plan for depths of 3'5' and 3'75' without shutter ...		
Type-plan for clear overfall sluices for depths not exceeding 1'75', with and without shutter ...	1	

LIST OF PLANS—VADAVAR SYSTEM—cont.

Particulars.	Number of sheets.	Numbers given.
<i>Portfolio No. 9—cont.</i>		
<i>Distributaries—cont.</i>		
Type-plan for clear overfall pipe sluices for depths of 2'5" and 2'75" with and without shutter ...	1	V—105
Do. for 2' open fall to discharge 10 cusecs ...	1	V—106
Do. for 2' open fall to discharge 25 cusecs ...	1	V—107
Do. for 2' open fall to discharge 50 cusecs ...	1	V—108
Do. for 3' open fall to discharge 10 cusecs ...	1	V—109
Do. for 3' open fall to discharge 25 cusecs ...	1	V—110
Do. for 4' syphon-well-drop to discharge 5 cusecs ...	1	V—111
Do. for 4' syphon-well-drop to discharge 10 cusecs ...	1	V—112
Do. for 4' syphon-well-drop to discharge 25 cusecs ...	1	V—113
Do. for 4' syphon-well-drop to discharge 50 cusecs ...	1	V—114
Do. for 4' open fall to discharge 100 cusecs ...	1	V—115
Do. for an outlet ...	1	V—116
Do. for cross wall with vent ...	1	V—117
<i>Puthur Channel—</i>		
Survey and longitudinal section sheets ...	5	V—118 to V—122
Cross section sheets ...	6	V—123 to V—128
Typical cross section sheet ...	1	V—129
Headsluice and 3' drop ...	1	V—130
Sluice for Pappan vaikal at 0 mile 660' ...	1	V—131
Headsluice and 2½' drop for Puthur No. 3 channel ...	1	V—132
1' drop at 0 mile 2,772' of Puthur No. 3 channel ...	1	V—133
Aqueduct at 0 mile 3,630' of Puthur No. 3 channel ...	1	V—134
Under-tunnel at 0 mile 4,158' of Puthur No. 3 channel ...	1	V—135
Aqueduct at 2 miles 4,950' of Puthur No. 3 channel ...	1	V—136
<i>Portfolio No. 10.</i>		
<i>Chettichatram Channel—</i>		
Survey and longitudinal section sheets ...	2	V—137 to V—138
Headsluice ...	1	V—139
2½' open fall at 3 miles 2,970' ...	1	V—140
1' drop at 4 miles 330' ...	1	V—141
5' syphon-well-drop at 0 mile 1,320' of Chettichatram No. 1 channel ...	1	V—142
Regulator at head of Chettichatram No. 2 channel ...	1	V—143
<i>Iluppadi Channel—</i>		
Survey and longitudinal section sheets ...	2	V—144 to V—145
Cross section sheets ...	6	V—146 to V—151
Headsluice and bridge at 0 mile 33' ...	1	V—152
Dividing dam at 1 mile 1,900' ...	1	V—153
Regulator at 3 miles 4,950' ...	1	V—154
<i>Muvanallur Channel—</i>		
Survey and longitudinal section sheets ...	3	U—155 to V—157
Headsluice ...	1	V—158
1' drop and bridge at 0 mile 4,818' ...	1	V—159
1' drop at 2 miles 3,828' ...	1	V—160
Headsluice for Muvanallur No. 1 channel ...	1	V—161

LIST OF PLANS—VADAVAR SYSTEM—cont.

Particulars.	Number of sheets.	Numbers given.
<i>Portfolio No. 10—cont.</i>		
<i>Muvanallur Channel—cont.</i>		
Under-tunnel at 0 mile 3,630' of the above channel ...	1	V—162
Regulator at head of Muvanallur No. 2 channel ...	1	V—163
<i>Mannargudi Channel—</i>		
Survey and longitudinal section sheets ...	6	V—164 to V—169
Head sluice ...	1	V—170
1' drop at 2 mile 1,980' ...	1	V—171
Girder bridge at 2 mile 3,300' ...	1	V—172
Regulator at 6 mile 990' ...	1	V—173
Head-slucce for municipal channel at 2 mile 4,340' ...	1	V—174
6' drop and bridge at 0 mile 790' of Mannargudi No. 3 channel ...	1	V—175
3' drop and bridge at 0 mile 3,130' of Mannargudi No. 6 channel ...	1	V—176
<i>Portfolio No. 11.</i>		
<i>Vadavar No. 1 Channel—</i>		
Survey and longitudinal section sheets (including Vadavar No. 2 channel) ...	3	V—177 to V—179
Head sluice ...	1	V—180
Regulator and bridge at 5 mile 1,815' ...	1	V—181
<i>Vadavar Extension Channel—</i>		
Survey and longitudinal section sheets ...	9	V—182 to V—190
Typical cross section sheet ...	1	V—191
Head sluice for Vadavar extension channel ...	1	V—192
3' drop at 3 mile 2,310' ...	1	V—193
2' drop and bridge at 4 mile 4,224' ...	1	V—194
2' drop at 5 mile 3,960' ...	1	V—195
4' drop at 8 mile 858' ...	1	V—196
2' drop and bridge at 8 mile 4,422' ...	1	V—197
Head sluice for Vadavar No. 3 channel ...	1	V—198
Regulator and bridge at 1 mile 4,422' on Vadavar No. 3 channel ...	1	V—199
Head sluice for Vadavar No. 4 channel ...	1	V—200
6' drop at 0 mile 1,320' on Vadavar No. 8 channel ...	1	V—201
Head sluice with 2'25" drop for Vadavar No. 10 channel ...	1	V—202
6' drop at 0 mile 2,310' on Vadavar No. 10 channel ...	1	V—203
<i>Palaiyar Channel—</i>		
Survey and longitudinal section sheets ...	4	V—204 to V—207
Typical cross section sheet ...	1	V—208
Head sluice ...	1	V—209
Girder bridge at 0 mile 4,470' ...	1	V—210
6' syphon well drop at 1 mile 2,970' ...	1	V—211
2' drop and bridge at 5 mile 3,927' ...	1	V—212
Under-tunnel at 6 mile 827' ...	1	V—213
Head sluice with bridge for Palaiyur No. 1 channel ...	1	V—214
Head sluice for Palaiyur No. 2 channel ...	1	V—215
2' drop and bridge at 0 mile 1,716' of Palaiyur No. 2 channel ...	1	V—216
Regulator and bridge at 0 mile 660' of Palaiyur No. 3 channel ...	1	V—217
Under-tunnel at 0 mile 2,310' of Palaiyur No. 3 channel ...	1	V—218
Cross sections at sites of under-tunnels ...	2	V—219 to V—220
<i>Maharajapuram Channel—</i>		
Survey and longitudinal section sheets ...	2	V—221 to V—222
Head sluice ...	1	V—223
4' drop at 0 mile 2,310' on Maharajapuram No. 3 channel ...	1	V—224

PART II

ABSTRACTS OF ESTIMATES.

PART II.

Abstracts of Estimates.

HEAD WORKS.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

I. WORKS.

B. LAND.

Estimate No. 1-H. (Plan No. 1-H.)

Estimate for acquisition of land for headworks.

Compensation for land for the dam site including water-spread area as per Return M of the Special Revenue Officer's report, dated 31st May 1910	..	..	5,50,000	5,50,000
Total of estimate ..	..	..	..	5,50,000
Total, B. Land ..	..	..	..	5,50,000
Grand Total ..	..	..	..	5,50,000

C. WORKS.

Estimate No. 2-H. (Plans Nos. 2-H to 13-H.)

Construction of Main dam.

537,852 sq. ft.	Benching and preparing foundations in rock ..	25 0 0	100 sq. ft.	1,34,463
2,848,444 c. ft.	Random rubble in surki mortar facing ..	26 4 0	100 c. ft.	7,47,717
31,380,718 "	Do. heating ..	24 4 0	100 "	76,09,825
108,754 "	Random rubble in cement ..	50 0 0	100 "	54,377
12,873 "	Cutstone archwork in cement ..	1 10 0	C. ft.	20,918
40,605 "	Cutstone in cement for floor, etc. ..	1 4 0	"	50,756
101,790 "	Wedge stone in cement ..	80 0 0	100 c. ft.	81,432
33,918 "	Concrete in surki mortar for toe protection ..	24 4 0	100 "	8,225
692,237 sq. ft.	Upstream face finish ..	15 0 0	100 sq. ft.	1,03,836
668,536 "	Downstream face finish ..	10 0 0	100 "	66,354
42,233 "	Pointing cutstone with cement ..	4 0 0	100 "	1,689
208 No.	Top of dam (roadway, parapets, etc.), Estimate No. 3-H ..	1,340 0 0	Span.	2,78,720
4,875,308 c. ft.	Excavation in hard rock ..	80 0 0	1,000 c. ft.	3,90,024
5,241,723 "	Excavation in soft rock ..	25 0 0	1,000 "	1,31,043
2,770,330 "	Earthwork, excavation in ordinary soil ..	10 0 0	1,000 "	27,704
8,012,053 "	Leading away spoil (earth and soft rock) ..	10 0 0	1,000 "	80,120
1,968,668 "	Earth filling in front of dam ..	20 0 0	1,000 "	39,374
1,470,866 "	Earth filling in rear of dam ..	10 0 0	1,000 "	14,710
6 No.	Conveyance of shutters and erection for construction sluices ..	1,000 0 0	Each.	6,000
1	Buttress No. I and storehouse (Estimate No. 4-H) ..	..	..	32,587
1	Deep supply sluices (Estimate No. 6-H) ..	..	..	8,76,021
1	Buttress No. II (Estimate No. 5-H) ..	..	..	16,709
	Central supply sluices (Estimate No. 7-H) ..	..	..	2,72,565
	Right supply sluices (Estimate No. 8-H) ..	..	..	1,40,302
684,600	Extra for Portland cement masonry in place of surki mortar masonry here and there as may be required 2 per cent on random rubble in surki mortar as above ..	23 12 0	100 c. ft.	11,184,571
	Petty supervision, 2 per cent ..	..	..	1,62,593
	Contingencies about 5 per cent ..	..	..	2,26,943
		..	..	5,67,893
	Total ..	..	..	12,142,000
	Add—			
	Diversion works in river bed ..		Lump sum.	80,000
	Pumping foundations ..	..	..	1,00,000
	Turbine pipes in the dam ..	..	..	24,000
	Closing construction sluices ..	..	..	15,000
	Yearly arrangements for surplus during construction ..	..	..	90,000
		..	..	3,09,000
	Total, Main dam ..	..	..	1,24,51,000

HEAD WORKS—cont.

Quantity.	Description of work	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

C. WORKS—cont.

Estimate No. 3-H. (Plan Nos. 6-H and 7-H.)

Estimate for one span of top of dam (Roadway and Parapets, etc.)

<i>Roadway for one span.</i>					
600 c. ft.	Random rubble in surki mortar facing ..	26 4 0	100 c. ft.	158	
525 "	Cutstone work corbels and blocking course, etc. (only the projections being dressed) ..	80 0 0	100 "	420	
949 "	Concrete in surki mortar ..	24 4 0	100 "	230	
141 sq. ft.	Plastering with cement, $\frac{3}{4}$ " thick (1 cement and 2 sand) ..	8 8 0	100 sq. ft.	12	
273 c. ft.	Metalling roadway ..	12 0 0	100 c. ft.	33	
268 sq. ft.	Pointing with cement ..	4 0 0	100 sq. ft.	11	
	Breeding, centering and removing ..			9	
<i>Parapets for one span.</i>					
338 c. ft.	Random rubble in surki mortar facing ..	26 6 0	100 c. ft.	89	
98 "	Cutstone coping for parapets in surki mortar ..	140 0 0	100 "	137	
572 sq. ft.	Pointing with cement ..	4 0 0	100 sq. ft.	23	
<i>Archwork for one span.</i>					
133 c. ft.	Cutstone archwork in cement ..	1 10 0	C. ft.	216	
47 sq. ft.	Pointing cutstone with cement ..	4 0 0	100 c. ft.	2	
	Total for one span of 26 feet (c to c of piers) ..			1,340	1,340

Estimate No. 4-H. (Plan No. 8-H.)

Buttress No. I and Storehouse at junction of Sections II and III Buttress.

93,144 c. ft.	Random rubble in surki mortar hearting ..	24 4 0	100 c. ft.	22,587	
5,239 "	Concrete in surki mortar ..	24 4 0	100 "	1,270	
158 "	Cutstone archwork ..	1 10 0	C. ft.	257	
893 sq. ft.	Plastering with cement, $\frac{3}{4}$ " thick (1 cement and 2 sand) ..	8 8 0	100 sq. ft.	76	
2,026 "	Pointing cutstone with cement ..	4 0 0	100 "	81	
400 "	Pointing parapets with cement ..	4 0 0	100 "	16	
94 c. ft.	Cutstone coping over parapets ..	140 0 0	100 c. ft.	132	
6,561 "	Random rubble in surki mortar facing ..	26 4 0	100 "	1,722	
3,281 sq. ft.	Rear face finish ..	10 0 0	100 sq. ft.	328	
2,426 c. ft.	Cutstone coping for piers ..	1 4 0	C. ft.	3,033	
	Total, Buttress ..				29,502

Store house.

3,957 c. ft.	Random rubble in surki mortar ..	26 4 0	100 c. ft.	1,039	
221 "	Cutstone archwork ..	1 10 0	C. ft.	359	
16 "	Cutstone in surki mortar ..	140 0 0	100 c. ft.	22	
1,827 sq. ft.	Plastering with mortar two coats and white-washing two coats ..	4 0 0	100 sq. ft.	73	
2,973 "	Pointing with cement ..	4 0 0	100 "	119	
848 "	Flooring with Cuddapah slabs 2" thick over a bed of 4" surki concrete and pointed with cement ..	30 0 0	100 "	254	
912 "	Jack arch terracing ..	35 0 0	100 "	319	
3,990 lb.	Roller steel joists, 9" x 4" at 21 lb. ..	8 0 0	Cwt.	285	
64 sq. ft.	Doors, panelled, including frames, hinges, bolts, etc. ..	1 8 0	Sq. ft.	96	
324 "	Batten windows with iron bars including frames, hinges, bolts, etc., complete ..	1 8 0	"	486	
1,035 "	Painting with chocolate paint, two coats ..	2 8 0	100 sq. ft.	26	
142 r. ft.	Cornice work ..	0 12 0	R. ft.	107	
	Total, Storehouse ..				3,185
	Total, Buttress and Storehouse ..				32,687

Estimate No. 5 H.

Buttress No. II at junction of Sections III and IV.

7,120 c. ft.	Random rubble in surki mortar facing ..	26 4 0	100 c. ft.	1,869	
55,454 "	Random rubble in surki mortar hearting ..	24 4 0	100 "	13,448	
3,920 sq. ft.	Rear face finish ..	10 0 0	100 sq. ft.	392	
	Total ..				15,709

HEAD WORKS—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

C. WORKS—cont.

Estimate No. 6-H (Plans Nos. 9-H to 11-H.)

Deep supply sluices.

35,111 sq. ft.	Benching and preparing foundations in rock ..	25 0 0	100 sq. ft.	8,778	
97,264 c. ft.	Random rubble in surki mortar facing ..	26 4 0	100 c. ft.	25,532	
217,427 "	Random rubble in cement ..	50 0 0	100 "	1,08,714	
1,915,023 "	Random rubble in surki mortar hearting ..	24 4 0	100 "	4,61,393	
64,916 "	Cutstone archwork in cement ..	1 10 0	C. ft.	1,05,489	
56,387 "	Cutstone in cement for floor, etc. ..	1 4 0	"	70,459	
46,927 sq. ft.	Upstream face finish ..	15 0 0	100 sq. ft.	7,039	
47,030 "	Downstream face finish ..	10 0 0	100 "	4,700	
78,570 "	Pointing cutstone with cement ..	4 0 0	100 "	3,143	
No. 14	Top of dam (roadway, parapets, etc.) ..	1,150 0 0	Span	16,100	
399 r. ft.	Hand railing ..	1 6 0	R. ft.	549	
69,275 c. ft.	Excavation in hard rock ..	80 0 0	1,000 c. ft.	5,542	
392,557 "	Excavation in soft rock ..	25 0 0	1,000 "	9,811	
392,557 "	Leading away spoil (soft rock) ..	10 0 0	1,000 "	3,925	
862,860 "	Excavation of supply channel in rear of deep supply sluice (downstream side) ..	25 0 0	1,000 "	21,571	
39,754 "	Excavation of leading channel in front of deep supply sluices (soft rock) ..	25 0 0	1,000 "	993	
39,755 "	Excavation of leading channel in front of deep supply sluices (hard rock) ..	80 0 0	1,000 "	3,180	
No. 14	Carriage and erection of sluice shutters at site, 32 tons each sluice ..	1,000 0 0	Each.	11,600	
	Carriage and erection of 1 curtain 35 tons ..			390	
	Carriage and erection of 1 crane ..			1,800	
	Total ..				8,76,021

Estimate No. 7-H (Plan No. 12 H.)

Central supply sluices.

150,550 c. ft.	Excavation in hard rock ..	80 0 0	1,000 c. ft.	12,044	
18,000 sq. ft.	Benching and preparing foundations in rock ..	25 0 0	100 sq. ft.	4,500	
381,212 c. ft.	Rubble in surki mortar hearting ..	24 4 0	100 c. ft.	92,414	
88,312 "	Rubble in surki mortar facing ..	23 4 0	100 "	23,182	
29,153 "	Rubble in cement ..	50 0 0	100 "	14,577	
59,858 "	Cutstone in cement ..	1 4 0	C. ft.	74,823	
1,129 "	Do. coping for parapets ..	140 0 0	100 c. ft.	1,581	
2,880 "	Do. archwork in cement ..	1 10 0	C. ft.	4,680	
603 "	Do. archwork for roadways ..	1 10 0	"	980	
3,981 "	Do. work for corbels, etc., dressed only at faces ..	80 0 0	100 c. ft.	3,185	
17,122 "	Concrete in surki mortar ..	24 4 0	100 "	4,152	
18,570 sq. ft.	Upstream face finish ..	15 0 0	100 sq. ft.	2,785	
48,216 "	Downstream face finish ..	10 0 0	100 "	4,822	
47,174 "	Pointing cutstone with cement ..	4 0 0	100 "	1,947	
3,611 "	Pointing parapets with cement ..	4 0 0	100 "	144	
1,634 "	Plastering with cement, $\frac{3}{4}$ " thick (1 cement and 2 sand) ..	8 8 0	100 "	139	
2,610 c. ft.	Road metalling ..	12 0 0	100 c. ft.	313	
310 r. ft.	Hand railings ..	1 6 0	R. ft.	426	
No. 16	Carriage and erection at site of shutter weight, 37 tons each shutter ..	1,500 0 0	Each.	25,600	
" 1	Carriage and erection of curtain ..	300 0 0		300	
	Total ..				2,72,565

Estimate No. 8-H (Plan No. 13-H.)

Right supply sluices 8 in number.

93,487 c. ft.	Excavation in hard rock ..	80 0 0	1,000 c. ft.	7,479	
46,744 "	Do. in soft rock ..	25 0 0	1,000 "	1,169	
12,580 sq. ft.	Benching and preparing foundations in rock ..	25 0 0	100 sq. ft.	3,245	
181,320 c. ft.	Rubble in surki mortar hearting ..	24 4 0	100 c. ft.	43,970	
43,045 "	Rubble in surki mortar facing ..	26 4 0	100 "	11,299	
23,040 "	Rubble in cement ..	50 0 0	100 "	11,520	
23,500 "	Cutstone in cement ..	1 4 0	C. ft.	23,375	
889 "	Do. coping for parapets ..	140 0 0	100 c. ft.	1,245	
872 "	Do. archwork in cement ..	1 10 0	C. ft.	1,417	
3,133 "	Do. work dressed only at faces ..	80 0 0	100 c. ft.	2,506	
18,736 "	Concrete in surki mortar ..	24 4 0	100 "	4,543	
22,774 sq. ft.	Pointing cutstone with cement ..	4 0 0	100 sq. ft.	911	
2,843 "	Do. parapet with cement ..	4 0 0	100 "	114	
2,163 "	Plastering with cement, $\frac{3}{4}$ " thick (1 cement and 2 sand) ..	8 8 0	100 "	194	
	Carried over ..				1,18,977

HEAD WORKS—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
C. WORKS—cont.					
Estimate No. 8-H (Plan No. 13-H)—cont Brought forward .. 1,18,977					
Right supply sluices 8 in number—cont.					
11,138 sq. ft.	Upstream face finish	15 0 0	100 sq. ft.	1,671	
22,753 "	Downstream face finish	10 0 0	100 "	2,275	
2,053 c. ft.	Metalling roadways	12 0 0	100 c. ft.	246	
242 r. ft.	Hand railings	1 6 0	R. ft.	323	
No. 8	Box girders carrying face wall with cement concrete filling.	400 0 0	Each.	3,200	
" 8	Carriage and erection at site of shutters (weight 38 tons each shutter).	1,700 0 0	"	13,600	
	Total				1,40,302

Estimate No. 9-H.

Provision of sluice shutters, Main dam (for delivery f.o.b. Madras).

6 No.	Sluices on Stoney Rollers with gear complete—				
14 "	For construction sluices each 6' X 12' ..	7,050 0 0	Each.	42,300	
16 "	For deep supply sluices each 6' X 12' ..	7,050 0 0	"	96,700	
	For central supply sluices each 6' X 25' with counter weight box.	11,250 0 0	"	1,80,000	
8 "	For right supply sluices 16' X 16' each with counter-weight box.	12,750 0 0	"	1,02,000	
1 "	Roller curtain for deep supply sluices, 13 tons.		Lump sum.	6,750	
1 "	Roller curtain for central supply sluices, 22 tons.		"	1,00,500	
2 sets.	Joists for supporting curtain, one for construction and one for deep supply sluices, 6 tons per set.	1,200 0 0	Set.	2,400	
1 set.	Joists for hanging curtain for central supply sluices, 13 tons.		"	2,600	
1 "	Special crane for manipulating curtain (vide Messrs. Ransomes & Rapiers' letter No. 7278, dated 1st July 1910).		"	16,500	
	Total				4,61,750
	Total, C. Works				1,29,12,750

K. BUILDINGS.

Estimate No. 10-H.

Construction of buildings.

Offices, workshops and stores, Public Works Department—quarters for staff, Public Works Department.				52,000	
Officers and Upper Subordinates				85,000	
Clerks and draftsmen				18,000	
Peons and watchmen				6,000	
Total				1,09,000	
Inspection bungalow				9,000	
Housing of workmen.					
100 artificers and mechanics				40,000	
Camp with maintenance				3,10,000	
Total				3,50,000	
Law and Police.					
Police station, cells, treasury and quarters for Magistrate and Police.				17,400	
Sanitation.					
Hospital with out-buildings and quarters for medical staff.				37,000	
Total, K. Buildings					5,74,400

HEAD WORKS—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

O. MISCELLANEOUS.

Estimate No. 11-H.

Miscellaneous Works.

Communications.					
Roads and railway tracks, construction, metalling, ballasting and upkeep (10 years) ..				3,15,000	
Sanitary works				50,000	
Water-supply.					
Installation of pumped and filtered pipe supply.				1,10,000	
Pumping and running expenses				40,000	
Total				5,15,000	5,15,000
Total, O. Miscellaneous					5,15,000

P. MAINTENANCE.

Maintenance of Works.

Maintenance of works during construction (15,000 yearly)				1,50,000	
Total, P. Maintenance					1,50,000

C. WORKS

Estimate No. 12-H. (Plans Nos. 14-H to 18-H.)

Constructing the main surplus sluices.

227,861 c. ft.	Random rubble in surki mortar	28 4 0	100 c. ft.	59,814	
25,572 "	Outstone work	1 4 0	C. ft.	31,985	
233,136 "	Rough stone pitching	8 0 0	100 c. ft.	18,651	
62,326 sq. ft.	Cement pointing	4 0 0	100 sq. ft.	2,493	
61,892 "	Grouting voids of apron	4 0 0	100 "	2,476	
1,093 c. ft.	Timber platform	5 0 0	C. ft.	5,465	
304 tons.	Scrap iron for counterbalance boxes	5 0 0	Ton.	1,520	
4,561 units.	Excavating foundations and cutting down saddle and removing up to 2 furlongs by tram line ..	35 0 0		1,59,635	
	Conveyance of shutters and erection at site ..			50,000	
32.75 c. ft.	Concrete in cement	60 0 0	100 c. ft.	1,965	
8,600 "	Metalling roadway	10 0 0		860	
	Total			3,34,844	
	Contingencies			16,742	
	Petty supervision			6,714	
	Total				3,58,300

Estimate No. 13-H. (Plans Nos. 17 and 18-H.)

Main surplus sluices, sluice shutters main surplus sluices (for delivery f.o.b. Madras).

19 No.	Sluices on Stoney rollers with gear complete each 40' X 15' for main surplus sluices including steel work for roadway (vide Messrs. Ransomes & Rapiers' letter No. 7278, dated 15th July 1910)	19,500 0 0	Each.	3,70,500	3,70,500
	Total, C. Works				7,28,800

HEAD WORKS—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS.		RS.	RS.
III.—TOOLS AND PLANT.					
Estimate No. 14-H.					
Headworks special tools and plant.					
	Central Power station (300 K.W.) with motors, overhead line and lighting plant	..	..	2,12,500	
	Pumping plant	..	..	19,800	
	Mortar and surki making plant	..	..	1,84,500	
	Quarry and stone working plant	..	..	27,000	
	Cranes and lifting plant	..	..	1,20,000	
	Workshop machinery	..	..	30,000	
	Stone crushing and concrete mixing plant	..	..	86,200	
	Road traction plant	..	..	70,000	
	Water conveyance, steam launches and barges.	..	..	2,00,000	
	Railway and tramway—				
	Track	2,77,000	..		
	Wagons	1,03,000	..		
	Locomotives	70,000	..		
				4,50,000	
	Unforeseen requirements	..	..	1,00,000	
					15,00,000
	Extra for machinery for additional output of 100 units concrete per day with special arrangements for extra cost of installing by Telfer system of conveyance.	..	..	..	5,60,000
	Grand Total	..	..	..	20,60,000

Abstract of Estimates.

GRAND ANICUT CANAL SYSTEM.
2. "MAIN CANALS AND BRANCHES."

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL.					
A. PRELIMINARY EXPENSES.					
Estimate No. 1-G.					
Preliminary expenses—Grand Anicut Canal.					
85 miles.	Share of cost of preliminary surveys	Lump sum.	..	40,000	
	Cost of acquiring land in Tanjore town	..	100 mile.	31,100	
	Laying out canal alignments during execution	..	..	8,500	
	Total	..	..	..	79,600
	Total, A. Preliminary Expenses	..	..	..	79,600

B. LAND.

Estimate No. 2-G.

Compensation for land to be acquired for the Grand Anicut Canal.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
33-70 acres.	Of wet land required for the diversion of the old Vennar into the Cauvery above the site of Grand Anicut	200 0 0	Acre.	6,740	
180-17 "	Wet land from head to R.D. 2/92-20	200 0 0	"	36,034	
5-05 "	Village-sites from R.D. 1/32-43 to 2/57-20	80 0 0	"	404	
15-13 "	Dry land from R.D. 1/97-20 to 2/16-54	80 0 0	"	1,210	
519-33 "	Do. " R.D. 2/92-20 to 11/97-19	80 0 0	"	41,546	
133-43 "	Wet land do. do.	200 0 0	"	26,888	
196-00 "	Dry land outside Tanjore town limits	80 0 0	"	15,680	
150-00 "	Wet land from R.D. 14/43-55 to 22/60-00	50 0 0	"	7,500	
150-00 "	Do. irrigated under wells R.D. 14/43-55 to 22/60-00	200 0 0	"	30,000	
89-43 "	Do. from R.D. 15/47-50 to 22/25-00	200 0 0	"	17,886	
95-00 "	Waste lands " 15/10-00 to 23/30-00	50 0 0	"	4,750	
16-21 "	Tank bed " 15/18-00 to 15/30-00	50 0 0	"	811	
241-00 "	Dry land from R.D. 23/30-00 to 31/26-75	50 0 0	"	12,050	
131-00 "	Wet land do. do.	200 0 0	"	26,200	
43-00 "	Do. irrigated under wells from R.D. 23/30-00 to 31/26-75	200 0 0	"	8,600	
132-39 "	Do. from R.D. 31/26-75 to 45/05-50	200 0 0	"	26,478	
55-40 "	Do. irrigated under wells from R.D. 31/26-75 to 45/05-50	200 0 0	"	11,680	
269-00 "	Dry land from R.D. 31/26-75 to 45/05-50	50 0 0	"	13,000	
	Total	..	..	2,86,656	
	Add 15 per cent for compulsory acquisition	..	..	42,998	
	Acquiring land through Muhammadan cemetery and the land in exchange between the Muhammadan cemetery and the Prince of Waies Medical school compound	Lump sum.	..	500	
2,480 units.	For temporary compensation for earth taken from borrow pits for bankings from R.D. 0 to 2/92-20	0 10 0	1,000 c. ft.	1,550	
19,224 "	Of earth for temporary compensation for earth taken from borrow pits for banking from R.D. 2/92-20 to 11/97-19	0 10 0	1,000 "	12,015	
1,284 "	Of earth for temporary compensation for earth taken from borrow pits for banking from R.D. 11/97-19 to R.D. 14/43-55	0 10 0	1,000 "	803	
11,880 "	Of earth for temporary compensation for earth taken from borrow pits for banking from R.D. 14/43-55 to R.D. 23/30-00	0 10 0	1,000 "	7,425	
14,212 "	Of earth for temporary compensation for earth taken from borrow pits for banking from R.D. 23/30-00 to R.D. 31/26-75	0 10 0	1,000 "	8,883	
9,613-5 "	Of earth for temporary compensation for earth taken from borrow pits for banking from R.D. 31/26-75 to R.D. 45/05-00	0 10 0	1,000 "	6,010	
	Total	..	..	3,66,839	
	Add sundries	..	..	1,581	3,68,420
	Total, B. Land	..	..	..	3,68,420

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

D. REGULATORS.

Estimate No. 3-G. (Plan Nos. G. 43 and 44.)

Constructing a head regulator for the Grand Anicut Canal.

390 units.	Concrete broken stone in surki mortar	20 4 0	100 c. ft.	7,898	
972-5 "	Table moulded brick in surki mortar	25 8 0	100 "	24,799	
1-86 "	Concrete broken stone in cement	65 0 0	100 "	121	
11,164 c. ft.	Cutstone work (facing stones)	1 4 0	C. ft.	13,955	
485 "	Do. (finely dressed)	2 0 0	"	972	
107 units.	Archwork (table moulded brick in surki mortar).	26 8 0	100 c. ft.	2,836	
82 6 "	Rubble in surki mortar	24 0 0	100 "	1,982	
528 "	Pointing with cement	4 0 0	100 sq. ft.	2,112	
350-5 "	Roughstone dry packing	12 12 0	100 c. ft.	4,469	
1,875 "	Gravel backing	4 7 0	100 "	83	
73 "	Road metalling, including graveling, etc., complete.	8 13 0	100 "	643	
No. 20	Guard stones	3 0 0	Each.	60	
600 units.	Earthwork excavating foundations	5 0 0	"	3,000	
No. 8	Box girders	462 0 0	"	3,696	
	Date and bench mark stones		Lump sum.	10	
	Centerings for arches		"	500	
	Baling water		"	1,000	
	Shed for materials		"	250	
No. 10	Demolishing existing ten lascar sheds at the side of the proposed regulator and re-erecting the same at some other convenient locality.	400 0 0	Each.	4,000	
	Remodelling existing rear return of Vennar regulator.		Lump sum.	1,000	
No.	8 shutters each 30' 0" X 4' 0" at Rs. 40 per sq. ft. delivered in Madras.	4,800 0 0	Each.	38,400	
No. 8	Extra for carriage to site and erection each sluice.	500 0 0	"	4,000	
	Total			115,786	
	Contingencies			5,795	
	Supervision			2,919	
	Total			1,24,500	

Estimate No. 4-G.

Regulator with bridge at R.D. 14/1640.

(a) One vent and one pier for the whole width of roadway, including screw gearing shutters, etc., complete.					
9-78 units.	Concrete broken brick in surki mortar	25 4 0		245-63	
5-76 "	Table moulded brick do.	28 14 0		166-32	
2-20 "	Archwork do. do.	29 14 0		65-73	
9-41 "	Cement plastering $\frac{3}{4}$ " thick 2 coats (1 cement and 3 sand).	6 12 0		63-62	
3-56 c. ft.	Teakwood wrought and put up	4 0 0		14-24	
25 "	Cutstone work, fine dressed	1 12 0		43-75	
1-80 "	Laterite blocks for pitching	25 4 0		45-45	
	Contingencies and petty supervision at 8 per cent.			51-61	
	Total			696-30	
(b) Two abutments and one vent, including front and rear wings. Revetment up and down canal.					
28-00 units.	Concrete broken bricks in surki mortar	25 4 0		707-00	
37-00 "	Table moulded brick do.	28 14 0		1,068-77	
2-20 "	Archwork do. do.	29 14 0		65-73	
18-00 "	Cement plastering, $\frac{3}{4}$ " thick 2 coats, 1 cement and 3 sand.	6 12 0		121-50	
3-76 "	Teakwood wrought and put up	4 0 0		14-24	
25-00 "	Cutstone work, fine dressed	1 12 0		43-75	
40-65 "	Laterite blocks for revetment, etc.	25 4 0		771-39	
9-33 "	Gravel backing	7 1 0		65-89	
	Contingencies and petty supervision at 8 per cent.			228-63	
	Total			3,086-50	
	Carried over			1,25,500	

GRAND ANICUT SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

D. REGULATORS—cont.

Estimate No. 4-G.—cont.

Brought forward .. 1,24,500

Regulator of 20 vents for the Grand Anicut Canal at R.D. 14/1640.

Item (a) 19 vents.	19 vents 15 X 696-30	696 3 0	Vent.	18,230	
Item (b)	Two abutments and one vent, including front rear wings, etc., cost 3086-50.	3,086 5 0		3,087	
Item (c) 20 vents.	Cost of screw gearing shutters 20 vents 20 X 182-4-0.	182 4 0	Vent.	3,645	
	Centering for arches		Lump sum.	500	
22 units.	(1) Earthwork	6 0 0	Unit.	132	
	(2) Baling water from foundations		Lump sum.	300	
	Shed for materials		"	200	
	Contingencies and petty supervision for items C 1 and 2.		"	6	
	Total			21,100	

Estimate No. 5-G. (Plan No. G. 45).

A Regulator of 15 spans at R.D. 15/9900.

194-50 units.	Concrete broken brick in surki mortar	21 11 0	100 c.ft.	4,218	
124-50 "	Table moulded brick in lime mortar	24 14 0	100 "	3,097	
29-53 "	Archwork brick in mortar	25 14 0	100 "	764	
100 "	Plastering with cement, $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 "	675	
48-43 "	Do. do.	6 12 0	100 "	327	
53-20 "	Concrete block revetment	22 12 0	100 "	1,210	
8-6 "	Brick jelly backing to revetment	10 10 0	100 "	91	
395 "	Cutstone work	1 12 0	C. ft.	631	
No. 15.	Screw gearing shutters, complete	182 4 0	Each.	2,734	
53-3 units.	Wood work (teak)	4 0 0	C. ft.	213	
	Earthwork, excavating foundations, etc., and forming.		Lump sum.	200	
	Sheds for materials		"	300	
	Centering for archwork		"	200	
	Total			14,720	
	Contingencies at 5 per cent			736	
	Petty supervision at $2\frac{1}{2}$ per cent			374	
	Total			15,830	

Estimate No. 6-G. (Plan No. G. 46).

Constructing a regulator at R.D. 19/2580.

50-00 units.	Concrete broken brick in surki mortar	24 14 0	100 c.ft.	3,731	
116-50 "	Table moulded brick in surki mortar	27 14 0	100 "	3,247	
22-80 "	Archwork segmental in mortar	28 14 0	100 "	658	
126-60 "	Plastering with cement, $\frac{3}{4}$ " thick (1. 3)	6 12 0	100 sq.ft.	854	
	Centering for archwork		Lump sum.	100	
50-10 "	Laterite stone revetment and apron	22 4 0	100 c.ft.	1,337	
420-30 "	Cutstone work	1 12 0	C.ft.	736	
9-30 "	Brick jelly backing to revetment	13 11 0	100 c.ft.	127	
46-22 "	Woodwork	4 0 0	C.ft.	185	
No. 13	Screw gearing shutters, etc., complete	171 4 0	Each.	2,226	
	Earthwork excavating foundations, forming bank and filling in, etc.		Lump sum.	85	
	*Cartage of iron articles to site, including railway fare.		"	186	
	Shed for materials		"	140	
	Total			13,612	
	Contingencies at 5 per cent			680	
	Supervision at $2\frac{1}{2}$ per cent			338	
	Total			14,630	
	Carried over			1,76,060	

GRAND ANICUT SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
RS. A. P. RS. RS.					
GRAND ANICUT CANAL—cont.					
D. REGULATORS—cont.					
Estimate No. 7-G (Plan No. G. 47).					
Regulator at R.D. 26/9428.					
130.10 units.	Concrete broken bricks in surki mortar ..	22 13 0	100 c.ft.	2,968	
102.90 "	Table moulded brick in lime mortar ..	25 6 0	100 "	2,611	
109.00 "	Cement plastering $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 sq. ft.	736	
19.50 "	Archwork in lime mortar ..	26 6 0	100 c.ft.	514	
206 "	Cutstone work ..	1 12 0	C.ft.	361	
96 "	Teakwood wrought and put up ..	4 0 0	"	384	
556 "	Concrete block apron and revetment ..	23 15 0	100 c.ft.	1,331	
85 "	Gravel backing ..	5 5 0	100 "	45	
No. 11.	Teakwood shutters with $2\frac{1}{2}$ " plank screw shafts $2\frac{1}{2}$ " diameter, including screw box, holding down bolts, angles, etc., complete.	180 0 0	Each.	1,930	
	Railway charges and cartage to site for shutters.		Lump sum.	70	
	Centering for arches ..		"	100	
	Excavating foundations, etc. ..		"	300	
	Sheds for materials ..		"	125	
	Total ..			11,523	
	Contingencies at 5 per cent ..			580	
	Petty supervision at $2\frac{1}{2}$ per cent ..			295	
	Total ..				12,400

Estimate No. 8-G. (Plan No. G. 48).

Regulator at R.D. 33/6600.					
64.20 units.	Concrete with broken brick jelly in surki mortar.	26 10 0	100 c.ft.	1,709	
56.60 "	Table moulded brick in lime mortar ..	29 2 0	100 "	1,649	
52.1 "	Cement plastering $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 sq. ft.	352	
79 "	Cutstone work ..	1 12 0	C. ft.	138	
25.30 "	Concrete block for revetment and pitching ..	27 4 0	100 c. ft.	689	
5.00 "	Gravel backing under revetment ..	5 5 0	100 "	27	
41.25 "	Teakwood wrought and put up ..	4 4 0	C. ft.	175	
No. 5	Teakwood shutters with planks $3\frac{1}{2}$ " thick, screw shafts $2\frac{1}{2}$ " diameter, including screw box brackets, holding down bolts and angle irons, etc., complete, cartage to site and fitting included.	200 0 0	Each.	1,000	
9.84 "	Archwork table moulded brick in mortar ..	30 2 0	100 c. ft.	297	
	Earthwork excavation and filling in ..		Lump sum.	100	
	Shed for materials ..		"	70	
	Centering for arches ..		"	80	
	Total ..			6,276	
	Contingencies at 5 per cent ..			316	
	Petty supervision at $2\frac{1}{2}$ per cent ..			158	
	Total ..				6,750

Estimate No. 9-G.

Regulator at R.D. 36/26'00.					
59.4 units.	Concrete brick jelly in surki mortar ..	22 5 0	100 c. ft.	1,325	
45.30 "	Table moulded brick in lime mortar ..	25 6 0	100 "	1,150	
44.80 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 sq. ft.	302	
9.9 "	Archwork table moulded brick in lime mortar ..	26 6 0	100 c. ft.	261	
79 "	Cutstone work ..	1 12 0	C. ft.	138	
24.27 "	Concrete block for revetment and pitching ..	23 5 0	100 c. ft.	566	
4.00 "	Gravel backing 6" under revetment ..	3 9 0	100 "	14	
41.25 "	Teakwood wrought and put up ..	4 0 0	C. ft.	165	
No. 5	Teakwood shutters with planks $3\frac{1}{2}$ " thick screw shafts $2\frac{1}{2}$ " diameter, including screw box holding down bolts, brackets, angle irons, etc., complete and cartage to site and fitting.	200 0 0	Each	1,000	
	Earthwork excavation and filling in ..		Lump sum.	110	
	Shed for materials ..		"	70	
	Centering for archwork ..		"	109	
	Total ..			5,200	
	Contingencies at 5 per cent ..			265	
	Petty supervision at $2\frac{1}{2}$ per cent ..			135	
	Total ..				5,600
	Carried over ..				2,00,810

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
RS. A. P. RS. RS.					
GRAND ANICUT CANAL—cont.					
D. REGULATORS—cont.					
Estimate No. 10 G. (Plan No. G. 49).					
A Regulator at R.D. 41/3500 of the Grand Anicut Canal.					
47.45 units.	Concrete with broken brick jelly in surki mortar.	24 4 0	100 c. ft.	1,150	
39.25 "	Table moulded brick in mortar ..	27 2 0	100 "	1,055	
7.88 "	Archwork table moulded in mortar ..	28 2 0	100 "	222	
36.37 "	Cement plastering $\frac{3}{4}$ " thick (1 to 3) ..	6 12 0	S. ft.	245	
20.90 "	Laterite block for revetment and pitching ..	19 4 0	100 c. ft.	402	
4.10 "	Gravel backing under revetments ..	7 1 0	100 "	29	
30.75 "	Teakwood wrought and put up ..	4 0 0	C. ft.	123	
63.00 "	Cutstone work ..	1 12 0	"	110	
No. 4.	Teakwood shutters with planks $3\frac{1}{2}$ " thick, screw shafts $2\frac{1}{2}$ " diameter, including screw box, brackets, holding down bolts, angle irons, etc., complete, including conveyance.	160 0 0	Each.	640	
	Earthwork excavating for foundations and filling in forming banks.		Lump sum	50	
	Shed for materials ..		"	45	
	Centering for archwork ..		"	80	
	Baling charges ..		"	25	
	Total ..			4,185	
	Contingencies at 5 per cent ..			209	
	Petty supervision at $2\frac{1}{2}$ per cent ..			105	
	Total ..				4,500
	Total, D. Regulators ..				2,05,310

Explanatory note regarding system of estimating for Syphon Aqueducts.

In order to give facilities for estimating for the cost of several syphon aqueducts of same type and general vertical dimensions (differences of levels) from the detail plan and estimate for one such work, it has been arranged in the case of such works as assimilate in type and levels to others to be constructed, to take out, and separately abstract, the quantities and cost of separate component parts of the work.

The component parts so abstracted are noted below.

Items—

(a) Cost of work in and under the bed of the canal per span of culvert per foot width of canal (span includes one arch and one pier with all work above or below it).

(b) Cost of two abutments and flooring and pitching and puddle work in the canal bed at approach and run off ends, less the cost of one pier and any foundation or superstructure above and below the width of one pier. The above to be per foot of canal bed width.

(c) Cost of balance of length of culverts or other arched over work not included under (a) with all work above or below this arched work per span of culvert.

(d) Cost of two abutments for portion (c) less one pier with all carried over or below the width of one pier. This item will be a lump sum.

(e) Cost of wing upstream (e_1) and downstream (e_2) end of culverts and revetment of drainage and canal margins and pitching of any part of canal bed or drainage bed (such as contraction triangles) not included in items (b) (i) and (j). These are lump sum items.

(f) Cost of canal wings (in type III only). This is a lump sum item.

(g) Cost of works above upstream end of culverts from and including drop wall to the face wall over arches—per span of culvert.

(h) Same as (g) on the downstream side of culverts from face of arches up to and including the lift wall.

(i) Flooring in drainage bed upstream of drop wall including puddle—per span of culvert.

(j) Flooring in drainage bed downstream—per span.

It will be noticed that for the same "rates" the items are unaltered for works having materially the same differences of level between chief components, viz. :—

Bed of canal—F.S.L. canal.

Ground level—Drainage bed and culvert bed where the work is for archways of the same span, sectional area and foundations.

(d), (e), (f) are lump sum items.

(g), (h), (i), (j) are span items.

"(a)" is an item dependent on canal bed-width and number of spans.

(b) is a "canal bed-width" item.

Examples—

A work of 6 spans of 6 feet with a bed-width of aqueduct of 120 feet will cost

$(a + g + h + i + j) \times 6 + 120 \times 6 \times a + 120 b + d + e + f$

A similar work of 4 spans with bed-width 95 feet will cost

$(a + g + h + i + j) \times 4 + 95 \times 4 \times a + 95 b + d + e + f$.

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS.					
Estimate No. 11-G. (Plan No. G. 44).					
Excavating for the proposed diversion of the old Vennar into the Cauvery river.					
2,740 units.	Earthwork in section I to III and left bank to the end where it joins on with the existing old Vennar bank.	5 8 0	1,000 c. ft.	15,070	
1,220 "	Right banks and padugai from C.S. No. 3 to the end where R.B. joins on with the existing old Vennar bank.	7 2 0	1,000 "	8,693	
323.6 "	Rough stone revetment and apron	13 12 0	100 "	4,399	
73 "	Gravel backing for revetment	4 7 0	"	324	
	Contingencies at 5 per cent			1,335	
	Petty supervision at 2½ per cent			659	
	Total				30,480

Constructing an irrigation syphon across the old Vennar diversion (Plan No. G. 50)

111.6 units.	Concrete broken stone in surki mortar	20 9 0	100 c. ft.	2,295	
126.8 "	Table moulded bricks do.	25 10 0	"	3,249	
57.4 "	Archwork in surki mortar	26 10 0	"	1,528	
	Centering charges 40 per cent			603	
86.8 "	Plastering with Portland cement ¾" thick (1 cement and 3 sand).	6 12 0	Sq. ft.	586	
3.4 "	Rough stone revetment	12 12 0	100 c. ft.	43	
1 "	Gravel backing	4 7 0	"	5	
0.28 "	Cuddapah slab doring	30 0 0	"	8	
	Earthwork excavating foundations		Lum sum.	150	
	Sheds for materials			80	
	Contingencies at 5 per cent			427	8,577
	Supervision			216	
	Grand total				39,700

Estimate No. 12 G. (Plan Nos. 51 and 52).

Syphon aqueduct at R.D. 2/1390 of the Grant Anicut Canal across the proposed diversion of the Adappampallam drain near Indalur.

(a) Under canal bed per foot run of canal bed width for one span clear of abutments.					
0.16 units.	Brick jelly concrete in surki	21 11 0	100 c. ft.	3.47	
0.26 "	Table moulded bricks in surki	25 13 0	100 "	6.71	
0.26 "	Archwork in surki	26 13 0	"	6.97	
0.36 "	Laterite stone packing	12 4 0	"	4.41	
0.40 "	Cement plastering (1 cement and 3 sand) ¾" thick.	6 12 0	100 sq. ft.	2.70	
0.15 "	Earthwork excavation (soil, hornblende schist).	15 0 0	1,000 c. ft.	1.95	
0.05 "	Do. (red clay and black loam)	4 5 0	"	0.22	
	Contingencies at 5 per cent.			1.32	26.43
	Supervision at 2½ per cent.			0.66	
	Total (a)				28.41
(b) Under canal bed per foot run of canal bed width for two abutments less one pier.					
1.07 units.	Brick jelly concrete in surki	21 11 0	100 c. ft.	1.52	
1.07 "	Table moulded bricks in surki	25 13 0	"	27.62	
1.60 "	Laterite stone packing	12 4 0	"	19.80	
0.33 "	Cement plastering ¾" thick; 1:3	6 12 0	100 sq. ft.	0.20	
4.04 "	Puddle clay work	10 0 0	100 c. ft.	4.04	
0.12 "	Earthwork excavation (soil, hornblende schist).	15 0 0	1,000 "	1.80	
0.06 "	Do. (red clay and black loam).	4 5 0	1,000 "	0.26	
	Contingencies at 5 per cent			2.75	55.64
	Supervision at 2½ per cent			1.38	
	Total (b)				4.13
	Carried over				39,700

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 39,700					
Estimate No. 12-G.—cont.					
Syphon aqueduct at R.D. No. 2/1390 of the Grand Anicut Canal across the proposed diversion of the Adappampallam drain near Indalur—cont.					
(c) Balance of culvert length arched over and carrying banks up and down-stream for the whole length for one span clear of abutments.					
1.36 units.	Brick jelly concrete in surki	21 11 0	100 c. ft.	29.50	
18.43 "	Table moulded bricks in surki	25 13 0	"	475.73	
4.72 "	Do. archwork in surki	26 13 0	"	126.56	
5.40 "	Laterite stone packing	12 4 0	"	66.15	
15.35 "	Cement plastering ¾" thick; 1:3	6 12 0	100 sq. ft.	103.61	
2.27 "	Earthwork excavation (soil hornblende schist).	15 0 0	1,000 c. ft.	34.05	
0.95 "	Do. (red clay and black loam)	4 5 0	"	4.10	
	Contingencies at 5 per cent			41.99	839.70
	Supervision at 2½ per cent			20.99	
	Total (c)				62.98

(d) Balance of culvert length arched over and carrying banks up and down-stream for the whole length for two abutments less one pier.

1.40 units.	Brick jelly concrete in surki	21 11 0	100 c. ft.	30.36	
29.71 "	Table moulded bricks in surki	25 13 0	"	766.89	
0.27 "	Cement plastering ¾" thick; 1:3	6 12 0	100 sq. ft.	1.82	
2.43 "	Earthwork excavation (soil hornblende schist).	15 0 0	1,000 c. ft.	36.45	
1.20 "	Do. (red clay and black loam)	4 5 0	"	5.17	
	Contingencies at 5 per cent			42.34	840.39
	Supervision at 2½ per cent			21.02	
	Total (d)				63.06

(e) Wings up-stream of culvert, including revetments for canal banks and drainage and also apron of the contracted portions of the drainage and canal banks.

2.92 units.	Brick jelly concrete in surki	21 11 0	100 c. ft.	63	
63.80 "	Table moulded bricks in surki	25 13 0	100 "	1,547	
80.65 "	Laterite stone packing	12 4 0	100 "	988	
18.08 "	Gravel backing	2 4 0	100 "	41	
52.80 "	Puddle clay work	10 0 0	1,000 "	528	
1.78 "	Cement plastering ¾" thick; 1:3	6 12 0	100 sq. ft.	93	
2.61 "	Earthwork excavation (soil hornblende schist).	15 0 0	1,000 c. ft.	39	
24.84 "	Do. banking	4 5 0	1,000 "	107	
	Extra cost of concrete apron			421	
	Contingencies at 5 per cent			196	3,927
	Supervision at 2½ per cent			98	
	Total (e)				294

N.B.—The cost of earthwork excavation in the red clay and black loam soil has been left out as the quantity is less than the quantity of earth required for banking.

(f) Wings down-stream of culvert, including revetments for canal banks and drainage and also apron of the contracted portions of the drainage and canal banks.

2.20 units.	Brick jelly concrete in surki	21 11 0	100 c. ft.	48	
44.00 "	Table moulded bricks in surki	25 13 0	100 "	1,136	
88.97 "	Laterite stone packing	12 4 0	100 "	1,090	
20.86 "	Gravel backing	2 4 0	100 "	47	
52.80 "	Puddle clay work	10 0 0	1,000 "	53	
11.39 "	Cement plastering ¾" thick; 1:3	6 12 0	100 sq. ft.	77	
1.81 "	Earthwork excavation (soil hornblende schist).	15 0 0	1,000 c. ft.	27	
16.51 "	Do. banking	4 5 0	1,000 "	71	
	Extra cost of concrete apron			615	
	Carried over				3,164
	Carried over				3,970.0

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 39,700

Estimate No. 12-G.—cont.

Syphon aqueduct at R.D. No. 2/1390 of the Grand Anicut Canal across the proposed diversion of the Adappampallam drain near Indalur—cont.

	Contingencies at 5 per cent	..	..	158	
	Supervision at 2½ per cent	..	..	79	
	Total ..	..	..	..	237
		..	..	..	3,401
	N.B.—The cost of earthwork excavation in red clay and black loam soil has been left out as the quantity is less than the quantity of earth required for banking.				
	(f) Wings connecting side walls of aqueduct up and down-stream of culvert, if any, to canal bank.				
1.95 units.	Brick jelly concrete in surki	21 11 0	100 c. ft.	43	
60.30 "	Table moulded bricks in surki	25 13 0	100 "	1,556	
3.91 "	Cement plastering, ¾" thick; 1:3	6 12 0	100 sq. ft.	60	
1.52 "	Earthwork excavation (soil hornblende schist).	15 0 0	1,000 c. ft.	23	
2.42 "	Do. (red clay and black loam).	4 5 0	1,000 "	10	
	Contingencies at 5 per cent	..	..	85	1,692
	Supervision at 2½ per cent	..	..	43	
	Total ..	..	..	..	128
		..	..	..	1,820
	(g) Masonry flooring and drop wall between wings and not under arches and up to drainage bed level for one span for the whole length on the up-stream side of the culvert.				
3.38 units.	Brick jelly concrete in surki	21 11 0	100 c. ft.	8.24	
9.33 "	Table moulded bricks in surki	25 13 0	100 "	242.12	
3.60 "	Laterite stone packing	12 4 0	100 "	44.10	
4.12 "	Cement plastering, ¾" thick; 1:3	6 12 0	100 sq. ft.	27.81	
1.64 "	Earthwork, excavation (soil hornblende schist).	15 0 0	100 "	24.60	
68 "	Do. (red clay and black loam).	4 5 0	100 "	2.93	
	Contingencies at 5 per cent	..	..	17.49	349.80
	Supervision at 2½ per cent	..	..	8.75	
	Total ..	..	..	..	26.24
		..	..	..	378.04
	(h) Cushion and lift wall between wings and not under arches and up to drainage bed level for one span for the whole length on the down-stream side of culvert.				
1.36 units.	Brick jelly concrete in surki	21 11 0	100 c. ft.	29.50	
7.15 "	Table moulded bricks in surki	25 13 0	100 "	184.56	
2.70 "	Cement plastering, ¾" thick; 1:3	6 12 0	100 sq. ft.	18.22	
1.22 "	Earthwork, excavation (soil hornblende schist).	15 0 0	1,000 c. ft.	18.30	
95 "	Do. (red clay and black loam).	4 5 0	1,000 "	4.10	
	Contingencies at 5 per cent	..	..	12.74	254.68
	Supervision at 2½ per cent	..	..	6.37	
	Total ..	..	..	..	19.11
		..	..	..	273.79
	(i) Pitching, etc., between wings on the up-stream bed per span parallel to canal.				
27.38 units.	Brick jelly concrete in surki	21 11 0	100 c. ft.	593.80	
21.11 "	Laterite stone packing	12 4 0	100 "	258.60	
8.41 "	Earthwork excavation (red clay and black loam).	4 5 0	1,000 "	36.27	
	Deduct the extra cost for concrete apron	..	..	..	888.67
	Net total ..	..	..	..	452.67
	Carried over ..	..	..	..	39,700

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 39,700

Estimate No. 12-G.—cont.

Syphon aqueduct at R.D. No. 2/1390 of the Grand Anicut Canal across the proposed diversion of the Adappampallam drain near Indalur—cont.

	Contingencies at 5 per cent	..	..	22.63	
	Supervision at 2½ per cent	..	..	11.32	
	Total for the whole width of the drainage bed.	..	..	..	33.95
	Hence total for one span ..	..	..	..	486.62
		..	..	..	486.62
	(f) Pitching, etc., between wings on the down-stream bed per span parallel to canal.				
42.02 units.	Brick jelly concrete in surki	21 11 0	100 c. ft.	868	
23.49 "	Laterite stone packing	12 4 0	100 "	288	
6.35 "	Earthwork excavation (soil hornblende schist)	15 0 0	1,000 c. ft.	95	
21.32 "	Do. (red clay and black loam).	4 5 0	1,000 "	92	
	Deduct the extra cost for concrete apron	..	..	..	1,343
	Net total ..	..	..	..	638
		..	..	..	705
	Contingencies at 5 per cent	..	..	35	
	Supervision at 2½ per cent	..	..	18	
	Total cost for the whole width of the drainage bed ..	..	..	..	53
		..	..	..	758
	Diversion of the Adappampallam drain.				
230.0 units.	Earthwork banking above aqueduct	4 5 0	1,000 c. ft.	992	
196.0 "	Do. excavation below aqueduct	4 5 0	1,000 "	845	
	Contingencies at 5 per cent	..	..	90	1,837
	Supervision at 2½ per cent	..	..	43	
	Total ..	..	..	..	133
		..	..	..	1,970
	N.B.—The cost of earthwork excavation above aqueduct has been left out as the quantity is less than the quantity of earth required for banking. And the cost of earthwork banking below aqueduct has been left out as the quantity is less than the quantity of earth obtained by cutting.				
	Constructing a syphon for irrigation and drainage at R.D. No. 2/1390.				
57.1 units.	Concrete, brick jelly in surki mortar	21 11 0	100 c. ft.	1,238	
32.3 "	Table-moulded brick in surki mortar	25 13 0	100 "	834	
28.44 "	Archwork, brick in surki mortar	26 13 0	100 "	753	
26.3 "	Plastering with Portland cement, ¾" thick; 1:3	6 12 0	100 sq. ft.	178	
6.6 "	Do. do. ¾" thick; 1:3	6 12 0	100 "	45	
1.75 "	Teakwood needle shutters	4 0 0	100 c. ft.	7	
0.30 "	Laterite block apron	12 4 0	100 c. ft.	4	
	Earthwork excavation	..	..	..	Lump sum.
	Baling charges	..	..	..	300
	Shed for materials	..	..	..	50
	Centerings for archwork	..	..	..	30
		..	..	..	90
	Contingencies at 5 per cent	..	..	172	3,539
	Supervision at 2½ per cent	..	..	89	
	Total ..	..	..	..	261
		..	..	..	3,800
	Carried over ..	..	..	..	39,700

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		Rs.		Rs.	Rs.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward ... 39,700

Estimate No. 12-G—cont.

Syphon Culvert at R.D. No. 2/1390 of the Grand Anicut Canal across the proposed diversion of the Adappampallam drain near Indalur and the diversion of the drainage.

120 R. ft.	Canal bed width for 6 spans at Rs. 28.41 per foot run per span.	6 + (28.41)	R. ft.	20,455	
120 "	For two abutments less one pier in canal bed per foot run.	59.17	"	7,100	
6 spans.	Portion of culvert arched over up and down-stream for 6 spans.	902.68	Span.	5,418	
1 span.	For two abutments less one pier in the portion of culvert arched over up and down-stream.	904	Lump sum.	904	
1 "	Wings up-stream of culvert including revetments for the canal banks and drainage and also apron of the contracted portion of canal.	4,221	"	4,221	
1 "	Wings down-stream of culvert including revetments of the canal banks and drainage and also apron of the contracted portion of canal.	3,401	"	3,401	
1 "	Wings connecting side walls of aqueduct to canal bank up and down-stream.	1,820	"	1,820	
0 spans.	Drop, etc., between wings up to drainage bed level on the up-stream side for 6 spans.	376.04	Span.	2,256	
6 "	Cushion, etc., between wings up to drainage bed level on the down-stream side for 6 spans.	273.79	"	1,643	
	Pitching, etc., in the drainage bed up-stream for 6 spans.	487	"	487	
	Pitching, etc., in the drainage bed down-stream for 6 spans.	758	"	758	
	Cost of earthwork in cutting and banking for the diversion of the Adappampallam drain above and below aqueduct.			1,970	
	Centering for archwork		Lump sum.	500	
	Baling water		"	500	
	Shed for materials		"	469	
	Amount as per separate estimate for constructing a syphon for irrigation and drainage across the Adappampallam drain.			3,800	51,900
	Total for work at R.D. 2/3190				55,700

Estimate No. 13-G.—(Plan No. G-53.)

Syphon aqueduct of 18 vents of 12' x 6' at R.D. 4/0784.

1,914 units.	Concrete broken brick in surki mortar	21 4 0	100 c. ft.	40,673	
1,106 "	Table moulded brick work in surki mortar	25 9 0	100 "	23,272	
628 "	Archwork in surki mortar	26 9 0	100 "	16,681	
1,585 "	Plastering with Portland cement, $\frac{3}{4}$ " thick; 1:3.	6 12 0	100 sq. ft.	10,699	
518.5 "	Laterite blocks for apron and revetment	13 4 0	100 c. ft.	6,870	
24 "	Gravel backing	4 7 0	100 "	107	
	Excavating foundations and filling, etc., complete		Lump sum.	3,000	
	Removing the earth in front and rear of the viaduct		"	1,000	
	Baling water and planking the sides of the concrete in foundation.		"	2,000	
45,000	Filling trenches rear of abutments with puddle..	10 0 0	1,000 c. ft.	450	
	Laying centerings for the arches and removing.		Lump sum.	1,500	
1,300 R. ft.	Hand railing with angle iron uprights $2\frac{1}{2}$ " x $2\frac{1}{2}$ " x $\frac{3}{4}$ " at intervals of 8 feet with flat bars, etc., complete at Rs. 1-8-0 per R. ft.	1 8 0	R. ft.	1,950	
	Sheds for materials		Lump sum.	1,000	
	Contingencies at 5 per cent			5,700	
	Petty supervision at $2\frac{1}{2}$ per cent			2,698	
	Total				1,22,800
	Carried over				2,18,000

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		Rs. A. P.		Rs.	Rs.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 2,18,000

Estimate No. 14-G.—(Plan No. 54-G.)

Syphon aqueduct of 7 spans of 6' each at R.D. 4/7562.

532.05 units.	Concrete, broken brick in surki mortar	22 12 0	100 c. ft.	12,115	
420.50 "	Table-moulded brick in surki mortar	26 12 0	100 "	11,248	
299.91 "	Archwork, table-moulded brick in surki mortar.	27 12 0	100 "	8,322	
571.00 "	Cement plastering, $\frac{3}{4}$ " thick; 1:3	6 12 0	100 sq. ft.	3,854	
180.12 "	Laterite blocks for revetment and pitching	14 4 0	100 c. ft.	2,567	
24.48 "	Gravel backing	5 5 0	100 "	130	
281.43 "	Clay puddle	10 0 0	1,000 c. ft.	281	
53 "	Earthwork, excavating foundations	5 10 0	1,000 "	298	
1.777 "	Do. rear channel	3 12 0	1,000 "	6,664	
	Baling water		Lump sum.	1,200	
	Shed for materials		"	600	
	Centering for arches		"	1,000	
	Contingencies at 5 per cent			2,445	
	Petty supervision at $2\frac{1}{2}$ per cent			1,276	
	Total				52,000

Estimate No. 15-G.

Syphon aqueduct at R.D. 5/5070 (8 vents of 12' x 6').

(a) Under bed of canal for one span of a pier and vent clear of abutment per foot run of canal bed width.					
5938 units.	Concrete in surki mortar	22 13 0	100 c. ft.	13,54	
2081 "	Table-moulded brick in surki mortar	27 8 0	100 "	5,66	
2648 "	Archwork	28 3 0	100 "	7,46	
52 "	Cement plastering, 2 coats, $\frac{3}{4}$ " thick; 1:3	6 12 0	100 sq. ft.	3,51	
112 "	Earthwork (same rate as for bank)	4 5 0	100 c. ft.	0,61	
	Contingencies and petty supervision at 8 per cent.			2,46	
	Total				33,24
(b) Under bed of canal two abutments less one pier per foot run of canal bed width including pitching on canal bed, etc.					
365 units.	Concrete in surki mortar	22 13 0	100 c. ft.	8,33	
5925 "	Table-moulded brick in surki mortar	27 3 0	100 "	16,00	
120 "	Laterite blocks for revetment	16 4 0	100 "	19,50	
304 "	Clay puddle	10 0 0	1,000 "	3,04	
124 "	Earthwork	4 5 0	1,000 "	0,53	
	Contingencies and petty supervision at 8 per cent.			3,80	
	Total				51,29
(c) Balance of culvert length under banks up-stream clear of abutments for one span length of a pier and vent.					
3,178 units.	Concrete in surki mortar	22 13 0	100 c. ft.	72,50	
6,447 "	Table-moulded brick in surki mortar	27 3 0	100 "	175,30	
1,418 "	Archwork in surki mortar	28 3 0	100 "	40,00	
6,291 "	Cement plastering with 2 coats, $\frac{3}{4}$ " thick; 1:3	6 12 0	100 sq. ft.	42,47	
945 "	Earthwork	4 5 0	1,000 c. ft.	4,07	
	Contingencies and petty supervision at 8 per cent.			26,74	
	Total				261,08
(e) Balance of culvert length down-stream clear of abutment for one span of a pier and vent.					
7,874 units.	Concrete in surki mortar	22 13 0	100 c. ft.	179,60	
8,704 "	Table-moulded brick in surki mortar	27 3 0	100 "	236,68	
2,668 "	Archwork	28 3 0	100 "	75,21	
9,226 "	Cement plastering with 2 coats, $\frac{3}{4}$ " thick; 1:3	6 12 0	100 sq. ft.	62,28	
1,980 "	Earthwork	4 5 0	1,000 c. ft.	8,53	
	Contingencies and petty supervision at 8 per cent.			44,98	
	Total				607,28
	Carried over				2,70,000

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount	Total.
(1)	(2)	(3)	(4)	(5)	(6)
	RS. A. P.			RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 2,70,000					
Estimate No. 15-G.—cont.					
Syphon aqueduct at R.D. 5/5070 (8 vents of 12' × 6')—cont.					
(d ₁) Two abutments less one pier for the whole length of portion c, up-stream.					
2-81 units.	Concrete in surki mortar	22 13 0	100 c. ft.	64-10	
6-91 "	Table moulded brick in surki mortar	27 3 0	100 "	187-88	
9-62 "	Earth work	4 5 0	1,000 "	4-14	
	Contingencies and petty supervision at 8 per cent.			2,049	
	Total				276-61
(d ₂) Two abutments less one pier for the whole length of portion (e ₂) down-stream.					
6-25 units.	Concrete surki mortar	22 13 2	100 c. ft.	142-58	
15-54 "	Table moulded brick in surki mortar	27 3 0	100 "	422-53	
2-139 "	Earthwork	4 5 0	1,000 "	9-22	
	Contingencies and petty supervision at 8 per cent.			45-95	
	Total				620-98
(e ₁) Wings up-stream of culvert including revetment for canal banks and drainage and also apron for the contracted portion of drainage and canal bed.					
71-51 units.	Concrete in surki mortar	22 13 0	100 c. ft.	1,631-14	
51-62 "	Table-moulded brick in surki mortar	27 3 0	100 "	1,403-03	
14-02 "	Cement plastering, 2 coats, $\frac{3}{4}$ " thick, 1: 3	6 12 0	100 sq. ft.	94-93	
30-47 "	Laterite block for revetment	16 4 0	100 c. ft.	495-13	
9-50 "	Gravel backing	6 4 0	100 "	59-62	
6-126 "	Earthwork	4 5 0	1,000 "	26-40	
	Contingencies and petty supervision at 8 per cent.			296-79	
	Total				4,006-74
(e ₂) Wings down-stream side of culvert including revetment for canal banks and drainage and also apron of the contracted portion of drainage and canal bed.					
73-72 units.	Concrete in surki mortar	22 13 0	100 c. ft.	1,681-55	
56-39 "	Table-moulded brick in surki mortar	27 3 0	100 "	1,533-24	
15-98 "	Cement plastering, 2 coats, $\frac{3}{4}$ " thick, 1: 3	6 12 0	100 sq. ft.	108-00	
29-08 "	Laterite blocks for revetment	16 4 0	100 c. ft.	472-55	
9-50 "	Gravel backing	6 4 0	100 "	59-37	
6-105 "	Earthwork	4 5 0	1,000 "	26-31	
	Contingencies and petty supervision at 8 per cent.			310-48	
	Total				4,191-50
(f) Wings connecting side walls of Aqueduct to canal banks.					
13-98 units.	Concrete in surki mortar	22 13 0	100 c. ft.	318-88	
51-75 "	Table-moulded brick in surki mortar	27 3 0	100 "	1,407-08	
6-86 "	Cement plastering, 2 coats, $\frac{3}{4}$ " thick, 1: 3	6 12 0	100 sq. ft.	46-30	
2-154 "	Earthwork	4 5 0	1,000 c. ft.	9-28	
	Contingencies and petty supervision at 8 per cent.			142-52	
	Total				1,924-06
(g) Up-stream masonry, etc., per span parallel to canal including pitching of stream bed.					
6-75 units.	Concrete in surki mortar	22 13 0	100 c. ft.	153-96	
6-615 "	Table-moulded brick in surki mortar	27 3 0	100 "	179-86	
5-34 "	Cement plastering, 2 coats, $\frac{3}{4}$ " thick, 1: 3	6 12 0	100 sq. ft.	36-04	
8-70 "	Laterite blocks for pitching	16 4 0	100 c. ft.	141-37	
2-138 "	Earthwork	4 5 0	1,000 "	9-21	
	Contingencies and petty supervision at 8 per cent.			41-63	
	Total				562-07
	Carried over				2,70,000

26-

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
	RS. A. P.			RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 2,70,000					
Estimate No. 15-G.—cont.					
Syphon Aqueduct at R.D. 5/5070 (8 vents of 12' × 6')—cont.					
(h) Down-stream masonry, etc., per span parallel to canal including pitching of stream-bed.					
9-00 units.	Concrete in surki mortar	22 13 0	100 c. ft.	205-31	
1-79 "	Table-moulded brick in surki mortar	27 3 0	100 "	48-67	
3-95 "	Cement plastering 2 coats 1: 3	6 12 0	100 sq. ft.	26-55	
7-65 "	Laterite blocks for pitching	6 4 0	100 c. ft.	124-31	
2-415 "	Earthwork	4 5 0	1,000 "	10-41	
	Contingencies and petty supervision at 8 per cent.			33-22	
	Total				418-48
Syphon Aqueduct of 8 vents of 12' × 6' at R.D. 5/5070.					
3 × 117 (a)	Under bed of canal per foot run of bed-width one vent and pier.	33-241	R. ft. under vent.	31,113	
117 (b)	Two abutments less one pier for portion (a)	51 29	R. ft.	6,001	
8 × (c ₁)	Balance of culvert length up-stream one vent and pier.	351-08	Span.	2,889	
(c ₂)	Balance of culvert length down-stream	607-28		4,858	
(d ₁)	Two abutments less one pier for portion e ₁			277	
(d ₂)	do. do. for portion e ₂			620	
(e ₁)	Wings up-stream			4,007	
(e ₂)	do. down-stream			4,191	
(f)	Wings connecting side walls of aqueduct			1,024	
8 × (g ₁)	Up-stream masonry, etc., per span	562-07	Span.	4,497	
8 × (g ₂)	Down-stream do. do.	448-48		3,588	
154	Earthwork, excavating rear channel	4 8 0	1,000 c. ft.	700	
	Baling water from foundations		Lump sum.	1,200	
700 r.ft.	Laying centerings for arches and removing			2,000	
	Hand railings with L iron upright and flat bars complete.	1 8 0	R. ft.	1,050	
	Excavating foundations and planking sides of concrete foundations.		Lump sum	850	
	Shed for materials			635	
	Total				70,400
Estimate No. 16-G.—(Plan No. G-55).					
Syphon aqueduct 7 spans of 6 feet combined with surplus sluice at R.D. 50/9750.					
530-8 units.	Concrete broken brick in surki mortar	22 10 0	100 c. ft.	12,009	
575-3 "	Table moulded brickwork in surki mortar	27 1 0	100 "	15,569	
260-6 "	Archwork do.	28 1 0	100 "	7,313	
98 "	Cut-stone work	1 12 0	C. ft.	172	
584-1 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1: 3	6 12 0	100 sq. ft.	3,943	
207-3 "	Laterite revetment and apron	17 4 0	100 c. ft.	3,575	
21-1 "	Gravel backing	4 7 0	100 "	94	
54 cwts.	Rolled channels	9 0 0	Cwt.	486	
250 lb.	Iron work	0 2 6	Lb.	39	
52-8 "	Woodwork	4 0 0	C. ft.	211	
No. 7	Shutters screw-gearing with locking arrangements complete	120 0 0	Each	1,260	
330 units.	Earthwork excavating foundations, etc.	5 10 0	1,000 c. ft.	1,656	
504 "	Earthwork rear channel	3 12 0	1,000 "	1,890	
60 "	Clay piddle	10 0 0	1,000 "	600	
360 r.ft.	Hand rails	1 8 0	R. ft.	540	
	Baling water from foundations		Lump sum.	1,000	
	Centering for arches			600	
	Shed for materials			500	
	Contingencies			2,570	
	Petty supervision			1,272	
	Total				55,500
	Carried over				3,95,009

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 3,95,900					
Estimate No. 17-G.—(Plan No. G-56).					
Syphon aqueduct at R.D. 8/6247 (8 spans of 6').					
593 8 c. ft.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	14,833	
445 6 "	Table moulded brick in surki mortar	29 3 0	100 "	13,003	
320 03 "	Archwork	30 3 0	100 "	9,661	
529 20 sq. ft.	Cement plastering, 2 coats, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	3,572	
170 93 c. ft.	Laterite blocks for revetment and pitching ..	18 4 0	100 c. ft.	3,119	
25 12 "	Gravel backing	5 5 0	100 "	133	
28 143 "	Clay puddle	10 0 0	1,000 c. ft.	281	
137 units.	Earthwork excavation (same rate as for the bank on canal)	5 14 0	Unit.	805	
	Baling water from foundations		Lump sum.	1,200	
	Centering for arches			750	
	Shed for materials			500	
	Contingencies			2,393	
	Petty supervision			1,260	
	Total				51,500

Estimate No. 18-G.—(Plan No. G-57).

Syphon aqueduct of 10 spans of 12' x 6' at R.D. 10/0049.

(a) Under bed of canal for one span of a pier and vent clear of abutments per foot run of canal bed width.					
5938 units.	Concrete in surki mortar	24 5 0	100 c. ft.	14 44	
2081 "	Table-moulded brick in surki mortar	28 13 0	100 "	5 99	
2648 "	Archwork in surki mortar	29 13 0	100 "	7 89	
52 "	Cement plastering, 2 coats, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	3 51	
142 "	Earthwork	5 7 0	1,000 c. ft.	0 77	
	Contingencies and petty supervision at 8 per cent.			2 63	
	Total				35 23
(b) Two abutments less one pier under bed of canal per foot run of canal bed width including pitching canal bed.					
365 units.	Concrete in surki mortar	24 5 0	100 c. ft.	8 87	
5925 "	Table-moulded brick in surki mortar	28 13 0	100 "	17 07	
1 20 "	Laterite block for revetments, etc.	19 4 0	100 "	25 10	
304 "	Clay puddle	10 0 0	1,000 "	3 04	
124 "	Earthwork	5 7 0	1,000 "	0 67	
	Contingencies and petty supervision at 8 per cent.			4 22	
	Total				56 97
(c ₁) Balance of culvert length under banks up-stream clear of abutment for one span length of a pier and vent.					
3 1788 units.	Concrete in surki mortar	24 5 0	100 c. ft.	77 28	
6 4474 "	Table-moulded brick in surki mortar	28 13 0	100 "	185 75	
1 4189 "	Archwork in surki mortar	29 13 0	100 "	42 30	
6 2917 "	Cement plastering, 2 coats, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	42 47	
945 "	Earthwork	5 7 0	1,000 c. ft.	5 14	
	Contingencies and petty supervision at 8 per cent.			28 43	
	Total				381 37
(c ₂) Balance of culvert length under banks down stream clear of abutments for one span of a pier and vent.					
7 8741 units.	Concrete in surki mortar	24 5 0	100 c. ft.	191 44	
8 7046 "	Table-moulded brick in surki mortar	28 13 0	100 "	250 81	
2 6681 "	Archwork in surki mortar	29 13 0	100 "	79 54	
9 2267 "	Cement plastering, 2 coats, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	62 28	
1 980 "	Earthwork	5 7 0	1,000 c. ft.	10 76	
	Contingencies and petty supervision at 8 per cent.			47 16	
	Total				641 99
	Carried over				4,47,400

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 4,47,400					
Estimate No. 18-G—cont.					
Syphon aqueduct of 10 spans of 12' x 6' at R.D. 10/0049—cont.					
(d ₁) Two abutments less one pier for the whole length of portion (c ₁) up-stream side.					
2 81 units.	Concrete in surki mortar	24 5 0	100 c. ft.	68 31	
6 91 "	Table-moulded brick in surki mortar	28 13 0	100 "	199 08	
962 "	Earthwork	5 7 0	1,000 "	5 23	
	Contingencies and petty supervision at 8 per cent.			21 80	
	Total				294 42
(d ₂) Two abutments less one pier for the whole length of portion (c ₂) down-stream side.					
6 25 units.	Concrete in surki mortar	24 5 0	100 c. ft.	151 95	
15 54 "	Table-moulded brick in surki mortar	28 13 0	100 "	447 75	
2 139 "	Earthwork	5 7 0	1,000 "	11 62	
	Contingencies and petty supervision at 8 per cent.			48 72	
	Total				660 04
(e ₁) Wings up-stream of culvert including revetment for canal banks and drainage and also apron of the contracted portion of drainage and canal.					
71 51 units.	Concrete in surki mortar	24 5 0	100 c. ft.	1,738 62	
55 94 "	Table-moulded brick in surki mortar	28 13 0	100 "	1,611 80	
14 67 "	Cement plastering, 2 coats, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	99 02	
30 47 "	Laterite block for revetment, etc.	19 4 0	100 c. ft.	583 54	
9 50 "	Gravel backing	4 7 0	100 "	42 15	
6 126 "	Earthwork	5 7 0	1,000 "	33 30	
	Contingencies and petty supervision at 8 per cent.			328 49	
	Total				4,494 39
(e ₂) Wings down-stream side of culvert including revetment for canal banks drainage and also contracted portion of drainage and canal banks.					
73 72 units.	Concrete in surki mortar	24 5 0	100 c. ft.	1,792 35	
56 39 "	Table-moulded brick in surki mortar	28 13 0	100 "	1,624 76	
15 98 "	Cement plastering, 2 coats, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	107 86	
29 08 "	Laterite block for revetment	19 4 0	100 c. ft.	559 79	
9 50 "	Gravel backing	4 7 0	100 "	42 15	
6 105 "	Earthwork	5 7 0	1,000 "	33 19	
	Contingencies and petty supervision at 8 per cent.			332 02	
	Total				4,492 12
(f) Wings connecting side walls of aqueduct to canal banks.					
13 98 units.	Concrete in surki mortar	24 5 0	100 c. ft.	339 89	
51 75 "	Table-moulded brick in surki mortar	28 13 0	100 "	1,491 07	
6 86 "	Cement plastering, 2 coats, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	46 30	
2 154 "	Earthwork	5 7 0	1,000 c. ft.	11 71	
	Contingencies and petty supervision at 8 per cent.			150 61	
	Total				2,039 58
(g) Up-stream masonry, etc., per span parallel to canal including pitching stream bed.					
6 75 units.	Concrete in surki mortar	24 5 0	100 c. ft.	164 11	
6 00 "	Table-moulded brick in surki mortar	28 13 0	100 "	172 87	
5 11 "	Cement plastering, 2 coats, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	34 49	
8 70 "	Laterite blocks for pitching	19 4 0	100 c. ft.	167 48	
2 138 "	Earthwork	5 7 0	1,000 "	11 62	
	Contingencies and petty supervision at 8 per cent.			43 95	
	Total				594 52
(h) Down-stream masonry, etc., per span parallel to canal including pitching stream bed.					
9 00 units.	Concrete in surki mortar	24 5 0	100 c. ft.	218 32	
1 79 "	Table moulded brick in surki mortar	28 13 0	100 "	51 57	
3 95 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	26 66	
7 65 "	Laterite blocks for pitching	19 4 0	100 c. ft.	147 26	
2 415 "	Earthwork	5 7 0	1,000 "	13 13	
	Contingencies and petty supervision at 8 per cent.			36 66	
	Total				492 10
	Carried over				4,47,400

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 4,47,46

Estimate No. 18-G—cont.

Syphon aqueduct of 10 vents of 12' x 6' at R.D. 10/0049 (condensed abstract) Plan No. G-57.

10 x 113 (a)	Under bed of canal per foot run of bed width one vent and one pier.	35-23	R. ft. of one vent.	39,801	
113 (b)	Two abutments less one pier for portion (a) ..	56-97	R. ft.	6,438	
10 (c)	Balance of culvert length upstream one vent and one pier.	381-37	Vent.	3,814	
10 (c)	Balance of culvert length downstream ..	642-00	"	6,420	
(d)	Two abutments less one pier for portion (c) ..	..	..	284	
(d)	Do. do. (c) ..	..	..	660	
(e)	Wings upstream ..	..	..	4,440	
(e)	Wings downstream ..	..	..	4,492	
(f)	Wings connecting side walls of aqueduct ..	..	..	2,040	
10 (g)	Upstream masonry, etc., per span ..	594-59	Span.	5,946	
10 (h)	Downstream masonry, etc., per span ..	492-10	"	4,921	
	Laying centerings for arches and removing ..	..	Lump sum.	3,000	
810 r. ft.	Hand railings with L iron upright and flat bars, complete.	1 8 0	R. ft.	1,215	
	Baling water from foundations ..	..	Lump sum.	1,500	
	Excavating planking and removing projection in stream course in front and rear of aqueduct.	..	Do.	2,000	
	Shed for materials ..	..	..	1,019	
	Total ..	..	..	..	38,000

Estimate No. 19-G. (Plan No. G-58.)

Syphon aqueduct at R.D. 11/2430 (5 vents 6' x 6').

	(a) Under bed of canal for one span of a pier and vent per foot run of canal bed width.				
2535 units.	Concrete broken brick in surki mortar ..	24 8 0	100 c. ft.	6-21	
1161 "	Table moulded brick in surki mortar ..	28 15 0	100 "	3-29	
1733 "	Archwork table moulded brick in surki mortar ..	29 15 0	100 "	5-19	
3362 "	Cement plastering, two coats, 3/4" thick, 1:3 ..	6 12 0	100 sq. ft.	2-27	
094 "	Earthwork, excavation ..	5 10 0	1,000 c. ft.	0-53	
	Contingencies and petty supervision at 8 per cent.	..	..	1-40	
	Total ..	..	..	..	18-89
	(b) Under bed of canal two abutments less one pier per foot run of canal bed width.				
2607 units.	Concrete broken brick in surki mortar ..	24 8 0	100 c. ft.	6-39	
5825 "	Table moulded brick in surki mortar ..	28 15 0	100 "	16-85	
025 "	Cement plastering, two coats, 3/4" thick, 1:3 ..	6 12 0	100 sq. ft.	0-17	
54 "	Laterite block for pitching ..	22 4 0	100 c. ft.	12-02	
1-80 "	Clay puddle ..	10 0 0	1,000 "	1-80	
118 "	Earthwork ..	5 10 0	1,000 "	0-66	
	Contingencies and petty supervision at 8 per cent.	..	..	3-03	
	Total ..	..	..	..	40-92
	(c) Balance of culvert length under banks up and downstream one span and one pier for the whole length.				
13-00 units.	Concrete broken brick in surki mortar ..	24 8 0	100 c. ft.	318-50	
11-035 "	Table moulded brick in surki mortar ..	28 15 0	100 "	319-33	
16-90 "	Archwork table moulded brick in surki mortar ..	29 15 0	100 "	505-95	
16-39 "	Cement plastering, two coats, 3/4" thick, 1:3 ..	6 12 0	100 sq. ft.	110-25	
3-34 "	Laterite blocks for revetment ..	22 4 0	100 c. ft.	74-32	
1-11 "	Gravel backing ..	4 7 0	100 "	4-53	
7-404 "	Earthwork, excavation ..	5 10 0	1,000 "	41-65	
	Contingencies and petty supervision at 8 per cent.	..	..	110-00	
	Total ..	..	..	..	1,484-93
	Carried over ..	..	..	..	5,35,400

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

Brought forward .. 5,35,400

F. CROSS DRAINAGE WORKS—cont.

Estimate No. 19-G. (Plan No. G-58)—cont.

Syphon aqueduct at R.D. 11/2430 (5 vents 6' x 6')—cont.

	(d) Balance length of culvert under banks, two abutments and one vent.				
15-81 units.	Concrete broken brick in surki mortar ..	24 8 0	100 c. ft.	387-34	
32-50 "	Table moulded brick in surki mortar ..	28 15 0	100 "	938-42	
1-3256 "	Laterite blocks for revetment ..	22 4 0	100 "	28-49	
4419 "	Gravel backing ..	4 7 0	100 "	1-96	
7-837 "	Earthwork ..	5 10 0	1,000 "	44-08	
	Contingencies and petty supervision at 8 per cent.	..	..	109-94	
	Total ..	..	..	..	1,511-23
	(e) Wings up and down stream including revetment to canal banks and drainage.				
19-52 units.	Concrete broken brick in surki mortar ..	24 8 0	100 c. ft.	478-24	
39-20 "	Table moulded brick in surki mortar ..	28 15 0	100 "	1,134-35	
18-85 "	Cement plastering, two coats, 3/4" thick, 1:3 ..	6 12 0	100 sq. ft.	93-49	
50-27 "	Laterite blocks for revetment ..	22 4 0	100 c. ft.	1,118-51	
16-16 "	Gravel backing ..	4 7 0	100 "	71-71	
14-045 "	Earthwork ..	5 10 0	1,000 "	79-00	
	Contingencies and petty supervision at 8 per cent.	..	..	238-02	
	Total ..	..	..	..	3,213-32
	(g) & (h) Up and down masonry flooring, etc., between wings and not under arches per foot run of drain width between abutments, includes also pitching stream bed.				
32 units.	Concrete in surki mortar ..	24 8 0	100 c. ft.	7-84	
16 "	Table moulded brick in surki mortar ..	28 15 0	100 "	4-63	
115 "	Cement plastering, two coats, 3/4" thick, 1:3 ..	6 12 0	100 sq. ft.	0-78	
52 "	Laterite blocks for pitching ..	22 4 0	100 c. ft.	11-57	
099 "	Earthwork ..	5 10 0	1,000 "	0-56	
	Contingencies and petty supervision at 8 per cent.	..	..	2-03	
	Total ..	..	..	..	27-41

Syphon aqueduct of 5 vents of 6' x 6' at R.D. 11/2430.

(condensed abstract).

5 x 172 units.	Under bed of canal per foot run of bed with one vent and one pier.	18-89	R. ft. of one vent	16,245	
172 (b) "	Two abutments less one pier for portion (a) ..	40-42	R. ft.	7,038	
5 (c) "	Balance of culvert length up and down stream one vent and one pier.	1,484-93	One span.	7,425	
(d) "	Two abutments less one pier for portion (c) ..	..	..	1,511	
(e) "	Wings up and down stream ..	..	..	3,213	
37 1/2 (g) & (h) "	Up and down masonry, etc., per foot run of stream width between abutments.	27-41	R. ft.	1,028	
	Earthwork, excavating foundations and removing projections in the stream course front and rear of masonry and planking concrete sides.	..	Lump sum.	1,000	
	Baling water from foundations ..	..	..	700	
	Laying centerings and removing ..	..	..	1,000	
	Shed for materials ..	..	..	340	
	Total ..	..	..	39,500	
	Grand Total ..	..	..	..	39,500
	Carried over ..	..	..	..	5,74,900

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 5,74,900					
Estimate No. 20-G.					
Syphon aqueduct at R.D. 12/0970.					
	Item (a) same as estimate number 21-G. ..	..	..	18-66	
	Item (b) Do. 21-G. ..	..	..	47-32	
	Item (c) Balance of culvert length up stream side for one vent and one pier for the whole length—				
3-125 units.	Concrete broken brick in surki mortar ..	25 0 0	100 c. ft.	203-87	
4-315 "	Table moulded brick in do. ..	29 3 0	100 "	125-94	
4-969 "	Archwork in surki mortar ..	30 3 0	100 "	150-00	
7-62 "	Cement plastering, two coats, 1:3 ..	6 12 0	100 sq. ft.	51-44	
1-670 "	Laterite blocks for revetment ..	24 4 0	100 c. ft.	40-50	
557 "	Gravel backing ..	7 1 0	100 "	3-93	
	Contingencies and petty supervision at 8 per cent. ..	..	..	46-01	
	Total ..	..	..	..	621-19
14-068 units.	(d1) Two abutments and one vent for portion (e)				
	Concrete broken brick in surki mortar ..	25 0 0	100 c. ft.	351-58	
16-325 "	Table moulded brick in surki mortar ..	29 3 0	100 "	476-49	
4-969 "	Arch work in surki mortar ..	30 3 0	100 "	150-00	
7-34 "	Cement plastering, two coats, 1:3 ..	6 12 0	100 sq. ft.	49-54	
2-323 "	Laterite blocks for revetment ..	24 4 0	100 c. ft.	56-00	
778 "	Gravel backing ..	7 1 0	100 "	5-49	
	Contingencies and petty supervision at 8 per cent. ..	..	..	87-13	
	Total ..	..	..	..	1,176-23
	Item (e2) same as in estimate number 21-G ..	..	..	580-48	
	Item (d2) same as in estimate number 21-G ..	..	..	1,060-67	
	(e1) Wing walls upstream side including revetment, etc., canal.				
7-056 units.	Concrete broken brick in surki mortar ..	25 0 0	100 c. ft.	176-40	
12-677 "	Table moulded brick in surki mortar ..	29 3 0	100 "	370-09	
4-753 "	Cement plastering, two coats, 1:3 ..	6 12 0	100 sq. ft.	32-08	
26-195 "	Laterite blocks for revetment ..	24 4 0	100 c. ft.	635-23	
8-73 "	Gravel backing ..	7 1 0	100 "	61-15	
	Contingencies and petty supervision, 8 per cent. ..	..	..	102-04	
	Total ..	..	..	..	1,377-4
	(e2) Wings downstream side, etc.				
11-138 units.	Concrete broken brick in surki mortar ..	25 0 0	100 c. ft.	278-45	
27-51 "	Table moulded brick in surki mortar ..	29 3 0	100 "	803-01	
9-58 "	Cement plastering, two coats, 1:3 ..	6 12 0	100 sq. ft.	64-87	
26-20 "	Laterite blocks for revetment ..	24 4 0	100 c. ft.	635-35	
8-73 "	Gravel backing ..	7 1 0	100 "	61-65	
	Contingencies and petty supervision at 8 per cent. ..	..	..	147-45	
	Total ..	..	..	..	1,990-58
	(g) Upstream masonry, etc., per foot run of stream between abutments.				
2908 units.	Concrete broken brick in surki mortar ..	25 0 0	100 c. ft.	7-27	
0-563 "	Table moulded brick in surki mortar ..	29 3 0	100 "	1-64	
0-69 "	Cement plastering, two coats, 1:3 ..	6 12 0	100 sq. ft.	47	
10 "	Laterite blocks for pitching ..	24 4 0	100 c. ft.	2-42	
	Contingencies and petty supervision at 8 per cent. ..	..	..	9	
	Total ..	..	..	..	12-74
	(h) Downstream masonry, etc., per foot run of stream between abutments.				
5306 units.	Concrete broken brick in surki mortar ..	25 0 0	100 c. ft.	13-27	
0-469 "	Brick in surki mortar ..	29 3 0	100 "	1-38	
0-850 "	Cement plastering, two coats, 1:3 ..	6 12 0	100 sq. ft.	57	
10 "	Laterite blocks for pitching ..	24 4 0	100 c. ft.	2-42	
	Contingencies and petty supervision at 8 per cent. ..	..	..	1-41	
	Total ..	..	..	..	19-05
	Carried over ..				5,74,900

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 5,74,900					
Estimate No. 20-G—cont.					
Syphon aqueduct of 4 vents at R.D. 12/0970.					
172 r.ft.	Item (a) three vents ..	55-98	R.ft.	9,629	
172	Item (b) Two abutments and one vent under bed of canal.	47-32	"	8,139	
3	Item (c) Balance of culvert length upstream side for one vent and one pier.	621-19	Vent.	1,864	
	Item (d1) Two abutments and one vent for balance length upstream.	1,176-23	..	1,176	
3	Item (c) Balance length downstream ..	580-48	Vent.	1,741	
	Item (d2) Two abutments and one vent balance length downstream.	1,060-67	..	1,061	
	Item (e1) Wing-walls upstream ..	1,377-49	..	1,377	
	Item (e2) Wings downstream side ..	1,990-58	..	1,990	
29½	Item (g) Upstream masonry per foot run of stream between abutments.	12-74	R.ft.	377	
29½	Item (h) Upstream masonry per foot run of downstream.	19-05	"	565	
	Centering for arches ..	Lump sum.		460	
118	Earthwork ..	5 14 0	1,000 c.ft.	693	
	Baling water from foundations ..	Lump sum.		700	
210-6.	Earthwork cutting stream in rear ..	5 0 0	1,000 c. ft.	1,053	
	Contingencies on last 3 ..	..	..	125	
	Total ..	..	..	..	31,000
Estimate No. 21-G. (Plan No. G. 59.)					
Constructing a syphon aqueduct at R.D. 12/5569.					
	(a) Under bed of canal one vent and one pier per foot run of canal bed width.				
2535 units.	Concrete broken brick in surki mortar ..	25 0 0	100 c. ft.	6-34	
0-977 "	Table moulded bricks in surki mortar ..	29 3 0	100 "	2-85	
1-875 "	Archwork, moulded bricks in brick mortar ..	30 3 0	100 "	5-98	
3-125 "	Cement plastering, two coats, 1:3 ..	6 12 0	100 "	2-11	
	Contingencies and petty supervision at 8 per cent. ..	..	..	1-38	
	Total ..	..	..	..	18-66
	(b) Under bed of canal two abutments and one vent per foot run of canal bed width.				
4517 units.	Concrete broken brick in surki mortar ..	25 0 0	100 c. ft.	11-29	
4-931 "	Table moulded brick in surki mortar ..	29 3 0	100 "	14-38	
1-875 "	Archwork in brick surki mortar ..	30 3 0	100 "	5-65	
3-437 "	Cement plastering, two coats, 1:3 ..	6 12 0	100 "	2-32	
3-60 "	Laterite blocks for revetment ..	24 4 0	100 "	8-73	
1-44 "	Clay puddle ..	10 0 0	1,000 "	1-44	
	Contingencies and petty supervision at 8 per cent. ..	..	..	3-50	
	Total ..	..	..	..	47-32
	(c) Balance length of culvert upstream side for one vent and one pier for the whole length.				
7-6802 units.	Concrete broken brick in surki mortar ..	25 0 0	100 c. ft.	192-01	
4-632 "	Table moulded brick in surki mortar ..	29 3 0	100 "	135-20	
4-593 "	Archwork, brick in surki mortar ..	30 3 0	100 "	138-66	
7-5111 "	Cement plastering, two coats, 1:3 ..	6 12 0	100 "	50-70	
1-670 "	Laterite blocks for revetment ..	24 4 0	100 "	40-50	
556 "	Gravel backing ..	7 1 0	100 "	3-93	
	Contingencies and petty supervision at 8 per cent. ..	..	..	44-87	
	Total ..	..	..	..	605-77
	Carried over ..				8,05,900

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 6,05,900					
Estimate No. 21-G. (Plan No. G. 59)—cont.					
Constructing a syphon aqueduct at R.D. 12/5569—cont.					
(e1) Wing walls upstream side including revetment to canal bank.					
8-116 units.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	202-90	
11-908 "	Table moulded brick in surki mortar	29 3 0	100 "	347-67	
5-1498 "	Cement plastering, two coats, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	34-76	
21-105 "	Laterite block for revetment	24 4 0	100 c. ft.	511-80	
7-035 "	Gravel backing	2 1 0	100 "	49-68	
	Contingencies and petty supervision at 8 per cent.			91-74	
	Total ..				1,238-45
(e2) Wings downstream side including revetment to canal bank.					
9-424 units.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	235 6 0	
25-265 "	Table moulded brick in surki mortar	29 3 0	100 "	737-48	
7-961 "	Cement plastering, two coats, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	53-74	
20-68 "	Laterite blocks for revetment	24 4 0	100 c. ft.	501-49	
6-89 "	Gravel backing	7 1 0	100 "	48-66	
	Contingencies and petty supervision at 8 per cent.			125-58	
	Total ..				1,702-55
(g) Upstream masonry, etc., per foot run of stream between abutment.					
0-2463 units.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	6-16	
0-563 "	Table moulded brick in surki mortar	29 3 0	100 "	1-64	
0-094 "	Cement plastering, two coats, 1:3	6 12 0	100 sq. ft.	63	
	Contingencies and petty supervision at 8 per cent.			0-68	
	Total ..				9-11
(h) Down stream masonry, etc., per foot run of stream between abutments.					
0-231 units.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	5-78	
0-049 "	Table moulded brick in surki mortar	29 3 0	100 "	1-37	
0-085 "	Cement plastering, two coats, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	57	
	Contingencies and petty supervision at 8 per cent.			62	
	Total ..				8-34
(d1) Two abutments and one pier for item (c).					
12-222 units.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	305-55	
16-145 "	Table moulded brick in surki mortar	29 3 0	100 "	471-23	
4-969 "	Archwork	30 3 0	100 "	149-86	
7-168 "	Cement plastering, two coats, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	48-38	
2-333 "	Laterite blocks for revetment	24 4 0	100 c. ft.	58-58	
0-778 "	Gravel backing	7 1 0	100 "	5-47	
	Contingencies and petty supervision at 8 per cent.			82-97	
	Total ..				1,120-04
(c2) Balance of culvert length downstream side one vent and one pier for the whole length.					
6-455 units.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	161-38	
5-163 "	Table moulded brick in surki mortar	29 3 0	100 "	150-70	
4-333 "	Archwork brick in surki mortar	30 3 0	100 "	130-81	
7-432 "	Cement plastering, two coats, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	50-17	
1-670 "	Laterite blocks for revetments	24 4 0	100 c. ft.	40-50	
0-557 "	Gravel backing	7 1 0	100 "	3-83	
	Contingencies and petty supervision at 8 per cent.			42-99	
	Total ..				580-48
	Carried over ..				6,05,900

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 6,05,900					
Estimate No. 21-G. (Plan No. G. 59)—cont.					
Constructing a syphon aqueduct at R. D. 12/5569—cont.					
(d2) Two abutments and one pier for item (e).					
11-225 units.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	280-63	
15-465 "	Table moulded brick in surki mortar	29 3 0	100 "	451-38	
4-687 "	Archwork brick in surki mortar	30 3 0	100 "	140-90	
6-981 "	Cement plastering, two coats, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	47-12	
2-333 "	Laterite blocks for revetment	24 4 0	100 "	58-58	
1-778 "	Gravel backing	7 1 0	100 "	5-19	
	Contingencies and petty supervision			78-57	
	Total ..				1,06,067
172 r. ft.	Item (b) Two abutments and one vent under bed of canal	47-32	R. ft.	8,139	
172 "	Item (a) Four vents and one vent under bed of canal	(4 × 18-66)		12,838	
	Item (d2) Two abutments and one vent balance length upstream	1120		1,120	
4 vents.	Item (e1) Four vents and one vent balance length upstream	605-57	Vent.	2,423	
	Item (d2) Two abutments and one vent balance length downstream	1,060-77		1,061	
4 vents.	Item (e2) Four vents and one vent balance length downstream	580-48	Vent.	2,322	
	Item (e1) Wings upstream	1,233-45		1,238	
	Item (e2) Do. downstream	1,702-55		1,703	
37½ r. ft.	Item (g) Upstream masonry, etc., per foot run of stream between abutments	9-11	R. ft.	341	
37½ "	Item (h) Downstream masonry, etc., per foot run of stream between abutments	8-34		313	
	Shed for materials		Lump sum.	400	
	Centering for arches			1,000	
	Baling water from foundations			1,000	
496 units.	Earthwork cutting stream in rear and excavating foundations	9	1,000 c. ft.	4,526	
	Contingencies for above	2		276	
	Total ..				38,700
	Total ..				38,700
Estimate No. 22-G. (Plan No. G. 60.)					
Superpassage for the Seppu Naickenvari across Grand Anicut canal at R.D. 13/1719.					
49-00 units.	Concrete broken brick in surki mortar	25 4 0	Unit.	1,237	
324-10 "	Table moulded brick in surki mortar	28 14 0		9,358	
89-00 "	Archwork, brick in surki mortar	29 14 0		2,659	
179-60 "	Cement plastering, 2 coats, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0		1,212	
37-3 "	Laterite blocks for revetment and pitching ..	25 4 0		942	
8-10 "	Gravel backing	7 1 0		57	
32-3 "	Clay puddle	10 0 0		323	
3-9 "	Earthwork (excavating through rock)	10 11 0		42	
	Cost for centering of arches		Lump sum.	500	
	Shed for materials			150	
	Extra for skew construction			1,000	
	Contingencies at 5 per cent			880	
	Petty supervision at 2½ per cent			440	
	Total ..				18,800
	Total ..				18,800
	Carried over ..				6,63,400

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 6,63,400

Estimate No. 23-G. (Plan No. G. 61.)

Inlet sluice at R.D. 13/6850.

85.5 units.	Table moulded brick in surki mortar	28 14 0	100 c. ft.	1,025	
4.75 "	Archwork, brick in surki mortar	29 14 0	100 "	142	
16.05 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	108	
	Centering for archwork			32	
	Shed for materials			20	
	Lump sum				
	Total			1,327	
	Contingencies at 5 per cent			66	
	Petty supervision at $2\frac{1}{2}$ per cent			37	
	Total			1,430	
	Total				1,43

Estimate No. 24-G. (Plan No. G. 62.)

Surplus sluice at R.D. 13/6850.

61.5 units.	Table moulded brickwork in surki mortar	28 14 0	100 c. ft.	1,776	
4.15 "	Brick archwork in surki mortar	29 14 0	100 "	124	
22.7 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	163	
17 o. ft.	Outstone work	1 12 0	C. ft.	30	
6.20 units.	Laterite block revetment	25 4 0	100 c. ft.	157	
2.10 "	Gravel backing	7 1 0	100 "	15	
	Teakwood shutter with 3" plank, $2\frac{1}{4}$ " screw shaft ..				
	angle iron for grooves, bolts, screw turning, ..				
	etc., complete			150	
5.56 cwt.	Wrought iron work	11 0 0	Cwt.	61	
	Centering for archwork			50	
	Shed for materials			30	
	Lump sum				
	Total			2,546	
	Contingencies at 5 per cent			127	
	Petty supervision at $2\frac{1}{2}$ per cent			67	
	Total			27,40	
	Total				2,740

Estimate No. 25-G. (Plan No. G. 63.)

Inlet at R.D. 14/0090.

22.7 units.	Concrete broken brick in surki mortar	25 4 0	100 c. ft.	572	
36.6 "	Table moulded brickwork in surki mortar	28 14 0	100 "	1,057	
3.5 "	Archwork, brick in surki mortar	29 14 0	100 "	105	
15.6 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	105	
	Centering for archwork			40	
	Shed for materials			20	
	Lump sum				
	Total			1,900	
	Contingencies at 5 per cent			95	
	Petty supervision at $2\frac{1}{2}$ per cent			45	
	Total			2,040	
	Total				2,040
	Carried over				6,69,610

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 6,69,610

Estimate No. 26-G.

Surplus sluice at R.D. 14/0090.

54.70 units.	Concrete broken brick in surki mortar	25 4 0	100 c. ft.	1,331	
43.40 "	Table moulded brick work in surki mortar	28 14 0	100 "	1,253	
4.15 "	Archwork	29 14 0	100 "	124	
16.20 "	Plastering with portland cement $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	109	
4.00 "	Do	6 12 0	100 "	27	
17 c. ft.	Outstone work	1 12 0	C. ft.	30	
10.08 units.	Laterite block revetment	25 4 0	100 c. ft.	255	
3.36 "	Gravel backing	7 1 0	100 "	24	
No. 1	Screw gearing shutter with its accessories complete ..	150 0 0	Each	150	
	Centering for the archwork		Lump sum.	50	
	Shed for materials			40	
	Total			34,43	
	Contingencies at 5 per cent			172	
	Petty supervision at $2\frac{1}{2}$ per cent			85	
	Total				3,700

Estimate No. 27-G. (Plan No. G. 64.)

Syphon aqueduct at R.D. 14/2096.

(a) Under bed of canal one vent and one pier per foot run of canal bed width.					
1643 units.	Concrete in surki mortar	25 4 0	100 c. ft.	4.15	
0.75 "	Table moulded brick in surki mortar	28 14 0	100 "	2.17	
132 "	Archwork brick in surki mortar	29 14 0	100 "	3.94	
2579 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	1.74	
	Contingencies and petty supervision at 8 per cent			1.00	
	Total				13.00
(b) Under bed of canal two abutments and one vent per foot run of canal bed width.					
3436 units.	Concrete in surki mortar	25 4 0	100 c. ft.	8.68	
4236 "	Table moulded brick in surki mortar	28 14 0	100 "	12.23	
1731 "	Archwork in surki mortar	29 14 0	100 "	5.17	
2929 "	Cement plastering, $\frac{3}{4}$ " thick 1:3	6 12 0	100 sq. ft.	1.98	
36 "	Laterite block for pitching	25 4 0	100 c. ft.	9.09	
144 "	Clay puddle	10 0 0		1.44	
	Contingencies and petty supervision			3.11	
	Total				41.7
(c) Balance length of culvert up stream side one vent and one pier for the whole length.					
5.006 units.	Concrete broken brick in surki mortar	25 4 0	100 c. ft.	126.40	
3.442 "	Table moulded brick in surki mortar	28 14 0	100 "	99.58	
3.498 "	Archwork brick in surki mortar	29 14 0	100 "	104.50	
6.200 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	42.46	
1.166 "	Laterite block for revetment	25 4 0	100 c. ft.	29.44	
3889 "	Gravel backing	7 1 0		2.75	
	Contingencies and petty supervision at 8 per cent			32.39	
	Total				437.60
(d) Two abutments and one vent for item (c)					
8.748 units.	Concrete broken brick in surki mortar	25 4 0	100 c. ft.	220.89	
14.02 "	Table moulded brick in surki mortar	28 14 0	100 "	404.83	
4.5872 "	Archwork brick in surki mortar	29 14 0	100 "	137.04	
6.017 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	40.61	
1.91 "	Laterite block for revetment	25 4 0	100 c. ft.	48.23	
636 "	Gravel backing	7 1 0		4.49	
	Contingencies and petty supervision at 8 per cent			68.61	
	Total				924.60
	Carried over				6,73,310

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 6,73,31					
Estimate No. 27-G. (Plan No. G. 64)—cont.					
Syphon aqueduct at R.D. 14/2096—cont.					
(c ₁) Balance length of culvert down stream side one vent and one pier including revetment, etc.					
4.67 units.	Concrete broken brick in surki mortar	25 4 0	100 c. ft.	117.92	
3.534 "	Table-moulded brick in surki mortar	28 14 0	100 "	102.04	
3.40 "	Archwork brick in surki mortar	29 14 0	100 "	101.58	
6.204 "	Cement plastering, 3/4" thick, 1 : 3	6 12 0	100 sq. ft.	41.88	
1.166 "	Laterite blocks for revetments	25 4 0	100 c. ft.	29.44	
8889 "	Gravel backing	7 1 0	100 "	2.75	
	Contingencies and petty supervision			31.64	
	Total				427.25
(c ₂) To abutments and one vent for item (c ₁).					
8.56 units.	Concrete broken brick in surki mortar	25 4 0	100 c. ft.	215.14	
13.513 "	Table-moulded brick in surki mortar	28 14 0	100 "	390.19	
4.457 "	Archwork brick in surki mortar	29 14 0	100 "	133.15	
5.956 "	Cement plastering, 3/4" thick, 1 : 3	6 12 0	100 sq. ft.	40.20	
1.910 "	Laterite blocks for revetments	25 4 0	100 c. ft.	48.73	
636 "	Gravel backing	7 1 0	100 "	4.49	
	Contingencies and petty supervision			66.60	
	Total				899.0
(c ₁) Wing walls up stream side including revetment, etc., to canal banks.					
12.817 units.	Concrete in surki mortar	25 4 0	100 c. ft.	323.63	
19.49 "	Table-moulded brick in surki mortar	28 14 0	100 "	562.17	
7.15 "	Cement plastering, 3/4" thick, 1 : 3	6 12 0	100 sq. ft.	48.26	
26.66 "	Laterite blocks for revetment and pitching	25 4 0	100 c. ft.	673.17	
8.74 "	Gravel backing	7 1 0	100 "	61.73	
	Contingencies and petty supervision			135.54	
	Total				1,803.10
(c ₂) Wing walls down stream including revetment, etc.					
16.769 units.	Concrete in surki mortar	25 4 0	100 c. ft.	423.42	
28.07 "	Table-moulded brick in surki mortar	28 14 0	100 "	810.52	
10.40 "	Cement plastering, 3/4" thick, 1 : 3	6 12 0	100 sq. ft.	70.20	
27.086 "	Laterite blocks for revetment and pitching	25 4 0	100 c. ft.	683.92	
8.88 "	Gravel backing	7 1 0	100 "	62.71	
	Contingencies and petty supervision			164.03	
	Total				2,214.80
(g) Up stream masonry flooring, etc., per foot run of stream bed width between abutments.					
57 units.	Concrete in surki mortar	25 4 0	100 c. ft.	14.39	
066 "	Table-moulded brick in surki mortar	28 14 0	100 "	1.91	
06 "	Cement plastering, 3/4" thick, 1 : 3	6 12 0	100 sq. ft.	.41	
00 "	Laterite blocks for revetment and pitching	25 4 0	100 c. ft.	2.52	
	Contingencies and petty supervision			1.67	
	Total				20.80
(h) Down stream masonry, etc., per foot run of bed width.					
7275 units.	Concrete in surki mortar	25 4 0	100 c. ft.	18.37	
056 "	Table-moulded brick in surki mortar	28 14 0	100 "	1.62	
08 "	Cement plastering, 3/4" thick, 1 : 3	6 12 0	100 sq. ft.	.41	
10 "	Laterite blocks for revetment and pitching	25 4 0	100 c. ft.	2.52	
	Contingencies and petty supervision			1.83	
	Total				24.75
	Carried over				6,73,310

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 6,73,310					
Estimate No. 27-G. (Plan No. G. 64)—cont.					
Syphon aqueduct of 2 spans of 4 ft. each at R.D. 14/2096.					
Item (b)	Two abutments and one vent under bed	41.7	R. ft.		7,131
171 r. ft.	One vent under bed	13.0	"		2,223
171 r. ft. (a)	Two abutments and one vent balance length up stream	924.5	"		925
(d ₁)	One vent balance up stream	437.5	"		438
(c ₁)	Two abutments and one vent balance down stream	899.0	"		899
(d ₂)	One vent down stream	427.0	"		427
(e ₁)	Wing walls up stream	1803.0	"		1,803
(e ₂)	Do. down stream	2,214.8	"		2,215
9.5 (g)	Up stream masonry, etc., per foot run of stream width between abutments	20.8	R. ft.		198
9.5 (h)	Down stream masonry, etc., per foot run of stream width between abutments	24.75	"		235
50.00 units ..	(1) Earthwork	6 2 0	1,000 c. ft.		306
	(2) Baling out water from foundations		Lump sum.		300
14.00 "	(3) Earthwork cutting stream in rear	6 2 0	1,000 c. ft.		86
	Centering for arches		Lump sum.		400
	Shed for materials				170
	Contingencies for items 1-3				44
	Total				17,800
N.B.—Data sheet for this is similar to the one at R.D. 13/88-90 for special class girder bridge.					
Estimate No. 28-G.					
Syphon aqueduct of 3 spans, 4 in. each at R.D. 14/3930.					
Item (a) 171 r. ft.	Two vents under bed 2 × 171 × 13.00	25.00	R. ft.		4,446
171 (b) r. ft.	Two abutments and one vent under bed 171 × 41.70	41.70	"		7,131
2 (c ₁)	Two vents of culvert up stream 2 × 437.5	437.5	Vent.		875
(d ₁)	Two abutments and one vent balance up stream	924.5	"		925
2 (c ₂)	Two vents of culvert down stream 2 × 427.25	427.25	Vent.		855
(d ₂)	Two abutments and one vent balance down stream	899.0	"		899
(e ₁)	Wing walls up stream 2 × 1,803.1	1,803.1	"		1,803
(e ₂)	Do. down stream 2 × 2,214.8	2,214.8	"		2,215
15 (g)	Up stream masonry, etc., per foot of stream width between abutments 15 × 20.8	20.8	R. ft.		312
15 (h)	Down stream masonry, etc., per foot of stream width between abutments 15 × 24.75	24.75	"		371
(1)	Extra cost of 534 c. ft. masonry for increase in height of wings				154
(2)	Extra cost of 120 sq. ft. of plastering for increase in height of wings				8
(3)	Baling out water from foundations		Lump sum.		300
478 units (4)	Earthwork (cutting stream in rear)	6 2 0	Unit.		2,928
	Centering for arches		Lump sum.		600
	Shed for materials				300
	Contingencies, etc., for items 1, 2, 3 and 4 and petty supervision				278
	Total				24,400
N.B.—Same rate as per special class bridge at R.D. 13/88-90.					
	Carried over				7,15,510

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 7,15,510

Estimate No. 29-G. (Plan No. G. 65).

Syphon aqueduct at R.D. 14/6200.

<i>(a) Under bed of canal for one span of a pier and a vent clear of abutments per foot run of canal bed width.</i>					
0.28 units.	Concrete broken bricks in surki mortar ..	21 0 0	100 c. ft.	5 14 1	
0.11 "	Table-moulded brick in surki mortar ..	25 0 0	100 "	2 12 1	
0.19 "	Archwork brick in surki mortar ..	28 8 0	100 "	5 0 7	
0.34 "	Cement plastering, $\frac{3}{4}$ " thick $\times$ 1:3 ..	6 12 0	100 sq. ft.	2 4 9	
0.084 "	Earthwork (excavating foundations, etc.) ..	3 12 0	1,000 c. ft.	0 5 0	
	Total ..			16 5 4	
	Contingencies at 5 per cent ..			0 13 1	
	Petty supervision at $2\frac{1}{2}$ per cent ..			0 6 7	
	Total for 1 R. ft. of 1 span ..			17 9 0	
	Total, three spans and 171 R. ft. bed width ..				9,010
<i>(b) Two abutments less one pier under bed of canal per foot run of canal bed width. This item includes pitching, clay puddling, etc., provided in the bed of canal.</i>					
0.29 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	6 1 5	
0.59 "	Table-moulded brick in surki mortar ..	25 8 0	100 "	15 0 9	
0.48 "	Concrete block pitching for canal bed ..	22 8 0	100 "	10 10 4	
1.64 "	Clay puddling ..	1 0 0	100 "	1 10 3	
0.127 "	Earthwork (excavating foundations, etc.) ..	3 12 0	1,000 "	0 7 7	
	Total ..			33 14 4	
	Contingencies at 5 per cent ..			1 11 1	
	Petty supervision at $2\frac{1}{2}$ per cent ..			0 13 7	
	Total for 1 R. ft. of bed width ..			36 7 0	
	Total for 171 R. ft. of canal bed width ..				6,231
<i>(c) Balance of culvert length arched over under banks up and down stream, clear of abutments for one span of a pier and vent.</i>					
13.94 units.	Concrete broken bricks in surki mortar ..	21 0 0	100 c. ft.	292 11 10	
9.87 "	Brick in surki mortar (table-moulded) ..	25 8 0	100 "	251 11 0	
9.38 "	Archwork brick in surki mortar ..	26 8 0	100 "	248 9 1	
15.65 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 "	105 10 2	
3.31 "	Concrete block revetment ..	22 3 0	100 "	73 7 1	
1.10 "	Brick jelly backing to revetment ..	10 4 0	100 "	11 4 6	
5.540 "	Earthwork (excavating foundations, etc.) ..	3 12 0	1,000 "	20 12 4	
	Total ..			1,004 2 0	
	Contingencies at 5 per cent ..			59 3 4	
	Petty supervision at $2\frac{1}{2}$ per cent ..			25 1 8	
	Total for one span ..			1,079 7 0	
	Total for three spans ..				3,238
	Carried over ..				18,479
	Carried over ..				7,15,510

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 7,15,510

Estimate No. 29-G. (Plan No. G. 65)—cont. Brought forward .. 18,479

Syphon aqueduct at R.D. 14/6200—cont.

<i>(d) Balance of culvert length under banks up and down stream for the whole length (two abutments less one pier).</i>					
<i>For two abutments alone—</i>					
10.94 units.	Concrete broken bricks in surki mortar ..	21 0 0	100 c. ft.	229 11 10	
23.73 "	Table-moulded brick in surki mortar ..	25 8 0	100 "	605 1 10	
2.42 "	Concrete block revetment ..	22 3 0	100 "	53 11 1	
0.81 "	Brick jelly backing to revetment ..	10 4 0	100 "	8 4 10	
7.972 "	Earthwork (excavating foundations, etc.) ..	3 12 0	1,000 "	29 14 3	
	Total ..			926 11 10	
	Contingencies at 5 per cent ..			46 5 5	
	Petty supervision at $2\frac{1}{2}$ per cent ..			23 2 9	
	Total for upstream alone ..			996 4 0	
	For downstream ..			996 4 0	
	Total ..			1,992 8 0	
	Deduct $1\frac{1}{8}/7\frac{1}{8}$ of item (c) alone for one pier ..			257 0 0	
	Net total ..				1,736
<i>(e₁) Wings, revetment and pitching to the sides of the drainage at the upstream side. This includes the triangular portion of the work formed by the splay of the wing.</i>					
16.00 units.	Concrete broken bricks in surki mortar ..	21 0 0	100 c. ft.	336 0 0	
15.28 "	Table-moulded brick in surki mortar ..	25 8 0	100 "	390 0 0	
9.25 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	82 0 0	
29.00 "	Concrete block revetment and pitching ..	22 3 0	100 c. ft.	643 0 0	
8.00 "	Brick jelly backing to revetment ..	10 4 0	100 "	82 0 0	
3.500 "	Earthwork ..	3 12 0	1,000 "	13 0 0	
	Total ..			1,526 0 0	
	Contingencies at 5 per cent ..			76 0 0	
	Petty supervision at $2\frac{1}{2}$ per cent ..			38 0 0	
	Total ..				1,640
<i>(e₂) Wings, revetments, etc., as for item above but on the down stream side of the drain.</i>					
36.15 units.	Concrete broken bricks in surki mortar ..	21 0 0	100 c. ft.	759 0 0	
26.60 "	Table-moulded brick in surki mortar ..	25 8 0	100 "	678 0 0	
21.30 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	144 0 0	
33.50 "	Concrete block revetment ..	22 3 0	100 c. ft.	743 0 0	
9.50 "	Brick jelly backing to revetment ..	10 4 0	100 "	97 0 0	
3.640 "	Earthwork (excavating foundation, etc.) ..	3 12 0	1,000 "	14 0 0	
	Total ..			2,435 0 0	
	Contingencies at 5 per cent ..			122 0 0	
	Petty supervision at $2\frac{1}{2}$ per cent ..			61 0 0	
	Total ..				2,618
	Carried over ..				24,473
	Carried over ..				7,15,510

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 7,15,510					
Estimate No. 29-G. (Plan No. G. 65)—cont. Brought forward .. 24,47 ²					
Syphon aqueduct at R.D. 14/6200—cont.					
(g) Up stream masonry flooring and drop wall between wings and not under arches up to drainage bed level per foot run parallel to canal.					
0.30 units.	Concrete broken bricks in surki mortar ..	21 0 0	100 c. ft.	6 4 10	
0.07 "	Table-moulded brick in surki mortar ..	25 8 0	100 "	1 12 7	
0.12 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	0 13 0	
0.150 "	Earthwork (excavating foundations, etc.) ..	3 12 0	1,000 c. ft.	0 9 0	
	Total ..			9 7 5	
	Contingencies at 5 per cent ..			0 7 7	
	Petty supervision at $2\frac{1}{2}$ per cent ..			0 3 10	
	Total for 1 R. ft. || to canal ..			10 2 10	
	Total for $21\frac{1}{2}$ R. ft. length ..				22
(h) Down stream cushions lift walls, etc., per foot run parallel to canal bed.					
0.33 units.	Concrete broken bricks in surki mortar ..	21 0 0	100 c. ft.	6 14 11	
0.06 "	Table-moulded brick in surki mortar ..	25 8 0	100 "	1 8 6	
0.13 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	0 14 0	
0.125 "	Earthwork (excavating foundations, etc.) ..	3 12 0	1,000 c. ft.	0 7 6	
	Total ..			9 12 11	
	Contingencies at 5 per cent ..			0 7 10	
	Petty supervision at $2\frac{1}{2}$ per cent ..			0 3 11	
	Total for 1 R. ft. || to canal ..			10 8 8	
	Total for $21\frac{1}{2}$ R. ft. || to canal ..				229
(i) Pitching between wings on stream bed per foot run parallel to canal up stream side.					
0.10 units.	Concrete broken bricks in surki mortar ..	21 0 0	100 c. ft.	2 1 7	
0.05 "	Plastering with cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	0 5 5	
	Total ..			2 7 0	
	Contingencies at 5 per cent ..			0 1 11	
	Petty supervision at $2\frac{1}{2}$ per cent ..			0 1 0	
	Total for 1 R. ft. || to canal ..			2 9 11	
	Total for $21\frac{1}{2}$ R. ft. || to canal ..				27
(j) Pitching between wings on stream bed per foot run parallel to canal (down stream side).					
0.34 units.	Concrete broken bricks in surki mortar ..	21 0 0	100 c. ft.	7 2 3	
0.17 "	Plastering with cement ..	6 12 0	100 sq. ft.	1 2 4	
	Total ..			8 4 7	
	Contingencies at 5 per cent ..			0 6 8	
	Petty supervision at $2\frac{1}{2}$ per cent ..			0 3 4	
	Total for 1 R. ft. || to canal ..			8 14 7	
	Total for $21\frac{1}{2}$ R. ft. || to canal ..				194
	Carried over ..				25,174
	Carried over ..				7,15,510

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(7)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 7,15,510					
Estimate No. 29-G. (Plan No. G. 65)—cont. Brought forward .. 25,174					
Syphon aqueduct at R.D. 14/6200—cont.					
Earthwork excavating front and rear channel, diversion of up stream and deepening rear channel, etc.					
145.000 units.	Earthwork ..	3 12 0	1,000 c. ft.	544	
	Contingencies at 5 per cent ..			27	
	Petty supervision at $2\frac{1}{2}$ per cent ..			14	
	Total ..			585	
	Centering for archwork ..			256	
	Bed for materials ..			385	
	Baling water ..			600	
	Total ..			1,241	
	Total ..			27,000	
Estimate No. 30-G. (Plan No. G. 66).					
Syphon aqueduct at R.D. 15/5250.					
(a) For one span of a pier and vent under bed of canal clear of abutments per foot run of canal bed width.					
15 units.	Concrete broken bricks in surki mortar ..	20 8 0	100 c. ft.	3.08	
0.08 "	Table-moulded brick in surki mortar ..	24 15 0	100 "	2.00	
0.16 "	Archwork in surki mortar ..	25 15 0	100 "	4.15	
0.26 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	1.75	
0.081 "	Earthwork, etc. ..	3 12 0	1,000 c. ft.	0.80	
	Total ..			11.28	
	Contingencies at 5 per cent ..			0.56	
	Supervision at 3 per cent ..			0.34	
	Total ..			12.18	
	For 3 spans of 166 feet bed width = $3 \times 166 \times$ Rs. 12.18 ..				6,066
(b) Two abutments less one pier under bed of canal per foot run of canal bed width.					
0.17 units.	Concrete broken bricks in surki mortar ..	20 8 0	100 c. ft.	3.49	
0.37 "	Table-moulded brick in surki mortar ..	24 15 0	100 "	9.23	
0.48 "	Concrete block revetment for canal bed ..	21 11 0	100 "	10.41	
1.60 "	Clay puddle ..	1 0 0	100 "	2.00	
0.122 "	Earthwork (excavating foundation, etc.) ..	3 12 0	1,000 "	4.46	
	Total ..			25.59	
	Contingencies at 5 per cent ..			2.33	
	Supervision at 3 per cent ..			0.80	
	Total ..			28.72	
	For 166 bed width = $166 \times$ Rs. 28.72 ..				4,76
(c) Balance of culvert length arched over underbanks up and down stream clear of abutments for one span of a pier and a vent.					
8.49 units.	Concrete broken brick in surki mortar ..	20 8 0	100 c. ft.	174.05	
6.60 "	Table-moulded brick in surki mortar ..	24 15 0	100 "	164.59	
8.26 "	Archwork in surki mortar ..	25 15 0	100 "	214.24	
12.62 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	85.19	
2.31 "	Concrete block revetments to canal banking ..	21 11 0	100 c. ft.	50.03	
77 unit.	Brick jelly backing ..	9 12 0	100 "	7.51	
4.000 units.	Earthwork (excavating foundations, etc.) ..	3 12 0	1,000 "	15.00	
	Total ..			710.61	
	Contingencies at 5 per cent ..			35.53	
	Supervision at 3 per cent ..			21.32	
	Total ..			767.46	
	For 3 spans = $3 \times$ Rs. 767.46 ..				2,302
	Carried over ..				13,136
	Carried over ..				7,42,510

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward ..					
Estimate No. 30-G. (Plan No. G. 66).				Brought forward ..	13,136
Syphon aqueduct at R.D. 15/5250.					
(d) Balance of culvert length for the portion under banks up and down stream for the whole length (two abutments less one pier).					
9.85 units.	Concrete in surki mortar	20 8 0	100 c. ft.	201.93	
18.93 "	Table moulded brick in surki mortar	24 15 0	100 "	472.07	
5.25 "	Concrete block revetment to canal bank	21 11 0	100 "	113.86	
1.42 "	Brick jelly backing	9 12 0	100 "	13.84	
4.550 "	Earthwork excavating foundations	3 12 0	1,000 "	17.07	
	Total			818.77	
	Contingencies at 5 per cent			40.90	
	Supervision at 3 per cent			24.59	
	Total			884.26	884
(e-1) Wings upstream culvert including revetment for canal banks and drainage and also apron of the contracted portion of the drainage.					
15.63 units.	Concrete broken bricks in surki mortar	20 8 0	100 c. ft.	320.42	
16.79 "	Table moulded brick in surki mortar	24 15 0	100 "	418.70	
10.42 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	70.34	
10.86 "	Concrete block revetment and pitching	21 11 0	100 c. ft.	235.63	
1.44 "	Brick jelly backing	9 12 0	100 "	14.04	
3.000 "	Earthwork excavating foundations, etc.	3 12 0	1,000 "	11.25	
	Total			1,070.28	
	Contingencies at 5 per cent			53.50	
	Supervision at 3 per cent			32.10	
	Grand Total			1,155.88	1,156
(e-2) Wings etc., down stream side.					
24.37 units.	Concrete broken brick in surki mortar	20 8 0	100 c. ft.	499.59	
28.20 "	Table moulded brick in surki mortar	24 15 0	100 "	578.55	
16.70 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	112.73	
14.17 "	Concrete block revetment and pitching	21 11 0	100 c. ft.	307.31	
1.46 "	Brick jelly backing	9 12 0	100 "	14.22	
5.000 "	Earthwork excavation, etc.	3 12 0	1,000 "	18.75	
	Total			1,531.15	
	Contingencies at 5 per cent			76.56	
	Petty supervision at 3 per cent			45.93	
	Total			1,653.63	1,654
(g) Upstream flooring and drop well for one running foot parallel to canal width.					
1.52 unit.	Concrete broken brick in surki mortar	20 8 0	100 c. ft.	10.66	
.08 "	Table moulded brick work in surki mortar	24 15 0	100 "	2.00	
0.31 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	2.09	
0.150 "	Earthwork excavation, etc.	3 12 0	1,000 c. ft.	.57	
.10 "	Concrete block revetment	21 11 0	100 "	2.17	
	Total			17.49	
	Contingencies at 5 per cent			.87	
	Supervision at 3 per cent			.52	
	Total			18.88	
	For 15 feet parallel to canal = $15 \times$ Rs. 18.88				283
	Carried over				17,113
	Carried over				7,42,510

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward ..					
Estimate No. 30-G (Plan No. G. 66)—cont.				Brought forward ..	17,113
Syphon aqueduct at R.D. 15/5250—cont.					
(h) Down-stream side flooring and drop wall, etc., for one running foot, parallel to canal.					
.61 unit.	Concrete broken brick in surki mortar	20 8 0	100 c. ft.	12.51	
.08 "	Table moulded brick work in surki mortar	24 15 0	100 "	2.00	
.25 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	1.69	
.10 "	Concrete block apron	21 11 0	100 c. ft.	2.17	
.160 "	Earthwork excavation	3 12 0	1,000 c. ft.	.57	
	Total			18.94	
	Contingencies at 5 per cent			0.95	
	Supervision at 3 per cent			0.57	
	Total			20.46	
	For 15 feet parallel to canal = $15 \times$ Rs. 20.46				307
87.000 units.	Earthwork excavating front and rear channel and deepening rear channel for 40 feet wide and side slopes, 1:1	3 12 0	1,000	326.25	
	Contingencies at 5 per cent			16.31	
	Supervision at 3 per cent			9.79	
	Total			352.35 or	352
(i) Concrete block revetment for canal bank.					
33.72 units.	Revetment concrete block	21 11 0	100 c. ft.	796.36	
12.24 "	Brick jelly-backing	9 12 0	100 "	119.34	
	Total			915.70	
	Contingencies at 5 per cent			45.79	
	Supervision at 3 per cent			27.47	
	Total			988.96 or	989
	Shed for materials			269	
	Baling water			360	
	Centring for archwork			210	
	Total				839
	Total				19,600
Estimate No. 31-G (Plan No. G. 67).					
Canal syphon at R.D. 15/8750.					
1,528.00 units.	Concrete brick jelly in surki mortar	21 11 0	100 c. ft.	33,139	
811.00 "	Table moulded brick in surki mortar	26 0 0	100 "	21,086	
259.00 "	Archwork table moulded brick in surki mortar	27 0 0	100 "	6,993	
785 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	5,296	
231.00 "	Concrete block for revetment and pitching	22 12 0	100 c. ft.	5,255	
36.00 "	Brick jelly-backing, 6", under revetment	10 10 0	100 "	383	
9 c. ft.	Cutstone work	1 12 0	C. ft.	16	
No. 4	Guard stones	3 0 0	Each	12	
115 r. ft.	Roadway including Westwoods' trough plate, cement concrete, road metalling, gravelling, etc., including standards	30 15 0	R. ft.	3,558	
183 cwt.	Roller steel beams, $29' \times 7\frac{1}{2} \times 89$ lb.	8 0 0	Cwt.	1,464	
No. 6	Stiffening frames	22 12 0	Each	137	
261 units.	Clay puddle filling	1 0 0	100 c. ft.	261	
500 "	Earthwork excavating for foundations filling in, etc.	5 8 0	1,000 "	2,750	
	Baling charges			2,000	
	Shed for materials			750	
	Centring for archwork			500	
	Total			83,700	
	Contingencies at 5 per cent			4,200	
	Petty supervision at 3 per cent			2,100	
	Total				90,000
	Carried over				8,52,110

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont.					
Estimate No. 32-G.					
Brought forward ..				8,52,110	
Syphon aqueduct at R.D. 16/05'40.					
(a) For one span of a pier and bent under bed of canal clear of abutments per foot run of canal bed width.					
0.15 unit.	Concrete broken brick in surki mortar ..	21 11 0	100 c.ft.	..	
0.075 "	Table moulded brick in surki mortar ..	26 0 0	100 "	..	
0.16 "	Table moulded archwork in surki mortar ..	27 0 0	100 "	3.25	
0.26 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3.	6 12 0	100 sq. ft.	1.95	
0.081 "	Earthwork, etc. ..	3 12 0	1,000 c.ft.	4.32	
				1.75	
	Total ..	..	..	0.30	
	Contingencies and supervision at 8 per cent ..	..	..	11.58	
	Total ..	..	..	..	92
	For 3 spans of 115 feet bed width = $3 \times 115 \times$ Rs. 12.5.	..	..	12.50	
				4,312.5 or	4,313
(b) Two abutments less one pier under bed of canal per foot run of canal bed width.					
0.17 unit.	Concrete broken brick in surki mortar ..	21 11 0	100 c.ft.	3.68	
0.37 "	Table moulded brick in surki mortar ..	26 0 0	100 "	9.62	
0.48 "	Concrete block apron for canal bed ..	22 12 0	100 "	10.92	
1.50 "	Clay puddling ..	2 0 0	100 "	3.00	
0.122 "	Earthwork excavation, etc. ..	3 12 0	1,000 "	0.46	
	Total ..	..	..	27.68	
	Contingencies and petty supervision ..	..	..	2.21	
	Total for one R. foot of canal bed width ..	..	..	29.89	
	For 115 feet bed width = $115 \times$ Rs. 29.89 ..	..	..	3,437.35 or	3,437
(c) Balance of culvert length arched over under banks up and down stream clear of abutments for one span of a pier and vent.					
8.73 units.	Concrete broken brick in surki mortar ..	21 11 0	100 c.ft.	189.33	
6.02 "	Table moulded brick in surki mortar ..	26 0 0	100 "	156.52	
8.18 "	Archwork brick in surki mortar ..	27 0 0	100 "	220.86	
12.54 "	Plastering with cement, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	84.65	
2.19 "	Concrete block revetment to canal bank ..	22 12 0	100 c.ft.	49.82	
0.78 "	Brick jelly-backing ..	10 10 0	100 "	7.75	
4.090 "	Earthwork excavation, etc. ..	3 12 0	1,000 "	15.00	
	Total ..	..	..	723.93	
	Contingencies and petty supervision at 8 per cent ..	..	..	57.91	
	Total for one span ..	..	..	781.84	
	For 3 spans, Rs. 3×781.84 or Rs. 2,345.52 or ..	..	..	..	2,346
(d) Balance of culvert length for the portion under banks up and down stream for the whole length (2 abutments less 1 pier).					
9.95 units.	Concrete broken brick in surki mortar ..	21 11 0	100 c.ft.	215.79	
20.19 "	Table moulded brick in surki mortar ..	26 0 0	100 "	524.94	
1.40 "	Concrete block revetment to canal bank ..	22 12 0	100 "	31.85	
0.47 "	Brick jelly-backing to revetment ..	10 10 0	100 "	4.99	
4.550 "	Earthwork excavation, etc. ..	3 12 0	1,000 "	17.07	
	Total ..	..	..	794.64	
	Contingencies and supervision at 8 per cent ..	..	..	63.57	
	Total ..	..	..	858.21 or	8 5
	Carried over ..			10,954	
	Carried over ..			8,52,110	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont.					
Estimate No. 32-G—cont.					
Brought forward ..				8,52,110	
Brought forward ..				10,954	
Syphon aqueduct at R.D. 16/05'40—cont.					
(e) Wings up-stream side including revetment for canal banks and drainage and also apron of the contracted portion of the stream.					
	Brought forward ..	..	..	11,74,057	
12.91 units.	Concrete broken brick in surki mortar ..	21 11 0	100 c.ft.	279.99	
22.67 "	Table moulded brick in surki mortar ..	26 0 0	100 "	534.98	
8.03 "	Cement-plastering, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	54.20	
12.49 "	Concrete block revetment ..	22 12 0	100 c.ft.	284.15	
2.00 "	Brick jelly-backing ..	10 10 0	100 "	21.25	
3.006 "	Earthwork excavation, etc. ..	3 12 0	1,000 "	11.25	
	Total ..	..	..	1,185.82	
	Contingencies and petty supervision at 8 per cent ..	..	..	99.22	
	Total ..	..	..	1,285.04 or	1,285
(e-2) Wings down-stream side including revetment, etc.					
23.13 units.	Concrete broken brick in surki mortar ..	21 11 0	100 c.ft.	501.63	
27.15 "	Table moulded brick in surki mortar ..	26 0 0	100 "	705.90	
16.08 "	Cement-plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	108.54	
16.93 "	Concrete block revetment ..	22 12 0	100 c.ft.	386.30	
2.37 "	Brick jelly-backing ..	10 10 0	100 "	25.17	
5.000 "	Earthwork excavation, etc. ..	3 12 0	1,000 "	18.75	
	Total ..	..	..	1,746.29	
	Contingencies and petty supervision at 8 per cent ..	..	..	139.70	
	Total ..	..	..	1,885.99 or	1,886
(g) Up-stream flooring and drop-wall for 1 r.ft. parallel to canal.					
0.63 unit.	Concrete broken brick in surki mortar ..	21 11 0	100 c.ft.	13.65	
0.08 "	Table moulded brick work in surki mortar ..	26 0 0	100 "	2.08	
0.28 "	Cement-plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	1.89	
0.150 "	Earthwork excavation, etc. ..	3 12 0	1,000 c.ft.	0.56	
0.10 "	Concrete block apron ..	22 12 0	100 "	2.28	
	Total ..	..	..	20.47	
	Contingencies and petty supervision at 8 per cent ..	..	..	1.63	
	Total for 1 r. ft. ..	..	..	22.10	
	For 15 r.ft. $22.10 \times 15 =$ Rs. 331.5 or ..	..	..	..	332
(h) Down-stream flooring drop wall, etc., for one running foot parallel to canal.					
0.61 unit.	Concrete broken brick in surki mortar ..	21 11 0	100 c.ft.	13.23	
0.08 "	Table moulded brick in surki mortar ..	26 0 0	100 "	2.08	
0.25 "	Cement-plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	1.89	
0.10 "	Concrete block apron ..	22 12 0	100 c.ft.	2.27	
0.150 "	Earthwork excavation, etc. ..	3 12 0	1,000 "	0.56	
	Total ..	..	..	19.83	
	Contingencies and petty supervision at 8 per cent ..	..	..	1.59	
	Total ..	..	..	21.42	
	For 15 feet, 15×21.42 or Rs. 321.40 or ..	..	..	..	321
124.000 units.	Earthwork excavation front and rear channel and deepening rear channel by $\frac{1}{4}$..	3 12 0	1,000 c.ft.	465	
	Contingencies and supervision at 8 per cent ..	..	..	37	
	Total ..	..	..	..	502
	Carried over ..			15,280	
	Carried over ..			8,52,110	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
	GRAND ANICUT CANAL—cont.		Brought forward ..		8,52,110
	F. CROSS DRAINAGE WORKS—cont.		Brought forward ..		15,280
	Estimate No. 32-G—cont.				
	Syphon aqueduct at R.D. 16/05-40—cont.				
	(i) Down-stream flooring drop wall, etc., for 1 sq. feet parallel to canal.				
34.72 units.	Concrete block revetment	22 12 0	100 c.ft.	789-88	
11.57 "	Brick jell-backing	10 10 0	100 "	122-93	
	Total			912-81	
	Contingencies and petty supervision at 8 per cent.			78-02	
	Total			985-83 or	986
	Shed for materials				209
	Centering for archwork				215
	Baling water				360
	Total				16,950

Estimate No. 33-G.

Syphon aqueduct at R.D. 17/3200.

	(a) Under bed canal for one span of a pier and a vent clear of abutments per foot run of canal bed width.				
0.28 unit.	Concrete broken brick in surki mortar	24 0 0	100 c.ft.	6 11 6	
0.11 "	Table moulded brick in surki mortar	38 4 0	100 "	3 1 9	
0.19 "	Archwork in surki mortar	29 4 0	100 "	5 8 11	
0.84 "	Plastering with cement, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	2 4 9	
0.084 "	Earthwork (excavation, etc.)	3 12 0	1,000 c.ft.	0 5 0	
	Total			17 15 11	
	Contingencies and supervision at 8 per cent			1 7 0	
	Total			19 6 11	
	For 3 spans and 114" bed width = $3 \times 114 \times 19-6-11$ = Rs. 3,645-11-0 or				6,646
	(b) Two abutments less one pier under bed of canal per foot run of canal bed width. This item includes pitching, clay puddle, etc., provided in the bed of canal.				
0.26 units.	Concrete broken brick in surki mortar	24 0 0	100 c.ft.	6 15 4	
0.59 "	Table moulded brick in surki mortar	28 4 0	100 "	16 10 8	
0.48 "	Laterite stone packing	24 4 0	100 "	11 10 3	
1.64 "	Clay puddle	1 0 0	100 "	1 10 5	
0.127 "	Earthwork (excavation, etc.)	3 12 0	1,000 "	0 7 3	
	Total			37 6 2	
	Contingencies and supervision at 8 per cent			2 15 10	
	Total			40 6 0	
	For 114 feet length of abutments— $114 \times 40-6-0$ = Rs. 4,602-12-0.				4,603
	(c) Balance of culvert length arched over under banks up and down stream for one span of 27½ ft.				
13.94 units.	Concrete broken brick in surki mortar	24 0 0	100 c.ft.	334 9 0	
9.75 "	Table moulded brick in surki mortar	28 4 0	100 "	275 11 6	
9.38 "	Archwork brick in surki mortar	29 4 0	100 "	274 5 10	
16.30 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	110 0 5	
3.31 "	Laterite stone packing	24 4 0	100 c.ft.	80 4 3	
1.10 "	Brick jell-backing to revetment	12 13 0	100 "	14 1 6	
5.540 "	Earthwork (excavation, etc.)	3 12 0	1,000 c.ft.	20 12 5	
	Total			1,109 12 11	
	Contingencies and supervision at 8 per cent			88 12 7	
	Total			1,198 9 6	
	For one span of 7½ ft. = Rs. 1,198-9-6				
	For 3 spans and 2 piers = $21\frac{1}{2} \times 7\frac{1}{2}$ = Rs. 152-3-3				
	For 3 spans and 2 piers = $21\frac{1}{2} \times 7\frac{1}{2}$ = Rs. 3,310-6-2 or.				3,310
	Carried over				14,559
	Carried over				8,69,060

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
	GRAND ANICUT CANAL—cont.				
	F. CROSS DRAINAGE WORKS—cont.		Brought forward ..		8,69,060
	Estimate No. 33-G—cont.		Brought forward ..		14,559
	Syphon aqueduct at R.D. 17/3200—cont.				
	(d) Balance of culvert length under banks up stream for the whole length (two abutments).				
10.94 units.	Concrete broken brick in surki mortar	24 0 0	100 c.ft.	282 9 0	
23.74 "	Table moulded brick in surki mortar	28 4 0	100 "	670 10 7	
7.972 "	Earthwork excavation, etc.	3 12 0	1,000 "	29 14 3	
2.42 "	Laterite stone packing canal bank	24 4 0	100 "	58 10 6	
0.81 "	Brick jell-backing to revetment	12 13 0	100 "	10 12 3	
	Total			1,032 8 7	
	Contingencies and supervision at 8 per cent			82 9 7	
	Total			1,115 2 2	
	For two abutments down and up streams $2 \times 1,115-2-2$ = Rs. 2,230-4-4 or				2,230
	(e-1) Wings and revetment of pitching to the sides of drainage up stream sides under constant proportion. This includes the triangular portion of work formed by the splay of the wing.				
16.00 units.	Concrete broken brick in surki mortar	24 0 0	100 c.ft.	334 0 0	
13.10 "	Table moulded brick in surki mortar	28 4 0	100 "	370 1 2	
8.17 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	55 2 3	
31.58 "	Laterite stone packing	24 4 0	100 c.ft.	765 13 0	
8.90 "	Brick jell-backing	12 13 0	100 "	114 0 2	
4.000 "	Earthwork (excavation, etc.)	3 12 0	1,000 "	16 0 0	
	Total			1,704 0 7	
	Contingencies and supervision at 8 per cent			136 5 1	
	Total			1,840 5 8	1,840
	(e-2) Down stream side.				
38.15 units.	Concrete broken brick in surki mortar	24 0 0	100 c.ft.	867 9 7	
26.60 "	Table moulded brick in surki mortar	28 4 0	100 "	751 7 2	
21.30 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	143 12 2	
33.50 "	Laterite stone packing	24 4 0	100 c.ft.	812 6 0	
9.50 "	Brick jell-backing	12 13 0	100 "	121 11 1	
3.640 "	Earthwork (excavation, etc.)	3 12 0	1,000 "	13 9 11	
	Total			2,710 7 11	
	Contingencies and supervision at 8 per cent			216 13 5	
	Total			2,927 5 4	2,927
	(g) Up stream masonry flooring drop wall between wings and not under arches per foot run parallel to canal.				
0.30 unit.	Concrete in surki mortar	24 0 0	100 c.ft.	7 3 2	
0.07 "	Table moulded brick in surki mortar	28 4 0	100 "	1 15 8	
0.12 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement to 3 sand.	6 12 0	100 sq. ft.	0 12 11	
0.150 "	Earthwork	3 12 0	1,000 c.ft.	0 9 0	
	Total			10 8 9	
	Contingencies and supervision at 8 per cent			0 13 6	
	Total cost			11 6 3	
	For $21\frac{1}{2}$ feet = $11-6-3 \times 21\frac{1}{2}$ = Rs. 247-11-11 or Rs. 248.				248
	Carried over				21,804
	Carried over				8,69,060

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 8,69,060
 Estimate No. 33-G—cont. Brought forward .. 21,804

Syphon aqueduct at R.D. 17/3200—cont.

(b) Down stream cushion lift walls, etc., per foot run parallel to canal.					
0.33 unit.	Concrete in surki mortar	24 0 0	100 c.ft.	7 14 8	
0.06 "	Table moulded brick in surki mortar	28 4 0	100 "	1 11 1	
0.13 "	Cement plastering, 1 cement to 3 sand	6 12 0	100 sq. ft.	0 14 0	
0.125 "	Earthwork (excavation, etc.)	3 12 0	1,000 c.ft.	0 7 6	
	Total			10 15 3	
	Contingencies and supervision at 8 per cent			0 14 1	
	Total			11 13 4	
	For 21½ feet = 11-13-4 × 21½ = Rs. 257-6-0				257
(i) Pitching between wings on stream bed per foot run parallel to canal up stream side.					
0.10 unit.	Concrete in surki mortar	24 0 0	100 c.ft.	2 6 5	
0.06 "	Plastering with cement, ½" thick, 1 : 3	6 12 0	100 sq. ft.	0 5 5	
	Total			2 11 10	
	Contingencies and supervision at 8 per cent			0 3 6	
	Total			2 15 4	
	For full length of 21½ feet × 2-15-4 = Rs. 64-5-3				64
(j) Pitching between wings on stream bed per foot run parallel to canal down stream side.					
0.34 unit.	Concrete in surki mortar	24 0 0	100 c.ft.	8 2 8	
0.17 "	Plastering with cement, ¾" thick (1 cement to 3 sand)	6 12 0	100 sq. ft.	1 2 4	
	Total			9 5 0	
	Contingencies and supervision			0 11 0	
	Total			10 0 0	
	For 21½ feet = 21½ × 10				218
Earthwork excavating foundations front and rear channel diversion deepening rear channel 5½ feet and 4½ bottom width.					
166.5 units.	Earthwork excavation, etc.	3 12 0	1,000 c.ft.	624	
	Total			624	
	Contingencies and supervision, 8 per cent			50	
	Total				674
	Shed for materials			283	
	Centering for arches			300	
	Baling water			500	
	Total				1,083
	Total				24,100
	Carried over				8,93,160

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 8,93,160
 Estimate No. 34-G.

Syphon aqueduct at R.D. 18/09'80.

(a) Under bed of canal for one span of a pier and a vent clear of abutments per foot run of canal bed width.					
0.28 units.	Concrete broken bricks in surki mortar	28 0 0	100 c.ft.	7 4 6	
0.11 "	Table moulded brick in surki mortar	30 2 0	100 "	3 5 0	
0.19 "	Archwork brick in surki mortar	31 2 0	100 "	5 14 7	
0.34 "	Plastering with cement ½ inch thick (1 cement to 3 sand)	6 12 0	100 sq. ft.	2 4 8	
0.084 "	Earthwork (excavating foundations, etc.)	3 12 0	1,000 c.ft.	0 5 0	
	Total			19 1 9	
	Contingencies at 5 per cent			0 15 3	
	Petty supervision at 2½ per cent			0 7 8	
	Total for 1 ft. bed width for one span			20 8 8	
	Total for 5 spans of 113 feet canal bed width 5 × 113 × 20-8-8 =				11,606
(b) Two abutments less one pier under bed of canal per foot run of canal bed width. This item includes pitching, clay puddling, etc., provided in the bed of canal.					
0.29 units.	Concrete broken bricks in surki mortar	26 0 0	100 c.ft.	7 8 8	
0.59 "	Table moulded brick in surki mortar	30 2 0	100 "	17 12 5	
0.48 "	Laterite stone packing pitching	22 4 0	100 "	10 10 10	
1.64 "	Clay puddling	1 0 0	100 "	1 10 3	
0.127 "	Earthwork (excavating foundations, etc.)	3 12 0	1,000 "	0 7 7	
	Total			38 1 9	
	Contingencies at 5 per cent			1 14 6	
	Petty supervision at 2½ per cent			0 15 3	
	Total for 1 r. ft. of canal bed width			40 15 0	
	Total for 113 r. feet of canal bed width—113 × 40 × 56 =				4,629
(c) Balance of culvert length arched over under banks up and down stream for one span.					
13.94 units.	Concrete, broken bricks in surki mortar	26 0 0	100 c.ft.	362 7 0	
9.76 "	Table moulded brick in surki mortar	30 2 0	100 "	294 0 4	
9.38 "	Archwork in surki mortar	31 2 0	100 "	291 15 3	
16.42 "	Plastering with cement, ¾ inch thick, 1 : 3	6 12 0	100 sq. ft.	110 13 3	
3.31 "	Laterite stone packing	22 4 0	100 c.ft.	73 10 2	
1.10 "	Gravel backing to revetment	12 5 0	100 "	13 8 8	
5.000 "	Earthwork (excavating foundations, etc.)	3 12 0	1,000 "	18 12 0	
	Total			1,165 2 8	
	Contingencies at 5 per cent			58 4 2	
	Petty supervision at 2½ per cent			29 2 1	
	Total for one span of 7½ feet			1,252 8 11	
	Total for 1 r. ft.			159 2 0	
	Total for 37½ r. ft.				5,967
	Carried over				22,202
	Carried over				8,93,160

GRAND ANICUT CANAL SYSTEM—MAIN CANAL AND BRANCHES—cont.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont.				Brought forward ..	8,93,160
Estimate No. 34-G—cont.				Brought forward ..	22,202
Syphon aqueduct at R.D. 18/09-80—cont.					
(d) Balance of culvert length under banks up and down stream for the whole length.					
Two abutments only (for up stream only).					
10-94 units.	Concrete broken bricks in surki mortar ..	26 0 0	100 c.ft.	284 7 0	
23-73 "	Table moulded brick in surki mortar ..	30 2 0	100 "	714 13 10	
2-42 "	Laterite stone picking ..	22 4 0	100 "	53 13 6	
0-841 "	Gravel backing to revetment ..	12 5 0	100 "	9 15 7	
7-072 "	Earthwork (excavating foundations) ..	3 12 0	1,000 "	29 14 3	
	Total ..			1,093 0 2	
	Contingencies at 5 per cent ..			54 10 5	
	Petty supervision at 2½ per cent ..			27 5 3	
	Total for up stream side only ..			1,174 15 10	
	Total for up and down stream side ..				2,350
(e₁) Wings, revetment and pitching to the sides of the drainage on the up stream side. This item includes the triangular portion formed by the splay of the wing.					
16-00 units.	Concrete broken bricks in surki mortar ..	26 0 0	100 c.ft.	416 0 0	
15-25 "	Table moulded brick in surki mortar ..	30 2 0	100 "	460 0 0	
9-50 "	Plastering with cement, ¾ inch thick, 1:3 ..	6 12 0	100 sq. ft.	64 0 0	
31-58 "	Laterite stone packing and pitching ..	22 4 0	100 c.ft.	703 0 0	
8-86 "	Gravel backing to revetment ..	12 5 0	100 "	109 0 0	
4-000 "	Earthwork (excavating foundations, etc.) ..	3 12 0	1,000 "	15 0 0	
	Total ..			1,767 0 0	
	Contingencies at 5 per cent ..			88 0 0	
	Petty supervision at 2½ per cent ..			44 0 0	
	Total ..				1,899
(e₂) Wings, revetment, etc., as for e₁ above on the down stream side.					
33-15 units.	Concrete broken bricks in surki mortar ..	26 0 0	100 c.ft.	940 0 0	
26-60 "	Table moulded brick in surki mortar ..	30 2 0	100 "	801 0 0	
21-30 "	Cement plastering, ¾ inch thick, 1:3 ..	6 12 0	100 sq. ft.	144 0 0	
33-50 "	Laterite stone packing and pitching ..	22 4 0	100 c.ft.	745 0 0	
9-50 "	Gravel backing to revetment ..	12 5 0	100 "	117 0 0	
36-40 "	Earthwork (excavating foundations, etc.) ..	3 12 0	1,000 "	14 0 0	
	Total ..			2,761 0 0	
	Contingencies at 5 per cent ..			138 0 0	
	Petty supervision at 2½ per cent ..			69 0 0	
	Total ..				2,968
(g) Up stream masonry flooring and drop wall between wings and not under arches per foot run parallel to canal.					
0-30 unit.	Concrete broken bricks in surki mortar ..	26 0 0	100 c.ft.	7 12 10	
0-07 "	Table moulded brick in surki mortar ..	30 2 0	100 "	2 1 9	
0-12 "	Plastering with cement, ¾ inch thick, 1:3 ..	6 12 0	100 sq. ft.	0 13 0	
0-150 "	Earthwork (excavating foundations, etc.) ..	3 12 0	1,000 c.ft.	0 9 0	
	Total ..			11 4 7	
	Contingencies at 5 per cent ..			0 9 0	
	Petty supervision at 2½ per cent ..			0 4 5	
	Total for 1 r. ft. parallel to canal bed width ..			12 2 0	
	Total for 37½ r. ft. ..				455
	Carried over ..				29,874
	Carried over ..				8,93,160

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont.				Brought forward ..	8,93,160
Estimate No. 34-G—cont.				Brought forward ..	29,874
Syphon aqueduct at R.D. 18/09-80—cont.					
(h) Down stream cushion and lift wall, etc., per foot run parallel to canal bed width.					
0-33 units.	Concrete broken bricks in surki mortar ..	26 0 0	100 c.ft.	8 9 3	
0-06 "	Table moulded brick in surki mortar ..	30 2 0	100 "	1 12 11	
0-13 "	Plastering with cement, ¾ inch thick, 1:3 ..	6 12 0	100 sq. ft.	0 14 0	
0-125 "	Earthwork (excavating foundations, etc.) ..	3 12 0	1,000 c.ft.	0 7 6	
	Total ..			11 11 8	
	Contingencies at 5 per cent ..			0 9 5	
	Petty supervision at 2½ per cent ..			0 4 9	
	Total for 1 r. ft. parallel to canal ..			12 9 10	
	Total for 37½ r. ft. ..				473
(i) Pitching between wings on stream bed upstream for 1 r. ft. parallel to canal bed width.					
0-10 unit.	Concrete broken bricks in surki mortar ..	26 0 0	100 c. ft.	2 9 7	
0-05 "	Plastering with cement, ¾ inch thick, 1:3 ..	6 12 0	100 sq. ft.	0 5 5	
	Total ..			2 15 0	
	Contingencies at 5 per cent ..			0 2 4	
	Petty supervision at 2½ per cent ..			0 1 2	
	Total for 1 r. ft. parallel to canal ..			3 2 6	
	Total for 37½ r. ft. ..				118
(j) Pitching between wings on stream bed per foot run parallel bed width on the down stream side.					
0-34 unit.	Concrete broken brick in surki mortar ..	26 0 0	100 c. ft.	8 13 5	
0-17 "	Plastering with cement, ¾ inch thick (1 cement to 3 sand) ..	6 12 0	100 sq. ft.	1 2 2	
	Total ..			9 15 7	
	Contingencies at 5 per cent ..			0 8 0	
	Petty supervision at 2½ per cent ..			0 4 0	
	Total for 1 r. ft. parallel to canal bed width ..			10 11 7	
	Do. for 37½' do. ..				
01-011 units.	Earthwork excavating rear channel and front channel.	3 12 0	1,000 c. ft.	342 0 0	
	Total ..				342
	Sheds for materials ..			310 0 0	
	Centering for archwork ..			500 0 0	
	Baling water ..			700 0 0	
	Total ..				1,510
	Total ..				32,720
Deduct for reduction in ground level.					
2-88 units.	Revetment 2 × 137 × 7 × 1-5 ..	22 4 0		64 0 0	
96 "	Gravel backing ..	12 5 0		12 0 0	
	Contingencies and supervision ..			4 0 0	
	Total ..			80 0 0	
	Total ..				80
	Total ..				32,640
	Carried over ..				9,25,800

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		Rs. A. P.		Rs. A. P.	Rs.
GRAND ANICUT—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 9,25,800					
Estimate No. 35-G.					
Syphon aqueduct at R.D. 18/6450.					
(a) For one span of a pier and a vent under bed of canal clear of abutments per foot run of canal bed width.					
0.15 unit.	Concrete broken brick in surki mortar	25 5 0	100 c.ft.	4 3 2	
0.075 "	Table moulded brick in do.	29 12 0	100 "	2 3 8	
0.16 "	Archwork in do.	30 12 0	100 "	4 11 9	
0.26 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	1 12 1	
0.081 "	Earthwork excavation, etc.	3 12 0	1,000 c. ft.	0 4 10	
	Total			13 6 6	
	Contingencies at 5 per cent			0 10 9	
	Supervision at 3 per cent			0 6 5	
	Total			14 7 8	
	For 4 spans of 112' bed width $4 \times 112 \times 14-7-8 =$				6,487
(b) Two abutments less one pier under bed of canal per foot run of canal bed width.					
0.17 units.	Concrete broken brick in surki mortar	25 5 0	100 c.ft.	4 4 10	
0.37 "	Table moulded do.	29 12 0	100 "	11 0 2	
0.48 "	Laterite stone packing for canal bed	21 4 0	100 "	10 3 2	
1.50 "	Clay puddle	2 0 0	100 "	3 0 0	
0.122 "	Earthwork excavating foundations	3 12 0	1,000 "	0 7 4	
	Total			28 15 6	
	Contingencies at 5 per cent			1 7 2	
	Supervision at 3 per cent			0 13 6	
	Total			31 4 2	
	For 4 spans of 112' bed width $= 112 \times 31-4-2 = 3,501-4-4$ or				3,501
(c) Balance of culvert length arched over under banks parallel to canal, up and down stream clear of abutments for one span of a vent and a pier.					
8.78 units.	Concrete broken brick in surki mortar	25 5 0	100 c.ft.	222 0 0	
6.53 "	Table moulded do.	29 12 0	100 "	194 0 0	
8.26 "	Archwork in surki mortar	30 12 0	100 "	254 0 0	
12.63 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	85 0 0	
2.19 "	Laterite stone packing	21 4 0	100 c. ft.	47 0 0	
7.73 "	Gravel backing	11 7 0	100 "	8 0 0	
4.000 "	Earthwork excavation	3 12 0	1,000 "	15 0 0	
	Total			825 0 0	
	Contingencies at 5 per cent			40 0 0	
	Supervision at 3 per cent			19 0 0	
	Total			884 0 0	
	For 4 spans $4 \times Rs. 885 = 3,536$ or				3,536
(d) Balance of culvert length arched over under banks for the whole length. Two abutments less one pier.					
8.47 units.	Concrete broken brick in surki mortar	25 5 0	100 c.ft.	214 0 0	
19.34 "	Table moulded do.	29 12 0	100 "	575 0 0	
3.79 "	Laterite stone packing	21 4 0	100 "	81 0 0	
1.26 "	Gravel backing	11 7 0	100 "	14 0 0	
4.550 "	Earthwork excavation	3 12 0	1,000 "	17 0 0	
	Total			901 0 0	
	Contingencies at 5 per cent			45 0 0	
	Supervision at 3 per cent			27 0 0	
	Total			973 0 0	973
	Carried over				14,497
	Carried over				9,25,800

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		Rs. A. P.		Rs. A. P.	Rs.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 9,25,800					
Estimate No. 35-G—cont.					
Syphon aqueduct at R.D. 18/6450—cont.					
(e ₁) Wings upstream side including revetment, flooring between wings, etc., for the whole length.					
15.46 units.	Concrete broken brick in surki mortar	25 5 0	100 c. ft.	391 0 0	
15.53 "	Table moulded do.	29 12 0	100 "	462 0 0	
7.28 "	Cement plastering, $\frac{3}{4}$ " thick	6 12 0	100 sq. ft.	49 0 0	
8.89 "	Laterite stone packing	21 4 0	100 c. ft.	189 0 0	
80 "	Gravel backing	11 7 0	100 "	9 0 0	
3.000 "	Earthwork excavation	3 12 0	1,000 "	11 0 0	
	Total			1,111 0 0	
	Contingencies at 5 per cent			56 0 0	
	Supervision at 3 per cent			53 0 0	
	Total			1,200 0 0	1,200
(e ₂) Wings downstream side including revetment, flooring between wings, etc.					
28.04 units.	Concrete broken brick in surki mortar	25 5 0	100 c. ft.	659 0 0	
23.43 "	Table moulded brick in surki mortar	29 12 0	100 "	697 0 0	
15.77 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	106 0 0	
12.96 "	Laterite stone packing	21 4 0	100 c. ft.	275 0 0	
1.82 "	Gravel backing	11 7 0	100 "	21 0 0	
5.000 "	Earthwork excavation, etc.	3 12 0	1,000 "	19 0 0	
	Total			1,777 0 0	
	Contingencies at 5 per cent			86 0 0	
	Supervision at 3 per cent			53 0 0	
	Total			1,916 0 0	1,916
(g) Upstream masonry drop wall and flooring for 1 r. ft. parallel to canal.					
63 unit.	Concrete broken brick in surki mortar	25 5 0	100 c. ft.	16 5 5	
08 "	Brickwork in surki mortar	29 12 0	100 "	2 6 1	
28 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	1 10 0	
0.150 "	Earthwork excavation	3 12 0	1,000 c.ft.	0 9 0	
0.10 "	Laterite stone packing	21 4 0	100 "	2 2 0	
	Total			23 0 6	
	Contingencies at 5 per cent			1 2 5	
	Supervision at 3 per cent			0 11 1	
	Total			24 14 0	
	For $20\frac{1}{2}$ feet $= 20\frac{1}{2} \times 24-14-0 =$				510
(h) Downstream flooring and drop wall, etc., for 1 r. ft. parallel to canal.					
61 unit.	Concrete broken in surki mortar	25 5 0	100 c. ft.	15 7 0	
08 "	Brickwork in surki mortar	29 12 0	100 "	2 6 1	
25 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	1 11 0	
0.10 "	Laterite stone packing	21 4 0	100 "	2 2 0	
150 "	Earthwork excavation, etc.	3 12 0	1,000 "	0 9 0	
	Total			22 3 1	
	Contingencies at 5 per cent			1 1 9	
	Supervision at 3 per cent			0 10 8	
	Total			23 15 6	
	For 4 spans of 112' $= 20\frac{1}{2} \times Rs. 23-5-6 =$				491
	Carried over				18,614
	Carried over				9,25,800

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 9,25,800					
Estimate No. 35-G.—cont. Brought forward .. 18,614					
Syphon aqueduct at R.D. 18/6450—cont.					
(i) Revetment to canal bank.					
34.23 units.	Laterite stone packing	21 4 0	100 c. ft.	727 0 0	
11.41 "	Gravel backing	11 7 0	100 "	131 0 0	
	Total			858 0 0	
	Contingencies at 5 per cent			43 0 0	
	Supervision at 3 per cent			26 0 0	
	Total			927 0 0	927
407.000 units.	Earthwork excavating front and rear channel and deepening the same.	3 12 0	1,000 c. ft.	1,626 0 0	
	Total			1,626 0 0	
	Contingencies at 5 per cent			76 0 0	
	Supervision at 3 per cent			46 0 0	
	Total			1,648 0 0	1,648
	Shed for materials			251 0 0	
	Centering for arches			280 0 0	
	Baling water			480 0 0	
	Total				1,011
	Total				22,200

Estimate No. 36-G.

Constructing a syphon aqueduct at R.D. 19/31'65.

(a) For one span of a pier and a vent under bed of canal clear of abutments per foot run of canal bed width.					
0.15 unit.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	3.75	
0.75 "	Table moulded brick in surki mortar	29 3 0	100 "	2.19	
0.16 "	Archwork in do.	30 3 0	100 "	4.83	
0.26 "	Cement plastering, 3" thick, 1:3	6 12 0	100 sq. ft.	1.76	
0.081 "	Earthwork, etc.	3 12 0	1,000 c. ft.	0.30	
	Total			12.83	
	Contingencies at 5 per cent			0.64	
	Supervision at 3 per cent			0.38	
	Total			13.85	
	For 3 spans of 106' bed width = $3 \times 106 \times$ Rs. 13.85 = 4,404.30.				4,404
(b) Two abutments less one pier under bed of canal per foot run of canal bed width.					
0.17 unit.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	4.25	
0.37 "	Table moulded brick in do.	29 3 0	100 "	10.80	
0.48 "	Laterite stone apron	22 4 0	100 "	10.68	
1.50 "	Clay puddle	2 0 0	100 "	3.03	
0.122 "	Earthwork excavating foundation, etc.	3 12 0	1,000 "	0.45	
	Total			29.18	
	Contingencies at 5 per cent			1.46	
	Supervision at 3 per cent			0.88	
	Total			31.52	
	For 3 spans of 106' bed width $106 \times$ Rs. 31.52 = 3,341.12.				3,341
	Carried over				7,745
	Carried over				9,48,000

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 9,48,000					
Estimate No. 36-G.—cont. Brought forward .. 7,745					
Constructing a syphon aqueduct at R.D. 19/31'65—cont.					
(c) Balance of culvert length arched over under bank up and down a stream clear of abutments for one span of a pier and a vent for the whole length.					
8.50 units.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	212.50	
6.09 "	Table moulded brick in surki mortar	29 3 0	100 "	177.75	
7.94 "	Archwork brick in do.	30 3 0	100 "	239.69	
12.31 "	Cement plastering, 3" thick, 1:3	6 12 0	100 sq. ft.	83.09	
2.08 "	Laterite stone revetment to canal bank	22 4 0	100 c. ft.	46.28	
0.69 "	Brick jelly backing	13 11 0	100 "	9.44	
4.000 "	Earthwork excavation, etc.	3 12 0	1,000 "	15.00	
	Total			783.75	
	Contingencies at 5 per cent			39.19	
	Supervision at 3 per cent			23.51	
	Total			846.45	
	For 3 spans of 106' B. W. = $3 \times$ Rs. 846.45 =				2,539
(d) Balance of culvert length arched over under banks parallel to canal for the whole length. Two abutments less one pier.					
9.66 units.	Concrete broken brick in surki mortar	25 6 0	100 c. ft.	241.50	
18.52 "	Table moulded brick in surki mortar	29 3 0	100 "	537.45	
3.69 "	Laterite stone revetment and pitching	22 4 0	100 "	79.88	
1.20 "	Brick jelly backing	13 11 0	100 "	16.43	
5.560 "	Earthwork excavation, etc.	3 12 0	100 "	17.06	
	Total			892.32	
	Contingencies at 5 per cent			44.71	
	Supervision at 3 per cent			26.77	
	Total			963.80	964
(e1) Wings upstream side including flooring between wings, revetment, etc.					
11.62 units.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	290.50	
15.83 "	Table moulded brick in surki mortar	29 3 0	100 "	462.04	
8.10 "	Cement plastering, 3" thick	6 12 0	100 sq. ft.	84.68	
12.74 "	Laterite stone revetment and pitching	22 4 0	100 c. ft.	283.47	
2.08 "	Brick jelly backing	13 11 0	100 "	28.47	
3.000 "	Earthwork excavation	3 12 0	1,000 "	11.25	
	Total			1,130.41	
	Contingencies at 5 per cent			56.62	
	Supervision at 3 per cent			33.91	
	Total			1,220.94	1,221
(e2) Wings downstream side including flooring, etc., between wings, revetment, etc.					
21.46 units.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	536.50	
21.03 "	Table moulded brick in surki mortar	29 3 0	100 "	613.81	
13.38 "	Cement plastering, 3" thick, 1:3	6 12 0	100 sq. ft.	90.32	
15.34 "	Laterite stone revetment	22 4 0	100 c. ft.	341.32	
1.82 "	Brick jelly backing	13 11 0	100 "	24.91	
5.000 "	Earthwork excavation, etc.	3 12 0	1,000 "	18.75	
	Total			1,625.61	
	Contingencies at 5 per cent			81.23	
	Supervision at 3 per cent			48.77	
	Total			1,755.66	1,756
	Carried over				14,225
	Carried over				9,48,000

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 9,48,000					
Estimate No. 36-G.—cont. Brought forward .. 14,225					
Constructing a syphon aqueduct at R.D. 19/31'65—cont.					
(g) Upstream flooring and drop wall for 1 sq. foot parallel to canal.					
63 units.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	15.75	
08 "	Table moulded brick in surki mortar	29 3 0	100 "	2.34	
28 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	1.69	
0-150 "	Earthwork excavation	3 12 0	1,000 c. ft.	0.56	
0-10 "	Laterite stone apron	22 4 0	100 "	2.23	
	Total			22.57	
	Contingencies at 5 per cent			1.13	
	Supervision at 3 per cent			0.68	
	Total			24.38	
	For 15 feet = $15 \times \text{Rs. } 24.38 = 365.7$ or				366
(h) Downstream flooring, etc., for 1 sq. foot parallel to canal.					
61 units.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	15.25	
08 "	Table moulded brick in surki mortar	29 3 0	100 "	2.34	
25 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	1.68	
10 "	Laterite stone revetment	22 4 0	100 c. ft.	2.23	
150 "	Earthwork excavation, etc.	3 12 0	1,000 "	0.56	
	Total			22.06	
	Contingencies at 5 per cent			1.10	
	Supervision at 3 per cent			.66	
	Total			23.82	
	For 15 feet = $15 \times \text{Rs. } 23.82 = 357.30$ or				357
(i) Revetment to canal bank.					
27-85 units.	Laterite stone revetment	22 4 0	100 c. ft.	620	
9-28 "	Gravel backing to revetment	13 11 0	100 "	127	
	Total			747	
	Contingencies at 5 per cent			37	
	Supervision at 3 per cent			22	
	Total				806
Earthwork excavating front and rear channel.					
298-000 units.	Earthwork excavating rear channel for diversion and deepening the same	3 12 0	1,000 c. ft.	1,118	
	Contingencies at 5 per cent			57	
	Supervision at 3 per cent			35	
	Total				1,210
	Shed for materials			166	
	Centering to arches			210	
	Baling water			360	
	Total				736
	Total				17,700
	Carried over				9,65,700

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 9,65,700					
Estimate No. 37-G.					
Syphon aqueduct at R.D. 19/9150.					
(a) Under bed of canal for one span of a pier and a vent clear of abutments per foot run of canal bed width.					
0-28 unit.	Concrete broken brick in surki mortar	24 0 0	100 c. ft.	6 11 6	
0-11 "	Table-moulded brick in surki mortar	28 4 0	100 "	3 1 7	
0-19 "	Archwork in surki mortar	29 4 0	100 "	5 9 0	
0-34 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	2 4 8	
0-084 "	Earthwork excavation, etc.	3 12 0	1,000 c. ft.	0 5 0	
	Total			17 15 9	
	Contingencies at 5 per cent			0 14 6	
	Supervision at 3 per cent			0 8 9	
	Total			19 7 0	
	Total for 4 spans of 106' bed width = $4 \times 106 \times \text{Rs. } 19.70 = 8,342$				8,242
(b) Two abutments less one pier under bed of canal per foot run of canal bed width. This includes pitching clay puddle, etc., provided in the canal.					
0-29 unit.	Concrete broken brick in surki mortar	24 0 0	100 c. ft.	6 15 4	
0-59 "	Table-moulded brick in surki mortar	28 4 0	100 "	16 10 9	
0-48 "	Laterite stone packing for canal bed	23 4 0	100 "	11 10 2	
1-64 "	Clay puddle	1 0 0	100 "	1 10 3	
0-127 "	Earthwork, etc.	3 12 0	1,000 "	0 7 6	
	Total			37 6 0	
	Contingencies at 5 per cent			1 14 0	
	Supervision at 3 per cent			0 15 0	
	Total per foot run			40 3 0	
	For 4 spans of 106' bed width = $106 \times 40.30 = 4,260$.				4,260
(c) Balance of culvert length arched over under banks up and down stream for the whole length.					
13-94 units.	Concrete broken brick in surki mortar	24 0 0	100 c. ft.	334 9 0	
10-25 "	Table-moulded brick work in surki mortar	28 4 0	100 "	289 9 0	
9-38 "	Archwork in surki mortar	29 4 0	100 "	274 5 10	
15-54 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement to 3 sand	6 12 0	100 sq. ft.	104 14 3	
3-31 "	Laterite stone packing canal bank	23 4 0	100 c. ft.	76 15 3	
1-10 "	Brick jelly backing	12 13 0	100 "	13 10 4	
5-600 "	Earthwork excavation, etc.	3 12 0	1,000 "	20 12 4	
	Total			1,114 12 0	
	Contingencies at 5 per cent			55 12 0	
	Supervision at 3 per cent			27 10 0	
	Total			1,198 2 0	
	Total for running foot parallel to canal			152 2 3	
	For 4 spans of 106' bed width = $29\frac{1}{2} \times 152.2-3$.			4,507 0 0	
	* Deduct for revetment owing to the reduction of flooring sea level.			160 0 0	
	Net total				4,347
	Carried over				16,849
	Carried over				9,65,700
* Detail—					
	Revetment, $2 \times 120\frac{1}{2} \times 1.4 \times 1.5 = 5.42$ c. ft. at Rs. 23-4-0				126
	Brick jelly backing, $2\frac{1}{2} \times 1.81$ c. ft. at Rs. 12-13-0				23
					149
	Contingencies				7
	Supervision				4
	Total				160

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward ..					9,65,700
Estimate No. 37-G.—cont. Brought forward ..					16,849
Syphon aqueduct at R.D. 19/9150—cont.					
(d) Balance of culvert length arched over under banks up and downstream for the whole length.					
10.94 units.	Concrete broken brick in surki mortar ..	24 0 0	100 c.ft.	262 9 0	
23.73 "	Table-moulded brick in surki mortar ..	28 4 0	100 "	670 6 0	
7.972 "	Earthwork excavation ..	3 12 0	1,000 "	29 14 3	
2.42 "	Laterite stone packing canal bank ..	23 4 0	100 "	58 10 6	
0.84 "	Brick jelly backing ..	12 13 0	100 "	10 12 3	
	Total ..			1,032 4 0	
	Contingencies at 5 per cent ..			52 0 0	
	Supervision at 3 per cent ..			26 0 0	
	Total for upstream ..			1,110 4 0	
	For up and downstream = $2 \times$ Rs. 1,110 = 2,220.				2,220
(e ₁) Wings, etc., on the upstream side including flooring between wings, revetment and pitching to the sides of the drainage, etc.					
16.00 units.	Concrete broken brick in surki mortar ..	24 0 0	100 c.ft.	384 0 0	
17.90 "	Table-moulded brick in surki mortar ..	28 4 0	100 "	505 10 10	
10.26 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	69 4 0	
31.58 "	Laterite stone packing ..	23 4 0	100 c.ft.	734 3 9	
8.86 "	Brick jelly backing to revetment ..	12 13 0	100 "	113 4 3	
4.00 "	Earthwork excavation ..	3 12 0	100 "	15 0 0	
	Total ..			1,821 6 10	
	Contingencies at 5 per cent ..			90 0 0	
	Supervision at 3 per cent ..			49 0 0	
	Total ..			1,960 6 10	1,960
				or	
(e ₂) Wings downstream side including flooring between wings, etc.					
36.15 units.	Concrete broken brick in surki mortar ..	24 0 0	100 c.ft.	867 1 0	
26.60 "	Table-moulded brick in surki mortar ..	28 4 0	100 "	751 7 2	
21.30 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	143 12 4	
33.50 "	Laterite stone packing ..	23 4 0	100 c.ft.	778 14 0	
9.50 "	Brick jelly backing ..	12 13 0	100 "	121 11 6	
3.640 "	Earthwork excavation, etc. ..	3 12 0	1,000 "	13 10 4	
	Total ..			2,676 8 4	
	Contingencies at 5 per cent ..			134 0 0	
	Supervision ..			65 0 0	
	Total ..			2,875 8 4	2,875
				or	
(g) Upstream masonry flooring, drop wall between wings and not under arches per foot run parallel to canal.					
0.30 unit.	Concrete broken brick in surki mortar ..	24 0 0	100 c.ft.	7 3 3	
0.07 "	Table-moulded brick work in surki mortar ..	28 4 0	100 "	1 15 8	
0.12 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	0 13 0	
0.150 "	Earthwork excavation ..	3 12 0	1,000 c.ft.	0 9 0	
	Total ..			10 8 9	
	Contingencies at 5 per cent ..			0 8 6	
	Supervision ..			0 4 3	
	Total ..			11 5 6	
	For four spans = $29\frac{1}{2} \times$ Rs. 11-5-6 = Rs. 334.				334
	Carried over ..				24,238
	Carried over ..				9,65,700

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward ..					9,65,700
Estimate No. 37-G.—cont. Brought forward ..					24,238
Syphon aqueduct at R. D. 19/9150—cont.					
(h) Downstream flooring cushion and lift wall, etc., per foot run of canal bed width.					
0.33 unit.	Concrete broken brick in surki mortar ..	24 0 0	100 c. ft.	8 0 0	
0.06 "	Table-moulded brick in surki mortar ..	28 4 0	100 "	1 11 2	
0.18 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	0 14 0	
0.125 "	Earthwork excavation ..	3 12 0	1,000 c. ft.	0 7 6	
	Total ..			11 0 8	
	Contingencies at 5 per cent ..			0 8 9	
	Supervision ..			0 4 7	
	Total ..			11 14 0	
	For four spans— $29\frac{1}{2} \times$ Rs. 11-14-0 = Rs. 352.				352
(i) Pitching between wings on stream bed for foot run parallel to canal upstream side.					
0.10 unit.	Concrete broken brick in surki mortar ..	24 0 0	100 c. ft.	2 6 5	
0.05 "	Plastering with cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	0 5 4	
	Total ..			2 11 9	
	Contingencies at 5 per cent ..			0 2 0	
	Supervision ..			0 1 3	
	Total ..			2 15 0	
	For four spans— $29\frac{1}{2} \times$ Rs. 2-15-0 = Rs. 87.				87
(j) Pitching between wings on stream bed per foot run parallel to canal downstream side.					
34 unit.	Concrete broken brick in surki mortar ..	24 0 0	100 c. ft.	8 2 8	
0.17 "	Plastering with cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	1 2 4	
	Total ..			9 5 0	
	Contingencies at 5 per cent ..			0 7 0	
	Supervision at 3 per cent ..			0 4 0	
	Total ..			10 0 0	
	For four spans = $29\frac{1}{2} \times$ Rs. 10 = Rs. 296.				296
(k) Earthwork excavating front and rear channels diversion and deepening the same to 6'.					
139.000 units.	Earthwork excavation of channel ..	3 12 0	1,000 c. ft.	521 0 0	
	Contingencies at 5 per cent ..			26 0 0	
	Supervision at $2\frac{1}{2}$ per cent ..			13 0 0	
	Total ..				560
	Total ..				25,533
	Sheds for materials ..				267
	Centering for arches ..				400
	Baling water ..				700
	Total ..				26,900
	Carried over ..				9,92,600

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward...					
Estimate No. 38-G.					
Syphon aqueduct at R.D. No. 20/7600.					
(a) For one span of a pier and vent under bed of canal clear of abutments per foot run of canal bed width.					
0.16 unit.	Concrete broken brick in surki mortar	22 3 0	100 c. ft.	3.33	
0.075 "	Table-moulded brick in surki mortar	26 7 0	100 "	2.28	
0.16 "	Archwork in surki mortar	27 7 0	100 "	4.39	
0.26 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement to 3 sand.	6 12 0	100 sq. ft.	1.75	
0.081 "	Earthwork, etc.,	3 12 0	1,000 c. ft.	0.30	
	Total			12.05	
	Contingencies at 5 per cent			0.60	
	Supervision at 3 per cent			0.36	
	Total			13.01	
	For 3 spans of 101' bed widths, $3 \times 101 \times 13.01$.				3,942
(b) Two abutments less one pier under bed of canal per foot run of canal bed width.					
0.17 unit.	Concrete broken brick in surki mortar	22 3 0	100 c. ft.	3.77	
0.37 "	Table-moulded brick in surki mortar	26 7 0	100 "	9.80	
0.48 "	Laterite stone packing and pitching for canal bed.	22 4 0	100 "	10.68	
1.50 "	Clay puddle	2 0 0	100 "	3.00	
0.122 "	Earthwork excavation, etc.,	3 12 0	1,000 "	0.45	
	Total			27.70	
	Contingencies at 5 per cent			1.39	
	Supervision at 3 per cent			0.83	
	Total			29.92	
	For 101' bed width $101 \times 29.92 = 3,022$..				3,022
(c) Balance of culvert length arched over under banks up and down stream clear of abutments for one span of a pier and a vent for the whole length.					
3.56 units.	Concrete broken brick in surki mortar	22 3 0	100 c. ft.	189.93	
5.99 "	Table-moulded brick in surki mortar	26 7 0	100 "	158.86	
8.02 "	Archwork in surki mortar	27 7 0	100 "	220.06	
12.25 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement to 3 sand.	6 12 0	100 sq. ft.	82.69	
2.08 "	Laterite stone packing to canal bank	22 4 0	100 c. ft.	46.28	
70 "	Brick jelly backing	11 1 0	100 "	7.70	
4.00 "	Earthwork excavation	3 12 0	1,000 "	15.00	
	Total			720.01	
	Contingencies at 5 per cent			36.95	
	Supervision at 3 per cent			21.65	
	Total			778.61	
	For 3 spans, 3×778.61				2,336
(d) Balance of culvert length arched over under banks up and down stream for the whole length. Two abutments less one pier.					
9.94 units.	Concrete broken brick in surki mortar	22 3 0	100 c. ft.	220.54	
18.84 "	Table-moulded brick in surki mortar	26 7 0	100 "	498.08	
3.59 "	Laterite stone packing and pitching to canal bank.	22 4 0	100 "	79.88	
1.20 "	Brick jelly backing	11 1 0	100 "	13.28	
4.550 "	Earthwork excavation	3 12 0	1,000 "	17.06	
	Total			828.84	
	Contingencies at 5 per cent			41.44	
	Supervision at 3 per cent			24.87	
	Total			895.15 or	895
	Carried over				10,195
	Carried over				9,92,600

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward ..					
Estimate No. 38-G—cont. Brought forward ..					
Syphon aqueduct at R.D. No. 20/7600—cont.					
(e ₁) Wings upstream side including revetment, flooring between wings, and also apron of the contracted portion.					
10.50 units.	Concrete broken brick in surki mortar	22 3 0	100 c. ft.	232.97	
12.29 "	Table-moulded brick in surki mortar	26 7 0	100 "	324.92	
7.17 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement to 3 sand.	6 12 0	100 sq. ft.	48.40	
1.80 "	Laterite stone packing	22 4 0	100 c. ft.	40.06	
3.00 "	Earthwork, excavation, etc.,	3 12 0	1,000 "	11.25	
	Total			657.59	
	Contingencies at 5 per cent			32.88	
	Supervision at 3 per cent			19.73	
	Total			710.20 or	710
(e ₂) Wings down stream side including revetment, etc.					
21.46 units.	Concrete broken brick in surki mortar	22 3 0	100 c. ft.	476.14	
21.03 "	Table-moulded brick in surki mortar	26 7 0	100 "	555.98	
13.38 "	Cement plastering, $\frac{3}{4}$ " thick, 1 : 3	6 12 0	100 sq. ft.	90.32	
1.82 "	Brick jelly backing	11 1 0	100 c. ft.	20.13	
15.34 "	Laterite stone packing and pitching to canal bank.	22 4 0	100 "	341.32	
5.00 "	Earthwork excavation, etc.,	3 12 0	1,000 "	18.75	
	Total			1,502.64	
	Contingencies at 5 per cent			75.13	
	Supervision at 3 per cent			45.08	
	Total			1,622.85 or	1,623
(g) Upstream masonry and flooring for 1 sq. ft. parallel to canal.					
0.63 unit.	Concrete broken brick in surki mortar	22 7 0	100 c. ft.	13.98	
0.08 "	Table-moulded brickwork in surki mortar	26 7 0	100 "	2.12	
0.28 "	Cement plastering, $\frac{3}{4}$ " thick, 1 : 3	6 12 0	100 sq. ft.	1.89	
0.150 "	Earthwork excavation	3 12 0	1,000 c. ft.	0.56	
0.10 "	Laterite stone packing	22 4 0	100 "	2.23	
	Total			20.78	
	Contingencies at 5 per cent			1.04	
	Supervision at 3 per cent			0.62	
	Total			22.44	
	For 15' = 15×22.44				336.60 or 337
(h) Downstream flooring and drop wall, etc., for 1 sq. ft. parallel to canal.					
0.61 unit.	Concrete broken brick in surki mortar	22 7 0	100 c. ft.	13.53	
0.08 "	Table-moulded brickwork in surki mortar	26 7 0	100 "	2.12	
0.25 "	Cement plastering, $\frac{3}{4}$ " thick, 1 : 3	6 12 0	100 sq. ft.	1.69	
0.10 "	Laterite stone packing	22 4 0	100 c. ft.	2.23	
0.150 "	Earthwork excavation	3 12 0	1,000 "	0.56	
	Total			20.13	
	Contingencies at 5 per cent			1.01	
	Supervision at 3 per cent			0.60	
	Total			21.74	
	For 15' = 15×21.74				326.10 or 326
	Carried over				13,191
	Carried over				9,92,600

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. *Brought forward .. 9,92,600					
Estimate No. 38-G—cont. Brought forward .. 13,191					
(i) Revetment to canal bank.					
320-190 units.	Laterite stone packing	22 4 0	100 c.ft.	732-03	
97 "	Brick jelly backing	11 1 0	100 "	121-36	
	Total			853-39	
	Contingencies at 5 per cent			42-67	
	Supervision at 3 per cent			25-60	
	Total			921-66 or	922
Earthwork excavating front and rear channel.					
202-000 units.	Earthwork excavating front and rear channel and deepening rear channel to 5'.	3 12 0	1,000 c.ft.	758	
	Total			758	
	Contingencies at 5 per cent			38	
	Supervision at 3 per cent			23	
	Total			819	819
	Shed for materials			198 or	198
	Centering for arches			210 or	210
	Baling water			360 or	360
	Total			15,700	

Estimate No. 39-G (Plan No. G. 68).

Syphon aqueduct at R.D. 21/8750 (9 spans 12' x 6').

832-34 units.	Concrete broken bricks in surki mortar	19 14 0	100 c.ft.	16,543 0 0	
554-00 "	Table moulded brick in surki mortar	24 4 0	100 "	13,677 0 0	
187-10 "	Archwork do.	25 4 0	100 "	4,724 0 0	
621-00 "	Plastering with cement, $\frac{3}{4}$ " thick (1 cement to 3 sand)	6 12 0	100 sq. ft.	4,192 0 0	
190-80 "	Concrete block revetment	21 2 0	100 c.ft.	4,031 0 0	
14-20 "	Brick jelly backing to revetment	9 0 0	100 "	128-0 0	
736 R.H. "	Iron railing complete	1 8 0	R.ft.	1,104 0 0	
24-4 "	Clay puddle work	10 0 0	1,000 c.ft.	244 0 0	
188-100 "	Earthwork excavation filling in, forming banks, etc., complete	3 12 0	1,000 "	705 0 0	
78-00 "	Earthwork (excavating front and rear channels, and widening)	3 12 0	1,000 "	293 0 0	
	Shed for materials		Lump sum.	450 0 0	
	Centering for archwork			500 0 0	
	Baling water			1,000 0 0	
	Total			47,591 0 0	
	Contingencies at 5 per cent			2,380 0 0	
	Supervision at 3 per cent			1,429 0 0	
	Total			51,400 0 0	
	Total			51,400	

Estimate No. 40-G.

Syphon aqueduct at R.D. 23/3360 (17 spans of 12' x 6').

1353-00 units.	Concrete broken bricks in surki mortar	21 15 0	100 c.ft.	29,681 0 0	
847-50 "	Table moulded brick in do.	25 15 0	100 "	21,982 0 0	
348-00 "	Archwork in surki mortar	26 15 0	100 "	9,374 0 0	
1028-00 "	Plastering with cement, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	6,939 0 0	
244-00 "	Laterite stone backing	22 4 0	100 c.ft.	5,429 0 0	
14-12 "	Brick jelly backing	10 4 0	100 "	145 0 0	
1,216 "	Iron railings, etc., complete	1 8 0	R. ft.	1,824 0 0	
24,200 "	Clay puddle work	10 0 0	100 c.ft.	242 0 0	
360-000 "	Earthwork excavation	3 12 0		1,350 0 0	
224-000 "	Excavating sides of rear drain to fit in the syphon	3 12 0		840 0 0	
	Total			77,806 0 0	
	Carried over			77,806 0 0	
	Carried over			10,59,700	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 10,59,700					
Estimate No. 40-G—cont. Brought forward .. 77,806					
Syphon aqueduct at R.D. 23/3360 (17 spans of 12' x 6')—cont.					
	Shed for materials		Lump sum.	600 0 0	
	Bailing water			2,500 0 0	
	Centering for archwork			50 0 0	
	Total			80,958 0 0	
	Contingencies at 5 per cent			4,023 0 0	
	Supervision at 3 per cent			2,021 0 0	
	Total			87,000	
Estimate No. 41-G.					
Syphon aqueduct at R.D. 23/60'00 (Plan No. G. 69).					
(a) Under bed of canal per foot run of canal bed width one vent and one pier.					
2481 units.	Concrete broken brick in surki mortar	21 15 0	100 c. ft.	5-44	
0785 "	Table moulded brick in surki mortar	25 15 0	"	2-03	
1723 "	Archwork brick do.	26 15 0	"	4-67	
295 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	1-29	
	Total			14-13	
	Contingencies and petty supervision at 8 per cent			1-13	
	Total for 1 span of 1 r. ft.			15-26	
	Total for 3 spans of 100 r. ft. = 3 x 100 x 15-26 =			4,578	
(b) Under bed of canal per foot run of canal bed width two abutments and one vent.					
46 units.	Concrete broken brick in surki mortar	21 15 0	100 c. ft.	10-09	
49 "	Table moulded brick do.	25 15 0	100 "	12-71	
18875 "	Archwork brick do.	26 15 0	100 "	5-08	
54 "	Laterite stone packing	22 4 0	100 "	12-02	
33 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	2-23	
1-29 "	Clay puddle	1 0 0	100 c. ft.	1-29	
	Total			43-42	
	Contingencies and supervision at 8 per cent			3-47	
	Total for 1 r. ft.			46-89	
	Total for 100 r. ft. = 100 x 46-89 =			4,689	
(c) Balance of culvert length upstream side one vent and one pier for the whole length.					
6-70 units.	Concrete broken brick in surki mortar	21 15 0	100 c. ft.	147-00	
4-13 "	Table moulded brick in do.	25 15 0	100 "	107-12	
4-33 "	Archwork brick in do.	26 15 0	100 "	116-64	
6-78 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	45-77	
1-50 "	Laterite stone packing	22 4 0	100 c. ft.	33-38	
50 "	Gravel backing	10 9 0	100 "	5-28	
	Total			455-19	
	Contingencies and petty supervision at 8 per cent			36-42	
	Total for 1 sp.			491-61	
	Total for 3 spans = 3 x 491-61 = 1,474-83 or			1,475	
	Carried over			10,742	
	Carried over			11,46,700	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 11,46,700					
Estimate No. 41-G—cont. Brought forward .. 10,742					
Syphon Aqueduct at R.D. 23/60'00 (Plan No. G. 69)—cont.					
(c ₁) Balance of culvert length downstream side one vent and one pier including revetment to canal bank.					
5.91 units.	Concrete broken brick in surki mortar	21 15 0	100 c. ft.	129.65	
4.07 "	Table moulded brick in do.	25 15 0	100 "	105.57	
4.20 "	Archwork brick in do.	26 15 0	100 "	113.14	
6.63 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	44.75	
1.50 "	Laterite stone packing	22 4 0	100 c. ft.	33.38	
.50 "	Gravel backing	10 9 0	100 "	5.28	
	Total			431.77	
	Contingencies and petty supervision at 8 per cent.			34.54	
	Total for 1 span			466.31	
	Total for 3 spans = $3 \times 466.31 = 1,398.93$ or ..				1,399
(d ₁) Two abutments and one vent for the whole length of portion c.					
12.07 units.	Concrete broken brick in surki mortar	21 15 0	100 c. ft.	264.79	
14.51 "	Table moulded brick in do.	25 15 0	100 "	376.35	
4.69 "	Archwork brick in do.	26 15 0	100 "	126.34	
6.42 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	43.34	
2.29 "	Laterite stone packing	22 4 0	100 c. ft.	50.95	
.76 "	Gravel backing	10 9 0	100 "	8.03	
	Total			869.80	
	Contingencies and petty supervision at 8 per cent.			69.58	
	Total			939.38 or	993
(d ₂) Two abutments and one vent for portion c.					
10.68 units.	Concrete broken brick in surki mortar	21 15 0	100 c. ft.	234.29	
14.15 "	Table moulded brick in do.	25 15 0	100 "	367.02	
4.55 "	Archwork brick in do.	26 15 0	100 "	122.57	
6.21 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	41.92	
2.29 "	Laterite stone packing	22 4 0	100 c. ft.	50.95	
.76 "	Gravel backing	10 9 0	100 "	8.03	
	Total			824.78	
	Contingencies and petty supervision at 8 per cent.			65.98	
	Total			890.76 or	
(e ₁) Wings upstream of culvert length including revetment to drainage and canal banks includes also triangular portion of ramp entry and drop wall for the same.					
.56 units.	Concrete broken brick in surki mortar	21 15 0	100 c. ft.	319.41	
19.08 "	Table moulded brick in do.	25 15 0	100 "	494.89	
8.22 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	56.49	
26.34 "	Laterite blocks for pitching	22 4 0	100 c. ft.	586.07	
8.78 "	Gravel backing	10 9 0	100 "	92.74	
	Total			1,548.60	
	Contingencies and petty supervision at 8 per cent.			123.89	
	Total			1,672.49 or	1,673
	Carried over				15,644
	Carried over				11,46,700

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 11,46,700					
Estimate No. 41-G—cont. Brought forward .. 15,644					
Syphon aqueduct at R.D. 23/60'00 (Plan No. G. 69)—cont.					
(e ₂) Wings downstream of culvert length including revetment to drainage and canal banks includes also triangular portion of entry ramp and drop wall for the same.					
15.56 units.	Concrete broken bricks in surki mortar	21 15 0	100 c. ft.	339.15	
22.79 "	Table moulded brick in surki mortar	25 15 0	100 "	591.12	
9.45 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	63.79	
24.65 "	Laterite stone revetment	22 4 0	100 c. ft.	548.46	
8.22 "	Gravel backing	10 9 0	100 "	86.82	
	Total			1,629.34	
	Contingencies and petty supervision at 8 per cent.			130.35	
	Total			1,759.69 or	1,760
(g) Upstream masonry flooring, etc., per foot run of drain width between abutments.					
.50 unit.	Concrete broken brick in surki mortar	21 15 0	100 c. ft.	10.97	
.075 "	Table moulded brick in surki mortar	25 15 0	100 "	1.95	
.21 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	1.42	
	Total			14.34	
	Contingencies and petty supervision at 8 per cent.			1.15	
	Total for 1 r. ft.			15.49	
	Total for 29 $\frac{1}{2}$ r. ft. =				459
(h ₂) Downstream masonry, flooring, etc., per foot run of drain of width between abutments.					
.38 unit.	Concrete broken brick in surki mortar	21 15 0	100 c. ft.	8.33	
.075 "	Table moulded brick in surki mortar	25 15 0	100 "	1.95	
.16 "	Cement plastering $\frac{3}{4}$ " thick (1 cement and 3 sand)	22 4 0	100 sq. ft.	1.08	
	Total			11.36	
	Contingencies and petty supervision at 8 per cent.			.91	
	Total for r. ft.			12.27	
	Total for 29 $\frac{1}{2}$ r. ft. = $12.27 \times 29\frac{1}{2}$				364
(j) Concrete flooring close to lift wall and laterite stone packing.					
7.75 units.	Concrete broken brick in surki mortar	21 15 0	100 c. ft.	170.01	
5.82 "	Laterite stone packing	22 4 0	100 "	129.50	
	Total			299.51	
	Contingencies and petty supervision at 8 per cent.			23.96	
	Total			323.47 or	323
70.000 units.	Earthwork including cutting in rear channel	5 0 0	100 c. ft.	350	
	Baling water		Lump sum.	500	
	Shed for materials		"	180	
	Centering for arches		"	220	
	Total			1,250	
	Total				19,800
	Carried over				11,66,500

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 11,66,500					
Estimate No. 42-G.					
Syphon aqueduct at R.D. 24/6430.					
(a) Under foot of canal per foot run of canal bed width. One vent and one pier.					
2481 units.	Concrete in surki mortar	28 3 0	100 c. ft.	5-76	
0785 "	Table moulded brick in surki mortar	27 0 0	100 "	2-12	
1733 "	Archwork in surki mortar	28 0 0	100 "	4-85	
295 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 "	1-99	
	Contingencies and petty supervision at 8 per cent.			1-18	
	Total per r.ft.			15-90	
	Total for 98 r.ft. $15-90 \times 98$			1,558-20 or 1,558	
(b) Under bed of canal per foot run of canal bed width. Two abutments and one vent.					
46 units.	Concrete in surki mortar	23 3 0	100 c. ft.	10-67	
49 "	Table moulded brick in surki mortar	27 0 0	100 "	13-23	
18875 "	Archwork in surki mortar	28 0 0	100 "	5-29	
54 "	Laterite blocks for pitching	24 4 0	100 "	13-10	
33 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 "	2-23	
1-29 "	Clay puddle	1 0 0	100 "	1-29	
	Contingencies and petty supervision at 8 per cent.			3-86	
	Total for 1 r.ft.			49-67	
	Total for 98 r. ft. $49-67 \times 98$			4,867-66 or 4,868	
(c ₁) Balance of culvert length upstream side. One vent and one pier for the whole length.					
6-70 units.	Concrete in surki mortar	23 3 0		155-36	
4-33 "	Archwork in surki mortar	28 0 0		121-24	
4-83 "	Table moulded brick in surki mortar	27 0 0		111-51	
6-78 "	Cement plastering $\frac{3}{4}$ " thick (1 cement and 1 sand).	6 12 0		45-77	
1-50 "	Laterite stone packing	24 4 0		36-37	
	Gravel backing	9 11 0		4-85	
	Contingencies and petty supervision at 8 per cent.			38-00	
	Total			513-10 or 513	
(c ₂) Balance of culvert length downstream side. One vent and one pier.					
5-91 units.	Concrete in surki mortar	23 3 0	100 c. ft.	137-04	
4-07 "	Table moulded brick in surki mortar	27 0 0	100 "	109-89	
4-20 "	Archwork do. do.	28 0 0	100 "	117-60	
6-63 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 sq. ft.	44-75	
1-50 "	Laterite stone packing	24 4 0	100 c. ft.	36-37	
50 "	Gravel backing	9 11 0	100 "	4-85	
	Contingencies and petty supervision at 8 per cent.			36-04	
	Total			486-54 or 487	
(d ₁) Two abutments and one vent for portion c ₁ .					
12-07 units.	Concrete in surki mortar	23 3 0	100 c. ft.	279-87	
14-51 "	Table moulded brick in surki mortar	27 0 0	100 "	391-77	
4-69 "	Archwork in surki mortar	28 0 0	100 "	131-32	
6-42 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 sq. ft.	43-34	
2-29 "	Laterite stone packing	24 4 0	100 c. ft.	55-53	
76 "	Gravel backing	9 11 0	100 "	7-36	
	Contingencies and petty supervision at 8 per cent.			72-74	
	Total			98,193 or 982	
	Carried over				8,408
	Carried over				11,66,500

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 11,66,500					
Estimate No. 42-G.—cont.					
Syphon aqueduct at R.D. 24/6430—cont.					
(d ₂) Two abutments and one vent for portion c ₂ .					
10-68 units.	Concrete in surki mortar	23 3 0	100 c. ft.	246-64	
14-15 "	Table moulded brick in surki mortar	27 0 0	100 "	382-05	
4-55 "	Archwork in surki mortar	28 0 0	100 "	127-40	
6-21 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 sq. ft.	41-92	
2-29 "	Laterite stone packing	24 4 0	100 c. ft.	55-53	
76 "	Gravel backing	9 11 0	100 "	7-36	
	Contingencies and petty supervision at 8 per cent.			68-91	
	Total			930-81 or 931	
(e ₁) Wings upstream of culvert length including revetment to canal banks, also triangular portion of entry ramps and drop walls for the same.					
14-56 units.	Concrete in surki mortar	23 3 0	100 c. ft.	337-61	
19-08 "	Table moulded brick in surki mortar	27 0 0	100 "	515-16	
8-22 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 sq. ft.	55-49	
26-34 "	Concrete blocks for revetment	24 4 0	100 c. ft.	638-76	
8-78 "	Gravel backing	9 11 0	100 "	85-06	
	Contingencies and petty supervision at 8 per cent.			130-66	
	Total			1,762-63 or 1,763	
(e ₂) Wings downstream of culvert length including revetment to canal banks, also triangular portion of exit ramps and drop walls for the same.					
16-46 units.	Concrete in surki mortar	23 3 0	100 c. ft.	358-48	
22-79 "	Table moulded brick in surki mortar	27 0 0	100 "	615-33	
9-45 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 sq. ft.	63-79	
24-65 "	Concrete blocks for revetment	24 4 0	100 c. ft.	597-76	
8-22 "	Gravel backing	9 11 0	100 "	79-63	
	Contingencies and petty supervision at 8 per cent.			137-20	
	Total			1,852-19 or 1,852	
(g) Upstream masonry, etc., per foot run of stream width between abutments.					
50 unit.	Concrete in surki mortar	23 3 0	100 c. ft.	11-60	
075 "	Table moulded brick in surki mortar	27 0 0	100 "	2-02	
21 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 sq. ft.	1-42	
	Contingencies and petty supervision at 8 per cent.			1-20	
	Total for 1 r. ft.			16-24	
	Total for $13\frac{1}{2}$ r. ft. = $13\frac{1}{2} \times 16-24$			225-33 or 225	
(h) Down stream masonry, etc., per foot run of stream width between abutments.					
38 unit.	Concrete in surki mortar	23 3 0	100 c. ft.	8-81	
075 "	Table moulded brick in surki mortar	27 0 0	100 "	2-02	
16 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 sq. ft.	1-08	
	Contingencies and petty supervision at 8 per cent.			95	
	Total for 1 r. ft.			12-86	
	Total for $13\frac{1}{2}$ r. ft. = $13\frac{1}{2} \times 12-86$			178-43 or 178	
(j) Down stream concrete apron close to liftwall.					
6-98 units.	Concrete in surki mortar	23 3 0	100 c. ft.	161-85	
3-00 "	Concrete block for revetment	24 4 0	100 "	72-75	
	Contingencies and petty supervision at 8 per cent.			18-77	
	Total			253-37 or 253	
	Carried over				13,610
	Carried over				11,66,500

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 11,66,500					
Estimate No. 42 G.—cont. Brought forward .. 13,610					
Syphon aqueduct at R.D. 24/6430—cont.					
Lump sum items to be added (See detailed estimate).					
1.71 units.	Concrete for the extra portion	23 3 0	100 c. ft.	39.65	
7.02 "	Table-moulded brick in surki mortar	27 0 0	100 "	189.54	
2.07 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	13.97	
2.54 "	Concrete blocks for pitching and revetment ..	24 4 0	100 "	61.60	
.85 "	Gravel backing	9 11 0	100 "	8.23	
	Contingencies and petty supervision at 8 per cent.			26.04	
21.50 "	Earthwork including excavation front and rear channel.	3 12 0	100 c. ft.	339.63 or 339	
	Centerings for arches			150.00	
	Baling water for foundations			200.00	
	Shed for materials			121.00	551
	Total				14,500

Estimate No. 43-G. (Plan No. G. 70).

Syphon aqueduct at R.D. 25/3560.

(a) Estimate for the portion of aqueduct under the bed of canal and clear of abutments for one span and one pier per foot length of canal bed width.					
.30 unit.	Concrete broken brick in surki mortar	24 7 0	100 c. ft.	7 5 4	
.09 "	Table-moulded brick in surki mortar	28 1 0	100 "	2 8 5	
.164 "	Archwork in surki mortar	29 1 0	100 "	4 12 3	
.32 "	Cement plastering with cement, $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 sq. ft.	2 2 7	
.091 "	Earthwork	3 12 0	1,000 c. ft.	0 5 5	
	Total			17 2 0	
	Contingencies at 5 per cent			0 13 9	
	Petty supervision at 3 per cent			0 8 3	
	Total for one span			18 8 0	
	Total for 4 spans and 97' bed width				7,178
(b) Two abutments less one pier under bed of canal including apron of canal per foot run of canal bed width.					
.26 unit.	Concrete broken brick in surki mortar	24 7 0	100 c. ft.	6 5 7	
.42 "	Table-moulded brick in surki mortar	28 1 0	100 "	11 12 8	
.48 "	Laterite stone packing	24 4 0	100 "	11 10 3	
1.44 "	Clay puddle work	1 0 0	100 "	1 7 2	
.117 "	Earthwork	3 12 0	1,000 "	0 7 0	
	Total			31 10 8	
	Contingencies at 5 per cent			1 10 0	
	Supervision at 3 per cent			1 0 0	
	Total for 1 r. ft. of bed width			34 4 8	
	Total for 97 r. ft.				3,326
	Carried over				10,504
	Carried over				11,81,000

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 11,81,000					
Estimate No. 43-G.—cont. Brought forward .. 10,504					
Syphon aqueduct at R.D. 25/3560—cont.					
(c ₁) Balance of culvert arched over under banks for one span parallel to canal length upstream.					
7.63 units.	Concrete broken brick in surki mortar	24 7 0	100 c. ft.	186	
4.35 "	Brick work in surki mortar	28 1 0	100 "	122	
3.94 "	Archwork	29 1 0	100 "	115	
6.67 "	Plastering with cement, $\frac{3}{4}$ " thick, 1 : 3 ..	6 12 0	100 sq. ft.	45	
3.012 "	Earthwork	3 12 0	1,000 c. ft.	11	
	Total			479	
	Contingencies at 5 per cent			24	
	Supervision at 3 per cent			14	
	Total for one span			517	
	Total for four spans				2,068
(c ₂) Balance length of culvert arched over under banks for one span parallel to canal length downstream.					
7.54 units.	Concrete broken brick in surki mortar	24 7 0	100 c. ft.	184	
4.70 "	Brickwork in surki mortar	28 1 0	100 "	132	
4.10 "	Archwork	29 1 0	100 "	119	
7.08 "	Plastering with cement, $\frac{3}{4}$ " thick, 1 : 3 ..	6 12 0	100 sq. ft.	48	
3.012 "	Earthwork			11	
	Lump sum				
	Total			494	
	Contingencies at 5 per cent			25	
	Supervision at 3 per cent			19	
	Total for one span			538	
	Total for four spans				2,152
(d ₁) Two abutments less one pier for the portion (O. II) separately downstream side.					
7.39 units.	Concrete broken brick in surki mortar	24 7 0	100 c. ft.	181	
12.42 "	Brick work in surki mortar	28 1 0	100 "	349	
2.71 "	Plastering with cement, $\frac{3}{4}$ " thick, 1 : 3 ..	6 12 0	100 sq. ft.	18	
2.156 "	Earthwork	3 12 0	1,000 c. ft.	9	
	Contingencies and petty supervision			45	
	Total				602
(d ₂) Two abutments less one pier for the portion O separately upstream side.					
7.18 units.	Concrete broken brick in surki mortar	24 7 0	100 c. ft.	175	
10.31 "	Table-moulded brick in surki mortar	28 1 0	100 "	289	
2.46 "	Plastering with cement, $\frac{3}{4}$ " thick, 1 : 3 ..	6 12 0	100 sq. ft.	17	
2.516 "	Earthwork	3 12 0	1,000 c. ft.	9	
	Total			490	
	Contingencies at 5 per cent			25	
	Petty supervision at 3 per cent			15	
	Total			530	
(e ₁) Wings upstream of culvert including revetment for stream and canal bank and also apron at contracted portion to the stream and canal.					
21.42 units.	Concrete broken brick in surki mortar	24 7 0	100 c. ft.	523	
20.35 "	Brickwork in surki mortar	28 1 0	100 "	571	
10.44 "	Plastering with cement, $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 sq. ft.	70	
32.33 "	Revetment to canal bank, etc.	24 4 0	100 c. ft.	784	
12.12 "	Gravel backing	8 13 0	100 "	107	
5.25 "	Earthwork	3 12 0	1,000 "	20	
	Total			2,075	
	Contingencies at 5 per cent			103	
	Petty supervision at 3 per cent			62	
	Total				2,240
	Carried over				18,096
	Carried over				11,81,000

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 11,81,000

Estimate No. 43-G.—cont. Brought forward .. 18,096

Syphon aqueduct at R.D. 25/3560—cont.

<i>(e) Wings downstream of culvert including revetment for stream and canal bank and also apron at contracted portion to the stream and canal.</i>					
28.92 units.	Concrete broken brick in surki mortar	24 7 0	100 c. ft.	707	
35.92 "	Table-moulded brick in surki mortar	28 1 0	100 "	1,005	
15.46 "	Plastering with cement, $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 sq. ft.	104	
36.83 "	Revetment to canal bank	24 4 0	100 c. ft.	893	
12.12 "	Gravel backing	8 13 0	100 "	107	
8.568 "	Earthwork excavating	3 12 0	1,000 "	34	
	Total			2,851	
	Contingencies at 5 per cent			142	
	Supervision at 3 per cent			85	
	Total				3,076
<i>(g) Upstream masonry flooring and drop wall between wings and not under arches up to drainage bed level for one span parallel to canal.</i>					
4.92 units.	Concrete broken brick in surki mortar	24 7 0	100 c. ft.	120 3 9	
.74 "	Table-moulded brick in surki mortar	28 1 0	100 "	20 12 10	
.01 "	Plastering with cement, $\frac{3}{4}$ " thick, 1: 3	6 12 0	100 sq. ft.	13 9 1	
1.989 "	Earthwork	3 12 0	1,000 c. ft.	7 6 2	
	Total			161 15 10	
	Contingencies at 5 per cent			8 2 5	
	Supervision at 3 per cent			4 14 3	
	Total for 1 span parallel to width of canal ..			175 0 6	
	Total for 3 spans				525
<i>(h) Downstream masonry flooring cushion lift wall, etc., between wings and not under arches up to drainage bed level for one span parallel to canal.</i>					
5.98 units.	Concrete broken brick in surki mortar	24 7 0	100 c. ft.	146 0 0	
.74 "	Table-moulded brick in surki mortar	28 1 0	100 "	21 0 0	
2.36 "	Plastering with cement, $\frac{3}{4}$ " thick, 1: 3	6 12 0	100 sq. ft.	16 0 0	
2.764 "	Earthwork, etc.	3 12 0	1,000 c. ft.	10 0 0	
0.79 "	Laterite stone apron	24 4 0	100 "	19 0 0	
	Total			212 0 0	
	Contingencies at 5 per cent			10 0 0	
	Supervision at 3 per cent			7 0 0	
	Total for one span parallel to width of canal ..			229 0 0	
	Total for one span parallel for 3 spans				687
250 units.	Earthwork, excavating rear channel	3 12 0	1,000 c. ft.	938 0 0	
	Contingencies at 5 per cent			45 0 0	
	Supervision at 3 per cent			27 0 0	
	Total				1,010
	Carried over				23,394
	Carried over				11,81,000

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 11,81,000

Estimate No. 43-G.—cont. Brought forward .. 23,394

Syphon aqueduct at R.D. 25/3560—cont.

<i>(i) Upstream flooring, dropwall, etc., for one ventway parallel to canal.</i>					
3.74 units.	Concrete broken brick in surki mortar	24 7 0	100 c. ft.	91	
.75 "	Table-moulded brick in surki mortar	28 1 0	100 "	13	
1.28 "	Cement plastering, $\frac{3}{4}$ " thick, 1: 3	6 12 0	100 sq. ft.	9	
1.320 "	Earthwork	3 12 0	1,000 c. ft.	4	
	Total			117	
	Contingencies at 5 per cent			6	
	Supervision at 3 per cent			4	
	Total for one ventway (upstream)				127
<i>(j) Downstream flooring, dropwall, etc., for one ventway parallel to canal.</i>					
5.92 units.	Concrete broken brick in surki mortar	24 7 0	100 c. ft.	145	
.45 "	Table-moulded brick in surki mortar	28 1 0	100 "	13	
1.56 "	Cement plastering, $\frac{3}{4}$ " thick, 1: 3	6 12 0	100 sq. ft.	11	
2.106 "	Earthwork	3 12 0	1,000 c. ft.	7	
.60 "	Laterite stone packing	24 4 0	100 "	15	
	Total			191	
	Contingencies at 5 per cent			11	
	Supervision at 3 per cent			6	
	Total for one ventway (downstream)				208
	Centering			300	
	Shed for materials			271	
	Baling water			500	
	Total				1,071
	Grand total				24,800

Estimate No. 44-G.

Syphon aqueduct at R.D. 25/9530.

<i>(a) Under bed of canal per foot run of canal bed width one vent and one pier.</i>					
2.481 unit.	Concrete broken brick in surki mortar	22 13 0	100 c. ft.	5.66	
.0785 "	Table-moulded brick in surki mortar	26 3 0	100 "	2.05	
.1733 "	Archwork, brick in surki mortar	27 3 0	100 "	4.71	
295 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement and 3 sand	6 12 0	100 sq. ft.	1.99	
	Total			14.41	
	Contingencies and petty supervision at 8 per cent			1.15	
	Total for 1 r. ft.			15.56	
	Total for 97 r. ft. = 97×15.56				1,509.32 or 1,509
<i>(b) Under bed of canal per foot run of canal bed width, two abutments and one vent.</i>					
.46 unit.	Concrete broken brick in surki mortar	22 13 0	100 c. ft.	10.49	
.49 "	Table-moulded brick in surki mortar	26 3 0	100 "	12.83	
.18875 "	Archwork, brick in surki mortar	27 3 0	100 "	5.13	
.51 "	Concrete blocks for revetment	24 1 0	100 "	12.69	
.33 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement and 3 sand	6 12 0	100 sq. ft.	2.23	
1.29 "	Clay puddle	1 0 0	100 c. ft.	1.29	
	Total			44.96	
	Contingencies and petty supervision at 8 per cent			3.60	
	Total for 1 r. ft.			48.56	
	Total for 97 r. ft. = 97×48.56				4,710.32 or 4,710
	Carried over				6,219
	Carried over				12,05,800

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 12,05,800

Estimate No. 44-G—cont. Brought forward .. 6,219

Syphon aqueduct at R.D. 25/9530—cont.

<i>(c₁) Balance of culvert length downstream side, one vent and pier for the whole length.</i>					
6.70 units.	Concrete, broken brick in surki mortar ..	22 13 0	100 c. ft.	152.84	
4.13 "	Table-moulded brick in surki mortar ..	26 3 0	100 "	108.15	
4.33 "	Archwork brick in surki mortar ..	27 3 0	100 "	117.72	
6.78 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	45.77	
1.50 "	Concrete block revetment ..	24 1 0	100 "	36.09	
.50 "	Gravel backing ..	6 3 0	100 c. ft.	3.19	
	Total ..			463.76	
	Contingencies and petty supervision at 8 per cent ..			37.10	
	Total ..			500.86 or	501
<i>(c₂) Balance of culvert length downstream side, one vent and one pier including revetment to canal bank.</i>					
5.91 units.	Concrete broken brick in surki mortar ..	22 10 0	100 c. ft.	134.82	
4.07 "	Table-moulded brick in surki mortar ..	26 3 0	100 "	106.58	
4.20 "	Archwork brick in surki mortar ..	27 3 0	100 "	114.19	
6.63 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	44.75	
1.50 "	Concrete block revetment ..	24 1 0	100 c. ft.	36.09	
.05 "	Gravel backing ..	6 3 0	100 "	3.19	
	Total ..			439.62	
	Contingencies and petty supervision at 8 per cent ..			35.17	
	Total ..			474.79 or	475
<i>(d₁) Two abutments and one vent for the whole length of portion c₁.</i>					
12.07 units.	Concrete broken brick in surki mortar ..	22 13 0	100 c. ft.	275.35	
14.51 "	Table-moulded brick in surki mortar ..	26 3 0	100 "	379.98	
4.69 "	Archwork brick in surki mortar ..	27 3 0	100 "	127.51	
6.42 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	43.34	
2.29 "	Concrete block revetment ..	24 1 0	100 c. ft.	55.10	
.76 "	Gravel backing ..	6 3 0	100 "	4.70	
	Total ..			885.93	
	Contingencies and petty supervision at 8 per cent ..			70.88	
	Total ..			956.86 or	957
<i>(d₂) Two abutments and one vent for portion (c₂).</i>					
10.68 units.	Concrete broken brick in surki mortar ..	22 13 0	100 c. ft.	243.64	
14.15 "	Table-moulded brick in surki mortar ..	26 3 0	100 "	370.55	
4.55 "	Archwork brick in surki mortar ..	27 3 0	100 "	123.70	
6.21 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	41.92	
2.29 "	Concrete block revetment ..	24 1 0	100 c. ft.	55.01	
.76 "	Gravel backing ..	6 3 0	"	4.70	
	Total ..			839.52	
	Contingencies and petty supervision at 8 per cent ..			67.16	
	Total ..			906.68 or	907
	Carried over ..				9,059
	Carried over ..				12,05,800

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 12,05,800

Estimate No. 44-G—cont. Brought forward .. 9,059

Syphon aqueduct at R.D. 25/9530—cont.

<i>(e₁) Wings upstream of culvert length including revetment to drainage and canal banks includes also triangular portion of ramp entry and drop wall for the same.</i>					
13.22 units.	Concrete broken brick in surki mortar ..	22 13 0	100 c. ft.	301.85	
8.68 "	Table moulded brick in surki mortar ..	26 3 0	100 "	436.81	
7.08 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	47.79	
21.25 "	Concrete blocks for revetment ..	24 1 0	100 c. ft.	511.33	
7.09 "	Gravel backing ..	6 3 0	100 "	43.87	
	Total ..			1,341.38	
	Contingencies and petty supervision at 8 per cent ..			107.31	
	Total ..			1,448.69 or	1,449
<i>(e₂) Wings downstream of culvert length including revetment to drainage and canal banks, includes also triangular portion of exit ramp and lift wall for the same.</i>					
15.46 units.	Concrete broken brick in surki mortar ..	22 13 0	100 c. ft.	352.68	
22.79 "	Table moulded brick in surki mortar ..	26 3 0	100 "	596.81	
9.45 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	63.79	
24.65 "	Concrete block revetment ..	24 1 0	100 c. ft.	593.14	
8.22 "	Gravel backing ..	6 3 0	100 "	50.86	
	Total ..			1,657.28	
	Contingencies and petty supervision at 8 per cent ..			132.58	
	Total ..			1,789.86 or	1,790
<i>(g) Upstream masonry flooring, etc., per foot run of drain width between abutments.</i>					
50 units.	Concrete broken brick in surki mortar ..	22 13 0	100 c. ft.	11.40	
.075 "	Table moulded brick in surki mortar ..	26 3 0	100 "	1.96	
.21 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	1.42	
	Total ..			14.78	
	Contingencies and petty supervision at 8 per cent ..			1.18	
	Total for 1 R. ft. ..			15.96	
	Total for 13½ R. ft. = 13½ × 15.96 =			221.44 or	221
<i>(h) Downstream masonry flooring, etc., per foot run of drain width between abutments.</i>					
38 units.	Concrete broken brick in surki mortar ..	22 13 0	100 c. ft.	8.67	
.075 "	Table moulded brick in surki mortar ..	26 3 0	100 "	1.96	
.16 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	1.08	
	Total ..			11.71	
	Contingencies and petty supervision at 8 per cent ..			.34	
	Total for 1 R. ft. ..			12.65	
	Total for 13½ R. ft. = 13½ × 12.65 =			175.52 or	175
	Carried over ..				12,694
	Carried over ..				12,05,800

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 12,05,800
 Estimate No. 44-G—cont. Brought forward .. 12,694

Syphon aqueduct at R. D. 25/9530—cont.

(j) Concrete flooring close to lift wall.					
5.20 units.	Concrete broken brick in surki mortar ..	22 13 0	100 c. ft.	118 58	
2.07 "	Concrete block revetment, rear side ..	24 1 0	100 "	49 81	
	Total ..			168 37	
	Contingencies and petty supervision at 8 per cent ..			13 47	
	Total ..			181 8 or	182
1.9 units.	Earthwork including cutting rear channel ..	4 0 0	Unit.	750	
	Centering for arches ..			150	
	Baling water ..			300	
	Shed for materials ..			114	1,354
	Total ..				14,200

Estimate No. 45-G.

Syphon aqueduct at R.D. 26/8428.

(a) For one span of a pier and a vent under bed of canal clear of abutments for one foot length of canal bed-width.					
0.09 units.	Table moulded brick in surki mortar ..	23 7 0	100 c. ft.	2 6 1	
0.30 "	Concrete broken bricks in do. ..	22 13 0	100 "	6 13 6	
0.16 "	Archwork brick in surki mortar ..	27 7 0	100 "	4 6 3	
0.32 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	2 2 7	
0.091 "	Earthwork, excavating foundations ..	3 12 0	1,000 c. ft.	0 5 6	
	Total ..			16 1 11	
	Contingencies at 5 per cent ..			0 12 11	
	Petty supervision at 3 per cent ..			0 7 9	
	Total for 1 span of 1 r. ft. ..			17 6 7	
	Total for 8 span of 93' = $8 \times 17-7 \times 93$..				12,954
(b) Two abutments less 1 pier under bed of canal including apron of canal per foot run of canal bed-width.					
0.26 units.	Concrete broken bricks in surki mortar ..	22 13 0	100 c. ft.	5 14 11	
0.42 "	Table moulded bricks in do. ..	26 7 0	100 "	11 1 9	
0.48 "	Concrete block or laterite stone packing and apron ..	23 15 0	100 "	11 7 10	
1.44 "	Clay puddle work ..	1 0 0	100 "	1 7 0	
0.117 "	Earthwork excavating foundations, etc. ..	3 12 0	1,000 "	0 7 0	
	Total ..			30 0 6	
	Contingencies at 5 per cent ..			1 8 4	
	Petty supervision at 3 per cent ..			0 14 2	
	Total for 1 r. ft. ..			32 13 0	
	Total for 93 r. ft. of canal bed-width $93 \times 32-13-0$..				3,052
	Carried over ..				18,006
	Carried over ..				12,20,030

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 12,20,000
 Estimate No. 45-G—cont. Brought forward .. 16,006

Syphon aqueduct at R.D. 26/8428—cont.

(c ₁) Balance of culvert length up stream under front tanks (arched over) for one span of a pier and a vent parallel to canal length.					
7.63 units.	Concrete broken bricks in surki mortar ..	22 13 0	100 c. ft.	174 0 8	
4.35 "	Table moulded brick in do. ..	26 7 0	100 "	115 0 2	
3.94 "	Archwork brick in surki mortar ..	27 7 0	100 "	108 1 9	
6.67 "	Cement plastering $\frac{3}{4}$ " thick 1:3 ..	6 12 0	100 sq. ft.	45 0 1	
	Earthwork ..	3 12 0	1,000 c. ft.	11 4 1	
	Total ..			453 7 8	
	Contingencies at 5 per cent ..			22 2 8	
	Petty supervision at 3 per cent ..			10 15 8	
	Total for one span ..			486 10 0	
	Total for 8 spans = $8 \times 486-10-0$..				3,893
(c ₂) Balance of culvert length downstream arched over under rear tank for one span of a pier and a vent.					
7.54 units.	Concrete broken bricks in surki mortar ..	22 13 0	100 c. ft.	171 15 10	
4.70 "	Table moulded brick in surki mortar ..	26 7 0	100 "	124 4 4	
4.10 "	Archwork brick in surki mortar ..	27 7 0	100 "	112 2 0	
7.03 "	Cement plastering $\frac{3}{4}$ " thick 1:3 ..	6 12 0	100 sq. ft.	47 12 8	
3.012 "	Earthwork ..	3 12 0	100 c. ft.	11 4 9	
	Total ..			467 13 7	
	Contingencies at 5 per cent ..			23 6 6	
	Petty supervision at $2\frac{1}{2}$ per cent ..			8 12 0	
	Total ..			500 0 0	
	Total for 8 spans = $8 \times 500 =$..				4,000
(d ₁) Two abutments less one pier for portion (c ₁).					
7.18 units.	Concrete broken bricks in surki mortar ..	22 13 0	100 c. ft.	163 12 5	
10.31 "	Table moulded brick in do. ..	26 7 0	100 "	272 9 5	
2.46 "	Archwork brick in surki mortar ..	27 7 0	100 "	16 9 8	
2.766 "	Cement plastering $\frac{3}{4}$ " thick 1:3 ..	3 12 0	100 sq. ft.	9 7 0	
	Earthwork ..	3 12 0	1,000 c. ft.		
	Total ..			462 6 6	
	Contingencies at 5 per cent ..			23 1 10	
	Petty supervision at $2\frac{1}{2}$ per cent ..			11 7 8	
	Total ..				497
(d ₂) Two abutments less one pier for portion (c ₂) (downstream side).					
7.39 units.	Concrete broken bricks in surki mortar ..	22 13 0	100 c. ft.	168 9 1	
12.42 "	Table moulded brick in do. ..	26 7 0	100 "	328 6 1	
2.71 "	Cement plastering $\frac{3}{4}$ " thick 1:3 ..	6 12 0	100 sq. ft.	18 4 8	
2.516 "	Earthwork ..	3 12 0	1,000 c. ft.	9 7 0	
	Total ..			524 10 10	
	Contingencies at 5 per cent ..			26 3 4	
	Petty supervision at 3 per cent ..			13 0 0	
	Total ..			563 13 0 or	564
	Carried over ..				24,960
	Carried over ..				12,20,000

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 12,20,000					
Estimate No. 45-G.—cont. Brought forward .. 24,960					
Syphon aqueduct at R.D. 23/8428—cont.					
(d ₂) Two abutments less one pier for portion (e ₂) (down stream side)—cont.					
21.42 units.	(e ₁) Concrete broken bricks in surki mortar ..	22 15 0	100 c. ft.	488 9 5	
20.35 "	Table moulded brick in do. ..	26 7 0	100 "	538 0 10	
10.44 "	Cement plastering $\frac{3}{4}$ " thick 1 : 3 ..	6 12 0	100 sq. ft.	70 7 6	
46.83 "	Concrete block revetment ..	23 15 0	100 c. ft.	1,109 0 4	
15.44 "	Gravel backing to revetment ..	5 5 0	100 "	82 0 5	
5.25 "	Earthwork ..	3 12 0	1,000 "	19 10 10	
	Total ..			2,307 13 4	
	Contingencies at 5 per cent ..			115 6 3	
	Petty supervision at $2\frac{1}{2}$ per cent ..			51 12 5	
	Total ..				2,475
28.92 units.	(e ₂) Concrete broken bricks in surki mortar ..	22 13 0	100 c. ft.	659 10 9	
25.92 "	Table moulded brick in do. ..	26 7 0	100 "	949 11 0	
15.46 "	Cement plastering $\frac{3}{4}$ " thick 1 : 3 ..	6 12 0	100 sq. ft.	104 5 7	
51.26 "	Concrete block revetment ..	23 15 0	100 c. ft.	1,227 0 8	
15.60 "	Gravel backing to revetment ..	5 5 0	100 "	82 14 0	
8.000 "	Earthwork ..	3 12 0	1,000 "	30 0 0	
	Total ..			3,053 10 6	
	Contingencies at 5 per cent ..			152 1 5	
	Petty supervision at $2\frac{1}{2}$ per cent ..			76 0 1	
	Total ..			3,281 12 6	or 3,282
(g) Upstream flooring and drop wall between wings for one span parallel to bed level as per estimate S.A. at R.D. 25/3560.					
4.92 units.	Concrete broken bricks in surki mortar ..	22 13 0	100 c. ft.	112 3 7	
.74 "	Table moulded brick in do. ..	26 7 0	100 "	19 9 0	
2.01 "	Cement plastering $\frac{3}{4}$ " thick 1 : 3 ..	6 12 0	100 sq. ft.	13 9 0	
2.000 "	Earthwork ..	3 12 0	1,000 c. ft.	7 8 0	
	Total ..			152 13 8	
	Contingencies at 5 per cent ..			7 10 3	
	Petty supervision at 3 per cent ..			4 2 1	
	Total for one span ..			164 10 0	
	Total for 7 spans = $7 \times 164-10-0 = 1,152-6-0$.				1,152
(h) Downstream masonry flooring and lift wall between wings and for one span parallel to canal.					
5.98 units.	Concrete broken bricks in surki mortar ..	22 13 0	100 c. ft.	133 6 5	
.74 "	Table moulded brick in do. ..	26 7 0	100 "	19 9 0	
2.36 "	Cement plastering $\frac{3}{4}$ " thick, 1 cement, 3 sand ..	6 12 0	100 sq. ft.	15 14 11	
2.764 "	Earthwork ..	3 12 0	1,000 c. ft.	10 5 10	
.79 "	Concrete block apron ..	23 15 0	100 "	18 15 4	
	Total ..			201 3 6	
	Contingencies at 5 per cent ..			10 1 0	
	Petty supervision at 3 per cent ..			7 2 3	
	Total for one span ..			218 6 9	
	Total for 7 spans = $7 \times 218-6-9$ Rs. = 1,528-15-3 or ..				1,529
Earthwork excavation of rear channel.					
units 3,893.250	For carrying drainage water ..	3 12 0	1,000 c. ft.	14,500 0 0	
	Contingencies at 5 per cent ..			730 0 0	
	Petty supervision at $2\frac{1}{2}$ per cent ..			370 0 0	
	Total ..				15,700
	Carried over ..				49,093
	Carried over ..				12,20,000

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

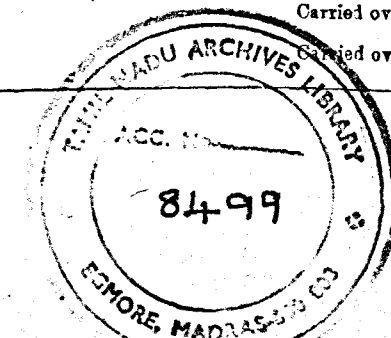
Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 12,20,000					
Estimate No. 45-G.—cont. Brought forward .. 49,098					
Syphon aqueduct at R.D. 26/8428—cont.					
(i) Upstream flooring, drop-wall, etc., for one ventway parallel to canal.					
3.74 units.	Concrete broken bricks in surki mortar ..	22 13 0	100 c. ft.	85 5 2	
.45 "	Table moulded bricks in do. ..	26 7 0	100 "	11 14 4	
1.28 "	Cement plastering $\frac{3}{4}$ " thick 1 cement, 3 sand ..	6 12 0	100 sq. ft.	8 10 5	
1.320 "	Earthwork ..	3 12 0	1,000 c. ft.	4 15 2	
	Total ..			110 13 1	
	Contingencies at 5 per cent ..			5 8 3	
	Petty supervision at $2\frac{1}{2}$ per cent ..			2 2 0	
	Total for one ventway ..			118 7 9	or 118
(j) Down stream flooring, drop wall, etc., for one ventway parallel to canal.					
5.92 units.	Concrete broken bricks in surki mortar ..	23 12 0	100 c. ft.	140 15 4	
.45 "	Table moulded bricks in surki mortar ..	26 7 0	100 "	11 14 4	
1.56 "	Cement plastering $\frac{3}{4}$ " thick 1 cement, 3 sand ..	6 12 0	100 sq. ft.	10 8 6	
2.106 "	Earthwork ..	3 12 0	1,000 c. ft.	7 14 4	
.60 "	Concrete block apron ..	23 15 0	100 "	14 6 5	
	Total ..			185 10 11	
	Contingencies at 5 per cent ..			9 5 9	
	Petty supervision at $2\frac{1}{2}$ per cent ..			4 15 4	
	Total ..				200
	Centring for archwork ..			Lump sum ..	250
	Shed for materials ..				134
	Baling water ..				1,100
	Total ..				50,900
Estimate No. 46-G.					
Syphon aqueduct at R.D. 28/2135.					
(a) Under bed of canal per foot run of canal bed width one vent and one pier.					
2.181 units.	Concrete broken brick in surki mortar ..	23 4 0	100 c. ft.	5 12 4	
.0785 "	Table moulded brick in do. ..	27 1 0	100 "	2 2 0	
.1733 "	Archwork do. do. ..	28 1 0	100 "	4 13 10	
.295 "	Cement plastering $\frac{3}{4}$ " thick 1 : 3 ..	6 12 0	100 sq. ft.	1 15 10	
	Total ..			14 12 0	
	Contingencies and petty supervision ..			1 2 9	
	Total ..			15 14 9	
	For 3 piers and bed width $3 \times 93 \times 15-14-9 =$			4,442 3 3	or say 4,442
(b) Under bed of canal per foot run of canal bed width two abutments and one vent.					
.46 units.	Concrete broken brick in surki mortar ..	23 4 0	100 c. ft.	10 11 1	
.49 "	Table moulded brick in do. ..	27 1 0	100 "	13 4 2	
.18875 "	Archwork do. do. ..	28 1 0	100 "	5 4 9	
.54 "	Concrete blocks for pitching ..	24 4 0	100 "	13 1 6	
.33 "	Cement plastering $\frac{3}{4}$ " thick 1 : 3 ..	6 12 0	100 sq. ft.	2 3 8	
1.29 "	Clay puddle ..	1 0 0	100 c. ft.	1 4 8	
	Contingencies and petty supervision at 8 per cent ..			3 10 9	
	Total ..			49 8 7	
	For 93' bed width $93 \times 49-8-7 =$			4,608 14 3	or say 4,607
	Carried over ..				9,049
	Carried over ..				12,70,900

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 12,70,900					
Estimate No. 46-G.—cont. Brought forward .. 9,049					
Syphon aqueduct at R.D. 28/2135—cont.					
(c ₁) Balance of culvert length upstream one vent and one pier for the whole length.					
6.70 units.	Concrete broken brick in surki mortar ..	23 4 0	100 c. ft.	155 12 5	
4.13 "	Table moulded brick in do. ..	27 1 0	100 "	111 12 3	
4.33 "	Archwork do. ..	28 1 0	100 "	121 8 2	
6.78 "	Cement plastering $\frac{3}{4}$ " thick 1:3 ..	6 12 0	100 sq. ft.	45 12 3	
1.50 "	Concrete blocks for revetment ..	24 4 0	100 c. ft.	36 6 0	
.50 "	Gravel backing ..	4 7 0	100 "	2 3 6	
	Total ..			473 6 7	
	Contingencies and petty supervision at 8 per cent. ..			37 14 0	
	Total ..			511 4 7	
	For 3 piers and 3 spans 3×511-4-7=			1,533 13 9	1,534
(c ₂) Balance of culvert length downstream side one vent and one pier including revetment to canal banks.					
5.91 units.	Concrete broken brick in surki mortar ..	23 4 0	100 c. ft.	137 6 7	
4.07 "	Table moulded brick in do. ..	27 1 0	100 "	110 2 4	
4.20 "	Archwork do. ..	28 1 0	100 "	117 13 10	
6.63 "	Cement plastering $\frac{3}{4}$ " thick 1:3 ..	6 12 0	100 sq. ft.	44 12 5	
1.50 "	Concrete blocks for revetment ..	24 4 0	100 c. ft.	36 6 0	
.50 "	Gravel backing ..	4 7 0	100 "	2 3 6	
	Total ..			448 12 8	
	Contingencies and petty supervision at 8 per cent. ..			35 14 5	
	Total ..			484 11 1	
	For 3 piers 3×484-11-1=			1,454 1 3	1,454
(d ₁) Two abutments and one vent for the whole length O.					
12.07 units.	Concrete broken brick in surki mortar ..	23 4 0	100 c. ft.	280 6 9	
14.51 "	Table moulded brick in surki mortar ..	27 1 0	100 "	392 10 10	
4.89 "	Archwork brick in surki mortar ..	28 1 0	100 "	131 9 10	
6.42 "	Cement plastering $\frac{3}{4}$ " thick 1:3 ..	6 12 0	100 sq. ft.	43 5 4	
2.29 "	Concrete blocks for revetment ..	24 4 0	100 c. ft.	55 8 6	
.76 "	Gravel backing ..	4 7 0	100 "	3 6 0	
	Total ..			906 15 3	
	Contingencies and petty supervision at 8 per cent. ..			72 8 0	
	Total ..			979 7 3	979
(d ₂) Two abutments and one vent for the whole length (c ₂).					
10.68 units.	Concrete broken brick in surki mortar ..	23 4 0	100 c. ft.	246 4 11	
14.15 "	Table moulded brick in surki mortar ..	27 1 0	100 "	382 14 11	
4.55 "	Archwork brick in surki mortar ..	28 1 0	100 "	127 10 11	
6.21 "	Cement plastering $\frac{3}{4}$ " thick 1:3 ..	6 12 0	100 sq. ft.	41 14 8	
2.29 "	Concrete blocks for revetment ..	24 4 0	100 c. ft.	55 8 6	
.76 "	Gravel backing ..	4 7 0	100 "	3 6 0	
	Total ..			859 11 11	
	Contingencies and petty supervision at 8 per cent. ..			68 12 6	
	Total ..			928 3 5	929
	Carried over ..				13,945
	Carried over ..				12,70,000

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 12,70,900					
Estimate No. 46-G.—cont. Brought forward .. 13,945					
Syphon aqueduct at R.D. 28/2135—cont.					
(e ₁) Wings upstream of culvert including revetment to drainage and canal banks, including also triangular portion of entry ramp and drop wall for the same.					
14.56 units.	Concrete, broken bricks in surki mortar ..	23 4 0	100 c. ft.	338 8 4	
19.08 "	Table-moulded brick in surki mortar ..	27 1 0	100 "	516 5 7	
8.22 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	55 7 10	
26.34 "	Concrete blocks for revetment ..	24 4 0	100 c. ft.	638 12 0	
8.78 "	Gravel backing ..	4 7 0	100 "	38 15 5	
	Total ..			1,588 1 2	
	Contingencies and petty supervision at 8 per cent. ..			127 0 10	
	Total ..			1,715 2 0	1,715
(e ₂) Wings downstream of culvert including revetment to drainage and canal banks, also triangular portion of exit ramp and drop wall for the same.					
15.46 units.	Concrete, broken brick in surki mortar ..	23 4 0	100 c. ft.	359 7 2	
22.79 "	Table-moulded brick in surki mortar ..	27 1 0	100 "	616 12 1	
9.45 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	63 12 7	
24.65 "	Concrete blocks for revetment ..	24 4 0	100 c. ft.	597 12 9	
8.22 "	Gravel backing ..	4 7 0	100 "	36 7 7	
	Total ..			1,674 3 7	
	Contingencies and petty supervision at 8 per cent. ..			133 15 0	
	Total ..			1,808 2 7	1,808
(g) Upstream masonry flooring, etc., per foot run of drain width between abutments.					
.50 unit.	Concrete, broken brick in surki mortar ..	23 4 0	100 c. ft.	11 10 0	
.075 "	Table-moulded brick in surki mortar ..	27 1 0	100 "	2 0 5	
.21 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	1 6 8	
	Contingencies and petty supervision at 8 per cent. ..			1 3 5	
	Total ..			16 4 4	
	For 29½' width, 29½ × Rs. 16-4-4 ..			482 0 3	482
(h) Downstream masonry flooring per foot run of drain width between abutments.					
.38 unit.	Concrete, broken brick in surki mortar ..	23 4 0	100 c. ft.	8 13 4	
.075 "	Table-moulded brick in surki mortar ..	27 1 0	100 "	2 0 5	
.16 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	1 1 3	
	Total ..			11 15 0	
	Contingencies and petty supervision at 8 per cent. ..			0 15 3	
	Total ..			12 14 3	
	Total, 29½ × Rs. 12-14-5 ..			381 14 1	382
	Carried over ..				18,332
	Carried over ..				12,70,900



GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward ..					
Estimate No. 46-G.—cont. Brought forward ..					
Syphon aqueduct at R.D. 28/2135—cont.					
(j) Concrete flooring close to lift wall and laterite stone packing.					
7.75 units.	Concrete, broken brick in surki mortar ..	23 4 0	100 c. ft.	180 3 0	
5.82 "	Concrete blocks for pitching ..	24 4 0	"	141 2 0	
	Total ..			321 5 2	
	Contingencies and petty supervision at 8 per cent ..			25 11 3	
	Total ..			347 0 5	
				or say	347
	Total ..				18,679
Deduct for—					
1.96 units.	Concrete, broken brick in surki mortar ..	23 4 0	100 c. ft.	45 9 1	
9.20 "	Table-moulded brick in surki mortar ..	27 1 0	100 "	248 15 7	
1.72 "	Cement plastering, $\frac{3}{4}$ " thick, 1 : 3 ..	6 12 0	100 sq. ft.	11 9 9	
14.57 "	Concrete blocks for revetment ..	24 4 0	100 c. ft.	359 5 2	
4.86 "	Gravel backing ..	4 7 0	100 "	21 9 0	
	Total ..			687 0 0	
	Contingencies and petty supervision at 8 per cent ..			54 15 0	
	Total ..			742 0 0	742
	Total of estimate less deductions ..				17,937
	Earthwork, excavation, etc. ..		Lump sum.		63
	Baling charges, etc. ..				300
	Shed for materials, etc. ..				200
	Centering for archwork ..				200
	Total ..				18,700
Estimate No. 47-G.					
Syphon aqueduct at R.D. 28/9500.					
(a) For one span of a pier and a vent under the bed of canal clear of abutments.					
0.30 units.	Concrete, broken bricks in surki mortar ..	22 13 0	100 c. ft.	6 13 6	
0.09 "	Table-moulded bricks in surki mortar ..	26 13 0	100 "	2 6 7	
0.16 "	Archwork do. ..	27 13 0	100 "	4 7 2	
0.32 "	Plastering with cement, $\frac{3}{4}$ " thick, 1 cement to 3 sand ..	6 12 0	100 sq. ft.	2 2 7	
0.091 "	Earthwork, excavating foundations, etc. ..	3 12 0	1,000 c. ft.	0 5 6	
	Total ..			16 3 4	
	Contingencies at 5 per cent ..			0 13 0	
	Petty supervision at 3 per cent ..			0 7 10	
	Total for 1 R. ft. of 1 span ..			17 8 2	
	Total for 2 spans—88 R. ft. bed width ..				3,081
(b) Two abutments less one pier under bed of canal for 1 r. foot of canal bed width.					
0.26 units.	Concrete, broken brick in surki mortar ..	22 13 0	100 c. ft.	5.93	
0.42 "	Table-moulded brick in surki mortar ..	26 13 0	100 "	11.36	
0.48 "	Concrete block apron ..	23 14 0	100 "	11.46	
1.44 "	Clay puddling ..	1 0 0	100 "	1.44	
0.117 "	Earthwork (excavation, etc.) ..	3 12 0	1,000 "	.44	
	Total ..			30.53	
	Contingencies at 5 per cent ..			1.56	
	Petty supervision at 2½ per cent ..			.78	
	Total for R. ft ..			32.87	
	Total for 88' bed width ..				2,892
	Carried over ..				5,973
	Carried over ..				12,89,600

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward ..					
Estimate No. 47-G.—cont. Brought forward ..					
Syphon aqueduct at R. D. 28/9500—cont.					
(c ₁) Balance of culvert length arched over under bank for one span on the upstream side.					
7.63 units.	Concrete, broken bricks in surki mortar ..	22 13 0	100 c. ft.	174	
4.35 "	Table-moulded brick in surki mortar ..	26 13 0	100 "	117	
3.94 "	Archwork do. ..	27 13 0	100 "	110	
6.67 "	Plastering with cement, $\frac{3}{4}$ " thick, 1 : 3 ..	6 12 0	100 "	45	
3.012 "	Earthwork, excavating foundations, etc. ..	3 12 0	100 "	11	
	Total ..			457	
	Contingencies at 5 per cent ..			23	
	Petty supervision at 2½ per cent ..			12	
	Total for 1 span ..			492	
	Total for 2 spans ..				984
(c ₂) Balance of culvert length as for item (c ₁) but on the downstream side.					
7.54 units.	Concrete, broken brick in surki mortar ..	22 13 0	100 c. ft.	171	
4.70 "	Table-moulded brick in surki mortar ..	26 13 0	100 "	126	
4.10 "	Archwork do. ..	27 13 0	100 "	113	
7.08 "	Plastering with cement, $\frac{3}{4}$ " thick, 1 : 3 ..	6 12 0	100 sq. ft.	18	
3.012 "	Earthwork, excavating foundations, etc. ..	3 12 0	1,000 c. ft.	11	
	Total ..			469	
	Contingencies at 5 per cent ..			23	
	Petty supervision at 2½ per cent ..			12	
	Total for 1 span ..			504	
	Total for 2 spans ..				1,008
(d ₁) Two abutments less one pier for the portion (c ₁) (upstream side).					
7.18 units.	Concrete, broken bricks in surki mortar ..	22 13 0	100 c. ft.	163	
10.31 "	Table-moulded bricks in surki mortar ..	26 13 0	100 "	276	
2.46 "	Plastering with cement, $\frac{3}{4}$ " thick, 1 : 3 ..	6 12 0	100 sq. ft.	17	
2.516 "	Earthwork, excavating foundations, etc. ..	3 12 0	1,000 c. ft.	9	
	Total ..			465	
	Contingencies at 5 per cent ..			26	
	Petty supervision at 2½ per cent ..			12	
	Total ..				500
(d ₂) Two abutments less one pier for the portion (c ₂) (downstream side).					
7.39 units.	Concrete, broken brick in surki mortar ..	22 13 0	100 c. ft.	169	
12.42 "	Table-moulded brick in surki mortar ..	26 13 0	100 "	333	
2.71 "	Plastering with cement, $\frac{3}{4}$ " thick, 1 : 3 ..	6 12 0	100 sq. ft.	18	
2.516 "	Earthwork, excavating foundations, etc. ..	3 12 0	1,000 c. ft.	9	
	Total ..			529	
	Contingencies at 5 per cent ..			26	
	Petty supervision at 2½ per cent ..			13	
	Total ..				568
(e ₁) Wings upstream of culvert including revetment to drainage and canal bank including triangular portion of ramp and drop wall formed by the splay of the wing.					
21.42 units.	Concrete, broken brick in surki mortar ..	22 13 0	100 c. ft.	489	
20.35 "	Table-moulded brick in surki mortar ..	26 13 0	100 "	546	
10.44 "	Plastering with cement, $\frac{3}{4}$ " thick, 1 : 3 ..	6 12 0	100 sq. ft.	71	
29.23 "	Concrete block revetment and apron ..	23 14 0	100 c. ft.	698	
11.12 "	Gravel backing to revetment ..	4 7 0	100 "	49	
5.250 "	Earthwork, excavating foundations ..	3 12 0	1,000 "	20	
	Total ..			1,873	
	Contingencies at 5 per cent ..			94	
	Petty supervision at 2½ per cent ..			47	
	Total ..				2,014
	Carried over ..				11,047
	Carried over ..				12,89,600

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 12,89,600

Estimate No. 47-G.—cont. Brought forward .. 11,047

Syphon aqueduct at R.D. 28/9500—cont.

<i>(e₂) Wings, etc., as per e₂ but on the downstream side.</i>					
28-92 units.	Concrete, broken bricks in surki mortar ..	22 13 0	100 c. ft.	660	
35-92 "	Table-moulded brick in surki mortar ..	26 13 0	100 "	963	
15-46 "	Plastering with cement, $\frac{3}{4}$ " thick, 1 : 3 ..	6 12 0	100 sq. ft.	105	
33-73 "	Concrete block revetment and apron ..	23 14 0	100 c. ft.	805	
11-12 "	Gravel backing ..	4 7 0	100 "	49	
8-668 "	Earthwork ..	3 12 0	1,000 "	32	
	Total ..			2,614	
	Contingencies at 5 per cent ..			131	
	Petty supervision at $2\frac{1}{2}$ per cent ..			65	
	Total ..				2,810
<i>g, h, i & j as per abstracts of estimate for syphon aqueduct at R.D. 28/8428.</i>					
	<i>(g) for one span ..</i>				165
	<i>(h) do. ..</i>				196
	<i>(i) do. ..</i>				186
	<i>(j) do. ..</i>				200
60-000 units.	I. Earthwork (excavation of rear channel)—				
	Earthwork ..	3 12 0	1,000 c. ft.	225	
	Contingencies at 5 per cent ..			8	
	Petty supervision at $2\frac{1}{2}$ per cent ..			8	
	Total ..				236
	Centering for archwork ..		Lump sum.	150	
	Baling water ..			370	
	Shed for materials ..			140	
	Total ..				15,500

Estimate No. 48-G. (Plan No. G. 72).

An under-tunnel for Komarankolam at R.D. 30/2135.

166-0 units.	Concrete, broken brick in surki mortar ..	19 13 0	100 c. ft.	3,239	
101-3 "	Table-moulded bricks in do. ..	24 4 0	100 "	2,467	
56-2 "	Archwork do. do. ..	25 4 0	100 "	1,419	
110-0 "	Cement plastering, $\frac{1}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 sq. ft.	743	
94-00 "	Concrete blocks for revetments and apron ..	21 1 0	100 c. ft.	1,980	
17-2 "	Gravel backing ..	3 2 0	100 "	54	
18-600 "	Clay puddling ..	10 0 0	1,000 "	186	
40-000 "	Earthwork, excavating foundations, etc. ..	3 12 0	1,000 "	150	
	Centering for archwork ..		Lump sum.	150	
	Baling water ..			160	
	Shed for materials ..			105	
	Total ..				10,693
	Contingencies at 5 per cent ..			535	
	Petty supervision at $2\frac{1}{2}$ per cent ..			272	
	Total ..				11,500
	Carried over ..				13,16,600

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 13,16,600

Estimate No. 49-G.

Syphon aqueduct at R.D. 30/2685.

<i>(a) Abstract of estimate for the portion of aqueduct under the bed of canal and in clear of abutment for one span of a pier per foot run of canal bed width.</i>					
62 units.	Concrete, broken brick in surki mortar ..	19 13 0	100 c. ft.	12-29	
33 "	Table-moulded brick in do. ..	24 4 0	100 "	8-00	
27 "	Archwork, brick in do. ..	25 4 0	100 "	6-82	
60 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement : 3 sand).	6 12 0	100 sq. ft.	4-05	
2-25 "	Earthwork, excavation, etc. ..	3 12 0	1,000 c. ft.	0-84	
	Total ..				32-00
	Contingencies and petty supervision at $7\frac{1}{2}$ per cent ..				2-72
	Total for 1 R. ft. ..				34-72
	For 12 spans of 46' bed-width, $12 \times 46 \times 34-72$.				19,165
<i>(b) Two abutments less one pier under bed of canal including apron of canal per foot run of canal bed width.</i>					
70 units.	Concrete, broken brick in surki mortar ..	19 13 0	100 c. ft.	13-88	
1-25 "	Table-moulded brick in surki mortar ..	24 4 0	100 "	30-31	
90 "	Concrete block revetment ..	21 1 0	100 "	18-06	
3-42 "	Clay puddle work ..	1 0 0	100 "	3-42	
2-85 "	Earthwork ..	3 12 0	1,000 "	1-06	
	Total ..				67-63
	Contingencies at 5 per cent ..				3-38
	Shed for materials and supervision at $2\frac{1}{2}$ per cent.				2-36
	Total for 1 R. ft. canal bed width ..				73-37
	Total for 46 R. ft. of canal bed width $46 \times 73-37 =$..				3,375
<i>(c₁) Balance of culvert length arched over under foot-path including head wall on 1 parapet for one span parallel to canal upstream side.</i>					
2-91 units.	Concrete, broken brick in surki mortar ..	19 13 0	100 c. ft.	57-65	
7-26 "	Table-moulded brick in surki mortar ..	24 4 0	100 "	175-06	
1-47 "	Archwork brick in surki mortar ..	25 4 0	100 "	37-12	
7-25 "	Cement plastering, $\frac{1}{4}$ " thick (1 cement : 3 sand) ..	6 12 0	100 sq. ft.	48-93	
1-395 "	Earthwork, excavation ..	3 12 0	1,000 c. ft.	5-23	
	Total ..				324-99
	Contingencies at 5 per cent ..				16-25
	Shed for materials and supervision at $2\frac{1}{2}$ per cent.				11-37
	Total for one span ..				352-61
	Total for 12 spans, $12 \times 352-61$..				4,231
<i>(c₂) Balance of culvert length arched over under cart-track including head wall and parapet for one span parallel to canal downstream side.</i>					
6-74 units.	Concrete, broken brick in surki mortar ..	19 13 0	100 c. ft.	133-54	
9-98 "	Table-moulded brick ..	24 4 0	100 "	242-01	
2-61 "	Archwork, brick in surki mortar ..	25 4 0	100 "	65-90	
9-98 "	Cement plastering, $\frac{1}{4}$ " thick (1 cement : 3 sand) ..	6 12 0	100 sq. ft.	67-36	
2-886 "	Earthwork, excavation ..	3 12 0	1,000 c. ft.	10-82	
	Total ..				519-63
	Contingencies and supervision at $7\frac{1}{2}$ per cent ..				44-16
	Total for one span ..				563-79
	Total for 12 spans, $12 \times 563-79$..				6,765
	Carried over ..				33,536
	Carried over ..				13,16,600

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 13,16,600					
Estimate No. 49-G—cont. Brought forward .. 33,538					
Syphon aqueduct at R.D. 30/2685—cont.					
(d ₃) Two abutments less one pier for the portion of (c ₁) separately (upstream side).					
4.18 units.	Concrete, broken brick in surki mortar	19 13 0	100 c. ft.	82 13 0	
28.18 "	Table-moulded brick in surki mortar	24 4 0	100 "	683 6 0	
3.00 "	Cement plastering, $\frac{3}{8}$ " thick (1 cement : 3 sand) ..	6 12 0	100 sq. ft.	20 4 0	
1.620 "	Earthwork, excavation	3 12 0	1,000 c. ft.	6 1 0	
	Total			792 8 0	
	Contingencies and petty supervision at $7\frac{1}{2}$ per cent			59 8 0	
	Shed for materials			8 0 0	
	Total				860
(d ₂) Two abutments less one pier or the portion of c ₂ separately (downstream side).					
8.72 units.	Concrete, broken brick in surki mortar	19 13 0	100 c. ft.	172 12 0	
34.73 "	Table-moulded brick in surki mortar	24 4 0	100 "	939 1 0	
3.63 "	Cement plastering, $\frac{3}{8}$ " thick (1 cement : 3 sand) ..	6 12 0	100 sq. ft.	24 8 0	
3.240 "	Earthwork, excavation	3 12 0	1,000 c. ft.	12 3 0	
	Total			1,148 8 0	
	Contingencies at 5 per cent			59 8 0	
	Shed for materials and petty supervision at $2\frac{1}{2}$ per cent			42 0 0	
	Total				1,250
(e ₁) Wings upstream of culvert length including revetment for stream and canal bank and also apron at contracted portion in the stream and canal. Lump sum.					
36.64 units.	Concrete, broken brick in surki mortar	19 13 0	100 c. ft.	725.93	
80.01 "	Table-moulded brick in surki mortar	24 4 0	100 "	1,940.27	
70.74 "	Cement plastering, $\frac{3}{8}$ " thick (1 cement : 3 sand) ..	6 12 0	100 "	477.60	
54.69 "	Revetment to canal bank	21 1 0	100 "	1,151.91	
11.04 "	Gravel backing	3 2 0	100 "	34.50	
17.436 "	Earthwork, excavation	3 12 0	1,000 "	65.38	
	Total			4,396.19	
90.03 "	Concrete block revetment	19 13 0	100 c. ft.	1,783.73	
	Total			6,179.92	
	Contingencies at 5 per cent			309.00	
	Petty supervision at 3 per cent			216.30	
	Total			6,705.21 or	6,705
(e ₂) Wings downstream of culvert length including revetment for stream and canal bank and also apron at contracted portion in the stream and canal. Lump sum.					
34.06 units.	Concrete, broken brick in surki mortar	19 13 0	100 c. ft.	686.71	
77.81 "	Table-moulded brick in surki mortar	24 4 0	100 "	1,886.89	
51.72 "	Cement plastering, $\frac{3}{8}$ " thick (1 cement : 3 sand) ..	6 12 0	100 sq. ft.	349.11	
55.84 "	Revetment to canal bank	21 1 0	100 c. ft.	1,176.13	
12.43 "	Gravel backing	3 2 0	100 "	38.84	
15.877 "	Earthwork, excavation	3 12 0	1,000 "	59.54	
57.58 "	Concrete block revetment	19 13 0	100 "	1,140.79	
	Total			5,388.01	
	Contingencies at 5 per cent			266.90	
	Petty supervision at $3\frac{1}{2}$ per cent			186.83	
	Total				5,792
	Carried over				48,143
	Carried over				13,16,600

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 13,16,600					
Estimate No. 49-G—cont. Brought forward .. 48,143					
Syphon aqueduct at R.D. 30/2685—cont.					
(f) Wings connecting side wall aqueduct to canal bank.					
19.98 units.	Concrete, broken brick in surki mortar	19 13 0	100 c. ft.	378.02	
42.54 "	Table-moulded brick in surki mortar	24 4 0	100 "	1,031.60	
10.07 "	Cement plastering, $\frac{3}{8}$ " thick (1 cement : 3 sand) ..	6 12 0	100 sq. ft.	67.97	
	Total			1,477.59	
	Contingencies at 5 per cent			73.90	
	Petty supervision at $3\frac{1}{2}$ per cent			51.73	
	Total			1,603.22 or	1,603
(g) Upstream masonry flooring and drop wall between wings and not under arches up to drainage bed level for one span parallel to canal.					
5.41 units.	Concrete, broken brick in surki mortar	19 13 0	100 c. ft.	126.99	
5.42 "	Table-moulded brick in surki mortar	24 4 0	100 "	134.26	
7.97 "	Cement plastering, $\frac{3}{8}$ " thick (1 cement : 3 sand) ..	6 12 0	100 sq. ft.	53.80	
5.063 "	Earthwork, excavation	3 12 0	1,000 c. ft.	18.98	
	Total			333.93	
	Contingencies at 5 per cent			16.60	
	Shed for materials and petty supervision at $3\frac{1}{2}$ per cent			21.76	
	Total for one span			372.29	
	Total for 12 spans $12 \times 372.29 =$				4,473
(h) Downstream masonry flooring, cushion, left wall, etc., between wings and not under arches up to drainage bed level for one span parallel to canal.					
13.91 units.	Concrete, broken brick in surki mortar	19 13 0	100 c. ft.	267.7	
2.27 "	Table-moulded brick in surki mortar	24 4 0	100 "	53.0	
2.47 "	Cement plastering, $\frac{3}{8}$ " thick (1 cement : 3 sand) ..	6 12 0	100 sq. ft.	43.9	
12.825 "	Earthwork, excavation	3 12 0	1,000 c. ft.	48.0	
	Total			422.62	
	Contingencies at 5 per cent			21.24	
	Shed for materials and petty supervision			14.87	
	Total for one span			458.73	
	For 12 spans $12 \times 458.73 =$				5,505
(i) Pitching between wings on stream bed level from abutment to abutment parallel to canal upstream.					
20.38 units.	Pitching upstream	21 1 0	100 c. ft.	1,482.37	
153.90 "	Clay piddle, upstream	1 0 0	100 "	153.90	
	Total			1,636.27	
	Contingencies at 5 per cent			81.80	
	Shed for materials and petty supervision at $3\frac{1}{2}$ per cent			57.26	
	Total			1,775.33 or	1,775
	Carried over				61,437
	Carried over				13,16,600

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity. (1)	Description of work (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 13,16,600					
Estimate No. 49-G—cont. Brought forward .. 61,427					
Syphon aqueduct at R.D. 30/2685—cont.					
(j) Fitching between wings on stream bed from abutment to abutment parallel to canal downstream.					
52.99 units.	Pitching downstream	21 1 0	100 c. ft.	1,116.00	
	Contingencies at 5 per cent	..	..	55 80	
	Shed for materials and petty supervision at 3½ per cent.	..	..	39 06	
	Total	..	..	1,210.86	
	Centering for arch	..	..	462 0	
	Baling water	..	..	1,400.0	3,073
	Total	..	..	..	64,500
Estimate No. 50-G.					
Syphon aqueduct at R.D. 30/7835.					
(a) For one span of a pier and a vent under bed of canal and clear of abutment for one foot length of canal bed width.					
0.62 unit.	Concrete, broken bricks in surki mortar	20 12 0	100 c. ft.	12 13 10	
0.33 "	Table-moulded brick in surki mortar	25 1 0	100 "	8 4 4	
0.27 "	Archwork do.	26 1 0	100 "	7 0 7	
0.60 "	Plastering with cement, ¾" thick (1 cement : 3 sand).	6 12 0	100 sq. ft.	4 0 0	
0.225 "	Earthwork, excavating foundations, etc.	3 12 0	1,000 c. ft.	0 13 6	
	Total	..	..	33 1 1	
	Contingencies at 5 per cent	..	..	1 10 5	
	Petty supervision and sheds at 3½ per cent	..	..	1 2 6	
	Total for 1 R. ft. bed width, 1 span	..	..	35 14 0	
	Total for 24 spans and 46' bottom width	..	..	..	39,606
(b) Two abutments less one pier under bed of canal including apron of canal per foot run of canal bed width.					
0.70 units.	Concrete, broken bricks in surki mortar	20 12 0	100 c. ft.	14 8 5	
1.25 "	Table-moulded brick in surki mortar	25 1 0	100 "	31 5 3	
0.90 "	Concrete block apron	22 0 0	100 "	19 12 10	
3.42 "	Clay puddling	1 0 0	100 "	3 6 9	
0.285 "	Earthwork, excavating foundations, etc.	3 12 0	1,000 c. ft.	1 1 1	
	Total	..	..	70 2 4	
	Contingencies at 5 per cent	..	..	3 8 1	
	Petty supervision and sheds at 3½ per cent	..	..	2 7 9	
	Total per foot run of canal bed width	..	..	76 2 2	
	Total per foot run for 46 R. ft.	..	..	..	3,502
(c) Balance length of culvert arched over under foot-path including head wall for one span parallel to canal.					
3.83 units.	Concrete, broken bricks in surki mortar	20 12 0	100 c. ft.	79 7 7	
7.26 "	Table-moulded brick in surki mortar	25 1 0	100 "	181 15 2	
1.47 "	Archwork, brick in surki mortar	26 1 0	100 "	38 4 11	
7.25 "	Plastering with cement, ¾" thick, 1 : 3	6 12 0	100 sq. ft.	48 15 0	
1.395 "	Earthwork, excavating foundations, etc.	3 12 0	1,000 c. ft.	5 3 8	
	Total	..	..	353 14 4	
	Contingencies at 5 per cent	..	..	17 11 1	
	Petty supervision and sheds at 3½ per cent	..	..	12 6 2	
	Total for 1 span	..	..	383 15 7	
	Total for 24 spans	..	..	..	9,215
	Carried over	..	..	..	52,323
	Carried over	..	..	..	13,81,100

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity. (1)	Description of work (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 13,81,100					
Estimate No. 50-G—cont. Brought forward .. 52,323					
Syphon aqueduct at R.D. 30/7835—cont.					
(e) Same as item (c) but under roadway on the downstream side.					
6.74 units.	Concrete broken brick in surki mortar	20 12 0	100 c. ft.	139 13 9	
9.98 "	Table moulded brick in surki mortar	25 1 0	100 "	250 1 11	
2.61 "	Archwork do.	26 1 0	100 "	68 0 4	
9.98 "	Plastering with cement, ¾" thick, 1 : 3	6 12 0	100 sq. ft.	67 5 9	
2.885 "	Earthwork (excavating foundations, etc.)	3 12 0	1,000 c. ft.	10 13 2	
	Total	..	..	536 2 11	
	Contingencies at 5 per cent	..	..	26 12 11	
	Petty supervision at 3½ per cent	..	..	18 12 2	
	Total for 1 span	..	..	581 12 0	
	Total for 24 spans	..	..	..	13,962
(d) Two abutments less one pier for the portion (e) on the upstream side.					
418 units.	Concrete broken bricks in surki mortar	20 12 0	100 c. ft.	86 11 9	
2,818 "	Table moulded brick in surki mortar	25 1 0	100 "	706 4 2	
300 "	Plastering with cement, ¾" thick, 1 : 3	6 12 0	100 sq. ft.	20 4 0	
1,620 "	Earthwork (excavating foundations, etc.)	3 12 0	1,000 c. ft.	6 1 2	
	Total	..	..	819 5 1	
	Contingencies at 5 per cent	..	..	40 15 5	
	Petty supervision and sheds at 3½ per cent	..	..	31 6 1	
	Total	..	..	891 10 7	892
(d) Two abutments less one pier for the portion (e) under roadway downstream side.					
8.72 units.	Concrete broken brick in surki mortar	20 12 0	100 c. ft.	181	
38.73 "	Table moulded brick in surki mortar	25 1 0	100 "	970	
3.63 "	Plastering with cement, ¾" thick, 1 : 3	6 12 0	100 sq. ft.	25	
3.240 "	Earthwork (excavating foundations, etc.)	3 12 0	1,000 c. ft.	12	
	Total	..	..	1,188	
	Contingencies at 5 per cent	..	..	59	
	Shed and petty supervision at 3½ per cent	..	..	42	
	Total	..	..	..	1,289
(e) Wings upstream of culvert including revetment for stream and canal bank and also apron at contracted section.					
36.64 units.	Concrete broken brick in surki mortar	20 12 0	100 c. ft.	760	
90.03 "	Do. apron	20 12 0	100 "	1,868	
80.04 "	Table moulded brick in surki mortar	25 1 0	100 "	2,006	
70.74 "	Plastering with cement, ¾" thick, 1 : 3	6 12 0	100 sq. ft.	477	
64.69 "	Concrete block revetment and apron	22 0 0	100 c. ft.	1,203	
11.04 "	Gravel backing to revetment	3 9 0	100 "	39	
17.436 "	Earthwork (excavating foundations, etc.)	3 12 0	1,000 "	65	
	Total	..	..	6,418	
	Contingencies at 5 per cent	..	..	321	
	Petty supervision and sheds at 3½ per cent	..	..	226	
	Total	..	..	..	6,965
	Carried over	..	..	..	75,431
	Carried over	..	..	..	13,81,100

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward ..					
Estimate No. 50-G—cont. Brought forward ..					
Syphon aqueduct at R.D. 30/7835—cont.					
(e) Wings downstream of culvert including revetment, etc., as for item e ₁ .					
34.66 units.	Concrete broken brick in surki mortar ..	20 12 0	100 c. ft.	719	
77.81 "	Table moulded brick in surki mortar ..	25 1 0	100 "	1,950	
51.72 "	Plastering with cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	349	
55.84 "	Concrete block revetment and apron ..	22 0 0	100 c. ft.	1,228	
12.43 "	Gravel backing to revetment ..	3 9 0	100 "	44	
15.877 "	Earthwork (excavating founds, etc.) ..	3 12 0	1,000 "	59	
57.58 "	Concrete apron ..	20 12 0	100 "	1,195	
	Total ..			5,544	
	Contingencies at 5 per cent ..			277	
	Sheds and petty supervision at $3\frac{1}{2}$ per cent ..			194	
	Total ..				6,015
(f) Wings connecting side wall of aqueduct to canal bank.					
19.08 units.	Concrete broken brick in surki mortar ..	20 12 0	100 c. ft.	396	
42.54 "	Table moulded brick in do. ..	25 1 0	100 "	1,066	
10.07 "	Plastering with cement, $\frac{3}{4}$ " thick, 1 cement to 3 sand ..	6 12 0	100 sq. ft.	68	
	Total ..			1,530	
	Contingencies at 5 per cent ..			77	
	Supervision and sheds $3\frac{1}{2}$ per cent ..			53	
	Total ..				1,660
(g) Upstream masonry flooring 1 drop wall between wings up to drainage bed level for 1 span parallel to canal.					
6.41 units.	Concrete broken brick in surki mortar ..	20 12 0	100 c. ft.	133	
5.62 "	Table moulded brick in surki mortar ..	25 1 0	100 "	141	
7.87 "	Plastering with cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	54	
5.063 "	Earthwork (excavating founds, etc.) ..	3 12 0	1,000 c. ft.	19	
	Total ..			347	
	Contingencies at 5 per cent ..			17	
	Sheds and petty supervision at $3\frac{1}{2}$ per cent ..			12	
	Total for 1 span ..			376	
	Total for 24 spans ..				9,024
(h) Downstream masonry flooring one left wall, etc., between wings up to drainage bed level for one span parallel to canal.					
13.01 units.	Concrete broken brick in surki mortar ..	20 12 0	100 c. ft.	270	
2.97 "	Table moulded brick in surki mortar ..	25 1 0	100 "	57	
9.47 "	Plastering with cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	64	
12.825 "	Earthwork (excavating founds, etc.) ..	3 12 0	1,000 c. ft.	48	
	Total ..			439	
	Contingencies at 5 per cent ..			22	
	Petty supervision and sheds at $3\frac{1}{2}$ per cent ..			15	
	Total for 1 span ..			476	
	Total for 24 spans ..				11,424
	Carried over ..			1,03,554	
	Carried over ..			13,81,102	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward ..					
Estimate No. 50-G—cont. Brought forward ..					
Syphon aqueduct at R.D. 30/7835—cont.					
(i) Pitching between abutment throughout the whole stream bed on the upstream side.					
204.5 units	Concrete block apron ..	22 0 0	100 c. ft.	4,499	
307.8 "	Clay puddling ..	1 0 0	100 "	308	
	Total ..			4,807	
	Contingencies at 5 per cent ..			240	
	Sheds and petty supervision at $3\frac{1}{2}$ per cent ..			168	
	Total ..			5,215	5,215
(j) Same as item (i) but on the downstream side.					
150.20 units.	Concrete block apron ..	22 0 0	100 c. ft.	3,304	
	Contingencies at 5 per cent ..			165	
	Petty supervision and sheds at $3\frac{1}{2}$ per cent ..			116	
	Total ..			3,585	3,585
	Centering for arches ..			1,146	
	Baling water ..			3,000	
	Total ..			4,146	
	Total ..				1,16,500
Estimate No. 51-G.					
Syphon aqueduct at R.D. 32/6400.					
(a) Estimate for a portion of aqueduct under bed of canal in clear between abutments for one span and one pier per foot run of canal bed width.					
0.62 unit.	Concrete brick jelly in surki mortar ..	24 4 0	1,000 c. ft.	15.04	
0.21 "	Table moulded brickwork in surki mortar ..	28 6 0	1,000 "	5.96	
0.27 "	Archwork table moulded brick in surki mortar ..	29 6 0	1,000 "	7.93	
	Centering for archwork, etc. ..			3.17	
0.52 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	3.51	
0.15 "	Earthwork for excavation ..	5 0 0	1,000 c. ft.	0.75	
	Total ..			36.36	
	Contingencies at 5 per cent ..			1.82	
	Petty supervision at 3 per cent ..			1.12	
	Total for one span per foot run of canal ..			39.30	
	Total cost for 8 span and 45 R. ft. width of canal=8×45×39.30.			141.48	14,148
(b) Estimate for the portion of abutments under the bed of canal including apron of canal, less one pier per foot run of canal width.					
0.36 units.	Concrete brick jelly in surki mortar ..	24 4 0	100 c. ft.	8.73	
0.51 "	Table moulded brick in do. ..	28 6 0	100 "	14.47	
1.00 "	Concrete blocks apron ..	25 2 0	100 "	25.13	
2.76 "	Clay puddle pitching ..	4 13 0	100 "	13.28	
0.12 "	Earthwork ..	5 0 0	1,000 "	0.60	
	Total ..			62.21	
	Contingencies at 5 per cent ..			3.11	
	Petty supervision at 3 per cent ..			1.88	
	Total per foot run of canal bed width ..			67.20	
	Total for 45 R. ft. of canal bed width = 67.20 × 45 = 3,024.				3,024
	Carried over ..			17,172	
	Carried over ..			14,97,690	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 14,97,600					
Estimate No. 51-G.—cont. Brought forward .. 17,172					
Syphon aqueduct at R.D. 32/6400—cont.					
(c ₁) Balance of culvert length upstream arched over carrying canal including lead wall between abutment, etc., for one span parallel to canal.					
3.68 units.	Concrete brick jelly in surki mortar ..	24 4 0	100 c. ft.	89.24	
5.04 "	Table moulded brickwork in surki mortar ..	28 6 0	100 "	143.01	
1.47 "	Archwork table moulded brick in surki mortar ..	29 6 0	100 "	43.18	
	Centering for arches ..	Lump sum.		17.27	
5.95 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1 cement and 3 sand.	6 12 0	109 sq. ft.	40.16	
0.95 "	Earthwork ..	5 0 0	1,000 c. ft.	4.75	
	Total ..			337.61	
	Contingencies at 5 per cent ..			16.89	
	Petty supervision at 3 per cent ..			10.10	
	Cost of 1 pier = $\frac{364.60}{5} = 72.92$.				
	Total cost for span ..			364.60	
	Total cost for 8 spans = $364.60 \times 8 = 2,916.80$.				2,917
(c ₂) Balance of culvert length downstream arched over carrying canal including roadways for one span parallel to canal.					
7.36 units.	Concrete brick jelly in surki mortar ..	24 4 0	100 c. ft.	178.48	
7.20 "	Table moulded brick in surki mortar ..	28 6 0	100 "	204.30	
2.77 "	Archwork moulded brick in surki mortar ..	29 6 0	100 "	81.37	
	Centering for archwork ..	Lump sum.		32.55	
8.76 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1 cement and 3 sand.	6 12 0	100 sq. ft.	59.13	
2.000 "	Earthwork ..	5 0 0	100 c. ft.	10.00	
	Total ..			555.83	
	Contingencies at 5 per cent ..			28.24	
	Petty supervision at 3 per cent ..			16.93	
	Total for span ..			611.00	
	Total cost for 8 spans 611×8 ..			4,888	4,888
	Cost of one pier $\frac{611.00}{5} = 122.20$.				
(d ₁) Two abutments less one pier for the portion (c ₁) upstream.					
3.69 units.	Concrete brick jelly in surki mortar ..	24 4 0	100 c. ft.	89.48	
6.89 "	Table moulded brickwork in surki mortar ..	28 6 0	100 "	194.65	
0.18 "	Archwork table moulded brick in surki mortar ..	29 6 0	100 "	5.29	
	Centering for archwork, etc. ..	Lump sum.		2.12	
1.02 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1 cement and 3 sand.	6 12 0	100 sq. ft.	6.89	
1.32 "	Earthwork ..	5 0 0	100 c. ft.	6.60	
	Total ..			305.03	
	Contingencies at 5 per cent ..			15.27	
	Petty supervision at 3 per cent ..			9.20	
	Cost of two abutments without deduction of pier.			329.60	
	Hence required cost of two abutments less one pier = $329.60 - 72.92$.			256.68	257
	Carried over ..			25,234	
	Carried over ..			14,97,600	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 14,97,600					
Estimate No. 51-G.—cont. Brought forward .. 305.63 25,234					
Syphon aqueduct at R.D. 32/6400—cont.					
(d ₂) Two abutments less one pier for the portion (c ₂) downstream.					
8.01 units.	Concrete brick jelly in surki mortar ..	24 4 0	100 c. ft.	194.24	
16.29 "	Table moulded brick in surki mortar ..	28 6 0	100 "	462.23	
0.36 "	Archwork table moulded brick in surki mortar ..	29 6 0	100 "	10.58	
	Centering for archwork, etc. ..	Lump sum.		4.23	
2.34 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 2 cement and 3 sand.	6 12 6	100 sq. ft.	15.80	
2.70 "	Earthwork ..	4 0 0	1,000 c. ft.	13.50	
	Total ..			700.58	
	Contingencies at 5 per cent ..			35.29	
	Petty supervision at 3 per cent ..			21.03	
	Total cost of two abutments without deduction of pier.			756.90	
	Cost of one pier—vide (c ₂) abutment ..			122.20	
	Hence required cost of two abutments less one pier = $756.90 - 122.20$..			634.70	635
(e ₁) Wings upstream of culvert including revetments of canal banks and drainage and also apron of contracted portion of drainage and canal bed.					
21.50 units.	Concrete brick jelly in surki mortar ..	24 4 0	100 c. ft.	521.38	
36.79 "	Table moulded brickwork in surki mortar ..	28 6 0	100 "	1,043.92	
26.51 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1 cement and 3 sand.	6 12 0	100 sq. ft.	178.94	
34.20 "	Concrete block revetment and pitching ..	25 2 0	100 c. ft.	859.28	
7.30 "	Gravel-backing to revetment, 6" ..	6 3 0	100 "	45.17	
14.00 "	Concrete brick jelly in surki mortar (for apron).	24 4 0	100 "	339.60	
10.70 "	Earthwork ..	5 0 0	1,000 "	53.60	
	Total ..			3,041.69	
14.00 "	Deduct the difference of cost between concrete and concrete block apron in stream bed.	0 14 0	100 c. ft.	12.25	
	Net amount ..			3,029.44	
	Contingencies at 5 per cent ..			151.56	
	Petty supervision at 3 per cent ..			91.00	
	Total ..			3,272.00	3,272
(e ₂) Wings downstream of culvert including revetment of canal banks and drainage and also apron of contracted portion of drainage and canal bed.					
22.40 units.	Concrete brick jelly in surki mortar ..	24 4 0	100 c. ft.	543.20	
36.80 "	Table moulded brickwork in surki mortar ..	28 6 0	100 "	1,044.20	
26.90 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1 cement and 3 sand.	6 12 0	100 sq. ft.	181.58	
38.50 "	Concrete block revetment ..	25 2 0	100 c. ft.	987.31	
12.90 "	Concrete in surki mortar (for apron) ..	24 4 0	100 "	312.82	
11.26 "	Earthwork ..	5 0 0	1,000 "	56.30	
7.77 "	Gravel-backing to revetment ..	6 3 0	100 "	48.08	
	Total ..			3,153.60	
12.90 "	Deduct the difference of rate between concrete and concrete block pitching ..	0 14 0	100 c. ft.	11.29	
	Net amount ..			3,142.21	
	Contingencies at 5 per cent ..			157.11	
	Petty supervision at 3 per cent ..			94.28	
	Total amount ..			3,393.60	or 3,394
	Carried over ..			32,535	
	Carried over ..			14,97,600	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont.					
	Brought forward ..	..	..	14,97,600	
	Estimate No. 51-G.—cont.	Brought forward ..	..	32,535	
Syphon aqueduct at R.D. 32/6400—cont.					
(f) Wings connecting side walls of aqueduct to canal bank.					
10.70 units.	Concrete brick jelly in surki mortar	24 4 0	100 c. ft.	259.48	
38.80 "	Table-moulded brick in surki mortar	28 6 0	100 "	1,100.95	
6.80 "	Plastering with portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	39.15	
3.40 "	Earthwork	5 0 0	1,000 c.ft.	17.00	
	Total ..	..	..	1,416.68	
	Contingencies at 5 per cent	..	..	70.82	
	Petty supervision at 3 per cent	..	..	42.60	
	Total ..	..	..	1,530.00	1,530
(g) Up-stream masonry, floorings and dropwall between wings up to drainage bed level for one span parallel to canal.					
6.30 units.	Concrete brick jelly in surki mortar	24 4 0	100 c. ft.	162.78	
4.00 "	Table moulded brick in surki mortar	28 6 0	100 "	170.25	
4.30 "	Plastering with portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	32.40	
2.05 "	Earthwork	5 0 0	100 c. ft.	10.25	
	Total ..	..	..	365.68	
	Contingencies at 5 per cent	..	..	18.38	
	Petty supervision at 3 per cent	..	..	10.94	
	Total for one span ..	..	..	395.00	
	Total for 8 spans = 395×8 ..	..	..	3,160.00	3,160
(h) Down-stream masonry flooring cushion lift wall between wings up to drainage bed level for one span.					
11.70 units.	Concrete brick jelly in surki mortar	24 4 0	100 c.ft.	283.73	
1.80 "	Table moulded brick in surki mortar	28 6 0	100 "	61.08	
4.10 "	Plastering with portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	27.68	
2.16 "	Earthwork	5 0 0	1,000 c.ft.	10.80	
	Total ..	..	..	373.29	
	Contingencies at 5 per cent	..	..	18.66	
	Petty supervision at 3 per cent	..	..	11.25	
	Total for one span ..	..	..	403.20	
	Total cost for 8 spans = 403.20×8 ..	..	..	3,225.60	3,226
(i) Pitching between wings in up stream bed.					
5.55 units.	Concrete block pitching	25 2 0	100 c. ft.	139.44	
	Contingencies at 5 per cent	..	..	6.97	
	Petty supervision at 3 per cent	..	..	4.18	
	Total for one span ..	..	..	150.59	
	Total for 8 spans = 150.59×8 ..	..	..	1,204.72	1,205
	Carried over ..	..	..	or 41,656	
	Carried over ..	..	..	14,97,600	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont.					
	Brought forward ..	..	..	14,97,600	
	Estimate No. 51-G.—cont.	Brought forward ..	..	41,656	
Syphon aqueduct at R.D. 32/6400—cont.					
(j) Pitching between wings in downstream bed.					
5.25 units	Concrete block pitching	25 2 0	100 c. ft.	131.91	
	Contingencies at 5 per cent	..	..	6.50	
	Petty supervision at 3 per cent	..	..	3.99	
	Total ..	..	..	142.40	
	Total cost for 8 spans = 142.40×8 ..	..	..	1,139.20 or	1,139
Hand-railing 2' high, complete.					
630 r. ft.	Hand-rails	1 8 0	R. ft.	945	
	Contingencies	..	..	47	
	Petty supervision	..	..	28	
	Total ..	..	..	1,020	1,020
Cutting rear channel.					
300.00 units.	Cutting rear channel	4 0 0	1,000 c. ft.	1,200	
	Contingencies at 5 per cent	..	..	60	
	Petty supervision at 3 per cent	..	..	40	
	Total ..	..	..	1,300	1,300
	Total ..	..	..	..	45,115
	Shed for materials	..	..	Lump sum.	985
	Baling water	..	..	..	1,200
	Total ..	..	..	..	47,300
Estimate No. 52-G. (Plan No. G. 75).					
Syphon aqueduct at R.D. 33/8334.					
(a) Under bed of canal for 1 span of a pier and a vent clear of abutments per foot run of canal width.					
28 c. ft.	Concrete broken brick in surki mortar	26 10 0	100 c. ft.	7.48	
10 "	Brick in surki mortar	30 7 0	100 "	3.05	
19 "	Archwork brick in surki mortar	31 7 0	100 "	5.98	
32 sq. ft.	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	2.16	
150 c. ft.	Earthwork excavation (sandy loam)	5 0 0	1,000 c. ft.	0.75	
	Total ..	..	..	19.40	
	Contingencies at 5 per cent	..	..	.95	
	Supervision including shed for materials	..	..	.66	
	Grand Total ..	..	..	21.01 or say 21.00	4,368
	For 4 spans of 52 r. ft. of bed width = $4 \times 52 \times 21.00$	..	..	..	4,368
	Carried over ..	..	..	15,44,900	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 15,44,900

Estimate No. 52-G. (Plan No. G. 75)—cont. Brought forward .. 4,368

Syphon aqueduct at R.D. 33/8334—cont.

<i>(b) Two abutments (less one pier) under bed of canal per foot run of canal bed width. This includes pitching clay puddle and the filling in provided in the bed of canal.</i>					
22 c. ft.	Concrete in surki mortar	26 10 0	100 c. ft.	7-73	
60 "	Brick in surki mortar	30 7 0	100 "	18-26	
48 "	Concrete block (pitching)	27 4 0	100 "	13-08	
146 "	Clay puddle	6 9 0	100 "	9-58	
124 "	Earthwork	5 0 0	1,000 "	0-62	
	Total			49-27	
	Contingencies at 5 per cent			2-44	
	Supervision at 3 per cent including erecting shed			1-71	
	Grand Total			53-42	
	Deduct the cost of pier including archwork and concrete over per foot run as noted below			7-40	
	Total less deductions of item (b) per foot run			46-02	
	For 52 r. ft. of canal bed width = 52 × 46-02 =				2,393
<i>Cost of a pier per foot run including archwork and concrete over.</i>					
8 c. ft.	Concrete broken brick	26 10 0	100 c. ft.	2-13	
10 "	Brick in surki mortar	30 7 0	100 "	3-05	
80 "	Earthwork	5 0 0	1,000 "	0-49	
4 "	Archwork	31 7 0	100 "	1-26	
	Total			6-84	
	Contingencies at 5 per cent			33	
	Supervision at 2½ per cent			23	
	Grand total per foot run of pier			7-40	
<i>(c) Balance of culvert length over under banks up and downstream clear of abutments for 1 span for 40' 6".</i>					
1,040 c. ft.	Concrete broken brick in surki mortar	26 10 0	100 c. ft.	277	
683 "	Brick in surki mortar	30 7 0	100 "	208	
712 "	Archwork brick in surki mortar	31 7 0	100 "	224	
1,166 "	Cement plastering, ¾" thick, 1:3	6 12 0	100 sq. ft.	79	
4,800 "	Earthwork	5 0 0	1,000 c. ft.	24	
266 "	Concrete blocks	27 4 0	100 "	72	
58 "	Gravel backing	5 5 0	100 "	5	
	Total			889	
	Contingencies at 5 per cent			43	
	Supervision at 3 per cent including erecting shed			28	
	Grand Total			960	
	For 4 spans 4 × 960 = 3,840				3,840
	Carried over				10,601
	Carried over				15,44,900

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 15,44,900

Estimate No. 52-G. (Plan No. G. 75)—cont. Brought forward .. 10,601

Syphon aqueduct at R.D. 33/8334—cont.

<i>(d) Balance of culvert length under banks up and down stream for the whole length. Two abutments less one pier.</i>					
1,340 c. ft.	Concrete in surki mortar	26 10 0	100 c. ft.	357	
2,410 "	Brick in surki mortar	30 7 0	100 "	734	
124 "	Concrete blocks	27 4 0	100 "	34	
41 "	Gravel backing	5 5 0	100 "	2	
4,000 "	Earthwork	5 0 0	1,000 "	20	
	Total			1,147	
	Contingencies at 5 per cent			56	
	Supervision at 3 per cent			40	
	Total			1,243	
	Deduct cost of pier for full length 40' 6" at 7-40 per foot run			300	
	Total less deductions per foot run of item (d)			943	
	Total cost of two abutments less one pier for the whole length				943
<i>(e-2) Wings downstream of culvert including revetment for canal banks and drainage and also apron of contracted portion of the drainage and canal banks.</i>					
2,090 c. ft.	Concrete broken brick in surki mortar	26 10 0	100 c. ft.	556	
1,760 "	Brick in surki mortar	30 7 0	100 "	536	
1,250 sq. ft.	Cement plastering, ¾" thick, 1:3	6 12 0	100 sq. ft.	84	
2,300 c. ft.	Concrete blocks for revetment and pitching	27 4 0	100 c. ft.	627	
700 "	Gravel backing	5 5 0	100 "	37	
2,900 "	Earthwork	5 0 0	1,000 "	15	
	Total			1,855	
	Contingencies at 5 per cent			91	
	Supervision 3 per cent including erecting shed for materials			63	
	Total			2,009	
	Total cost of wings, etc., downstream				2,009
<i>(e-1) Wings upstream of culvert including revetment for canal banks and drainage and also apron at contracted portion of the drainage and canal banks.</i>					
1,750 c. ft.	Concrete broken brick in surki mortar	26 10 0	100 c. ft.	466	
1,520 "	Brick in surki mortar	30 7 0	100 "	463	
900 sq. ft.	Plastering with portland cement ¾" thick, 1:3	6 12 0	100 sq. ft.	61	
2,450 c. ft.	Concrete blocks for revetment	27 4 0	100 c. ft.	663	
600 "	Gravel backing	5 5 0	100 "	32	
2,300 "	Earthwork	5 0 0	1,000 "	12	
	Total			1,702	
	Contingencies at 5 per cent			84	
	Supervision at 3 per cent			60	
	Total cost of wings, etc., upstream				1,846
	Carried over				15,399
	Carried over				15,44,900

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 15,44,900					
Estimate No. 52-G. (Plan No. G. 75)—cont. Brought forward .. 15,399					
Syphon aqueduct at R.D. 33/8334—cont.					
(g) Upstream flooring, dropwall between wings and not under arches up to drainage bed level.					
543 c. ft.	Concrete broken brick in surki mortar	26 10 0	100 c. ft.	144-58	
52 "	Table moulded brick in surki mortar	30 7 0	100 "	15-83	
202 sq. ft.	Cement plastering (¾" thick, 1 cement and 3 sand)	6 12 0	100 sq. ft.	13-63	
1,500 c. ft.	Earthwork	5 0 0	1,000 c. ft.	7-50	
	Total			181-54	
	Contingencies at 5 per cent			9-07	
	Supervision at 2½ per cent including erecting shed			6-35	
	Total			196-96	
	Total cost of four spans, 4 × 196-96				788
(h) Downstream cushion lift wall, etc., per span parallel to canal.					
93 c. ft.	Concrete in surki mortar	26 10 0	100 c. ft.	24-77	
52 "	Brick in surki mortar	30 7 0	100 "	15-83	
48 sq. ft.	Cement plastering (¾" thick, 1 cement and 3 sand)	6 12 0	100 sq. ft.	3-24	
176 c. ft.	Earthwork	5 0 0	1,000 c. ft.	0-88	
	Total			44-71	
	Contingencies at 5 per cent			2-23	
	Supervision at 2½ per cent including erecting sheds for materials			1-56	
	Total			48-50	
	Total cost for 4 spans 4 × 48-50				154
(i) Pitching between wings on stream bed per span parallel to canal upstream.					
79 c. ft.	Concrete blocks	27 4 0	100 c. ft.	21-52	
79 "	Earthwork	5 0 0	1,000 "	40	
	Total			21-92	
	Contingencies at 5 per cent			1-10	
	Supervision at 2½ per cent including erecting shed for materials			0-78	
	Total			23-80	
	Total cost for 4 spans 4 × 23-80				95
(j) Floor between wings downstream.					
157 c. ft.	Concrete broken brick in surki mortar	26 10 0	100 c. ft.	41-80	
79 "	Cement plastering, ¾" thick, 1 cement and 3 sand	6 12 0	100 sq. ft.	5-33	
157 "	Earthwork	5 0 0	1,000 c. ft.	0-78	
	Total			47-91	
	Contingencies at 5 per cent			2-40	
	Supervision at 2½ per cent			1-67	
	Total cost of 4 spans 4 × 51-98			51-98	208
130 units.	Centering for arch work	Lump sum.			400
	Earthwork excavating front and rear channel	4 0 0 + 1,000 ft.			520
	Baling water	Lump sum.			396
	Total				18,000
	Carried over				15,62,900

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 15,82,900					
Estimate No. 53-G.					
Syphon aqueduct at R. D. 34/2400.					
Item (a).					
28 c. ft.	Concrete broken brick in surki mortar	26 8 0	100 c. ft.	7-42	
10 "	Brick in surki mortar	30 4 0	100 "	3-02	
19 "	Archwork brick in surki mortar	31 4 0	100 "	5-94	
32 "	Cement plastering, ¾" thick, 1 : 3	6 12 0	100 sq. ft.	2-16	
15 "	Earthwork	5 0 0	1,000 c. ft.	0-75	
	Total			19-29	
	Contingencies at 5 per cent			0-96	
	Petty supervision at 2½ per cent and sheds			0-67	
	Total			20-92	
	For 4 spans of 52 feet of width of canal = 4 × 52 × 20-92				4,347
Item (b).					
29 c. ft.	Concrete in surki mortar	26 8 0	100 c. ft.	7-69	
60 "	Brick in surki mortar	30 4 0	100 "	18-16	
48 "	Concrete blocks pitching	27 3 0	100 "	13-08	
146 "	Clay puddle	6 3 0	100 "	9-03	
124 "	Earthwork	5 0 0	1,000 "	0-82	
	Total			48-57	
	Deduct for pier			6-79	
	Petty supervision at 2½ per cent and sheds			41-78	
	Contingencies at 5 per cent			1-46	
	Total			2-09	
	For 52 r.ft. of width of canal 52 × 45-33				2,357
	Deduct for pier				
8 c. ft.	Concrete broken brick in surki mortar	26 8 0	100 c. ft.	2-12	
10 "	Brick in surki mortar	30 4 0	100 "	3-02	
80 "	Earthwork	5 0 0	1,000 "	0-40	
4 "	Archwork	31 4 0	100 "	1-26	
	Total			6-79	
Item (c).					
1,040 c. ft.	Concrete broken bricks in surki mortar	26 8 0	100 c. ft.	276	
683 "	Brick in surki mortar	30 4 0	100 "	207	
712 "	Archwork brick in surki mortar	31 4 0	100 "	223	
1,166 "	Cement plastering, ¾" thick, 1 : 3	6 12 0	100 sq. ft.	79	
4,800 "	Earthwork	5 0 0	1,000 c. ft.	24	
263 "	Concrete blocks	27 3 0	100 "	72	
88 "	Gravel backing	5 5 0	100 "	5	
	Total			886	
	Contingencies at 5 per cent			44	
	Petty supervision at 2½ per cent and sheds			31	
	Total			961	
	For 4 spans 4 × 961 =				3,844
	Carried over				10,548
	Carried over				15,62,900

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 15,62,90					
Estimate No. 53-G.—cont. Brought forward .. 10,54					
Syphon aqueduct at R.D. 34/2400—cont.					
Item (d).					
1,340 c. ft.	Concrete in surki mortar	26 8 0	100 c. ft.	355	
2,410 "	Brick in surki mortar	30 4 0	100 "	729	
124 "	Concrete blocks	27 3 0	100 "	34	
41 "	Gravel backing	5 5 0	100 "	2	
4,090 "	Earthwork	5 0 0	1,000 "	20	
	Total			1,140	
	Deduct the cost of pier of 40' 6" long, at 6.79 a r. ft.			275	
	Contingencies at 5 per cent			865	
	Petty supervision at 2½ per cent. and sheds			43	
	Total cost of two abutments less one pier			938	938
Item (e1).					
1,750 c. ft.	Concrete brick in surki mortar	26 8 0	100 c. ft.	464	
1,520 "	Brick in surki mortar	30 4 0	100 "	460	
900 "	Plastering with Portland cement, 1:3	6 12 0	100 sq. ft.	61	
2,450 "	Concrete blocks	27 3 0	100 c. ft.	666	
600 "	Gravel backing	5 5 0	100 "	32	
2,300 "	Earthwork	5 0 0	1,000 "	12	
	Total			1,695	
	Contingencies at 5 per cent			85	
	Petty supervision at 2½ per cent and sheds			59	
	Total cost of wings in front			1,839	1,839
Item (e2).					
2,090 c. ft.	Concrete broken brick in surki mortar	26 8 0	100 c. ft.	554	
1,760 "	Brick in surki mortar	30 4 0	100 "	532	
1,250 "	Cement plastering ¾" thick	6 12 0	100 sq. ft.	84	
2,300 "	Concrete blocks	27 3 0	100 c. ft.	625	
700 "	Gravel backing	5 5 0	100 "	37	
2,900 "	Earthwork	5 0 0	1,000 "	15	
	Total			1,847	
	Contingencies at 5 per cent			92	
	Petty supervision at 2½ per cent and sheds			65	
	Total			2,004	
	Total cost of wings in rear				2,004
Item (g).					
543 c. ft.	Concrete broken bricks in surki mortar	26 8 0	100 c. ft.	143.90	
52 "	Brick in surki mortar	30 4 0	100 "	15.73	
202 "	Cement plastering, ¾" thick, 1:3	6 12 0	100 sq. ft.	13.63	
1,500 "	Earthwork	5 0 0	1,000 c. ft.	7.50	
	Total			180.76	
	Contingencies at 5 per cent			9.00	
	Petty supervision at 2½ per cent and sheds			6.30	
	Total			196.06	
	For 4 spans 4 × 196.06				784
	Carried over				16,113
	Carried over				15,62,900

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 15,62,900					
Estimate No. 53-G.—cont. Brought forward .. 16,113					
Syphon aqueduct at R.D. 34/2400—cont.					
Item (h).					
93 c.ft.	Concrete in surki mortar	26 8 0	100 c.ft.	24.65	
52 "	Brick in surki mortar	30 4 0	100 "	15.73	
48 "	Cement plastering, ¾" thick, 1:3	6 12 0	100 sq.ft.	3.24	
176 "	Earthwork	5 0 0	1,000 c.ft.	0.88	
	Total			44.50	
	Contingencies at 5 per cent			2.22	
	Petty supervision at 2½ per cent and sheds			1.55	
	Total			48.27	
	For 4 spans 4 × 48.27				195
Item (i).					
79 c.ft.	Concrete blocks	27 3 0	100 c.ft.	21.48	
79 "	Earthwork	5 0 0	1,000 "	0.39	
	Total			21.87	
	Contingencies at 5 per cent			1.09	
	Petty supervision at 2½ per cent and sheds			0.76	
	Total			23.72	
	For 4 spans 4 × 23.72				95
Item (j).					
157 c.ft.	Concrete broken bricks in surki mortar	26 8 0	100 c.ft.	41.60	
79 "	Cement plastering, ¾" thick, 1:3	6 12 0	100 "	5.33	
167 "	Earthwork	5 0 0	1,000 "	0.78	
	Total			47.71	
	Contingencies at 5 per cent			2.38	
	Petty supervision at 2½ per cent and sheds			1.67	
	Total			51.76	
	For 4 spans 4 × 51.76				207
Lump sum.	Centering for archwork		Lump sum.		400
110 units.	Earthwork excavating front and rear channel	4 0 0	1,000 c.ft.		440
Lump sum.	Baling water		Lump sum.		400
	Total				17,850
Estimate No. 54-G.					
Syphon aqueduct at R.D. 34/6250.					
(a) Portion under bed of canal and clear between abutments for 1 span and 1 pier.					
17 c.ft.	Concrete broken brick in surki mortar	24 14 0	100 c.ft.	4.22	
6 "	Brick in surki mortar	28 12 0	100 "	1.73	
16 "	Archwork brick in surki mortar	29 12 0	100 "	4.76	
24 "	Cement plastering, ¾" thick, 1:3	6 12 0	100 sq.ft.	1.63	
63 "	Earthwork	5 0 0		.32	
	Total			12.65	
	Contingencies at 5 per cent			0.63	
	Supervision at 2½ per cent			0.32	
	Total			13.60	
	For 2 spans of 52 r.ft. of width of canal 2 × 52 × 13.60				1,414
	Carried over				1,414
	Carried over				15,80,750

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 15,80,750					
Estimate No. 54-G.—cont. Brought forward .. 1,414					
Syphon aqueduct at R.D. 34/6250—cont.					
(b) Two abutments for the above portion under the bed of canal including apron for canal less one pier per foot run.					
18 c. ft.	Concrete broken brick	24 14 0	100 c.ft.	4-48	
4 sq. ft.	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3.	6 12 0	100 sq.ft.	0-27	
38 "	Brick in surki mortar	28 12 0	100 c.ft.	10-93	
36 "	Concrete blocks	25 12 0	100 "	9-27	
150 "	Clay puddle	5 13 0	100 "	8-72	
56 "	Earthwork	5 0 0	1,000 "	0-28	
	Total			33-95	
	Contingencies at 5 per cent			1-70	
	Petty supervision at $2\frac{1}{2}$ per cent			0-85	
	Total			35-50	
	Deduct cost of a pier per ft. run as per this rate.			2-66	
	Total cost of item (b) less deduction			33-84	
	For 52 r. ft. of width of canal $52 \times 33-84 =$..		17-60		1,760
(c) Balance of culvert length arched over under banks up and down stream clear of abutments for 1 span and a pier.					
749 c. ft.	Concrete broken brick in surki mortar	24 14 0	100 c.ft.	186-31	
450 "	Brick in surki mortar	28 12 0	100 "	129-38	
632 "	Archwork brick in surki mortar	29 12 0	100 "	188-02	
860 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq.ft.	58-05	
186 "	Concrete blocks	25 12 0	100 c.ft.	47-90	
62 "	Gravel backing	4 7 0	100 "	2-75	
2,300 "	Earthwork	5 0 0	1,000 "	11-50	
	Total			623-91	
	Contingencies at 5 per cent			31-20	
	Supervision at $2\frac{1}{2}$ per cent			15-60	
	Total			670-71	
	For 2 spans $2 \times 670-71$				1,341
(d) Two abutments less one pier for the portion C.					
732 c. ft.	Concrete broken brick in surki mortar	24 14 0	100 c.ft.	182-09	
1,520 "	Brick in surki mortar	28 12 0	100 "	437-00	
120 "	Concrete blocks	25 12 0	100 "	30-90	
4,000 "	Earthwork	5 0 0	1,000 "	20-00	
	Total			669-99	
	Contingencies, 5 per cent			33-50	
	Supervision, $2\frac{1}{2}$ per cent			16-75	
	Total			720-24	
	Deduct cost of pier 40 feet long at 2-66 as detailed below.			106	
	Cost of a pier 40 feet long for the portion C.				
142 c. ft.	Concrete	24 14 0	100 c.ft.	35-32	
240 "	Brickwork	28 12 0	100 "	69-00	
400 "	Earthwork	5 0 0	1,000 "	2-00	
	40 feet of pier costs Rs. 106-32			106-32	
	1 foot do. Rs. 2-66				
	Total cost of two abutments less one pier				614
	Carried over				5,129
	Carried over				15,80,750

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 15,80,750					
Estimate No. 54-G.—cont. Brought forward .. 5,129					
Syphon aqueduct at R.D. 34/6250—cont.					
(e ₁) Wings in rear of culverts including revetments for stream and canal and also apron at contracted portion under canal and stream.					
1,083 c.ft.	Concrete broken brick in surki mortar	24 14 0	100 c.ft.	264-42	
1,685 "	Brick in surki mortar (table moulded)	28 12 0	100 "	478-69	
959 "	Plastering with Portland cement, $\frac{3}{4}$ " 1:3	6 12 0	100 sq.ft.	64-73	
2,050 "	Concrete blocks	25 12 0	100 c.ft.	528-38	
683 "	Gravel backing	4 7 0	100 "	30-33	
1,575 "	Earthwork	5 0 0	1,000 "	7-88	
	Total			1,374-43	
	Contingencies at 5 per cent			68-72	
	Supervision including erecting shed for materials			34-36	
	Total			1,477-51	
	Total				or 1,478
(e ₂) Wings in front of culverts including revetments for stream and canal and also apron at contracted portion under canal and stream.					
880 c.ft.	Concrete broken brick in surki mortar	24 14 0	100 c.ft.	213-93	
1,050 "	Brick in surki mortar	28 12 2	100 "	301-88	
690 "	Plastering with Portland cement, $\frac{3}{4}$ " (1 cement and 3 sand)	6 12 0	100 sq. ft.	40-50	
2,200 "	Earthwork	5 0 0	1,000 c. ft.	11-00	
1,582 "	Concrete blocks	25 12 0	100 "	407-37	
527 "	Gravel backing	4 7 0	100 "	23-40	
	Total			998-08	
	Contingencies, at 5 per cent			49-90	
	Supervision at $2\frac{1}{2}$ per cent			24-95	
	Total			1,072-93	
	Total cost of wings in front				or 1,073
(g) Upstream flooring drop wall between wings and not under arches up to drainage bed level per span parallel to canal.					
276 c. ft.	Concrete broken brick in surki mortar	24 14 0	100 c. ft.	68-41	
31 "	Brick in surki mortar	28 12 0	100 "	7-35	
11 sq. ft.	Plastering, $\frac{1}{4}$ " thick, 1:3 (cement)	6 12 0	100 "	7-43	
800 c. ft.	Earthwork	5 0 0	1,000 "	4-00	
	Total			87-19	
	Contingencies at 5 per cent			5-00	
	Supervision at $2\frac{1}{2}$ per cent			3-22	
	Total			95-41	
	For 2 spans $2 \times 95-41$				191
	Carried over				7,871
	Carried over				15,80,750

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 15,80,750

Brought forward .. 7,571

Estimate No. 54-G—cont.

Syphon aqueduct at R.D. 34/6250—cont.

<i>(h) Downstream cushion lift wall, etc., per span parallel to canal.</i>					
45 c. ft.	Concrete broken brick in surki mortar	24 14 0	100 c. ft.	11.19	
31 "	Brick in surki mortar	28 12 0	100 "	8.91	
33 sq. ft.	Plastering with portland cement, $\frac{3}{4}$ " thick, 1 cement and 3 sand.	6 12 0	100 sq. ft.	2.23	
80 c. ft.	Earthwork	5 0 0	1,000 c. ft.	0.40	
	Total			22.73	
	Contingencies at 5 per cent			1.14	
	Supervision at $2\frac{1}{2}$ per cent			0.57	
	Total			24.44	
	For 2 spans 2×24.44				49
<i>(j) Pitching between wings downstream per span parallel to canal.</i>					
264 c. ft.	Concrete broken brick in surki mortar	24 14 0	100 c. ft.	65.67	
132 sq. ft.	Plastering with portland cement, $\frac{3}{4}$ " 1 : 3	6 12 0	100 sq. ft.	8.91	
150 c. ft.	Earthwork	5 0 0	1,000 c. ft.	0.75	
55 "	Concrete blocks	25 12 0	100 "	14.18	
	Total			89.49	
	Contingencies at 5 per cent			4.47	
	Supervision at $2\frac{1}{2}$ per cent			2.24	
	Total			96.20	
	For 2 spans 2×96.20				192
	Centering of archwork				150
150 units.	Earthwork excavating front and rear channel ..	4 0 0	1,000 c. ft.		600
	Baling water				200
	Shed for materials				88
	Total				9,150

Estimate No. 55-G. (Plan No. G. 76).

Syphon aqueduct at R.D. 35/3750.

269.9 units.	Concrete brick jelly in surki mortar	23 12 0	100 c. ft.	6,427	
187.5 "	Table-moulded brick in surki mortar	27 12 0	100 "	5,203	
93.1 "	Archwork brick in surki mortar	28 12 0	100 "	2,677	
	Centering for archwork			1,071	
226.8 "	Plastering with portland cement, $\frac{3}{4}$ " thick (proportion 3 to 1)	6 12 0	100 sq. ft.	1,531	
88.8 "	Concrete block revetment and pitching	24 12 0	100 c. ft.	2,198	
17.7 "	Gravel-backing to revetment	3 9 0	100 "	63	
72.0 "	Clay puddle	3 15 0	100 "	284	
	Earthwork including cutting rear channel ..		Lump sum.	500	
	Baling water and shed for materials			500	
	Total			20,454	20,454
	Contingencies at 5 per cent			1,029	
	Petty supervision at $2\frac{1}{2}$ per cent			517	
	Total				22,000
	Total				Carried over .. 16,11,900

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 16,11,900

Estimate No. 56-G (Plan No. G. 77).

Syphon aqueduct at R.D. 36/1570 of the Grand Anicut Canal.

60-60 units.	Concrete brick jelly in surki mortar	22 5 0	100 c. ft.	1,350	
94.20 "	Table-moulded brick in surki mortar	26 8 0	100 "	2,496	
15.00 "	Archwork brick in surki mortar	27 8 0	100 "	413	
	Centering for arches		Lump sum.	165	
50.00 "	Plastering with portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	338	
45.10 "	Concrete block revetment and pitching	23 5 0	100 c. ft.	1,051	
9.40 "	Gravel-backing to revetment and pitching ..	3 9 0	100 "	34	
57.3 "	Clay puddle pitching	3 1 0	100 "	176	
70.000 "	Earthwork excavating including cutting rear channel	4 8 0	1,000 "	315	
	Baling		Lump sum.	82	
	Shed for materials			50	
	Total			6,470	
	Contingencies at 5 per cent			350	
	Petty supervision at $2\frac{1}{2}$ per cent			210	
	Total				7,030

Estimate No. 57-G.

Syphon aqueduct at R.D. 36/3100.

(Details same as per estimate at R.D. 37/0800.)

49 X 2	Item (a) as per estimate for syphon aqueduct at R.D. 37/0800.	12.89	R. ft.	1,263	
40	Item (b) as per estimate excluding cost for puddling Rs. 23.33.				
	Cost of puddling Rs. 4-8-0 = $.91 \times 7.41$.				
	= 6.74				
	30.07				
2 spans	Item (c) as per estimate for syphon aqueduct at 4 vents of 4' X 4' R.D. 37/0800.	29.08	R. ft.	1,425	
	Item (d) as per estimate for syphon aqueduct at 4 vents of 4' X 4' R.D. 37/0800.	61.632	Per span.	1,233	
			Lump sum.	553	
	Item (e.) as per estimate for syphon aqueduct at 4 vents of 4' X 4' R.D. 37/0800.			1,154	
	Item (e.) as per estimate for syphon aqueduct at 4 vents of 4' X 4' R.D. 37/0800.			1,380	
2 spans.	Item (g) as per estimate for syphon aqueduct at 4 vents of 4' X 4' R.D. 37/0800.	124.28	Per span.	249	
	Item (h) as per estimate for syphon aqueduct at 4 vents of 4' X 4' R.D. 37/0800.	23.44		47	
	Item (j) as per estimate for syphon aqueduct at 4 vents of 4' X 4' R.D. 37/0800.	118.69		237	
50 units.	Earthwork excavating front and rear channel ..	4.00	1,000 c. ft.	200	
	Centering for archwork		Lump sum.	100	
	Baling out water			200	
	Shed for materials			59	
	Total				8,100
	Carried over				16,27,030

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 16,27,030					
Estimate No. 58-G (Plan No. G. 78).					
Syphon aqueduct at R.D. 37/0800.					
(a) Portion under bed of canal and clear between abutments for one span and one pier.					
17 unit.	Concrete broken brick in surki mortar	22 15 0	100 c.ft.	3-90	
06 "	Table-moulded brick in surki mortar	27 4 0	100 "	1-84	
16 "	Archwork brick in surki mortar	28 4 0	100 "	4-52	
24 "	Cement plastering, $\frac{3}{4}$ " thick, 1 : 3	6 12 0	100 sq. ft.	1-62	
063 "	Earthwork	5 0 0	1,000 c.ft.	5-31	
	Total			11-99	
	Contingencies at 5 per cent			60	
	Petty supervision at $2\frac{1}{2}$ per cent			30	
	Total for 1 r. ft.			12-89	
	For 4 spans of 49 r. ft. bed width of canal 4 × 49 × 12-89				2,526
(b) Two abutments for the above portion under the bed of canal including apron for canal, less span per ft. run.					
18 unit.	Concrete broken brick in surki mortar	22 15 0	100 c.ft.	4-13	
38 "	Table-moulded brick in surki mortar	27 4 0	100 "	10-35	
04 "	Cement plastering, $\frac{3}{4}$ " thick, 1 : 3	6 12 0	100 sq. ft.	0-27	
35 "	Concrete block revetment	3 14 0	100 c.ft.	8-60	
1-50 "	Clay puddle	3 15 0	100 "	5-91	
056 "	Earthwork	5 0 0	1,000 "	5-28	
	Total			29-55	
	Contingencies at 5 per cent			1-48	
	Petty supervision at $2\frac{1}{2}$ per cent			0-74	
	Total			31-77	
	Deduct cost of a pier per foot run as arrived at page			2-69	
	Total cost of item (b) per foot run less deductions			29-08	
	Total for 49 r. ft. of width of canal 49 × 29-08				1,425
(c) Balance of culvert length arched over under banks up and down stream clear of abutments for one span and a pier.					
7-15 units.	Concrete broken brick in surki mortar	22 15 0	100 c.ft.	164-02	
4-60 "	Table-moulded brick do.	27 4 0	100 "	125-35	
6-07 "	Archwork brick do.	28 4 0	100 "	171-48	
8-35 "	Cement plastering, $\frac{3}{4}$ " thick, 1 : 3	6 12 0	100 sq. ft.	56-36	
1-86 "	Concrete block revetment	23 14 0	100 c.ft.	44-41	
0-62 "	Gravel backing	2 12 0	100 "	1-71	
2-000 "	Earthwork	5 0 0	1,000 "	10-00	
	Total			573-33	
	Contingencies at 5 per cent			28-66	
	Petty supervision at $2\frac{1}{2}$ per cent			14-83	
	Total for one span			616-82	
	For four spans 4 × 616-82				2,465
	Carried over				6,416
	Carried over				16,27,030

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 16,27,030					
Estimate No. 58-G—cont. Brought forward .. 6,416					
Syphon aqueduct at R.D. 37/0800—cont.					
(d) Two abutments less one pier for the portion (c).					
7-14 units.	Concrete broken brick in surki mortar	22 15 0	100 c.ft.	163-79	
14-50 "	Table-moulded brick in do.	27 4 0	100 "	395-18	
120-00 "	Concrete block revetment	23 14 0	100 "	28-65	
4-300 "	Earthwork	5 0 0	1,000 "	21-50	
	Total			609-07	
	Contingencies at 5 per cent			30-45	
	Petty supervision at $2\frac{1}{2}$ per cent			15-23	
	Total			654-75	
	Deduct cost of 1 pier for the full length 38 ft.			102-11	
	Total cost less deductions			552-64	553
(e) Wings in front of culvert length including revetments for stream and canal and also apron at contracted portion under canal and stream.					
11-02 units.	Concrete broken brick in surki mortar	22 15 0	100 c.ft.	252-80	
13-50 "	Brick in surki mortar	27 4 0	100 "	367-88	
8-00 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement : 3 sand)	6 12 0	100 sq. ft.	54-00	
15-82 "	Concrete block revetment	23 14 0	100 c.ft.	377-70	
5-27 "	Gravel backing	2 12 0	100 "	14-49	
1-250 "	Earthwork	5 0 0	1,000 "	6-25	
	Total			1,073-12	
	Contingencies at 5 per cent			53-66	
	Petty supervision at $2\frac{1}{2}$ per cent			26-83	
	Total wings in front			1,153-61 or	1,154
(f) Wings in rear of culvert length including revetments for stream and canal also apron at contracted portion under canal and stream.					
11-33 units.	Concrete broken brick in surki mortar	22 15 0	100 c.ft.	259-68	
15-62 "	Table-moulded brick do.	27 4 0	100 "	425-65	
8-85 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement : 3 sand)	6 12 0	100 sq. ft.	59-74	
21-66 "	Concrete block revetment	23 14 0	100 c.ft.	517-13	
6-79 "	Gravel backing	2 12 0	100 "	18-67	
600 "	Earthwork	5 0 0	1,000 "	3-00	
	Total			1,283-86	
	Contingencies at 5 per cent			64-11	
	Petty supervision at $2\frac{1}{2}$ per cent			32-06	
	Total			1,380-63 or	1,380
(g) Upstream flooring dropwall wings and not under arches up to drainage bed level per span parallel to canal.					
3-92 units.	Concrete broken brick in surki mortar	22 15 0	100 c.ft.	89-92	
31 "	Table-moulded brick do.	27 4 0	100 "	8-45	
1-71 sq. ft.	Cement plastering, $\frac{3}{4}$ " thick (1 cement : 3 sand)	6 12 0	100 sq. ft.	11-54	
1-40 units.	Earthwork	5 0 0	1,000 c.ft.	5-70	
	Total			115-61	
	Contingencies at 5 per cent			5-78	
	Petty supervision at $2\frac{1}{2}$ per cent			2-89	
	Total for 1 span			124-28	
	For 4 spans 4 × 124-28 = 497-12				497
	Carried over				10,000
	Carried over				16,27,030

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 16,27,030

Estimate No. 58-G—cont. Brought forward .. 10,000

Syphon aqueduct at R.D. 37/0800—cont.

<i>(h) Fitching with concrete between wings and downstream per span parallel to canal.</i>					
2.64 units.	Concrete broken brick in surki mortar ..	22 15 0	100 c.ft.	60.56	
1.32 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement : 3 sand..	27 4 0	100 "	36.97	
1.50 "	Earthwork ..	5 0 0	1,000 "	.75	
.66 "	Concrete block revetment ..	23.14 0	100 "	13.13	
	Total ..			110.41	
	Contingencies at 5 per cent ..			5.52	
	Petty supervision at $2\frac{1}{2}$ per cent ..			2.76	
	Total for 1 span ..			118.69	
	Total for 4 spans $4 \times 118.69 = 474.76$ or ..				475
<i>(i) Downstream cushion lift wall, etc., per span parallel to canal.</i>					
.45 unit.	Concrete broken brick in surki mortar ..	22 15 0	100 c.ft.	10.32	
.31 "	Table-moulded brick in do. ..	27 4 0	100 "	8.45	
.33 "	Cement plastering, $\frac{3}{4}$ " thick, 1 cement : 3 sand..	6 12 0	100 sq. ft.	2.23	
.080 "	Earthwork ..	5 0 0	1,000 c.ft.	.40	
	Total ..			21.40	
	Contingencies at 5 per cent ..			1.49	
	Petty supervision at $2\frac{1}{2}$ per cent ..			.55	
	Total for 1 span ..			23.44	
	For 4 spans 4×23.44 ..				94
160 units.	Earthwork excavating front and rear channel ..	3 12 0	1,000 c.ft.	600	
	Centering for archwork ..			200	
	Baling out water ..			208	
	Shed for materials ..			125	
	Total ..				1,131
	Total ..				11,700

Estimate No. 59-G (Plan No. G. 79).

Syphon aqueduct at R.D. 37/8300.

<i>(a) Estimate for portion of aqueduct under the bed of canal, clear between abutments (for 1 span and 1 pier per foot run of canal bed width).</i>					
0.62 unit.	Concrete broken brick in surki mortar ..	20 6 0	100 c.ft.	12.63	
0.21 "	Brick work in surki mortar ..	25 2 0	100 "	5.28	
0.27 "	Archwork brick in surki mortar ..	26 2 0	100 "	7.06	
	Centering for archwork ..			2.92	
0.52 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1 cement and 3 sand. ..	6 12 0	400 sq. ft.	3.51	
0.12 "	Earthwork excavating foundations, etc. ..	5 0 0	1,000 c.ft.	0.80	
	Total ..			32.00	
	Contingencies at 5 per cent ..			1.60	
	Petty supervision at $2\frac{1}{2}$ per cent ..			0.80	
	This is the cost per span and per ft. run ..			R. 34.40	
	The cost of 13 spans and 25' bed width of canal = $34.40 \times 13 \times 25$.				11,180
	Carried over ..				11,180
	Carried over ..				16,38,730

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 16,38,730

Brought forward .. 11,180

Estimate No. 59-G. (Plan No. G. 79)—cont.

Syphon aqueduct at R.D. 37/8300—cont.

<i>(b) Estimate for abutments for above portion under bed of canal including apron less one pier per foot run of canal bed width.</i>					
0.36 units.	Concrete broken brick in surki mortar ..	20 6 0	100 c. ft.	7.34	
0.52 "	Brickwork in surki mortar ..	25 2 0	100 "	13.06	
0.92 "	Concrete block apron or pitching ..	21 8 0	100 "	19.78	
2.61 "	Clay puddle pitching ..	2 4 0	100 "	5.87	
0.096 "	Earthwork excavating foundation ..	5 0 0	1,000 "	0.48	
	Total ..			6.53	
	Contingencies at 5 per cent ..			2.33	
	Petty supervision at $2\frac{1}{2}$ per cent ..			1.17	
	Cost per foot run of canal bed width ..			50.03	
	Cost of 25 r. ft. of canal width $50.03 \times 25 = 1,250.75$ or ..				1,251
<i>(c) Balance length of culvert upstream arched over and carrying canal including heat wall and front path between abutments for one span.</i>					
3.63 units.	Concrete broken brick in surki mortar ..	20 6 0	100 c. ft.	74.98	
4.5 "	Brickwork in surki mortar ..	25 2 0	100 "	113.01	
1.46 "	Archwork brick in surki mortar ..	26 2 0	100 "	38.14	
	Centering for archwork ..			15.26	
	Plastering with portland cement, $\frac{3}{4}$ " thick, 1 : 3. ..	6 12 0	100 sq. ft.	37.80	
0.793 "	Earthwork excavating foundation and filling ..	5 0 0	1,000 c. ft.	3.97	
	Total ..			283.16	
	Contingencies at 5 per cent ..			14.16	
	Petty supervision at $2\frac{1}{2}$ per cent ..			7.08	
	Cost per span of syphon ..			304.40	
	Total cost for 13 spans $13 \times 304.4 = 3,957.2$ or ..				3,957
	Cost of 3 r. ft. or pier $\frac{304.4}{5} = 60.88$.				
<i>(c2) Balance length of culvert downstream arched over and carrying canal including roadway between abutments for one span.</i>					
7.35 units.	Concrete broken brick in surki mortar ..	20 6 0	100 c. ft.	149.76	
6.48 "	Brickwork in surki mortar ..	25 2 0	100 "	162.81	
2.74 "	Archwork brick in mortar ..	26 2 0	100 "	71.53	
	Centering for archwork ..			28.63	
8.29 "	Plastering with portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand). ..	6 12 0	100 sq. ft.	55.96	
1.694 "	Earthwork, etc. ..	5 0 0	1,000 c. ft.	8.47	
	Total ..			477.21	
	Contingencies at 5 per cent ..			23.86	
	Petty supervision at $2\frac{1}{2}$ per cent ..			11.98	
	Cost per span of syphon ..			513.05	
	Total cost for 13 spans, 513×13 ..				
	Cost of 3 r. ft. or a pier $\frac{513.05}{5} = 102.60$..				6,649
	Carried over ..				23,057
	Carried over ..				16,38,730

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 16,38,730					
Estimate No. 59-G. (Plan No. G. 75)—cont. Brought forward .. 23,057					
Syphon aqueduct at R.D. 37/8300—cont.					
(d ₁) Two abutments less one pier for the whole length of the portion (c ₁).					
3.51 units.	Concrete broken brick in surki mortar ..	20 6 0	100 c. ft.	71.52	
6.21 "	Brickwork in surki mortar ..	25 2 0	100 "	156.03	
0.16 "	Archwork in surki mortar ..	26 2 0	100 "	4.70	
	Centering for archwork ..	Lump sum.		1.88	
0.96 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3.	6 12 0	100 sq. ft.	6.48	
0.998 "	Earthwork excavating and pitching ..	5 0 0	1,000 c.ft.	4.94	
	Total ..			245.55	
	Contingencies at 5 per cent ..			12.28	
	Petty supervision at $2\frac{1}{2}$ per cent ..			6.17	
	This is the cost of two abutments without deduction for a pier. Hence the required cost of two abutments for the whole length less one pier $264.00 - 60.83 = 203.12$.			264.00	
	Refer (c ₁) abstract. Total cost ..				203
Downstream.					
(d ₂) Two abutments less one pier for the whole length of the portion for (c ₂).					
7.47 units.	Concrete broken brick in surki ..	20 6 0	100 c. ft.	152.21	
14.31 "	Brickwork in surki mortar ..	25 2 0	100 "	359.54	
0.36 "	Archwork in surki mortar ..	26 2 0	100 "	9.40	
	Centering for archwork ..	Lump sum.		3.76	
2.16 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3.	6 12 0	100 sq. ft.	14.58	
2.00 "	Earthwork ..	5 0 0	1,000 c. ft.	10.00	
	Total ..			549.49	
	Contingencies at 5 per cent ..			27.27	
	Petty supervision at $2\frac{1}{2}$ per cent ..			13.74	
	This is the cost of two abutments without deduction of one pier. Hence the required cost of two abutments less one pier $590.70 - 102.6 = 488.1$.			590.70	
	Refer (c ₂) abstract ..				
	Total cost ..				488
(e ₁) Wings upstream.					
20.20 units.	Concrete brick jelly in surki mortar ..	20 6 0	100 c. ft.	411.58	
32.35 "	Table-moulded brick in surki mortar ..	25 2 0	100 "	825.60	
12.10 "	Plastering with surki mortar ..	6 12 0	100 sq. ft.	81.70	
31.3 "	Concrete block revetment and pitching ..	21 8 0	100 c. ft.	672.95	
6.5 "	Gravel-backing to revetment ..	3 9 0	100 "	23.10	
11.2 "	Concrete in surki mortar ..	20 6 0	100 "	228.20	
11.2 "	Plastering the concrete apron ..	6 12 0	100 sq. ft.	75.60	
65.40 "	Earthwork ..	5 0 0	1,000 c. ft.	32.70	
	Total ..			2,351.43	
11.2 "	Deduct the difference of rate between concrete and concrete block apron.	1 2 0	100 c. ft.	12.60	
	Net ..			2,338.83	
	Contingencies at 5 per cent ..			116.94	
	Petty supervision at $2\frac{1}{2}$ per cent ..			58.47	
	Total ..			2,514.24	2,514
	Carried over ..				26,262
	Carried over ..				16,38,730

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 16,38,730					
Estimate No. 59-G (Plan No. G. 79)—cont. Brought forward .. 26,262					
Syphon aqueduct at R.D. 37/8300—cont.					
(e ₂) Wings down stream.					
17.27 units.	Concrete brick jelly in surki mortar ..	20 6 0	100 c. ft.	351.87	
29.05 "	Table-moulded brick in surki mortar ..	25 2 0	100 "	729.58	
11.00 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3.	6 12 0	100 sq. ft.	74.30	
31.25 "	Concrete block revetment and pitching ..	21 8 0	100 c. ft.	671.87	
6.5 "	Gravel-backing to revetment ..	3 9 0	100 "	23.10	
5.73 "	Concrete in surki mortar (apron) ..	20 6 0	100 "	116.75	
5.73 "	Plastering to do. ..	6 12 0	100 sq. ft.	38.68	
5.55 "	Earthwork ..	5 0 0	1,000 c. ft.	27.75	
	Total ..			2,034.20	
5.73 "	Deduct the difference of rate between concrete and concrete block revetment ..	1 2 0		6.45	
	Net ..			2,027.75	
	Contingencies at 5 per cent ..			101.39	
	Petty supervision at $2\frac{1}{2}$ per cent ..			50.70	
	Total ..			2,179.84	2,180
(f) Wings connecting side walls.					
6.5 units.	Concrete brick jelly in surki mortar ..	20 6 0	100 c. ft.	132.44	
26.30 "	Table-moulded brick in surki mortar ..	25 2 0	100 "	660.80	
6.6 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3.	6 12 0	100 sq. ft.	44.55	
1.6 "	Earthwork ..	5 0 0	1,000 c. ft.	8.00	
	Total ..			845.79	
	Contingencies at 5 per cent ..			42.29	
	Petty supervision at $2\frac{1}{2}$ per cent ..			21.15	
	Total ..			909.23	909
(g) Upstream masonry flooring, dropwall between wings (not under arches) and up to drainage bed level for one span and one pier parallel to canal.					
6.3 units.	Concrete broken brick in surki mortar ..	20 6 0	100 c. ft.	128.36	
4.5 "	Brick work in surki mortar ..	25 2 0	100 "	113.06	
3.35 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3.	6 12 0	100 sq. ft.	22.61	
1.68 "	Earthwork, etc. ..	5 0 0	1,000 c. ft.	8.40	
	Total ..			272.43	
	Contingencies at 5 per cent ..			13.62	
	Petty supervision at $2\frac{1}{2}$ per cent ..			6.81	
	For one span ..			292.86	
	Total cost for 13 spans = 292.86×13 ..				3,807
(k) Downstream masonry flooring, cushion lift wall between wings (not under arches) and up to drainage bed level for one span and one pier parallel to canal.					
11.7 units.	Concrete broken brick in surki mortar ..	20 6 0	100 c. ft.	238.39	
1.77 "	Brickwork in surki mortar ..	25 2 0	100 "	44.47	
4.08 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3.	6 12 0	100 sq. ft.	27.54	
2.06 "	Earthwork, etc. ..	5 0 0	1,000 c. ft.	10.80	
	Total ..			321.20	
	Contingencies at 5 per cent ..			16.06	
	Petty supervision at $2\frac{1}{2}$ per cent ..			8.03	
	Cost for 1 span ..			345.29	
	Cost for 13 spans = 345.29×13 ..				4,489
	Carried over ..				37,647
	Carried over ..				16,38,730

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
	Brought forward ..			16,38,730	
	Brought forward ..			37,647	

F. CROSS DRAINAGE WORKS—cont.

Estimate No. 59-G. (Plan No. G-79)—cont.

Syphon aqueduct at R.D. 37/8300—cont.

(i) Pitching between wings on stream bed for one span and one pier parallel to canal upstream.					
5.25 units.	Concrete block pitching, 1' ..	21 8 0	100 c. ft.	112.83	
	Total ..			112.88	
	Contingencies at 5 per cent ..			5.64	
	Petty supervision at 2½ per cent ..			2.82	
	Total ..			121.34	
	Total cost for 13 spans 121.34×13 ..				1,553
	= 1,577 (1,577 - 24.27)				
(j) Pitching between wings on stream bed for one span and one pier parallel to canal downstream.					
3.90 units.	Concrete block pitching and apron ..	21 8 0	100 c. ft.	83.85	
	Contingencies at 5 per cent ..			4.19	
	Petty supervision at 2½ per cent ..			2.10	
	Total for one span ..			90.14	
	Total for 13 spans = $90.14 \times 13 = 1,172$ (1,172 - 13.03)				1,154
Hand railings.					
990 r. ft.	Hand railings complete ..	1 6 0	R. ft.	1 361	
	Contingencies at 5 per cent ..			68	
	Petty supervision at 2½ per cent ..			34	
	Total ..			1,463	1,463
	Shed for materials ..		Lump sum.		483
	Baling water ..				700
200 units.	Excavating rear channel ..	4 0 0		800	800
	Total ..				43,800

Estimate No. 60-G.

Syphon aqueduct at R.D. 38/7800.

93.34 units.	Concrete brick jelly in surki mortar ..	22 13 0	100 c. ft.	2,129	
101.70 "	Table moulded brick in do. ..	27 3 0	100 "	2,765	
37.3 "	Archwork brick in surki mortar ..	28 3 0	100 "	1,051	
97.10 "	Plastering with Portland cement, ¾" thick, 1:3 ..	6 12 0	Sq. ft.	655	
52.00 "	Concrete block revetment and pitching ..	23 12 0		1,235	
10 "	Gravel backing ..	3 9 0		37	
57.3 "	Clay puddle pitching ..	4 0 0		229	
	Earthwork excavating foundations ..		Lump sum.	300	
	Centering for archwork ..			200	
	Shed for materials ..			360	
	Baling water ..			400	
60.000 "	Cutting rear channel ..			225	
	Total ..			9,586	
	Contingencies at 5 per cent ..			480	
	Supervision at 2½ per cent ..			234	
	Total ..				10,300
	Carried over ..				16,92,830

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
	Brought forward ..			16,92,830	

F. CROSS DRAINAGE WORKS—cont. Brought forward .. 16,92,830

Estimate No. 61-G. (Plan No. G. 80.)

Syphon aqueduct at R.D. 39/8300.

(a) Under canal bed for 1 span of a pier and a vent clear of abutments per foot run of canal bed width.					
16½ c. ft.	Concrete broken brick in surki mortar ..	32 4 0	100 c. ft.	3.84	
6 "	Brick in surki mortar ..	27 15 0	100 "	1.68	
15 "	Archwork brick in surki mortar ..	28 15 0	100 "	4.34	
24 sq. ft.	Cement plastering, ¾" thick, 1:3 ..	6 12 0	100 sq. ft.	1.62	
55 c. ft.	Earthwork ..	4 5 0	100 c. ft.	0.24	
	Total ..			11.72	
	Contingencies at 5 per cent ..			.59	
	Supervision at 3 per cent ..			.35	
	Total ..			12.66	
2 × 44 r. ft.	.....	12.66	R. ft.		1,114
(b) Two abutments less one pier under bed of canal per foot run of canal bed width. This includes the pitching, clay puddle, etc., provided in the bed of canal.					
20 c. ft.	Concrete broken brick in surki mortar ..	23 4 0	100 c. ft.	4.65	
39 "	Table moulded brick in surki mortar ..	27 15 0	100 "	10.89	
13 sq. ft.	Plastering with Portland cement, ¾" thick, 1:3 ..	6 12 0	100 sq. ft.	0.88	
200 c. ft.	Earthwork ..	4 5 0	1,000 c. ft.	0.86	
48 "	Laterite block, rough ..	24 3 0	100 "	11.61	
130 "	Clay puddle ..	3 15 0	100 "	5.13	
	Total ..			34.01	
	Contingencies at 5 per cent ..			1.70	
	Supervision at 3 per cent ..			1.02	
	Total ..			36.73	
5.25 c. ft.	Concrete at ..	23 4 0		1.22	
6 "	Brickwork at ..	27 15 0		1.68	
8 sq. ft.	Plastering at ..	6 12 0		0.64	
15 "	Earth work at ..	4 5 0		.07	
	Total ..			3.51	
	Contingencies at 5 per cent ..			0.16	
	Supervision at 3 per cent ..			0.11	
	Total ..			3.78	
	Deduct cost of pier per foot run as detailed above.			3.78	
	Total cost of item (b) ..			32.95	
44 r. ft.	Item (b). Two abutments less one pier under bed of canal per foot run of canal bed width.		32.95 r. ft.	1,450	1,450
	Carried over ..				2,564
	Carried over ..				16,92,830

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 16,92,830					
Estimate No. 61-G. (Plan No. G. 80)—cont. Brought forward .. 2,564					
Syphon aqueduct at R.D. 39/8300—cont.					
(c) Balance of culvert length arched over under banks up and down stream clear of abutments for one span with a pier and bank.					
600 c. ft.	Concrete broken brick in surki mortar ..	23 4 0	100 c. ft.	140	
468 "	Brick in surki mortar ..	27 15 0	100 "	131	
533 "	Archwork brick in surki mortar ..	28 15 0	100 "	154	
850 "	Cement plastering, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	57	
183 sq. ft.	Laterite blocks, rough ..	24 3 0	100 c. ft.	39	
54 "	Gravel backing ..	4 7 0	100 "	2	
2,680 "	Earthwork ..	4 5 0	1,000 "	12	
	Total ..			535	
	Contingencies at 5 per cent ..			27	
	Supervision at 3 per cent ..			16	
	Total ..			578	
2 No.	Spans ..	578 0 0	Each span.		1,156
(d) Balance of culvert length for the portion (c) under banks up and down streams for the whole length.					
800 c. ft.	Concrete broken brick in surki mortar ..	23 4 0	100 c. ft.	186	
1,720 "	Brick in surki mortar ..	27 15 0	100 "	480	
300 "	Plastering with Portland cement ..	6 12 0	100 sq. ft.	21	
252 sq. ft.	Laterite block rough ..	24 3 0	100 c. ft.	61	
84 "	Gravel backing ..	4 7 0	100 "	4	
3,490 "	Earthwork ..	4 5 0	1,000 "	37	
	Total ..			789	
	Contingencies at 5 per cent ..			39	
	Supervision at 3 per cent ..			24	
	Total ..			852	
	Deduct cost of pier 38' 6" long at 3-78 ..			146	
	Total less deductions ..			706	706
(e) Wings, etc., upstream of culvert including revetment for canal banks.					
6-70 units.	Concrete broken brick ..	23 4 0	100 c. ft.	156	
11-30 "	Brick in surki mortar ..	27 15 0	100 "	316	
4-90 "	Cement plastering ..	6 12 0	100 sq. ft.	33	
14-90 "	Laterite block rough ..	24 3 0	100 c. ft.	360	
5-00 "	Gravel backing ..	4 7 0	100 "	22	
2,200 "	Earthwork ..	4 5 0	1,000 "	10	
	Total ..			897	
	Contingencies at 5 per cent ..			45	
	Supervision at 3 per cent ..			27	
	Total ..			939	
(e ₂) Wings in rear of culvert including revetment for canal banks.					
11-10 units.	Concrete broken brick in surki mortar ..	23 4 0	100 c. ft.	258	
13-50 "	Brick in surki mortar ..	27 15 0	100 "	377	
8-10 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	55	
14-90 "	Laterite blocks, rough ..	24 3 0	100 c. ft.	360	
5-00 "	Gravel backing ..	4 7 0	100 "	22	
4-800 "	Earthwork ..	4 5 0	1,000 "	21	
	Total ..			1,093	
	Contingencies, 5 per cent ..			55	
	Supervision, 3 per cent ..			33	
	Total ..			1,181	
	Carried over ..			6,576	
	Carried over ..			16,92,830	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont.					
Estimate No. 61-G. (Plan No. G. 80)—cont.					
Syphon aqueduct at R.D. 39/8300—cont.					
(g) Upstream masonry flooring and drop wall between wings and not under arches up to drainage bed level per span parallel to canal.					
2-20 units.	Concrete broken brick in surki mortar ..	23 4 0	100 c. ft.	51-15	
31 "	Brick in surki mortar ..	27 15 0	100 "	8-66	
1-07 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	7-22	
774 "	Earthwork ..	4 5 0	1,000 c. ft.	3-33	
	Total ..			70-36	
	Contingencies ..			3-52	
	Supervision ..			2-11	
	Total ..			75-99 or	76
(h) Downstream cushion lift wall, etc., per span parallel to canal.					
26 units.	Concrete broken brick in surki mortar ..	23 4 0	100 c. ft.	6-04	
31 "	Brick in surki mortar ..	27 15 0	100 "	8-66	
26 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	1-76	
0-59 "	Earthwork ..	4 5 0	1,000 c. ft.	2-25	
	Total ..			16-71	
	Contingencies at 5 per cent ..			84	
	Supervision at 3 per cent ..			50	
	Grand total ..			18-05 or	18
(i) Pitching between wings, etc., downstream.					
110 units.	Concrete broken brick ..	23 4 0	100 c. ft.	25-58	
55 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	3-71	
110 "	Earthwork ..	4 5 0	1,000 c. ft.	47	
	Total ..			29-76	
	Contingencies at 5 per cent ..			1-49	
	Supervision at 2½ per cent ..			75	
	Grand total ..			32-00	32
G. H. G.-2—Upstream and downstream masonry flooring, pitching, etc., between wings parallel to canal to the width of one ventway.					
2-27 units.	Concrete broken brick in surki mortar ..	23 4 0	100 c. ft.	53	
0-45 "	Table moulded brick in surki mortar ..	27 15 0	100 "	13	
1-36 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	9	
509 "	Earthwork ..	4 5 0	1,000 c. ft.	2	
	Total ..			77	
	Contingencies at 5 per cent ..			4	
	Supervision at 2½ per cent ..			2	
	Total ..			83	83
160-000 units L.S.	Earthwork cutting rear channel ..	3 12 0	1,000 c. ft.		600
	Baling water ..				200
	Centering for archwork ..				115
	Total ..				7,700
	Carried over ..				17,00,530

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
				Brought forward ..	17,00,530
F. CROSS DRAINAGE WORKS—cont.					
Estimate No. 62-G.					
Syphon aqueduct at R.D. 40/6000.					
125.1 units.	Concrete brick jelly in surki mortar ..	22 6 0	100 c. ft.	2,799	
118.2 "	Table-moulded brick jelly in surki mortar ..	26 9 0	100 "	3,140	
56.4 "	Archwork table moulded brick in surki mortar ..	27 9 0	100 "	1,555	
	Centering for archwork ..			300	
142.8 "	Plastering with Portland cement (¾" thick, 1 cement and 3 sand) ..	6 12 0	100 sq. ft.	964	
56.10 "	Concrete block revetment and pitching ..	23 7 0	100 c. ft.	1,315	
11.60 "	Gravel backing to revetment ..	4 7 0	100 "	51	
51.5 "	Clay puddling ..	3 1 0	100 "	158	
100.00 "	Earthwork for cutting rear channel ..	3 12 0	100 "	375	
	Earthwork excavating foundations ..			400	
	Shed for materials ..			400	
	Baling water ..			590	
	Total ..			12,047	
	Contingencies at 5 per cent ..			602	
	Petty supervision at 2½ per cent ..			301	
	Total ..				12,950

Estimate No. 63-G.

Syphon aqueduct at R.D. 41/6000.

(a) Portion under canal bed per span per foot run of canal bed with clear abutments.					
0.62 units.	Concrete brick jelly in surki mortar ..	22 8 0	100 c. ft.	13.95	
0.21 "	Table moulded brick in surki mortar ..	27 0 0	100 "	5.67	
0.27 "	Archwork table moulded brick in surki mortar ..	28 0 0	100 "	7.67	
0.52 "	Plastering with portland cement, ¾" thick (1 cement and 3 sand) ..	6 12 0	100 "	3.61	
0.120 "	Earthwork ..	5 0 0	100 sq. ft.	0.61	
	Centering for archwork extra 10 per cent of A.W. ..			3.07	
	Total rupees ..			34.48	
	Contingencies at 5 per cent ..			1.72	
	Petty supervision at 2½ per cent ..			0.88	
	Total ..			37.06	
	Cost per span and per running foot of canal width. ..			37.06	
	Cost of 6 spans of 20 running feet ..				4,447
(b) Two abutments less one pier under bed of canal including canal apron foot run of canal bed width.					
0.36 units.	Concrete brick jelly in surki mortar ..	22 8 0	100 c. ft.	8.10	
0.52 "	Table moulded brick in surki mortar ..	27 0 0	100 "	14.04	
0.92 "	Concrete block apron ..	23 7 0	100 "	21.56	
2.61 "	Clay paddle pitching ..	3 15 0	100 "	10.28	
0.096 "	Earthwork ..	5 0 0	1,000 "	0.48	
	Total ..			54.46	
	Contingencies at 5 per cent ..			2.72	
	Petty supervision at 2½ per cent ..			1.36	
	Cost per running foot of canal width ..			58.54	
	Total cost for 20 running feet of canal width 58.54 × 20 ..			1,170.86 or 1,171	
	Total ..				1,171
	Carried over ..				5,618
	Carried over ..				17,13,480

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
				Brought forward ..	17,13,480
F. CROSS DRAINAGE WORKS—cont.					
Estimate No. 63-G.—cont.					
Syphon aqueduct at R.D. 41/6000—cont.					
				Brought forward ..	5,618

(c₁) Balance length of culvert arched over and carrying canal—bank including headwall, etc., for one span parallel to canal upstream.					
3.68 units.	Concrete brick jelly in surki mortar ..	22 8 0	100 c. ft.	82.80	
4.22 "	Table moulded brick in surki mortar ..	27 0 0	100 "	113.94	
1.46 "	Archwork brick in surki mortar ..	28 0 0	100 "	40.88	
	Centering for arches ..			16.39	
6.3 "	Plastering with Portland cement ¾" thick 1:3 ..	6 12 0	100 sq. ft.	35.77	
0.793 "	Earthwork ..	5 0 0	1,000 c. ft.	3.96	
	Total ..			293.74	
	Contingencies at 5 per cent ..			14.69	
	Petty supervision at 2½ per cent ..			7.35	
	Total cost for one span and one pier of 15' ..			315.78	
	Total cost for 6 spans ..			315.78 × 6 = 1,894.68 or 1,895	
(c₂) Balance of culvert length arched over and carrying canal bank including headwall for one span parallel to canal downstream.					
7.35 units.	Concrete brick jelly in surki mortar ..	22 8 0	100 c. ft.	165.37	
6.20 "	Table-moulded brick in surki mortar ..	27 0 0	100 "	167.40	
2.74 "	Archwork brick in surki mortar ..	28 0 0	100 "	76.72	
	Centering for arches ..			30.69	
2.74 "	Plastering with Portland cement, ¾" thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	53.93	
1.694 "	Earthwork, etc. ..	5 0 0		8.47	
	Total ..			502.58	
	Contingencies at 5 per cent ..			25.13	
	Petty supervision at 2½ per cent ..			12.67	
	Cost for 1 span and 1 pier ..			540.28	
	Total cost for 6 spans 540.28 × 6 = 3,241.68 or 3,242				
(d₁) Two abutments less one pier for the portion "a".					
3.61 units.	Concrete brick jelly in surki mortar ..	22 8 0	100 c. ft.	7.898	
6.21 "	Table-moulded brick in surki mortar ..	27 0 0	100 "	167.87	
0.18 "	Archwork brick in surki mortar ..	28 0 0	100 "	5.04	
	Centering for archwork ..			2.02	
0.93 "	Plastering with Portland cement, ¾" ..	6 12 0	100 sq. ft.	6.48	
0.098 "	Earthwork ..	5 0 0	100 c. ft.	4.92	
	Total ..			265.11	
	Contingencies at 5 per cent ..			13.25	
	Petty supervision at 2½ per cent ..			6.63	
	Total ..			284.99	
This is the cost of two abuts without deduction of one pier:—					
Hence the required cost of two abuts less one pier ..					
				221.84	222
(d₂) Two abutments, etc., downstream.					
7.47 units.	Concrete brick jelly in surki mortar ..	22 8 0	100 c. ft.	168.08	
14.31 "	Table-moulded brick in surki mortar ..	27 0 0	100 "	386.34	
0.36 "	Archwork brick in surki mortar ..	28 0 0	100 "	10.08	
	Centering for arches ..			4.03	
2.16 "	Plastering with Portland cement, ¾" thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	14.58	
2.00 "	Earthwork ..	5 0 0	1,000 c. ft.	10.00	
	Total ..			593.14	
	Carried over ..				10,977
	Carried over ..				17,13,480

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
GRAND ANICUT CANAL—cont.					
		RS. A. P.		RS.	RS.
			Brought forward ..	17,13,480	
			Brought forward ..	10,977	
F. CROSS DRAINAGE WORKS—cont.					
Estimate No. 63-G—cont.					
Syphon aqueduct at R.D. 41/6000—cont.					
			Brought forward ..	593.14	
	Contingencies at 5 per cent	..	..	29.66	
	Petty supervision at 2½ per cent	..	..	14.83	
	Cost of two abutments without deduction of pier. The required cost of two abutments less one pier, 637.63 — 108.06 = 529.57 or	..	..	637.63	530
	(e₁) Wings up-stream of culvert including revetment for canal banks and drainage and also apron of contracted portion.				
31.4 units.	Concrete brick jelly in surki mortar	22 8 0	100 c. ft.	706.00	
32.04 "	Table-moulded brick in surki mortar	27 0 0	100 "	866.08	
23.30 "	Plastering with Portland cement, ¾" thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	157.28	
29.3 "	Concrete block revetment, etc.	23 7 0	100 c. ft.	686.72	
6.10 "	Gravel-backing to revetment	5 5 0	100 "	32.40	
6.54 "	Earthwork	5 0 0	1,000 "	32.70	
	Total	..	..	2,480.68	
11.2 "	Deduct the difference of rate between concrete and concrete blocks	0 15 0	..	10.50	
	Net	..	..	2,470.18	
	Contingencies at 5 per cent	..	..	123.51	
	Petty supervision at 2½ per cent	..	..	61.76	
	Total cost	..	..	2,655.45	2,655
	(e₂) Wing down-stream of culvert including revetment of canal and drainage and also apron of contracted portion.				
23.00 units.	Concrete brick jelly in surki mortar	22 8 0	100 c. ft.	517.50	
28.55 "	Table-moulded brick in surki mortar	27 0 0	100 "	770.85	
16.73 "	Plastering with Portland cement, ¾" thick 1 : 3.	6 12 0	100 sq. ft.	112.92	
29.3 "	Concrete block revetment and apron	23 7 0	100 c. ft.	686.72	
6.1 "	Gravel-backing to revetment	5 5 0	100 "	32.40	
5.581 "	Earthwork	5 0 0	1,000 "	27.75	
5.73 "	Deduct the difference of rate between concrete at concrete block	0 15 0	100 "	5.37	
	Contingencies at 5 per cent	..	..	107.14	
	Petty supervision at 2½ per cent	..	..	53.67	
	Total	..	..	2,303.48 or	2,304
	(f) Wings connecting side walls of aqueduct canal banks.				
6.5 units.	Concrete brick jelly in surki mortar	22 8 0	100 c. ft.	141.25	
23.60 "	Table-moulded brick in surki mortar	27 0 0	100 "	691.20	
6.60 "	Plastering with Portland cement, ¾" thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	44.55	
1.60 "	Earthwork	5 0 0	1,000 c. ft.	8.00	
	Total	..	..	890.00	
	Contingencies at 5 per cent	..	..	44.50	
	Petty supervision at 2½ per cent	..	..	22.50	
	Total	..	..	956.75 or	957
	(g) Up-stream masonry flooring and drop wall between wings not under arch and up to drainage bed level for one span and one pier parallel to canal.				
6.30 units.	Concrete brick jelly in surki mortar	22 8 0	100 c. ft.	141.75	
4.50 "	Table-moulded brick in surki mortar	27 0 0	100 "	121.50	
3.35 "	Plastering with Portland cement, ¾" thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	22.61	
1.68 "	Earthwork	5 0 0	1,000 c. ft.	8.40	
	Total	..	..	294.26	
	Carried over ..			17,423	
	Carried over ..			17,13,480	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
GRAND ANICUT CANAL—cont.					
		RS. A. P.		RS.	RS.
			Brought forward ..	17,13,480	
			Brought forward ..	17,423	
F. CROSS DRAINAGE WORKS—cont.					
Estimate No. 63-G—cont.					
Syphon aqueduct at R.D. 41/6000—cont.					
	(g) Up-stream masonry flooring and drop wall between wings, not under arch, up to drainage bed level for one span and one pier parallel to canal—cont.				
	Contingencies at 5 per cent	..	..	14.71	
	Petty supervision at 2½ per cent	..	..	7.36	
	Total cost for one span	..	..	316.33	
	Total cost for six spans, 316.33 × 6 = 1,897.98 or	..	..	..	1,898
	(h) Down-stream masonry flooring, cushion lift wall between wings (not under arch) up to drainage bed level for one span parallel to crest.				
11.70 units.	Concrete brick jelly in surki mortar	22 8 0	100 c. ft.	263.25	
1.77 "	Table-moulded brick in surki mortar	27 0 0	100 "	47.79	
4.08 "	Plastering with Portland cement, ¾" thick, 1 : 3	6 12 0	100 sq. ft.	27.54	
2.16 "	Earthwork	5 0 0	1,000 c. ft.	10.80	
	Total	..	..	349.38	
	Contingencies at 5 per cent.	..	..	17.47	
	Petty supervision at 2½ per cent.	..	..	8.74	
	Cost for one span	..	..	275.59	
	Cost for six spans, 375.59 × 6	..	..	..	2,253
	(i) Pitching between wings on stream bed for one span parallel to canal upstream side.				
5.25 units.	Concrete block revetment and pitching	23 7 0	100	123.05	
	Contingencies at 5 per cent	..	..	6.15	
	Petty supervision at 2½ per cent	..	..	3.8	
	Total	..	..	132.28	
	For 6 spans, 132.28 × 6 = 793.68 = 26.46	..	..	..	767
	(j) Pitching between wings on down stream bed for one span parallel to canal.				
3.9 units.	Concrete block revetment and pitching	23 7 0	100 c. ft.	91.41	
	Contingencies at 5 per cent	..	..	4.67	
	Petty supervision at 2½ per cent	..	..	2.29	
	Total	..	..	98.27	
	Cost for 6 spans, 98.27 × 6 = 589.62 = 19.65	..	..	..	570
	Hand railings including storm chains, etc., complete.				
466 r. ft.	Hand railings, 2 feet high	1 6 0	R. ft.	641	
	Contingencies at 5 per cent	..	..	32	
	Petty supervision at 2½ per cent	..	..	16	
	Total	..	..	..	689
100.00 units.	Shed for materials	..	..	..	200
	Baling water	..	..	..	500
	Excavating rear channel	4 0 0	1,000 c. ft.	..	400
	Total	..	..	..	24,700
	Carried over ..			17,38,180	

GRAND ANICUT CANAL SYSTEM--MAIN CANALS AND BRANCHES--cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL--cont.					
Brought forward ..				17,38,180	
F. CROSS DRAINAGE WORKS--cont.					
Estimate No. 64-G. (Plan No. G. 81).					
Syphon aqueduct at R.D. 42/14000.					
(a and b) Two abutments and one vent including pitching, puddle filling, etc., per foot run of canal bed width.					
36 c. ft.	Concrete brick jelly in surki mortar	24 4 0	100 c. ft.	8-28	
45 "	Table-moulded brick do.	28 6 0	100 "	12-77	
18 "	Archwork brick do.	29 6 0	100 "	5-29	
31 s. ft.	Plastering with Portland cement, $\frac{1}{2}$ " thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	2-09	
34 c. ft.	Laterite block pitching	19 4 0	100 c. ft.	6-55	
102 "	Clay puddle	4 18 0	100 "	4-91	
270 "	Earthwork	4 3 0	1 000 "	1-22	
	Total			41-11	
	Contingencies at 5 per cent			2-06	
	Petty supervision at 3 per cent			1-23	
	Total			44-40	
	Cost for 1 foot, say, Rs. 45.				
	Cost for 41 feet bottom width, $41 \times 45 =$..				1,845
(c1) and (d1) Balance of culvert length upstream side two abutments and one vent including revetment to canal banks.					
4-90 units.	Concrete brick jelly in surki mortar	24 4 0	100 c. ft.	118-80	
8-00 "	Table-moulded brick do.	28 6 0	100 "	227-00	
2-34 "	Archwork brick do.	29 6 0	100 "	68-74	
3-30 "	Plastering with Portland cement, $\frac{1}{2}$ " thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	22-25	
150 c. ft.	Laterite block	19 4 0	100 c. ft.	28-88	
50 "	Gravel backing, 6" thick	7 1 0	100 "	3-53	
3,200 "	Earthwork	4 8 0	1,000 "	14-40	
	Total			483-63 or 484	
	Contingencies at 5 per cent			24	
	Petty supervision at 3 per cent			14	
	Total			522	
(c2 and d2) Balance length of culvert downstream including head-wall and revetment to canal banks.					
7-7 units.	Concrete brick jelly in surki mortar	24 4 0	100 c. ft.	186-72	
12-90 "	Table-moulded brick do.	28 6 0	100 "	366-03	
3-90 "	Archwork brick do.	29 6 0	100 "	114-56	
5-12 "	Plastering with Portland cement, $\frac{1}{2}$ " thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	34-56	
1-50 "	Laterite block	19 4 0	100 c. ft.	28-88	
50 "	Gravel backing, 6"	7 1 0	100 "	3-53	
5-260 "	Earthwork	4 8 0	1,000 "	23-97	
	Total			758-25 or 758	
	Contingencies at 5 per cent			38	
	Petty supervision at 3 per cent			23	
	Total			818	
Carried over ..				3,186	
Carried over ..				17,38,180	

GRAND ANICUT CANAL SYSTEM--MAIN CANALS AND BRANCHES--cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL--cont.					
F. CROSS DRAINAGE WORKS--cont.				Brought forward ..	17,38,180
				Brought forward ..	3,186
Estimate No. 64-G (Plan No. G. 81)--cont.					
Syphon aqueduct at R.D. 42/1400--cont.					
(g) Upstream masonry flooring including pitching in drainage bed per foot run of drainage bed width between abutments.					
53 units.	Concrete brick jelly in surki mortar	24 4 0	100 c. ft.	12-85	
06 "	Table-moulded brick in do.	28 6 0	100 "	1-70	
10 "	Laterite block pitching	19 4 0	100 "	1-93	
26 "	Plastering with Portland cement, $\frac{1}{2}$ " thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	1-76	
	Total			18-24	
	Contingencies at 5 per cent			91	
	Petty supervision at 3 per cent			65	
	Total per foot			19-70 or 20-00	
	Cost for a span of 4 feet, $4 \times 20 =$				80
	Total				80
(h) Downstream masonry flooring, etc.					
52 units.	Concrete brick jelly in surki mortar	24 4 0	100 c. ft.	12-61	
09 "	Table-moulded brick do.	28 6 0	100 "	2-55	
13 "	Plastering with Portland cement, $\frac{1}{2}$ " thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	0-88	
15 "	Laterite block pitching	19 4 0	100 c. ft.	2-89	
	Total			18-93	
	Contingencies at 5 per cent			95	
	Petty supervision at 3 per cent			52	
	Total per foot			20-40 or 21-00	
	Cost for 4 feet, $4 \times 21 =$				84
	Total				84
(e1) Upstream wings including triangular portion of sloping ramp, remaining portion of pitching in drainage bed, revetment to drainage canal banks.					
9-10 units.	Concrete brick jelly in surki mortar	24 4 0	100 c. ft.	221-20	
15-20 "	Table-moulded brick in do.	28 6 0	100 "	431-30	
	Plastering with Portland cement, $\frac{1}{2}$ " thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	41-18	
6-10 "	Laterite block	19 4 0	100 c. ft.	157-85	
8-20 "	Gravel backing, 6"	7 1 0	100 "	18-35	
260 "	Total			869-89 or 870-00	
	Contingencies at 5 per cent			44-00	
	Petty supervision at 3 per cent			26-00	
	Total			940	
Carried over ..				4,290	
Carried over ..				17,38,180	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
	RS. A. P.			RS.	RS.
	GRAND ANICUT CANAL—cont.				
	F. CROSS DRAINAGE WORKS—cont. Brought forward .. 17,38,180				
	Estimate No. 64-G.—(Plan No. G-81)—cont. Brought forward .. 4,290				
	Syphon aqueduct at R.D. 42/1400—cont.				
	(e2) Downstream wings, including triangular portion of sloping ramp. Remaining portion of ramp in drainage bed, revetment to drainage and canal banks.				
9-50 units.	Concrete brick jelly in surki mortar ..	24 4 0	100 c. ft.	230-28	
12-15 "	Table-moulded brick in do. ..	28 6 0	100 "	344-76	
5-61 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	37-87	
9-00 "	Laterite block ..	19 4 0	100 c. ft.	173-25	
12-72 "	Gravel backing, 6" ..	7 1 0	100 "	19-21	
	Total ..			805-37 or 806	
	Contingencies at 5 per cent ..			40	
	Petty supervision at 3 per cent ..			24	
	Total ..				870
60 units.	Earthwork excavating foundations for wings ..			100	
	Cutting rear channel, $1,800 \times 15 \times 5 = 525,000$ or 60 units ..	8 12 0		224	
	Centering for archwork ..			104	
No. 4	Wheel guard stones ..	3 0 0	Each.	12	
	Balling water ..			150	
	Shed for materials ..			150	
	Total ..				740
	Total ..				5,900
	Estimate No. 65-G.				
	Syphon aqueduct at R.D. 42/5400 (L. vent of 4' 0" $\times$ 5' 0").				
	(b) Two abutments and one vent including pitching, puddle filling, etc., per foot run of canal bed width.				
0-36 units.	Concrete brick jelly in surki mortar ..	25 10 0	100 c. ft.	9-23	
0-45 "	Table-moulded brick in surki mortar ..	29 8 0	100 "	13-28	
0-18 "	Archwork table-moulded brick in surki mortar ..	30 8 0	100 "	5-49	
0-31 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	2-09	
0-34 "	Laterite block ..	19 4 0	100 c. ft.	6-55	
1-02 "	Clay puddle ..	5 11 0	100 "	5-80	
0-270 "	Earthwork ..	4 8 0	1,000 "	1-22	
	Total ..			43-66	
	Contingencies at 5 per cent ..			2-78	
	Petty supervision at $2\frac{1}{2}$ per cent ..			1-56	
	Total per foot ..			48-00	
	Cost for 41 ft. = 41×48 ..			1,968	1,968
	(d1) Balance of culvert length upstream side two abutments and one vent including revetment to canal banks.				
4-20 units.	Concrete brick jelly in surki mortar ..	25 10 0	100 c. ft.	125-68	
8-00 "	Table-moulded brick in surki mortar ..	29 8 0	100 "	236	
2-34 "	Archwork table-moulded brick in surki mortar ..	30 8 0	100 "	71-37	
3-30 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	22-28	
1-50 "	Laterite block pitching ..	19 4 0	100 c. ft.	28-88	
0-50 "	Gravel backing, 6" ..	7 15 0	100 "	3-97	
3-200 "	Earthwork ..	4 8 0	1,000 "	14-40	
	Total ..			502-46	
	Contingencies at 5 per cent ..			25-44	
	Petty supervision at 3 per cent ..			15-10	
	Total ..			543-40	543
	Carried over ..				2,511
	Carried over ..				17,44,080

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
	RS. A. P.			RS.	RS.
	GRAND ANICUT CANAL—cont.				
	F. CROSS DRAINAGE WORKS—cont. Brought forward .. 17,44,080				
	Estimate No. 65-G.—cont.				
	Syphon aqueduct at R.D. 42/5400 (L. vent of 4' 0" $\times$ 5' 0")—cont.				
	(d2) Balance length of culvert downstream including head-wall, revetment to canal banks.				
7-00 units.	Concrete brick jelly in surki mortar ..	25 10 0	100 c. ft.	197-31	
12-90 "	Table-moulded brick in surki mortar ..	29 8 0	100 "	380-55	
3-90 "	Archwork table-moulded brick in surki mortar ..	30 8 0	100 "	118-95	
5-12 "	Plastering with Portland cement, $\frac{3}{4}$ " thick 1:3 ..	6 12 0	100 sq. ft.	34-66	
1-50 "	Laterite block ..	19 4 0	100 c. ft.	28-83	
0-50 "	Gravel backing, 6" thick ..	7 15 0	100 "	3-97	
5-260 "	Earthwork ..	4 8 0	1,000 "	23-67	
	Total ..			787-89 or say 788	
	Contingencies at 5 per cent ..			39	
	Petty supervision at 3 per cent ..			25	
	Total ..				852
	(g) Upstream, masonry flooring including pitching in drainage bed per foot run of drainage bed width between abutments.				
0-41 units.	Concrete brick jelly in surki mortar ..	25 10 0	100 c. ft.	10-51	
0-06 "	Table-moulded brick in surki mortar ..	29 8 0	100 "	1-77	
0-20 "	Plastering with portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	1-35	
0-10 "	Laterite block ..	19 4 0	100 c. ft.	1-93	
	Total ..			15-56	
	Contingencies at 5 per cent ..			78	
	Petty supervision at 3 per cent ..			46	
	Total ..			16-80 or 17-00	
	Total per foot run ..				
	Cost of 4 feet $17 \times 4 = 68$..			68	
	Total ..				68
	(h) Downstream, masonry flooring including pitching in drainage bed per foot run of drainage bed width between abutments.				
0-52 units.	Concrete brick jelly in surki mortar ..	25 10 0	100 c. ft.	13-33	
0-09 "	Table-moulded brick in surki mortar ..	29 8 0	100 "	2-66	
0-13 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	0-88	
0-15 "	Laterite block pitching ..	19 4 0	100 c. ft.	2-89	
	Total ..			19-76	
	Contingencies at 5 per cent ..			99	
	Petty supervision at 3 per cent ..			55	
	Total ..			21-30	
	Total for 4 feet 22×4 ..			88	88
	(s1) Upstream wings, including triangular portion of sloping ramp. Remaining portion of pitching in drainage bed revetment to canal drainage banks.				
7-90 units.	Concrete brick jelly in surki mortar ..	25 10 0	100 c. ft.	202	
14-90 "	Table-moulded brick in surki mortar ..	29 8 0	100 "	440	
5-50 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	37	
8-20 "	Laterite block ..	19 4 0	100 c. ft.	158	
2-60 "	Gravel backing, 6" ..	7 15 0	100 "	21	
	Total ..			858	
	Contingencies at 5 per cent ..			43	
	Petty supervision at 3 per cent ..			26	
	Total ..				927
	Carried over ..				4,446
	Carried over ..				17,44,080

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	
	GRAND ANICUT CANAL—cont.				
	F. CROSS DRAINAGE WORKS—cont.		Brought forward ..	17,44,080	
	Estimate No. 65-G.—cont.		Brought forward ..	4,446	
	Syphon aqueduct at R.D. 42/5400 (L vent of 4' 0" × 5' 0")—cont.				
	(c2). Downstream wings, including triangular portion of sloping ramp. Remaining portion of pitching in drainage bed, revetment to drainage and canal banks.				
9.50 units.	Concrete brick jelly in surki mortar ..	25 10 0	100 c. ft.	243	
12.15 "	Table-moulded brick in surki mortar ..	29 8 0	100 "	358	
5.61 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	38	
9.00 "	Laterite block ..	19 4 0	100 c. ft.	173	
2.72 "	Gravel backing, 6" ..	7 15 0	100 "	22	
	Total ..			834	
	Contingencies at 5 per cent ..			42	
	Petty supervision at 3 per cent ..			25	
	Grand total ..			901	901
	Abstract of items—				
	Earthwork, excavating foundations for wings ..			100	
110.000 units.	Cutting rear channel (2,200 × 23 × $\frac{3}{4}$) 101.200 or 110 units ..	3 12 0		413	
	Centering for archwork ..			100	
4.00 "	Wheel-guard stones ..	3 0 0	each.	12	
	Baling water ..			130	
	Shed for materials ..			98	
	Total ..			853	
	Total ..			6,200	

Estimate No. 66-G. (Plan No. G. 82).

	Syphon aqueduct at R.D. 42/6400 (5 vents of 6' 0" × 6' 0").				
192.00 units.	Concrete brick jelly in surki mortar ..	25 10 0	100 c. ft.	4,920	
143.00 "	Table-moulded brick in surki mortar ..	29 8 0	100 "	4,219	
68.60 "	Archwork table-moulded brick in surki mortar ..	30 8 0	100 "	2,031	
155.00 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	1,046	
68.90 "	Laterite block for revetment and pitching ..	19 4 0	100 c. ft.	1,326	
12.30 "	Gravel backing 6" under revetment ..	7 15 0	100 "	98	
59.00 "	Clay puddle filling ..	5 11 0	100 "	338	
	Centering for archwork ..	L.S.		300	
80.000 "	Earthwork excavating for foundations ..	5 0 0	1,000 c. ft.	400	
2.75 "	Cutting rear channel, etc. ..	4 0 0	1,000 "	1,100	
	Baling water ..		Lump sum.	500	
	Shed for materials ..			100	
	Total ..			16,376	
	Contingencies at 5 per cent ..			816	
	Petty supervision ..			408	
	Total ..			17,600	

Estimate No. 67-G.

Syphon aqueduct at R.D. 43/3500.

	(a) Under canal bed for 1 span of a pier and a vent clear of abutments per foot run of canal bed width.				
16.5 units.	Concrete broken brick in surki mortar ..	26 5 0	100 c. ft.	4.34	
0.06 "	Brick in surki mortar ..	30 5 0	100 "	1.82	
1.15 "	Archwork brick in surki mortar ..	31 5 0	100 "	4.70	
2.4 "	Cement plastering, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	1.62	
0.059 "	Earthwork ..	4 5 0	1,000 c. ft.	0.24	
	Total ..			12.72	
	Contingencies at 5 per cent ..			0.64	
	Supervision including shed for material 3 per cent ..			0.88	
	Total ..			13.74	
2 × 38 r. ft.	Item (a) under canal bed for one span and one pier clear of abutments.		13.74 ft.	1,044	1,044
	Carried over ..			1,044	
	Carried over ..			17,67,880	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
	GRAND ANICUT CANAL—cont.				
	F. CROSS DRAINAGE WORKS—cont.		Brought forward ..	17,67,880	
	Estimate No. 67-G.—cont.		Brought forward ..	1,044	
	Syphon aqueduct at R.D. 43/3,500—cont.				
	(b) Two abutments less one pier under bed of canal per foot run of canal bed width. This includes the pitching clay puddle and provides in the bed of canal.				
0.20 units.	Concrete broken brick in surki mortar ..	26 5 0	100 c. ft.	5.26	
0.39 "	Brick in surki mortar (table-moulded) ..	30 5 0	100 "	11.82	
0.13 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	0.88	
2.00 "	Earthwork ..	4 5 0	1,000 c. ft.	0.86	
0.48 "	Laterite block pitching ..	19 4 0	100 "	9.24	
0.13 "	Clay puddle ..	6 9 0	100 "	8.53	
	Contingencies at 5 per cent ..			1.83	
	Supervision at 2½ per cent ..			1.10	
	Total ..			39.52	
	Deduct cost of one pier per foot run as estimated ..			4.13	
	Net cost of item (b) per foot run ..			35.39	
38 r. ft.	Item (b) two abutments less one pier under bed of canal.	35.39	R. ft.	1,344 or	1,345
	(c) Balance of culvert length arched over under banks up and downstream clear of abutments for 1 span width of a pier and a vent.				
6.00 units.	Concrete broken brick in surki mortar ..	26 5 0	100 c. ft.	158	
4.68 "	Brick in surki mortar ..	30 5 0	100 "	142	
5.33 "	Archwork brick in surki mortar ..	31 5 0	100 "	167	
8.50 "	Cement plastering $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	57	
1.63 "	Laterite blocks, rough ..	19 4 0	100 c. ft.	31	
0.54 "	Gravel backing ..	8 13 0	100 "	5	
2.680 "	Earthwork ..	4 5 0	1,000 "	12	
	Total ..			572	
	Contingencies at 5 per cent ..			30	
	Supervision at 2½ per cent ..			14	
	Total ..			616	
No. 2	Spans (item c) balance of culvert length arched over under banks up and down stream clear of abutments.	616 0 0	Per span.	..	1,232
	(d) Balance of culvert length for a portion (c) under banks up and down stream for the whole length.				
8.00 units.	Concrete broken brick in surki mortar ..	26 5 0	100 c. ft.	211	
17.20 "	Brick in surki mortar ..	30 5 0	100 "	521	
3.08 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	21	
2.52 "	Laterite block, rough ..	19 4 0	100 c. ft.	49	
84 "	Gravel backing ..	8 13 0	100 "	7	
8.490 "	Earthwork ..	4 5 0	1,000 "	37	
	Total ..			816	
	Contingencies at 5 per cent ..			42	
	Supervision including erecting shed for materials 3 per cent ..			25	
	Total ..			913	
	Deduct cost of pier 388—6" long at 4.13 ..			159	
	Total cost of item (d) less deductions ..			754	
	(e) Wings, etc., upstream of culvert including revetment for canal banks.				
6.70 units.	Concrete broken brick in surki mortar ..	26 5 0	100 c. ft.	176	
11.30 "	Brick in surki mortar ..	30 5 0	100 "	343	
4.90 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	33	
14.90 "	Laterite blocks, rough ..	19 4 0	100 c. ft.	289	
5.00 "	Gravel backing ..	8 13 0	100 "	44	
2.200 "	Earthwork ..	4 5 0	1,000 "	10	
	Total ..			893	
	Contingencies at 5 per cent ..			45	
	Supervision including shed for materials 3 per cent ..			27	
	Total ..			965	
	Carried over ..			5,340	
	Carried over ..			17,67,880	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 17,67,880					
Estimate No. 67-G—cont. Brought forward .. 5,340					
Syphon aqueduct at R.D. 43/3500—cont.					
(e) Wings in rear of culvert including revestment for canal banks.					
11.10 units.	Concrete broken brick in surki mortar ..	26 5 0	100 c.ft.	292	
13.50 "	Brick in surki mortar ..	30 5 0	100 "	409	
8.10 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq.ft.	55	
14.90 "	Laterite blocks, rough ..	19 4 0	100 c.ft.	287	
5.00 "	Gravel backing ..	8 13 0	100 "	44	
4.800 "	Earthwork ..	4 5 0	1,000 "	21	
	Total ..			1,108	
	Contingencies at 5 per cent ..			55	
	Supervision at 3 per cent ..			33	
	Total ..				1,196
(g) Upstream masonry flooring and drop wall between wings and not under arches up to drainage bed level per span parallel to canal.					
2.20 units.	Concrete broken brick in surki mortar ..	26 5 0	100 c.ft.	57.90	
.31 "	Brick in surki mortar ..	30 5 0	100 "	9.40	
1.07 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq.ft.	7.22	
7.74 "	Earthwork ..	4 5 0	1,000 c.ft.	3.33	
	Total ..			77.85	
	Contingencies ..			3.89	
	Supervision ..			2.34	
	Total ..			84.08 or	84
(h) Downstream cushion left walls, etc., per span parallel to canal.					
26 unit.	Concrete broken brick in surki mortar ..	26 5 0	100 c.ft.	6.84	
31 "	Brick in surki mortar ..	30 5 0	100 "	9.39	
26 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq.ft.	1.76	
59 "	Earthwork ..	4 5 0	1,000 c.ft.	.25	
	Total ..			18.24	
	Contingencies at 5 per cent ..			.91	
	Supervision including erecting shed for materials ..			.53	
	Total ..			19.7 or	20
(i) Pitching between wings, etc., downstream.					
1.10 units.	Concrete broken brick ..	26 5 0	100 c.ft.	28.94	
.55 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq.ft.	3.71	
1.10 "	Earthwork ..	4 5 0	1,000 c.ft.	.47	
	Total ..			33.12	
	Contingencies at 5 per cent ..			1.60	
	Supervision at 3 per cent ..			.99	
	Total ..			35.77 or	36
	Carried over ..				6,676
	Carried over ..				17,67,880

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
F. CROSS DRAINAGE WORKS—cont. Brought forward .. 17,67,880					
Estimate No. 67-G—cont. Brought forward .. 6,676					
Syphon aqueduct at R.D. 43/3500—cont.					
G.H.J. Upstream and downstream masonry flooring pitching between wings parallel to canal to the width of one vent way.					
2.27 units.	Concrete broken brick in surki mortar ..	26 5 0	100 c. ft.	60	
.45 "	Table-moulded brick in surki mortar ..	30 5 0	100 "	14	
1.36 "	Cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	9	
.509 "	Earthwork ..	4 5 0	1,000 c. ft.	2	
	Total ..			85	
	Contingencies at 5 per cent ..			4	
	Supervision at 3 per cent ..			3	
	Total ..				92
60.000 "	Earthwork for cutting rear channel ..	3 12 0	1,000 c.ft.	225	
	Centering for arch work ..			107	
	Baling ..			200	
	Total ..				7,300
Estimate No. 68-G.					
Syphon aqueduct at R.D. 44/2600.					
(a) Portion under canal bed per span per foot run of canal bed width clear of abutments.					
0.62 unit.	Concrete, brick jelly in surki mortar ..	27 12 0	100 c. ft.	17.24	
0.21 "	Table-moulded brick in surki mortar ..	31 14 0	100 "	6.69	
0.274 "	Archwork in surki mortar ..	32 14 0	100 "	9.01	
	Centering for archwork ..			3.60	
0.59 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	3.51	
0.12 "	Earthwork ..	5 0 0	1,000 c. ft.	0.60	
	Total ..			40.65	
	Contingencies at 5 per cent ..			2.03	
	Petty supervision at $2\frac{1}{2}$ per cent ..			1.02	
	Cost per span and per foot run ..			43.70	
	Total cost for 7 spans and 18 r.ft. of canal width.			$43.70 \times 7 \times 18 = 5,506.2$	5,506
2. (b) Abutments less one pier under bed of canal including canal apron per foot run of canal bed width.					
0.36 units.	Concrete brick jelly in surki mortar ..	27 12 0	100 c. ft.	9.99	
0.52 "	Table-moulded brick in surki mortar ..	31 14 0	100 "	16.57	
0.26 "	Literite block and pitching ..	18 4 0	100 "	16.79	
2.61 "	Clay puddle pitching ..	3 15 0	100 "	10.27	
0.096 "	Earthwork ..	5 0 0	1,000 "	0.48	
	Total ..			54.10	
	Contingencies at 5 per cent ..			2.70	
	Petty supervision at $2\frac{1}{2}$ per cent ..			1.35	
	Cost per foot run of canal width ..			58.15	
	Total cost for 18 r.ft. of canal width ..			$58.15 \times 18 = 1,046.7$	1,047
	Carried over ..				6,553
	Carried over ..				17,75,180

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont Brought forward .. 17,75,180

Estimate No. 68-G—cont. Brought forward .. 6,553

Syphon aqueduct at R.D. 44/2600—cont.

<i>(c₁) Balance length of culvert arched over and carrying canal banks including head wall, etc., per one span parallel to canal upstream side.</i>					
3.68 units.	Concrete brick jelly in surki mortar ..	27 12 0	100 c. ft.	102.12	
4.22 "	Table-moulded brick in surki mortar ..	31 14 0	100 "	134.51	
1.46 "	Archwork in surki mortar ..	32 14 0	100 "	48.00	
	Centering for arches, etc. ..		Lump sum.	19.20	
5.3 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1 : 3	6 12 0	100 sq. ft.	35.78	
0.793 "	Earthwork ..	5 3 0	1,000 c. ft.	3.97	
	Total ..			343.58	
	Contingencies at 5 per cent ..			17.18	
	Petty supervision at $2\frac{1}{2}$ per cent ..			8.59	
	Total cost per span ..			369.35	
	Total cost for 7 spans ..	369.35 $\times$ 7 =		2,585.45 or	2,585.3
<i>(c₂) Balance length of culvert arched over and carrying canal banks including roadway, etc., per one span parallel to canal downstream.</i>					
7.35 units.	Concrete brick jelly in surki mortar ..	27 12 0	100 c. ft.	203.96	
6.20 "	Table-moulded brick in surki mortar ..	31 14 0	100 "	197.82	
2.74 "	Archwork table-moulded brick in surki mortar ..	32 14 0	100 "	90.08	
	Centering for arches, etc., 40 per cent ..			36.05	
1.694 "	Earthwork ..	5 0 0	1,000 c. ft.	8.47	
7.99 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1 : 3	6 12 0	100 sq. ft.	53.93	
	Total ..			590.09	
	Contingencies at 5 per cent ..			29.50	
	Petty supervision at $2\frac{1}{2}$ per cent ..			14.75	
	Total cost for 1 span ..			634.34	
	Total cost for 7 spans $634.34 \times 7 =$..			4,440.38 or	4,440
<i>(d-1) Two abutments less one pier for the portion (c₁).</i>					
3.51 units.	Concrete brick jelly in surki mortar ..	27 12 0	100 c. ft.	97.40	
6.21 "	Table-moulded brick in surki mortar ..	31 14 0	100 "	197.94	
0.18 "	Archwork table-moulded brick in surki mortar ..	32 14 0	100 "	5.92	
	Centering for arches extra ..		Lump sum.	2.37	
0.96 "	Plastering with Portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	6.48	
0.98 "	Earthwork, etc. ..	5 0 0	1,000 c. ft.	4.94	
	Total ..			315.05	
	Contingencies at 5 per cent ..			15.75	
	Petty supervision at $2\frac{1}{2}$ per cent ..			7.88	
	Total ..			338.68	
	This is the cost of two abutments without deduction of one pier.				
	Hence the required cost of two abutments less one pier.				
	Refer (c ₁) $338.68 (3 \times 24.62) = 338.68 - 73.88$.			264.82 or	265
	Carried over ..			13,843	
	Carried over ..			1,775,180	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

F. CROSS DRAINAGE WORKS—cont.

Estimate No. 68-G—cont. Brought forward .. 17,75,180

Brought forward .. 13,843

Syphon aqueduct at R.D. 44/2600—cont.

<i>(d₂) Two abutments less one pier for the portion (c₂).</i>					
7.47 units.	Concrete brick jelly in surki mortar ..	27 12 0	100 c. ft.	207.29	
14.31 "	Table-moulded brick in surki mortar ..	31 14 0	100 "	456.13	
0.36 "	Archwork brick in surki mortar ..	32 14 0	100 "	11.84	
	Centering for arches, extra ..		Lump sum.	4.71	
2.16 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	14.58	
2.000 "	Earthwork ..	5 9 0	1,000 c. ft.	10.00	
	Total ..			704.58	
	Contingencies at 5 per cent ..			35.23	
	Petty supervision at $2\frac{1}{2}$ per cent ..			17.62	
	Total ..			757.43	
	This is the cost for two abutments without deduction of pier.				
	Hence the required cost of two abutments less one pier = $757.43 - (3 \times 42.29) = 757.43 - 126.87$			630.56 or	631
<i>(e₁) Wings upstream of culvert including revetment from canal banks and drainage and also apron of contracted portion L.S. item.</i>					
20.20 units.	Concrete brick jelly in surki mortar ..	27 12 0	100 c. ft.	560.56	
32.04 "	Table-moulded brick in surki mortar ..	31 14 0	100 "	1,021.27	
12.10 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1 : 3 ..	6 12 0	100 sq. ft.	81.67	
29.3 "	Laterite block revetment ..	18 4 0	100 c. ft.	534.72	
5.10 "	Gravel backing to revetment ..	10 9 0	100 "	64.43	
11.2 "	Concrete in surki mortar (for apron) ..	27 12 0	100 "	310.80	
11.2 "	Plastering with Portland cement, $\frac{3}{4}$ " for concrete apron ..	6 12 0	100 sq. ft.	75.60	
6.540 "	Earthwork ..	5 0 0	1,000 c. ft.	32.70	
	Total ..			2,681.74	
11.2 units.	Add the difference of rate between concrete and laterite blocks apron ..	9 8 0	100 c. ft.	106.40	
	Net Rs. ..			2,788.14	
	Contingencies at 5 per cent ..			139.41	
	Petty supervision at $2\frac{1}{2}$ per cent ..			69.71	
	Total ..			2,987.26	2,987
<i>(e₂) Wing downstream of culvert including revetment of canal and drainage and also apron of contracted portion.</i>					
17.27 units.	Concrete brick jelly in surki mortar ..	27 12 0	100 c. ft.	479.24	
28.55 "	Table-moulded brick in surki mortar ..	31 14 0	100 "	910.03	
11.00 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1 : 3 ..	6 12 0	100 sq. ft.	74.25	
29.30 "	Laterite block revetment and apron ..	18 4 0	100 c. ft.	534.72	
6.1 "	Gravel backing to revetment ..	10 9 0	100 "	64.43	
5.73 "	Concrete in surki mortar (for apron) ..	27 12 0	100 "	159.00	
5.73 "	Plastering with Portland cement, $\frac{3}{4}$ " (for concrete apron) ..	6 12 0	100 sq. ft.	38.67	
5.55 "	Earthwork ..	5 0 0	1,000 c. ft.	27.78	
	Total ..			2,288.10	
	Carried over ..			17,471	
	Carried over ..			17,75,180	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—*cont.*F. CROSS DRAINAGE WORKS—*cont.*Estimate No. 68-G—*cont.*

Brought forward .. 17,75,180

Brought forward .. 17,471

Syphon aqueduct at R.D. 44/2600—*cont.*

5.73 units.	Add the difference of rate between concrete and laterite block	9 8 0	..	54.43	
	Net Rs. ..	..	..	2,342.53	
	Contingencies at 5 per cent	..	..	117.13	
	Petty supervision at 2½ per cent	..	..	58.57	
	Total ..	..	..	2,518.23 or	2,518
	(f) Wings connecting side wall of aqueduct to canal banks.				
6.50 units.	Concrete brick jelly in surki mortar	27 12 0	100 c. ft.	150.37	
25.60 "	Table-moulded brick in surki mortar	31 14 0	100 "	816.00	
6.60 "	Plastering with Portland cement, ¾" thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	44.55	
1.60 "	Earthwork	5 0 0	1,000 c. ft.	8.00	
	Total ..	..	..	1,048.92	
	Contingencies at 5 per cent	..	..	52.18	
	Petty supervision at 2½ per cent	..	..	26.00	
	Total ..	..	..	1,127.00	1,127
	(g) Upstream, masonry floorings, and drop wall between wings not under arches and up to drainage bed level for one span and one pier parallel to canal.				
6.30 units.	Concrete brick jelly in surki mortar	27 12 0	100 c. ft.	174.82	
4.55 "	Table-moulded brick in surki mortar	31 14 0	100 "	143.44	
3.35 "	Plastering with Portland cement, ¾" thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	22.61	
1.68 "	Earthwork	5 0 0	1,000 c. ft.	8.40	
	Total ..	..	..	349.27	
	Contingencies at 5 per cent	..	..	17.46	
	Petty supervision at 2½ per cent	..	..	8.73	
	Total rupees for one span ..	..	..	375.46	
	Total cost for 7 spans $375.46 \times 7 = 2,628.22$ or ..	..	..	..	2,628
	(h) Downstream masonry flooring, cushion, lift wall between wings (not under arch) up to drainage bed level for one span parallel to canal.				
11.70 units.	Concrete brick jelly in surki mortar	27 12 0	..	324.67	
1.77 "	Table-moulded brick in surki mortar	31 14 0	..	56.42	
4.08 "	Plastering with Portland cement, ¾" thick, 1:3 ..	6 12 0	..	27.54	
2.16 "	Earthwork	5 0 0	..	10.80	
	Total ..	..	..	419.43	
	Contingencies at 5 per cent	..	..	20.97	
	Petty supervision at 2½ per cent	..	..	10.49	
	Total rupees for 1 span ..	..	..	450.89	
	Total cost for 7 spans $450.89 \times 7 = 3,156.23$ or ..	..	..	..	3,156
	Carried over ..			27,900	
	Carried over ..			17,75,180	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—*cont.*F. CROSS DRAINAGE WORKS—*cont.*Estimate No. 68-G—*cont.*

Brought forward .. 17,75,180

Brought forward .. 27,900

Syphon aqueduct at R.D. 44/2600—*cont.*

	(i) Pitching between wings on stream bed for one span parallel to canal upstream side.				
5.25 units.	Laterite block revetment and pitching	18 4 0	..	95.81	
	Contingencies at 5 per cent	..	..	4.79	
	Petty supervision at 2½ per cent	..	..	2.40	
	Total rupees for one span ..	..	..	103.00	
	Rs. 103 is the amount for 15 r. ft. parallel to canal bed. So for 1 r. ft. $\frac{103}{15}$, therefore for 3 r. ft. $\frac{103}{5} \times 3 = 20.6$ for 7 spans $(103 \times 7) - 20.6 = 700.4$ or	..	..	..	700
	(f) Pitching between wings in downstream bed for one span parallel to canal.				
3.9 units.	Laterite block revetment and pitching	18 4 0	..	71.18	
	Contingencies at 5 per cent	..	..	3.56	
	Petty supervision at 2½ per cent	..	..	1.78	
	Cost for one span ..	..	..	76.52	
	Rs. 76.52 is the amount for 15 r. ft. parallel to canal bed. So for 1 r. ft. $\frac{76.52}{15}$, therefore for 3 r. ft. $\frac{76.52}{5} \times 3 = 15.3$	..	..	..	
	Total cost for 7 spans $76.52 \times 7 - 15.3 = 520.34$ or ..	..	..	..	520
	Hand railings including stanchions, etc., complete.				
526 r. ft.	Hand railings, 2' high	1 6 0	R. ft.	..	723
	Contingencies at 5 per cent	..	..	36	
	Petty supervision at 2½ per cent	..	..	18	
	Total ..	..	..	777	
	Shed for materials	..	..	328	
	Baling water	..	..	400	
660 units.	Excavating rear channel	..	..	2,475	3,908
	Total ..	..	..	..	32,100
	Total, F. Cross Drainage Works ..	..	..	..	18,07,280

G. BRIDGES.

Estimate No. 69-G. (Plan No. G. 87).

"C" Class bridge across the Grand Anicut Canal at R.D. 1/3610 near Kiliyur village.

	For abutments and wings.				
16.64 units.	Concrete broken brick in surki mortar	21 8 0	100 c. ft.	358	
38.64 "	Table-moulded brick in chunam	24 12 0	100 "	833	
12.00 "	Roughstone revetment	13 12 0	100 "	165	
4.00 "	Gravel backing	5 8 0	100 "	22	
17.40 "	Plastering with Portland cement, ¾" thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	117	
2.32 "	Road metalling	7 4 0	100 c. ft.	17	
.81 "	Gravelling the road	5 8 0	100 "	4	
4.5 c. ft.	Cutstone work	1 12 0	C. ft.	8	
No. 8	Guard stones	3 0 0	Each	24	
20 units.	Earthwork excavating foundations	3 12 0	1,000 c. ft.	75	
	Contingencies at 5 per cent	..	..	82	
	Petty supervision at 2½ per cent	..	..	45	
	Total for abutments and wings ..	..	..	1,750	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL— <i>cont.</i>					
G. BRIDGES— <i>cont.</i>					
Estimate No. 69-G. (Plan No. G. 87)— <i>cont.</i>					
"C" Class bridge across the Grand Anicut Canal at R.D. 1/3610 near Kiliyur village— <i>cont.</i>					
<i>One pier.</i>					
3-00 units.	Concrete broken brick in surki mortar ..	21 8 0	100 c. ft.	65	
4-60 "	Table-moulded brick in chunam ..	24 12 0	100 "	114	
3-86 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	26	
4-5 c. ft.	Cutstone work ..	1 12 0	C. ft.	8	
4 units.	Earthwork excavating foundations ..	3 12 0	100 c. ft.	15	
	Contingencies at 5 per cent ..			11	
	Petty supervision at $2\frac{1}{2}$ per cent ..			6	
	Total for one pier ..			245	

Consolidated abstract for a trough plate bridge of 5 vents of 35 feet span 6 type across the Grand Anicut canal at R.D. 1/3610 near Kiliyur village.

No. 4	Cost of abutments and wings with revetment ..	1,750		
190 r. ft.	Piers ..	245 0 0	Each.	980
	Roadways including Westwood's trough plate, cement, concrete road metalling, gravelling, standard wheel guards and hand rails, etc. (as per type) ..	30 10 0	R. ft.	5,819
302 cwt.	Rolled-steel beams $20" \times 7\frac{1}{2}" \times 89$ lb. (as per type) ..	8 0 0	Cwt.	2,416
No. 10	Stiffening frames C class (as per type) ..	22 12 0	Each.	228
	Add for culvert ..			520
	Total ..			11,713
	Shed for materials ..			137
	Total of estimate ..			11,850

Culvert in continuation of above bridge R.D. 1/3610.

8-53 units.	Concrete broken brick in surki mortar ..	21 8 0	100 c. ft.	183
7-16 "	Table-moulded brick in chunam ..	24 12 0	100 "	177
2-08 "	Archwork brick in chunam ..	25 12 0	100 "	54
6-00 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	41
	Earthwork excavating foundations ..	Lump sum.	100 "	25
	Contingencies at 5 per cent ..			25
	Petty supervision at $2\frac{1}{2}$ per cent ..			15
	Total ..			520

Estimate No. 70-G.

"C" Class bridge at R.D. 2/8800.

<i>For abutments and wings.</i>					
16-64 units.	Concrete broken stone in surki mortar ..	21 15 0	100 c. ft.	365	
23-64 "	Table-moulded brick in chunam ..	24 14 0	100 "	837	
12-00 "	Laterite revetment ..	12 4 0	100 "	147	
4-00 "	Gravel backing ..	2 4 0	100 "	9	
17-40 "	Plastering with cement, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	117	
2-32 "	Road metalling ..	5 4 0	100 c. ft.	12	
0-81 "	Gravelling roadway ..	2 4 0	100 "	2	
4-5 "	Cutstone work ..	1 12 0	C. ft.	8	
No. 8.	Guard stones ..	3 0 0	Each.	24	
	Earthwork excavating foundations, etc. ..	Lump sum.		75	
	Contingencies at 5 per cent ..			82	
	Petty supervision ..			42	
	Total, Abutments and wings ..			1,721	
	Carried over ..			11,850	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL— <i>cont.</i>					
G. BRIDGES— <i>cont.</i>					
Estimate No. 70-G— <i>cont.</i>					
"C" Class bridge at R.D. 2/8800— <i>cont.</i>					
<i>One pier.</i>					
3-00 units.	Concrete broken stone in surki mortar ..	21 15 0	100 c. ft.	65	
4-60 "	Table moulded brick in chunam ..	26 0 0	100 "	114	
3-86 "	Plastering with cement, $\frac{3}{4}$ " thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	26	
4-5 "	Cutstone work ..	1 12 0	C. ft.	8	
	Earthwork excavating foundation, etc. ..	Lump sum.		15	
	Contingencies ..			8	
	Petty supervision ..			4	
	Total ..			241	

Abstract of estimate for bridge of 5 vents, 35 spans, at R.D. 2/8800.

No. 4.	Cost of abutments and wings with revetment, etc. ..	1,721		
190 r. ft.	Piers ..	241 0 0	Each.	984
	Roadway including Westwood's trough plate, cement concrete, road-metalling, etc. ..	30 10 0	R. ft.	5,819
302 cwt.	Rolled steel beams ..	8 0 0	Cwt.	2,416
No. 10.	Stiffening frames C class ..	22 8 0	Each.	225
	Shed for materials ..			105
	Total ..			11,250

Estimate No. 71-G.

"C" Class bridge at R.D. 3/9453 of 5 spans of 35' each.

<i>Abutments and wings carried 2' lower than type—</i>					
21-00 units.	Concrete broken brick in surki mortar ..	21 10 0	100 c. ft.	454	
48-50 "	Table moulded brickwork in lime mortar ..	24 11 0	100 "	1,197	
19-50 "	Laterite stone by dry revetment ..	13 4 0	100 "	258	
6-50 "	Gravel backing ..	4 7 0	100 "	29	
17-95 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	121	
5-75 "	Road-metalling ..	6 4 0	100 c. ft.	36	
2-09 "	Gravelling roadway ..	4 7 0	100 "	9	
3 c. ft.	Cutstone work ..	1 12 0	1 c. ft.	5	
No. 8	Earthwork excavating foundations ..	Lump sum.		25	
	Guard stones ..	3 0 0	Each.	24	
<i>Four piers.</i>					
11-84 units.	Concrete in surki mortar ..	21 10 0	100 c. ft.	256	
22-00 "	Brickwork in lime mortar ..	24 11 0	100 "	543	
12 c. ft.	Cutstone work ..	1 12 0	C. ft.	21	
	Plastering with portland cement, $\frac{3}{4}$ " thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	106	
1,564 units.	Excavating foundations, etc. ..	Lump sum.		15	
190 r. ft.	Roadway including Westwood's trough plate, cement concrete road-metalling, and gravelling including standards wheel guards and hand rails, etc., complete ..	30 15 0	R. ft.	5,878	
302 cwt.	Rolled steel beams $20" \times 7\frac{1}{2}" \times 89$ lb ..	8 0 0	Cwt.	2,416	
10 pairs.	Stiffening frames, "C" class ..	22 12 0	pair.	20	
	Shed for materials ..	Lump sum.		123	
	Contingencies ..	5 per cent		569	
	Petty supervision ..	$2\frac{1}{2}$ "		290	
	Total ..			12,600	

Estimate No. 72-G. (Plans Nos. G. 88-89.)

Railway bridge with 4 spans of 50 feet at R. D. 4/1404 (Railway line mileage 236/592).

17-000 units.	Earthwork excavation ..	12 0 0	1,000 c. ft.	204	
	Baling water ..	Lump sum.		1,000	
8-000 "	Filling in after foundations ..	5 0 0	1,000 c. ft.	40	
43-00 "	Concrete in surki mortar ..	18 0 0	100 c. ft.	774	
112-00 "	Masonry with stock bricks in lime mortar including cement plastering ..	40 0 0	100 "	4,480	
	Coping stones set in lime mortar ..	175 0 0	100 "	525	
1-20 "	Girder bed stones including setting, complete ..	150 0 0	100 "	150	
22-00 "	Boulders filling between abutments and wings ..	15 0 0	100 "	330	
	Carried over ..			35,700	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—*cont.*G. BRIDGES—*cont.*

Brought forward .. 35,700

Estimate No. 79-G. (Plan Nos. G. 88-89)—*cont.*Railway bridge with 4 spans of 50 feet at R.D. 4/1404 (Railway line mileage 236/592)—*cont.*

72 tons.	New 50 feet span girders, complete ..	180 0 0	Ton.	12,960	
560 c.ft.	Teakwood sleepers including hoopiron ties ..	4 8 0	C.ft.	2,620	
No. 310	Bearing plates ..	0 6 0	Each.	116	
" 460	Spikes ..	0 1 0	"	29	
72 tons.	Erection and painting girders ..	30 0 0	Ton.	2,160	
60·00 units.	Pitching with dry stones for slopes of channel ..	15 0 0	100 c.ft.	900	
80 L. yd.	New 56 lb. permanent-way exoluding sleepers ..	7 0 0	L. yd.	560	
80 "	Laying permanent-way ..	0 2 0	"	10	
80 "	Removing 50 lb. permanent-way ..	0 1 0	"	5	
122·000 units.	Removing bank ..	5 0 0	1,000 c.ft.	610	
33·000 "	Refilling bank ..	7 0 0	1,000 "	231	
No. 2	Rail nosing over ballast wall ..	10 0 0	Each.	20	
<i>Raising main line at 236/592.</i>					
290·000 units.	Earthwork in embankment ..	10 0 0	1,000 c.ft.	2,900	
33·000 "	Ballast (gravel) ..	35 0 0	1,000 "	1,155	
820 L. yd.	Removing and relaying permanent way ..	0 3 0	L. yd.	54	
No. 4	Gradient posts ..	6 0 0	Each.	24	
<i>Raising feet girder bridge.</i>					
15·00 units.	Demolishing masonry with stock bricks in lime ..	3 0 0	100 c.ft.	15	
60·00 "	Mortar including ce cent plastering ..	40 0 0	100 "	2,400	
No. 10	Removing and refixing girder bed stones ..	1 0 0	Each.	10	
32 tons.	Removing and refixing girder with sleepers ..	25 0 0	Ton.	800	
<i>Temporary Diversion.</i>					
14·700 units.	Earthwork ..	10 0 0	1,000 c.ft.	1,470	
7·000 "	Excavation for sleeper stack ..	5 0 0	1,000 "	35	
54·00 "	Dry stone boulders in foundations ..	15 0 0	100 c.ft.	810	
No. 500	Hard wood sleepers for stacks ..	3 0 0	Each.	1,500	
220 c.ft.	Teak sleepers over stacks ..	4 0 0	C.ft.	880	
150 "	Do. for bridge ..	4 0 0	"	600	
Ton. 30	Old 40 lb. rails for platform ..	35 0 0	Ton.	1,050	
740 lb.	Holding down bolts, 1" diameter, etc. ..	0 3 0	Lb.	139	
	Erection of rail platform sleeper stacks and re- moving the same ..		Lump sum.	100	
10·00 units	Pitching work boulders at sides of stacks ..	15 0 0	100 c.ft.	150	
30·900 "	Sand ballast ..	15 0 0	1,000 "	464	
900 L. yd.	50 lb. (2nd class) permanent way including sleepers ..	8 8 0	L. yd.	7,650	
900 "	Laying and removing permanent way including sleepers ..	0 3 0	"	169	
No. 1	New points and crossings 50 lb. ..	375 0 0	Each.	375	
" 1	New sleepers of gizes ..	450 0 0	Set.	450	
" 1	Laying and removing points and crossings includ- ing sleepers ..	15 0 0	"	15	
Nos. 2	Caution boards ..	15 0 0	Each.	30	
" 2	Signals ..	160 0 0	"	200	
" 4	Gradient posts ..	6 0 0	"	24	
" 1	Watchman's tent ..	100 0 0	"	100	
	Laying and removing caution boards, signals, etc. ..		Lump sum.	15	
<i>Miscellaneous.</i>					
	Loading and unloading ..		Lump sum.	850	
	Carriage of materials ..		Do.	350	
	Contingencies at 5 per cent ..			2,627	
	Total ..			55,165	
	Deduct the value of materials to be returned to stores ..			6,600	
	Total ..			48,565	
	Add 10 per cent on stores ..			2,398	
	Grand Total ..			50,963	
	Carried over ..			86,663	

N.B.—This estimate is prepared by the Chief Engineer, South Indian Railway, under their railway rates.

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—*cont.*G. BRIDGES—*cont.*

Brought forward .. 86,663

Estimate No. 73-G.

Foot-bridge at R.D. 5/1220 of 6 spans of 34 feet each.

<i>Abutments.</i>					
1·30 units.	Concrete broken brick in surki mortar ..	23 9 0	100 c. ft.	31	
1·36 "	Table-moulded brick work in lime mortar ..	26 7 0	100 "	36	
4·5 c. ft.	Cutstone work ..	1 12 0	C. ft.	8	
<i>Five piers.</i>					
7·95 units.	Concrete broken brick in surki mortar ..	23 9 0	100 c. ft.	187	
7·85 "	Brickwork in lime mortar ..	26 7 0	100 "	208	
14 c. ft.	Cutstone work ..	1 12 0	C. ft.	25	
10·35 units.	Plastering with cement $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	70	
161·44 cwt.	Rollad steel beams 215 $\frac{1}{2}$ r. ft' X 0·75 cwt. road- way including standards ..	8 0 0	Cwt.	1,292	
216 r. ft.	Hand rails, cleat and corrugated sheets ..	6 5 0	R. ft.	1,364	
	Earthwork excavating foundations ..		Lump sum.	30	
	Shed for materials ..			36	
	Contingencies at 5 per cent ..			165	
	Petty supervision at 2 $\frac{1}{2}$ per cent ..			88	
	Total ..			3,540	

Estimate No. 74-G.]

"C" Class bridge at R.D. 5/4949 of 5 spans of 35 feet each.

<i>Abutment and wings.</i>					
21·00 units.	Concrete broken brick in surki mortar ..	22 13 0	100 c. ft.	479	
48·50 "	Table-moulded brickwork in lime mortar ..	26 0 0	100 "	1,261	
19·50 "	Laterite block revetment ..	16 4 0	100 "	317	
6·50 "	Gravel backing ..	6 3 0	100 "	40	
17·95 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	121	
5·75 "	Road metalling ..	9 4 0	100 c. ft.	53	
2·09 "	Gravelling roadway ..	6 3 0	100 "	13	
3 c. ft.	Cutstone ..	1 12 0	1 c. ft.	5	
No. 8	Guard stones ..	3 0 0	Each.	24	
	Earthwork excavating foundations ..		Lump sum.	25	
<i>Four piers.</i>					
11·84 units.	Concrete broken brick in surki mortar ..	22 13 0	100 c. ft.	270	
22·00 "	Brickwork in lime mortar ..	26 0 0	100 "	572	
12 c. ft.	Cutstone work ..	1 12 0	C. ft.	21	
	Plastering with cement, $\frac{3}{4}$ " thick, 4: ..	6 12 0	100 sq. ft.	106	
1,564 sq. ft.	Excavating foundations, etc. ..		Lump sum.	15	
190 r. ft.	Roadway including West wood's trough plate, cement concrete, road metalling and gravelling including standards, wheel guards and hand rails ..	30 15 0	R. ft.	5,878	
	Rollad steel beams 26" X 7 $\frac{1}{2}$ " X 89 lb. ..	8 0 0	Cwt.	2,416	
302 cwt.	Stiffening frames C class ..	22 12 0	Pair.	228	
10 pairs.	Shed for materials ..		Lump sum.	120	
	Contingencies at 5 per cent ..			560	
	Petty supervision at 2 $\frac{1}{2}$ per cent ..			276	
	Total ..			12,800	
	Carried over ..			1,03,003	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

G. BRIDGES—cont.

Brought forward .. 1,03,003

Estimate No. 75-G.

"C" Class bridge at R.D. 6/2000 of 5 spans of 35 feet each.

Abutments and wings.					
19.63 units.	Concrete broken brick in surki mortar ..	23 2 0	100 c. ft.	454	
40.36 "	Table-moulded brick in lime mortar ..	26 2 0	100 "	1,054	
16.80 "	Laterite block revetment ..	17 4 0	100 "	290	
5.60 "	Gravel backing ..	3 9 0	100 "	20	
17.15 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	116	
5.75 "	Road metalling ..	10 4 0	100 c. ft.	59	
2.09 "	Gravelling the roadway ..	6 3 0	100 "	13	
3 c. ft.	Cutstone work ..	1 12 0	C. ft.	5	
No. 8	Earthwork excavating foundations ..	Lump sum.		52	
	Guard stones ..	3 0 0	Each.	24	
Four piers.					
11.84 units.	Concrete broken brick in surki mortar ..	23 2 0	100 c. ft.	274	
18.64 "	Brickwork in lime mortar ..	26 2 0	100 "	487	
12 "	Cutstone work ..	1 12 0	C. ft.	21	
13.40 "	Plastering with Portland cement $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	90	
	Earthwork excavating foundations, etc. ..	Lump sum.		25	
190 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling and graveling including standards, wheel guards and hand rails ..	30 15 0	R. ft.	5,878	
302 cwt.	Roller steel beams $20'' \times 7\frac{1}{2}'' \times 89$ lb. ..	8 0 0	Cwt.	2,416	
10 pairs.	Stiffening frames ..	22 12 0	Pair.	228	
	Shed for materials ..			120	
	Contingencies ..			580	
	Petty supervision ..			294	
Total ..					12,500

Estimate No. 76-G.

"B" Class bridge at R.D. 7/1150 of 5 spans of 35 feet each.

Abutments and wings carried 2 feet higher than type.					
23.80 units.	Concrete broken brick in surki mortar ..	23 12 0	100 c. ft.	565	
56.60 "	Brickwork in lime mortar ..	26 8 0	100 "	1,500	
16.80 "	Laterite block revetment ..	21 4 0	100 "	367	
5.60 "	Gravel backing ..	1 8 0	100 "	8	
19.10 "	Plastering with Portland cement $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	129	
8.05 "	Road metalling ..	14 4 0	100 c. ft.	115	
2.93 "	Gravelling ..	1 6 0	100 "	4	
5 c. ft.	Cutstone work ..	1 12 0	C. ft.	9	
No. 8	Excavating foundations ..	Lump sum.		30	
	Guard stones ..	3 0 0	Each.	24	
Four piers.					
13.20 units.	Concrete broken brick in surki mortar ..	23 12 9	100 c. ft.	314	
24.48 "	Brickwork in lime mortar ..	26 8 0	100 "	649	
20 c. ft.	Cutstone work ..	1 12 0	C. ft.	35	
11.40 units.	Plastering with cement $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	117	
	Earthwork excavating foundations ..	Lump sum.		30	
190 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling and graveling including standards, wheel guards and hand rails ..	39 2 0	R. ft.	7,434	
471.5 cwt.	Roller steel beams (two sides and one centre) $20'' \times 7\frac{1}{2}'' \times 89$ lb. and $24'' \times 7\frac{1}{2}'' \times 100$ lb. ..	8 0 0	Cwt.	3,772	
10 pairs.	Stiffening frames ..	35 8 0	Pair.	355	
	Shed for materials ..	Lump sum.		180	
	Contingencies ..			780	
	Petty supervision ..			393	
Total ..					16,800
Carried over ..					1,92,303

GRAND ANICUT CANAL SYSTEM -- MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

Brought forward .. 1,32,303

G. BRIDGES—cont.

Estimate No. 77-G.

"C" class Bridge at R.D. 7/7912 of 35 feet.

Abutments and wings.					
19.63 units.	Concrete broken brick in surki mortar ..	24 2 0	100 c. ft.	473	
40.36 "	Table-moulded brick work in lime mortar ..	27 1 0	100 "	1,092	
16.80 "	Laterite block revetment ..	21 4 0	100 "	357	
5.60 "	Gravel backing ..	3 9 0	100 "	20	
17.15 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	116	
5.75 "	Road metalling ..	14 4 0	100 c. ft.	82	
2.09 "	Gravelling the roadway ..	3 9 0	100 "	7	
5 "	Cutstone work ..	1 12 0	C. ft.	5	
No. 8	Earthwork (excavating foundations), etc. ..	Lump sum.		25	
	Guard stones ..	3 0 0	Each	24	
Four piers.					
11.84 units.	Concrete broken brick in surki mortar ..	24 2 0	100 c. ft.	236	
18.64 "	Brick work in lime mortar ..	27 1 0	100 "	504	
12 "	Cutstone work ..	1 12 0	C. ft.	21	
	Earthwork (excavating foundations, etc.) ..	Lump sum.		25	
13.40 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	91	
190 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling and graveling including standards, wheel guards and hand-rails ..	30 15 0	R. ft.	5,878	
302 cwt.	Roller steel beams, 29 inches $\times 7\frac{1}{2}$ inches $\times 89$ lb. ..	8 0 0	Cwt.	2,416	
10 pairs.	Stiffening frames ..	22 12 0	Pair.	228	
	Shed for materials ..	Lump sum.		150	
	Contingencies ..			600	
	Petty supervision ..			300	
Total ..					12,700

Estimate No. 78-G.

"C" class Bridge at R.D. 9/0375 of 5 spans of 35 feet.

Abutments and wings.					
19.63 units.	Concrete broken brick in surki mortar ..	25 0 0	100 c. ft.	490	
40.30 "	Table moulded brick work in lime mortar ..	27 14 0	100 "	1,125	
16.80 "	Laterite block revetment ..	19 4 0	100 "	32	
5.60 "	Gravel backing ..	5 5 0	100 "	30	
17.15 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	116	
5.75 "	Road metalling ..	11 4 0	100 c. ft.	65	
2.09 "	Gravelling the roadway ..	5 5 0	100 "	11	
3 "	Cutstone work ..	1 12 0	C. ft.	5	
No. 8	Earthwork (excavating foundations) ..	Lump sum.		25	
	Guard stones ..	3 0 0	C. ft.	24	
Four piers.					
11.64 units.	Concrete broken brick in surki motor ..	25 0 0	100 c. ft.	298	
18.64 "	Brickwork in lime mortar ..	27 14 0	100 "	520	
12 "	Cutstone work ..	1 12 0	C. ft.	21	
13.40 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	91	
	Earthwork (excavating foundations, etc.) ..	Lump sum.		25	
190 r. ft.	Roadway including Westwood's trough plates, cement concrete, road metalling and graveling including standards, wheel-guards and hand-rails ..	30 15 0	R. ft.	5,878	
302 cwt.	Roller steel beams, 20 inches $\times 7\frac{1}{2}$ inches $\times 89$ lb. ..	8 0 0	Cwt.	2,416	
10 pairs.	Stiffening frames ..	22 12 0	Pair.	228	
	Shed for materials ..	Lump sum.		120	
	Contingencies ..			590	
	Petty supervision ..			300	
Total ..					12,700
Carried over ..					1,57,703

GRAND ANICUT CANAL SYSTEM — MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

Brought forward .. 1,57,703

G. BRIDGES—cont.

Estimate No. 79-G.

"B" class bridge at R.D. 10/2500 of 5 spans of 35 feet.

<i>Abutments and wings.</i>					
20.05 units.	Concrete broken brick in surki mortar ..	24 11 0	100 c. ft.	495	
31.91 "	Table-moulded brick in lime mortar ..	27 12 0	100 "	1,162	
15.60 "	Laterite block revetment ..	20 4 0	100 "	316	
5.20 "	Gravel backing ..	4 7 0	100 "	23	
17.30 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	117	
44.15 "	Road metalling ..	13 4 0	100 c. ft.	585	
16.12 "	Gravelling the road ..	4 7 0	100 "	67	
5 "	Cutstone work ..	1 12 0	C. ft.	9	
No. 8 "	Guard stones ..	3 0 0	Each.	24	
	Earthwork (excavating foundations) ..		Lump sum.	50	
<i>Four Piers</i>					
13.20 units.	Concrete broken brick in surki mortar ..	24 2 0	100 c. ft.	326	
20.64 "	Brickwork in lime mortar ..	27 12 0	100 "	573	
14.84 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100sq. ft.	100	
20 "	Cutstone work ..	1 12 0	C. ft.	35	
	Earthwork (excavating foundations) ..		Lump sum.	25	
190 r. ft.	Roadway including Westwood's trough plate, standards, rails, cement, concrete and graveling, etc., complete.	39 2 0	R. ft.	7,434	
471.5 cwt.	Rolled-steel beams (two sides and one centre beam).	8 0 0	Cwt.	3,772	
10 pairs.	Stiffening frames ..	35 8 0	Pair.	355	
	Shed for materials ..		Lump sum.	156	
	Contingencies ..			780	
	Petty supervision ..			396	
	Total ..				16,800

"B" class girder bridge of 1 span of 25 feet across side drain.

19.80 units.	Concrete broken brick in surki mortar ..	24 11 0	100 c. ft.	489	
31.50 "	Table-moulded brickwork in lime mortar ..	27 12 0	100 "	874	
9 "	Cutstone work ..	1 12 0	C. ft.	16	
12.50 "	Plastering with cement $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	84	
46.5 cwt.	Rolled-steel beam 16"X6"X42 lb. ..	8 0 0	100 cwt.	372	
28 r. ft.	Roadway including Westwood's trough plate, cement, concrete, road metalling and graveling including standards, wheel-guards and hand rails.	39 2 0	R. ft.	1,096	
2 pairs	Stiffening frames ..	35 8 0	Pair.	71	
	Shed for materials ..		Lump sum.	30	
	Contingencies ..			150	
	Petty supervision ..			78	
	Total ..				3,260
	Total ..				20,060

Estimate No. 80-G.

Foot bridge at R.D. 11/8581 of 6 spans of 34 feet each.

<i>Abutments.</i>					
1.30 units.	Concrete broken brick in surki mortar ..	24 10 0	100 c. ft.	32	
1.36 "	Brickwork in lime mortar ..	27 11 0	100 "	38	
4.5 "	Cutstone work ..	1 12 0	C. ft.	8	
<i>Five piers.</i>					
7.95 "	Concrete broken brick in surki mortar ..	24 10 0	100 c. ft.	196	
7.85 "	Brickwork in lime mortar ..	27 10 0	100 "	217	
14 "	Cutstone work ..	1 12 0	100 "	25	
10.85 "	Plastering with cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	70	
161.44 cwt.	Rolled-steel beams 21 $\frac{1}{2}$ r. ft. X 0.75 cwt. ..	8 0 0	Cwt.	1,299	
216 r. ft.	Roadway including standards, hand-rails, cleats and corrugated sheets.	6 5 0	R. ft.	1,364	
	Earthwork (excavating foundations, etc., and forming on bank).		Lump sum.	20	
	Shed for materials ..			40	
	Contingencies ..			165	
	Petty supervision ..			83	
	Total ..				3,550
	Carried over ..				1,81,313

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

Brought forward .. 1,81,113

G. BRIDGES—cont.

Estimate No. 81-G. (Plan Nos. G-90 and 91).

Railway skew bridge with 7 spans of 40 feet at R.D. 12/3450.

Railway line, mileage 222/17-18.

21.000 units.	Earthwork excavation top soil ..	15 0 0	1,000 c. ft.	315	
21.600 "	Do. bottom soil ..	30 0 0	1,000 "	630	
14.000 "	Filling in after foundations ..	5 0 0	1,000 "	70	
70.00 "	Concrete in surki mortar ..	18 0 0	100 "	1,260	
191.06 "	Masonry with stock bricks in lime mortar including cement plastering ..	40 0 0	100 "	7,640	
3.10 "	Coping stones set in lime mortar ..	175 0 0	100 "	543	
3.00 "	Girder bed stones including setting, etc. ..	150 0 0	100 "	450	
3.00 "	Boulders filling between abutments ..	15 0 0	100 "	45	
91 tons.	New 40 ft. span girders complete ..	180 0 0	Ton.	16,380	
830 c. ft.	Teakwood sleepers including hoop iron ties ..	4 8 0	C. ft.	3,735	
450 "	Bearing plates ..	0 6 0	Each.	169	
1.350 "	Spikes ..	0 1 0	"	81	
91 "	Erection and painting girders ..	30 0 0	Ton.	2,730	
66.00 "	Pitching with dry stones for slopes of channel ..	15 0 0	100 c. ft.	990	
115 yds.	New 56 lb. permanent way excluding sleepers ..	7 0 0	L. yard.	825	
115 "	Laying permanent way ..	0 2 0	"	14	
115 "	Removing 50 lb. permanent way ..	0 1 0	"	7	
14.000 "	Removing bank ..	5 0 0	1,000 c. ft.	70	
3,000 "	Refilling bank ..	7 0 0	1,000 "	21	
No. 2 "	Rail nosing over ballast wall ..	10 0 0	Each.	20	
" 2 "	Refuges ..	100 0 0	"	200	
<i>Raising main line at mile 223.</i>					
123.000 "	Earthwork in embankment ..	12 0 0	1,000 c. ft.	1,476	
140.000 "	Do. in cutting ..	15 0 0	1,000 "	2,100	
680 "	Removing and relaying permanent way ..	0 8 0	L. yard.	124	
24.000 "	Ballast gravel ..	35 0 0	1,000 c. ft.	840	
No. 4 "	Gradient posts ..	6 0 0	Each.	24	
<i>Temporary diversion.</i>					
80.000 "	Earthwork embankment ..	12 0 0	1,000 c. ft.	960	
90.000 "	Do. cutting ..	15 0 0	1,000 "	1,350	
26.000 "	Sand ballasting ..	15 0 0	1,000 "	390	
720 "	50 lb. (2nd class) permanent way including sleepers ..	8 8 0	L. yard.	6,120	
720 yds.	Laying and removing permanent way including sleepers ..	0 3 0	"	135	
	New points and crossings ..	375 0 0	Set.	375	
1 "	New sleepers of sizes ..	450 0 0	"	450	
	Laying and removing points and crossings including sleepers ..	15 0 0	"	16	
No. 2 "	Caution boards ..	15 0 0	Each.	30	
" 2 "	Signals ..	100 0 0	"	200	
" 4 "	Gradient posts ..	6 0 0	"	24	
" 1 "	Watchman's hut ..	100 0 0	"	100	
	Laying and removing caution boards ..		Lump sum.	15	
	Total ..				50,306
<i>Miscellaneous.</i>					
	Loading and unloading ..		Lump sum.	700	
	Carriage of materials ..		"	375	
	Total ..				51,981
	Contingencies ..				2,599
	Deduct—the value of materials to be returned to stores ..		Lump sum.	3,850	
	Total ..				50,730
	Add 10 per cent on stores ..				2,616
	Total ..				53,346
	Carried over ..				2,84,659

N.B.—The estimate is prepared by the Chief Engineer, South Indian Railway, under Railway rates.

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
				Brought forward ..	2,34,659
G. BRIDGES—cont.					
Estimate No. 82-G.					
"C" class bridge at R.D. 12/4079.					
48.20 units.	Table-moulded brick work in lime mortar ..	27 12 0	100 c. ft.	1,343	
15 "	Outstone work ..	1 12 0	C. ft.	26	
No. 8 "	Guard stones ..	3 0 0	Each.	24	
30.53 units.	Plastering with portland cement, $\frac{3}{4}$ " thick, 1: 3 ..	6 12 0	100 sq. ft.	206	
8 "	Earthwork (excavating foundations and opening for abutments and wings outside the canal sectioning and felling in) ..	9 0 0	1,000 c. ft.	72	
2.09 "	Gravelling the road ..	4 7 0	100 "	9	
190 r. ft.	Roadway including Westwood's trough plates, cement concrete road metalling and gravelling including standards, wheel guards and hand rails ..	31 9 0	R. ft.	5,996	
5.75 units.	Road metalling for approaches with laterite stones ..	7 4 0	100 c. ft.	42	
302 cwt.	Roller-steel beams $20 \times 7\frac{1}{2} \times 59$ lb. ..	8 0 0	Cwt.	2,416	
10 pairs.	Stiffening frames ..	22 12 0	Pair.	223	
	Shed for materials ..		Lump sum.	120	
	Contingencies at 5 per cent ..			210	
	Petty supervision at $2\frac{1}{2}$ per cent ..			180	
	Total ..				10,800

Estimate No. 83-G. (Plan No. G-92).

Masonry bridge at R.D. 13/4907.

46.80 units.	Concrete broken brick in mortar ..	25 4 0	100 c. ft.	1,182	
374.20 "	Table-moulded brickwork in surki mortar ..	28 14 0	100 "	10,805	
122.58 "	Archwork ..	29 14 0	100 "	3,661	
237.00 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1: 3 ..	6 12 0	100 sq. ft.	1,660	
34.80 "	Revetment with laterite blocks ..	25 4 0	100 c. ft.	879	
11.60 "	Gravel backing, 6" thick ..	7 1 0	100 "	92	
88.90 "	Road metalling with laterite stones ..	9 4 0	100 "	822	
12 "	Excavating through red clay and gravel ..	6 2 0	100 "	74	
25 "	Do. vallam sand stones ..	10 11 0	100 "	267	
	Centerings for arches ..		Lump sum.	1,000	
	Shed for materials ..			220	
	Contingencies at 5 per cent ..			1,037	
	Petty supervision at $2\frac{1}{2}$ per cent ..			571	
	Total ..				22,200

Estimate No. 84-G.

Foot bridge at R. D. 13/6540.

217 c. ft.	Table-moulded brickwork in surki mortar ..	28 14 0	100 c. ft.	63	
7 "	Outstone work ..	1 12 0	1 "	12	
3 units.	Plastering with portland cement, $\frac{3}{4}$ " thick, 1: 3 ..	6 12 0	100 sq. ft.	20	
57.79 "	Roller-steel beams ..	8 0 0	Cwt.	462	
77½ r. ft.	Roadway including standards, hand rails, cleats and corrugated sheets, etc. ..	6 0 0	R. ft.	489	
	Shed for materials ..		Lump sum.	26	
	Contingencies at 5 per cent ..			53	
	Petty supervision at $2\frac{1}{2}$ per cent ..			25	
	Total ..				1,150

Estimate No. 85-G. (Plan No. G-93).

Special class girder bridge at R.D. 13/6768.

150.86 units.	Table-moulded brickwork in surki mortar ..	28 14 0	100 c. ft.	4,602	
55.29 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1: 3 ..	6 12 0	100 sq. ft.	373	
62 c. ft.	Outstone work ..	1 12 0	1 c. ft.	109	
Nos. 58 "	Guard stones ..	3 0 0	Each.	24	
70 units.	Earthwork excavating foundations, etc. ..	6 11 0	1,000 c. ft.	468	
117.75 "	Metalling the road with laterite stones ..	9 4 0	100 c. ft.	1,089	
1,045.8 cwt.	Roller-steel beams ..	8 0 0	Cwt.	8,366	
89 r. ft.	Roadway for the bridge with Westwood's trough plates, etc. ..	151 0 0	R. ft.	13,439	
26 pairs.	Stiffening frames ..	32 10 0	Pair.	848	
	Shed for materials ..		Lump sum.	300	
	Total ..			29,646	
	Contingencies at 5 per cent ..			1,600	
	Petty supervision at $2\frac{1}{2}$ per cent ..			754	
	Total ..				31,900
				Carried over ..	3,00,709

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
				Brought forward ..	3,00,709
G. BRIDGES—cont.					
Estimate No. 86-G.					
Special class girder bridge at R.D. 13/8890.					
55.6 units.	Concrete broken brick in surki mortar ..	25 4 0	100 c. ft.	1,404	
109.00 "	Table-moulded brickwork ..	28 14 0	100 "	3,147	
43.09 "	Plastering with portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	231	
36 "	Outstone work ..	1 12 0	1 c. ft.	63	
No. 8 "	Guard stones ..	3 0 0	Each.	24	
54 units.	Earthwork (excavating foundations, etc.—Same rates as per canal excavation) ..	6 11 0	1,000 c. ft.	361	
160.00 "	Metalling the road with laterite stone ..	9 4 0	100 "	1,480	
590.5 cwt.	Roller-steel beams ..	8 0 0	Cwt.	4,724	
89 r. ft.	Roadway for the bridge with Westwood's trough plate, etc. ..	86 14 3	R. ft.	7,723	
14 pairs.	Stiffening frames ..	32 10 0	Pair.	457	
	Shed for materials ..		Lump sum.	240	
	Total ..			19,924	
	Contingencies at 5 per cent ..			580	
	Petty supervision at $2\frac{1}{2}$ per cent ..			296	
	Total ..				20,800

Estimate No. 87-G.

Special class girder bridge at R.D. 14/0150.

55.6 units.	Concrete broken brick in surki mortar ..	25 4 0	100 c. ft.	1,404	
109.00 "	Table-moulded brickwork in ..	28 14 0	100 "	3,147	
43.09 "	Plastering with portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	231	
36 "	Outstone work ..	1 12 0	C. ft.	63	
No. 8 "	Guard stones ..	3 0 0	Each.	24	
54.00 units.	Earthwork (excavating foundations, etc.) ..	6 11 0	1,000 c. ft.	361	
160.00 "	Metalling road with laterite stone ..	9 4 0	100 c. ft.	1,480	
590.5 cwt.	Roller-steel beams ..	8 0 0	Cwt.	4,724	
89 r. ft.	Roadway for the bridge with Westwood's trough plate, etc., etc. ..	86 14 3	R. ft.	7,733	
14 pairs.	Stiffening frames ..	32 10 0	Pair.	457	
	Shed for materials ..		Lump sum.	240	
	Contingencies at 5 per cent ..			580	
	Petty supervision at $2\frac{1}{2}$ per cent ..			296	
	Total ..				20,800

Estimate No. 88-G. (Plan Nos. G. 94 and 95.)

Railway skew bridge with 3 spans of 50 feet at R.D. 14/0740 Railway line mileage 220/2.

73.000 units.	Excavation ..	12 0 0	1,000 c. ft.	876	
25.000 "	Filling in after foundations ..	5 0 0	1,000 "	125	
140.000 "	Concrete in surki mortar ..	18 0 0	100 c. ft.	2,520	
552.00 "	Masonry with stock bricks in lime mortar including cement plastering ..	40 0 0	100 c. ft.	22,080	
5.10 "	Coping stones set in lime mortar ..	75 0 0	100 "	893	
3.45 "	Girder bed stones including setting, complete ..	150 0 0	100 "	618	
40.00 "	Boulders filling between abutments ..	15 0 0	100 "	600	
108 tons.	New 50-span girders, complete ..	180 0 0	Ton.	19,440	
950 c. ft.	Teakwood sleepers including hoop iron ties ..	4 8 0	C. ft.	4,275	
No. 520 "	Bearing plates ..	0 6 0	Each.	195	
1.050 "	Spikes ..	0 1 0	"	66	
108 "	Erection and painting girders ..	30 0 0	Ton.	3,240	
60.00 units.	Pitching sides of abutments ..	15 0 0	100 c. ft.	900	
140 yds.	New 56 lb. permanent way excluding sleepers ..	7 0 0	L. yd.	980	
140 "	Laying permanent way ..	0 2 0	"	18	
140 "	Removing ..	0 1 0	"	9	
140 "	Removing and relaying 50 lb. permanent way ..	0 3 0	"	11	
60 "	Reballasting with gravel ..	35 0 0	1,000 c. ft.	175	
5,000 units.	Removing bank ..	5 0 0	1,000 "	900	
180,000 "	Refilling bank ..	7 0 0	1,000 "	420	
60,000 "					
				Carried over ..	3,42,309

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
			Brought forward ..	3,42,309	
G. BRIDGES—cont.					
Estimate No. 88-G (Plan Nos. G. 94 and 95)—cont.					
Railway skew bridge with 3 spans of 50 feet at R.D. 13/0740 Railway line mileage 220/2—cont.					
Temporary Diversion.					
381,000 c. ft.	Earthwork embankment	10 0 0	1,000 c. ft.	3,310	
3,500 "	Excavation for sleeper stacks	5 0 0	1,000 "	18	
4,400 "	Dry stone boulders at foundations ..	15 0 0	100 c. ft.	660	
No. 600	Hard wood sleepers for stacks	3 0 0	Each.	1,800	
140	Teak sleepers over stacks	4 0 0	C. ft.	560	
17 tons.	Old 40 lb. rails for platform	35 0 0	Ton.	595	
112	Teak sleepers for bridge	4 0 0	C. ft.	448	
112	Holding down bolts	0 3 0	lb.	209	
	Erection of rail platform including sleeper stacks and removing the same		Lump sum.	500	
2,250	Pitching with boulders at sides of sleeper stacks ..	15 0 0	100 c. ft.	338	
55,500	Sand ballast	15 0 0	1,000 c. ft.	833	
1,124	50 lb. (2nd class) permanent way including sleepers	8 8 0	L. yd.	9,554	
1,124	Laying and removing the above	0 3 0	"	211	
No. 2	New points and crossing 50 lb. complete	375 0 0	Set.	750	
2	New sleepers of sizes	450 0 0	"	900	
2	Laying and removing points and crossing including sleepers	15 0 0	Each.	30	
2	Caution boards	15 0 0	"	200	
2	Signals	100 0 0	"	24	
4	Gradient posts	6 0 0	"	100	
1	Watchman's hut	100 0 0	"	15	
	Laying and removing signals, caution boards, etc. ..		Lump sum.		
Miscellaneous.					
	Loading and unloading		Lump sum.	1,050	
	Carriage of materials		"	550	
	Contingencies at 5 per cent		"	4,046	
	Deduct the value of materials to be returned to stores		"	— 7,800	
	Add 10 per cent on stores		"	72,172	
	Total			3,42,309	80,594

Estimate No. 89-G.

"C" class bridge at R.D. 15/3100 (4 spans of 40 feet each).

For two abutments and wings.					
19-63 units.	Concrete broken bricks in surki mortar	20 8 0	100 c. ft.	402	
40-36 "	Table-moulded brick in lime mortar	23 14 0	100 "	964	
13-57 "	Laterite stone revetment	26 4 0	100 "	356	
4-62 "	Brick jelly backing	9 12 0	100 "	44	
17-15 "	Plastering with cement, $\frac{1}{4}$ " thick (1 cement to 3 sand)	6 12 0	100 sq. ft.	116	
6-28 "	Road metalling	19 4 0	100 c. ft.	121	
2-10 "	Gravelling	15 13 0	100 "	33	
3 "	Outstone work	1 12 0	C. ft.	5	
No. 8	Guard stones	3 0 0	Each.	24	
L. S.	Earthwork (excavating foundations and forming approaches)			100	
	Total			2,165	2,165
For three piers.					
8-80 units.	Concrete broken bricks in surki mortar	20 8 0	100 c. ft.	182	
13-98 "	Table-moulded brick in lime mortar	23 14 0	100 "	334	
9 "	Outstone work	1 12 0	C. ft.	16	
10-05 "	Plastering with cement, $\frac{3}{4}$ " thick (1 cement to 3 sand)	6 12 0	100 sq. ft.	68	
L. S.	Earthwork (excavating foundations, etc.)			30	
	Total			630	630
	Carried over			2,795	
	Carried over			4,22,903	

GRAND ANICUT CANAL SYSTEM—MAIN CANAL AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
			Brought forward ..	4,22,903	
G. BRIDGES—cont.					
Estimate No. 89-G—cont.					
"C" Class bridge at R.D. 15/3100 (4 spans of 40 feet each)—cont.					
172 sq. ft.	Roadway (including Westwood's trough plate with cement concrete, road metal, standards, etc.) ..	31 11 0	Square.	5,450	
307 cwt.	Roller-steel beams, 24" $\times$ 7 $\frac{1}{2}$ " $\times$ 100 lb.	8 0 0	Cwt.	2,456	
8 pairs.	Stiffening frames, "C" class	22 12 0	Pair	182	
	Shed for materials			117	8,205
	Total				11,000
	Contingencies at 5 per cent				550
	Petty supervision at 2 $\frac{1}{2}$ per cent				275
	Total				11,825
Estimate No. 90-G.					
"C" Class bridge at R.D. 16/4040.					
For abutments.					
19-63 units.	Concrete broken brick in surki mortar	23 2 0	100 c. ft.	464	
38-00 "	Table-moulded brick in lime mortar	26 3 0	100 "	995	
12-72 "	Concrete block revetment	24 1 0	100 "	303	
4-24 "	Brick jelly backing	11 15 0	100 "	50	
16-62 "	Plastering with cement, $\frac{3}{4}$ " thick (1 cement to 3 sand)	6 12 0	100 sq. ft.	112	
6-28 "	Road metalling	18 4 0	100 c. ft.	115	
2-10 "	Gravelling	14 15 0	100 "	31	
3 "	Outstone work	1 12 0	C. ft.	5	
No. 8	Guard stones	3 0 0	Each.	24	
	Total				2,192
Two piers.					
5-92 units.	Concrete broken brick in surki mortar	23 2 0	100 c. ft.	137	
8-62 "	Table-moulded brick in lime mortar	26 3 0	100 "	231	
6 "	Outstone work	1 12 0	C. ft.	11	
6-33 "	Plastering with cement, $\frac{3}{4}$ " thick	6 12 0	100 sq. ft.	43	
	Earthwork (excavating foundation, etc.)		Lump sum.	33	
	Total				452
123 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling, etc.	31 10 0	R. ft.	3,827	
246 r. ft. or 220 cwt.	Roller-steel beams, 24" $\times$ 7 $\frac{1}{2}$ " $\times$ 100 lb.	8 0 0	Cwt.	1,760	
6 pairs.	Stiffening frames, "C" class	22 12 0	Pair.	137	
	Shed for materials			92	5,806
	Total				8,450
	Contingencies at 5 per cent				425
	Supervision at 2 $\frac{1}{2}$ per cent				215
	Total				9,090
Estimate No. 91-G.					
"C" Class bridge at R.D. 17/6335, (3 spans of 35 feet each).					
For two abutments and wings.					
19-63 units.	Concrete broken bricks in surki mortar	25 0 0	100 c. ft.	491	
38-00 "	Table-moulded brick in lime mortar	27 14 0	100 "	1,059	
12-72 "	Laterite stone revetment	23 4 0	100 "	296	
4-24 "	Brick jelly backing	13 11 0	100 "	58	
16-62 "	Plastering with cement, $\frac{3}{4}$ " thick 1 : 3	6 12 0	1,000 sq. ft.	112	
6-28 "	Road metalling	16 4 0	100 c. ft.	102	
2-10 "	Gravelling	13 3 0	100 "	28	
31 s	Outstone work	1 12 0	C. ft.	5	
No. 8	Guard stones	3 0 0	Each.	24	
	Total				2,275
	Carried over				2,275
	Carried over				4,43,818

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
G. BRIDGES—cont.					
Estimate No. 91-G.				Brought forward ..	4,43,818
				Brought forward ..	2,275
"C" Class bridge at R.D. 17/6335 (3 spans of 35 feet each)—cont.					
Two piers.					
5-92 units.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	148	
882 "	Table-moulded brick in lime mortar	27 14 0	100 "	246	
6 "	Cutstone work	1 12 0	C. ft.	11	
6-33 "	Cement plastering, $\frac{3}{4}$ " thick	6 12 0	100 sq. ft.	43	
	Excavating foundations		Lump sum.	30	
	Total				478
123 r. ft.	Roadway including Westwood's trough plates, cement concrete, road metalling, etc.	31 8 0	R. ft.	3,875	
246 r. ft.	Roller-steel beams 24" $\times$ 7 $\frac{1}{2}$ " $\times$ 100 lb.	8 0 0	Cwt.	1,760	
or 220 cwt.	Stiffening frames, "C" class	22 12 0	Pair.	137	
6 pairs.	Shed for materials		Lump sum.	85	5,857
	Total				8,610
	Contingencies at 5 per cent				430
	Petty supervision at 2 $\frac{1}{2}$ per cent				220
	Total				9,260

Estimate No. 92-G.

"C" Class bridge at R.D. 18/4900 of 3 spans of 38 feet.

For two abutments and wings.					
19-63 units.	Concrete broken bricks in surki mortar	25 15 0	100 c. ft.	509	
30-00 "	Table-moulded brick in lime mortar	28 12 0	100 "	1,093	
12-72 "	Laterite stone revetment	21 4 0	100 "	270	
4-24 "	Brick jelly backing	14 9 0	100 "	62	
16-62 "	Plastering with cement, $\frac{3}{4}$ " thick (1 cement to 3 sand)	6 12 0	100 sq. ft.	113	
6-28 "	Road metalling	14 4 0	100 c. ft.	89	
2-10 "	Gravelling	11 7 0	100 "	24	
3 "	Cutstone work	1 12 0	C. ft.	5	
No. 8	Guard stones	3 0 0	Each.	24	
L. S.	Earthwork, excavating foundations, forming approaches.			100	
	Total				2,288
Two piers.					
5-92 units.	Concrete broken bricks in surki mortar	25 15 0	100 c. ft.	154	
8-32 "	Table-moulded brick in lime mortar	28 12 0	100 "	251	
6 "	Cutstone work	1 12 0	C. ft.	11	
6-33 "	Plastering with cement, $\frac{3}{4}$ " thick (1 cement to 3 sand)	6 12 0	100 sq. ft.	43	
L.S.	Earthwork, excavating foundations, etc.			30	
	Total				462
123 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling, standards, etc.	31 8 0	R. ft.	3,859	
246 r. ft.	Roller-steel beams 24" $\times$ 7 $\frac{1}{2}$ " $\times$ 100 lb.	8 0 0	Cwt.	1,760	
or 220 cwt.	Stiffening frames "C" class	22 12 0	Pair.	137	
6 pairs.	Shed for materials			84	5,810
	Total				8,620
	Contingencies at 5 per cent				431
	Petty supervision at 2 $\frac{1}{2}$ per cent				219
	Total				9,270
Carried over ..					4,62,348

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
G. BRIDGES—cont.					
Estimate No. 93-G.				Brought forward ..	4,62,348
"B" Class bridge at R.D. 19/2000 (3 spans of 38 feet each).					
Abutments as per standard estimate for 35' span bridge.					
20-05 units.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	501	
39-37 "	Table-moulded brick in lime mortar	27 14 0	100 "	1,097	
12-72 "	Laterite stone revetment	22 4 0	100 "	277	
4-24 "	Brick jelly backing	13 11 0	100 "	58	
16-74 "	Plastering with cement $\frac{3}{4}$ " thick (1 cement to 3 sand)	6 12 0	100 sq. ft.	113	
32-76 "	Road metalling	15 14 0	100 c. ft.	500	
10-10 "	Gravelling	12 5 0	100 "	124	
5-0 "	Cutstone work	1 12 0	C. ft.	9	
	Earthwork, excavating foundations, etc.		Lump sum.	100	
No. 8	Guard stones	3 0 0	Each.	24	
	Total				2,803
Two piers.					
6-60 units.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	165	
9-75 "	Table-moulded brick in lime mortar	27 14 0	100 "	272	
7-00 "	Plastering with cement, $\frac{3}{4}$ " thick (1 cement to 3 sand)	6 12 0	100 sq. ft.	47	
10-00 "	Cutstone work	1 12 0	c. ft.	18	
	Earthwork, excavating foundations, etc.		Lump sum.	30	
	Total				532
123 r. ft.	Roadway including Westwood's trough plate, etc.	39 13 0	R. ft.	4,897	
123 r. ft. or 305 cwt.	(1) Roller-steel beam 24" $\times$ 7 $\frac{1}{2}$ " $\times$ 100 lb.	8 0 0	Cwt.	2,440	
	(2) roller-steel beam 20" $\times$ 7 $\frac{1}{2}$ " $\times$ 89 lb. for roadway.				
6 pairs.	Stiffening frames, etc.	35 8 0	Pair.	213	
	Shed for materials		Lump sum.	115	
	Total				7,865
	Contingencies at 5 per cent				11,000
	Petty supervision at 2 $\frac{1}{2}$ per cent				550
	Total				250
	Total				11,800
Estimate No. 94-G.					
"C" Class bridge at R.D. 20/5250 (3 spans of 35 feet each).					
For abutments.					
19-63 units.	Concrete broken brick in surki mortar	23 2 0	100 c. ft.	454	
36-00 "	Table-moulded brick in lime mortar	26 3 0	100 "	943	
11-90 "	Laterite stone for revetment	22 4 0	100 "	265	
3-97 "	Brick jelly backing	11 15 0	100 "	47	
16-09 "	Plastering with portland cement $\frac{3}{4}$ " thick 1:3	6 12 0	100 sq. ft.	109	
6-28 "	Road metalling	15 4 0	100 c. ft.	98	
2-10 "	Gravelling	12 5 0	100 "	26	
	Cutstone work	1 12 0	C. ft.	5	
	Earthwork, excavating foundations, etc.		Lump sum.	100	
No. 8	Guard stones	3 0 0	Each.	24	
	Total				2,069
Two piers.					
5-92 units.	Concrete broken brick in surki mortar	23 2 0	100 c. ft.	137	
8-31 "	Table-moulded brick in lime mortar	26 3 0	100 "	218	
6 "	Cutstone work	1 12 0	C. ft.	11	
5-46 "	Plastering with portland cement $\frac{3}{4}$ " thick 1:3	6 12 0	100 sq. ft.	40	
	Excavating foundations, etc.		Lump sum.	30	
	Total				436
Carried over ..					2,505
Carried over ..					4,74,148

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
G. BRIDGES—cont.					
				Brought forward ..	4,74,148
				Brought forward ..	2,505
Estimate No. 94-G.—cont.					
"C" Class bridge at R.D. 20/5250 (3 spans of 35 feet each)—cont.					
1-14 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling and gravelling including standards, etc.	31 6 0	R. ft.	3,577	
228 r. ft. or 181 cwt. 6 pairs.	Rolled-steel beams 20" X 7½" X 82 lb. ..	8 0 0	Cwt.	1,448	
	Stiffening frames "C" class ..	22 12 0	Pair.	137	
	Shed for materials ..		Lump sum.	83	5,246
	Total ..				7,750
	Contingencies at 5 per cent ..			390	390
	Petty supervision at 2½ per cent ..			200	200
	Total ..				8,340

Estimate No. 95-G.

"C" Class bridge at R.D. 21/4000 (3 spans of 35 feet each).

For two abutments and wings.					
19-63 units.	Concrete broken bricks in surki mortar ..	21 4 0	100 c. ft.	417	
36-00 "	Table moulded brick in lime mortar ..	24 8 0	100 "	882	
11-90 "	Laterite stone revetment ..	22 4 0	100 "	265	
3-97 "	Brick jelly backing ..	10 4 0	100 "	49	
16-09 "	Cement plastering, ¾" thick (1 cement to 3 sand) ..	6 12 0	100 sq. ft.	109	
6-28 "	Road metalling ..	15 4 0	100 c. ft.	96	
2-10 "	Gravelling ..	12 5 0	100 "	26	
3 "	Cutstone work ..	1 12 0	C. ft.	5	
No. 8	Guard stones ..	3 0 0	Each.	24	
	Earthwork excavating foundations, etc., and forming approaches.		Lump sum.	100	
	Total ..				1,973
Two piers.					
5-92 units.	Concrete broken bricks in surki mortar ..	21 4 0	100 c. ft.	126	
8-31 "	Table-moulded brick in lime mortar ..	24 8 0	100 "	204	
6 "	Cutstone work ..	1 12 0	C. ft.	11	
5-96 "	Cement plastering, ¾" thick (1 cement to 3 sand) ..	6 12 0	100 sq. ft.	40	
	Earthwork (excavating foundations, etc.) ..		Lump sum.	30	
	Total ..				411
114 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling, standards, etc.	31 6 0	rt. ft.	3,577	
228 r. ft. or 181 cwt. 6 pairs.	Rolled-steel beams 20" X 7½" X 89 lb. ..	8 0 0	Cwt.	1,448	
	Stiffening frames "C" Class ..	22 12 0	Pair.	137	
	Shed for materials ..			74	5,236
	Total ..				7,620
	Contingencies at 5 per cent ..			381	
	Petty supervision at 2½ per cent ..			189	
	Total ..				8,190
				Carried over ..	4,90,678

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
G. BRIDGES—cont.					
				Brought forward ..	4,90,678
Estimate No. 96-G.					
"C" Class bridge at R.D. 22/6750 (3 spans of 35 feet).					
For two abutments and wings.					
19-63 units.	Concrete broken bricks in surki mortar ..	24 11 0	100 c. ft.	485	
36-00 "	Table moulded brick in lime mortar ..	24 14 0	100 "	896	
11-90 "	Laterite stone revetment ..	22 4 0	100 "	265	
3-97 "	Brick jelly backing ..	10 10 0	100 "	42	
16-09 "	Plastering with cement, ¾" thick (1 cement to 3 sand).	6 12 0	100 sq. ft.	109	
6-28 "	Road metalling ..	15 4 0	100 c. ft.	96	
2-10 "	Gravelling ..	12 5 0	100 "	26	
3 "	Cutstone work ..	1 12 0	C. ft.	5	
No. 8	Guard stones ..	3 0 0	Each.	24	
	Earthwork (excavating foundations, etc., and making up approaches).		Lump sum.	100	
	Total ..				2,048
	Contingencies at 5 per cent ..			102	
	Petty supervision at 2½ per cent ..			50	
	Total ..				2,200
For two piers.					
5-92 units.	Concrete broken bricks in surki mortar ..	24 11 0	100 c. ft.	148	
8-31 "	Table-moulded brick in lime mortar ..	24 14 0	100 "	207	
6 "	Cutstone work ..	1 12 0	C. ft.	11	
5-96 "	Cement plastering, ¾" thick (1 cement to 3 sand) ..	6 12 0	100 sq. ft.	40	
	Excavating foundations, etc., earthwork ..		Lump sum.	30	
	Total ..				434
	Contingencies at 5 per cent ..			22	
	Petty supervision at 2½ per cent ..			11	
	Total ..				467
114 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling and gravelling including standards, etc.	31 6 0	R. ft.	3,577	
228 r. ft. or 181 cwt. 6 pairs.	Rolled-steel beams 20" X 7½" X 89 lb. ..	8 0 0	Cwt.	1,448	
	Stiffening frames "C" class ..	22 12 0	Pair.	137	
	Shed for materials ..			76	
	Total ..				5,238
	Contingencies at 5 per cent ..			262	
	Petty supervision at 2½ per cent ..			133	
	Total ..				5,633
	Total ..				8,300
Estimate No. 97-G.					
"C" Class bridge at R.D. 24/3796.					
Under abutments and wings.					
17-10 units.	Concrete broken brick in surki mortar ..	23 3 0	100 c. ft.	397	
31-20 "	Table moulded brick in lime mortar ..	25 14 0	100 "	808	
13-44 "	Laterite stone revetment ..	24 4 0	100 "	326	
4-48 "	Gravel backing to revetment ..	9 11 0	100 "	43	
14-60 "	Plastering with cement, ¾" thick (1 : 3) ..	6 12 0	100 "	98	
6-30 "	Road metalling ..	17 4 0	100 "	109	
3 "	Cutstone work ..	1 12 0	C. ft.	5	
No. 8	Earthwork excavating foundations, etc.		Lump sum.	75	
2-10 units.	Gravelling ..	3 0 0	Each.	24	
		9 11 0	100 c. ft.	20	
	Total ..				1,905
	Contingencies at 5 per cent ..			95	
	Supervision at 2½ per cent ..			50	
	Total ..				2,050
				Carried over ..	2,050
				Carried over ..	4,98,978

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
			Brought forward ..	4,98,978	
			Brought forward ..	2,050	
G. BRIDGES—cont.					
Estimate No. 97-G—cont.					
"C" Class bridge at R.D. 24/3796—cont.					
One pier.					
2-96 units.	Concrete broken brick in surki mortar ..	23 3 0	100 c. ft.	69	
4-15 "	Table moulded brick in lime mortar ..	25 14 0	100 "	107	
2-98 "	Plastering with cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	20	
L.S. "	Earthwork excavating foundations, etc. ..		Lump sum.	3	
3 c. ft.	Cutstone work ..	1 12 0		5	
	Total ..			204	
	Contingencies at 5 per cent ..			10	
	Supervision at $2\frac{1}{2}$ per cent ..			6	
	Total for one pier ..			220	
	Total for two piers ..			2 × 220	440
111 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling and gravelling including standards, hand rails, etc. ..	31 8 0	R. ft.	3,497	
2 + 111 r. ft. or 176 cwt. 6 pairs.	Rolled-steel beams, 20" × 7" × 89 lb. ..	8 0 0	Cwt.	1,408	
	Stiffening frames for "C" class ..	22 12 0	Pair.	137	
	Shed for materials ..			78	
	Making approaches ..			40	
	Total ..			5,160	
	Total ..			7,650	

Estimate No. 98-G.

Foot Bridge at R.D. 24/9530.

Abutments.					
1-30 units.	Concrete broken bricks in surki mortar ..	24 7 0	100 c. ft.	32	
1-26 "	Table moulded brick in lime mortar ..	25 14 0	100 "	34	
4-5 "	Cutstone work ..	1 12 0	C. ft.	8	
L.S. "	Earthwork excavating foundations ..			5	
	Total ..			79	
	Contingencies at 5 per cent ..			4	
	Supervision at $2\frac{1}{2}$ per cent ..			3	
	Total ..			86	
For one pier.					
1-59 units.	Concrete broken brick in surki mortar ..	24 7 0	100 c. ft.	39	
1-49 "	Table moulded brick in lime mortar ..	25 14 0	100 "	40	
2-8 "	Cutstone work ..	1 12 0	C. ft.	5	
1-83 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement to 3 sand) ..	6 12 0	100 sq. ft.	12	
L.S. "	Earthwork excavating foundations ..		Lump sum.	3	
	Total ..			99	
	Contingencies at 5 per cent ..			5	
	Supervision at $2\frac{1}{2}$ per cent ..			3	
	Total for one pier ..			107	
	Total for three piers ..			3 × 107	321
108 cwt. 144 r. ft.	Rolled-steel girders ..	8 0 0	Cwt.	864	
	Roadway including standards, etc. ..	6 5 0	R. ft.	909	
	Sheds for materials, etc. ..			30	
	Making up approaches ..			40	
	Total ..			1,843	
	Total ..			2,250	
	Carried over ..			5,08,878	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
			Brought forward ..	5,08,878	
G. BRIDGES—cont.					
Estimate No. 99-G.					
"C" Class bridge at R.D. 25/61-30.					
Under abutments and wings.					
17-78 units.	Concrete broken bricks in surki mortar ..	23 6 0	100 c. ft.	416	
32-50 "	Table moulded brick in lime mortar ..	25 0 0	100 "	845	
13-44 "	Concrete block revetment ..	24 7 0	100 "	328	
4-48 "	Gravel backing to revetment ..	7 1 0	100 "	32	
14-91 "	Plastering with cement, $\frac{3}{4}$ " thick (1 : 3) ..	6 12 0	100 sq. ft.	101	
2-10 "	Road metalling ..	18 4 0	100 c. ft.	115	
6-30 "	Gravelling ..	7 1 0	100 "	15	
2-10 "	Cutstone work ..	1 12 0	C. ft.	5	
3 "	Guard stones ..	3 0 0	Each.	24	
No. 8	Earthwork excavating foundation, etc. ..			30	
	Total ..			1,981	
	Contingencies ..			99	
	Petty supervision ..			50	
	Total ..			2,110	
For one pier.					
2-96 units.	Concrete broken bricks in surki mortar ..	23 6 0	100 c. ft.	69	
4-15 "	Table moulded brick in lime mortar ..	25 0 0	100 "	108	
2-98 "	Plastering with Portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	20	
3 "	Cutstone work ..	1 12 0	C. ft.	5	
	Earthwork excavating foundations, etc. ..			8	
	Total ..			210	
	Contingencies and supervision ..			16	
	Total for 1 pier ..			226	
	Total for 2 piers ..			452	
108 units.	Roadway including Westwood's trough plate, cement concrete, etc. ..	31 8 0	R. ft.	3,402	
2 × 108 or 172 lb 6 pairs.	Rolled steel beams, 20" × 7 $\frac{1}{2}$ " × 89 lb. ..	8 0 0	Cwt.	1,376	
	Stiffening frames for "C" class bridge ..	22 12 0	Pair.	137	
	Shed for materials and making up approaches ..			128	
	Total ..			5,038	
	Total ..			7,600	

Estimate No. 100-G.

"B" Class girder bridge at R.D. 28/38-30.

17-40 units.	Concrete broken bricks in surki mortar ..	22 13 0	100 c. ft.	396	
32-40 "	Table moulded brick work in lime mortar ..	25 2 0	100 "	814	
13-4 "	Concrete block revetment ..	24 0 0	100 "	323	
4-48 "	Gravel backing to revetment ..	6 3 0	100 "	28	
13-88 "	Plastering with cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	94	
3-80 "	Road metalling, etc. ..	17 4 0	100 c. ft.	152	
2-90 "	Gravelling ..	6 3 0	100 "	18	
5 "	Cutstone work ..	1 12 0	C. ft.	9	
No. 8	Guard stones ..	3 0 0	Each.	24	
	Earthwork excavating foundation, etc. ..		Lump sum.	82	
	Total ..			1,940	
	Contingencies ..			97	
	Supervision ..			48	
	Total ..			2,085	
For one pier.					
3-30 units.	Concrete broken bricks in surki mortar ..	22 13 0	100 c. ft.	75	
5-24 "	Table moulded brick work in lime mortar ..	25 2 0	100 "	132	
5 "	Cutstone work ..	1 12 0	C. ft.	9	
3-20 "	Plastering with cement $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	22	
	Excavating foundations, etc. ..		Lump sum.	5	
	Total ..			243	
	Contingencies and supervision ..			17	
	Total for one pier ..			260	
	Total for two piers ..			520	
	Carried over ..			2,605	
	Carried over ..			5,16,478	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

G. BRIDGES—cont.

Estimate No. 100-G.—cont.

Brought forward .. 5,16,478

Brought forward .. 2,605

"B" Class girder bridge at R.D. 28/38'30—cont.

For one pier—cont.					
230 cwt.	Rolled steel beams ..	8 0 0	Cwt.	1,840	
108 r. ft.	Roadway including Westwood's trough plate, etc.,	39 7 0	R. ft.	4,259	
6 pairs.	Stiffening frames, "B" class ..	35 8 0	Pair.	213	
	Shed for materials ..			83	
	Meeting up approaches ..			100	
	Total ..				6,495
	Grand total ..				9,100

Estimate No. 101-G.

"C" Class bridge at R.D. 28/5135.

Abutments and wings.					
18-80 units.	Concrete broken bricks in surki mortar ..	22 13 0	100 c. ft.	429	
28-80 "	Table moulded brick in lime mortar ..	25 11 0	100 "	719	
12-60 "	Concrete block revetment ..	23 14 0	100 "	306	
4-20 "	Gravel backing ..	4 7 0	100 "	19	
16-50 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	111	
6-30 "	Road metalling ..	19 4 0	100 c. ft.	121	
2-10 "	Gravelling ..	4 7 0	100 "	9	
3 "	Cutstones ..	1 12 0	C. ft.	5	
No. 8	Guard stones ..	3 0 0	Each.	24	
	Earthwork, excavation, etc. ..		Lump sum.	94	
	Total ..				1,840
One pier.					
2-96 units.	Concrete in surki mortar ..	22 13 0	100 c. ft.	68	
3-90 "	Table moulded brick in lime mortar ..	25 11 0	100 "	100	
3 "	Cutstone work ..	1 12 0	C. ft.	5	
2-80 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	19	
	Earthwork, excavation, etc. ..		Lump sum.	8	
	Total ..				200
	For two piers — 2 × 200 ..				400
Two piers.					
105 r. ft.	Roadway including Westwood's trough plate, cement, concrete road metalling, etc.	31 8 0	R. ft.	3,308	
210 r. ft. or 167 cwt.	Rolled steel beams, 20' × 7½' × 89 lb.	8 0 0	Cwt.	1,318	
6 pairs.	Stiffening frames, "C" class ..	28 12 0	Pair.	187	
	Shed for materials ..			79	
	Total ..				4,860
	Contingencies at 5 per cent ..			110	
	Petty supervision at 3 per cent ..			60	
	Meeting up approaches ..			100	
	Total ..				270
	Grand total ..				7,370
	Carried over ..				5,32,948

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

G. BRIDGES—cont.

Brought forward .. 5,32,948

Estimate No. 102-G.

"C" Class bridge at R.D. 29/36'35.

Abutments and wings.					
18-80 units.	Concrete, broken brick in surki mortar ..	22 2 0	100 c. ft.	416	
28-80 "	Table moulded brick in lime mortar ..	25 2 0	100 "	704	
12-60 "	Concrete blocks for revetment and apron ..	23 2 0	100 "	292	
4-20 "	Gravel backing ..	3 9 0	100 "	15	
16-50 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	111	
6-30 "	Road metalling ..	19 4 0	100 c. ft.	121	
2-10 "	Gravelling ..	3 9 0	100 "	8	
3 "	Cutstone ..	1 12 0	C. ft.	5	
No. 8	Wheel guard stones ..	3 0 0	Each.	24	
	Earthwork excavation, etc. ..		Lump sum.	94	
	Total ..				1,79
One pier.					
2-96 units.	Concrete in surki mortar ..	22 2 0	100 c. ft.	65	
3-90 "	Table moulded brick in lime mortar ..	25 2 0	100 "	98	
3 "	Cutstone work ..	1 12 0	C. ft.	5	
2-80 "	Cement plastering, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	19	
	Earthwork, excavation, etc. ..		Lump sum.	23	
	Total ..				210
	For two piers 2 × 210 ..				420
Two piers.					
90 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling, etc.	31 8 0	R. ft.	2,835	
180 r. ft. or 121 cwt.	Rolled steel beams 18" × 7" × 75 lb.	8 0 0	Cwt.	968	
	Shed for materials ..		Lump sum.	87	
	Total ..				6,100
	Contingencies at 5 per cent ..			110	
	Supervision at 3 per cent ..			60	
	Meeting up approaches ..			80	
	Total ..				6,350

Estimate No. 103-G.

Girder bridge "C" class at R.D. 31/7325.

20-7 units.	Concrete brick jelly in surki mortar ..	24 2 0	100 c. ft.	499	
37-90 "	Table moulded brick in lime mortar ..	25 12 0	100 "	1,014	
6 "	Cutstone work ..	1 12 0	C. ft.	11	
13-50 "	Revetment with concrete blocks ..	25 1 0	100 c. ft.	388	
4-50 "	Gravel backing to revetments ..	7 1 0	100 "	32	
18-00 "	Plastering with Portland cement $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	122	
6-3 "	Road metalling with laterite, broken ..	18 4 0	100 c. ft.	115	
2-1 "	Gravelling ..	7 1 0	100 c. ft.	15	
	Earthwork excavation and filling in ..		Lump sum.	84	
8 No.	Guard stones ..	3 0 0	Each.	24	
86 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling, including standards, wheel guards, hand rails, etc.	31 8 0	R. ft.	2,709	
153-57 units.	Rolled steel beams 24" × 7½" × 100 lb.	8 0 0	Cwt.	1,229	
4 sets	Stiffening frames ..	22 12 0	Set.	91	
	Shed for material ..			67	
	Total ..				6,350
	Contingencies at 5 per cent ..			110	
	Petty supervision at 2½ per cent ..			60	
	Total ..				6,520
	Carried over ..				5,45,818

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
G. BRIDGES—cont.					
Estimate No. 104-G.					
Girder bridge "C" class at R.D. 34/6500.					
15.12 units.	Concrete broken stone in surki mortar ..	24 14 0	100 c. ft.	376	
84.10 "	Table moulded brick in ordinary mortar ..	27 8 0	100 "	938	
6 "	Outstone work ..	1 12 0	C. ft.	11	
12.60 "	Revetment with concrete blocks ..	25 12 0	100 c. ft.	324	
3.40 "	Gravel backing ..	4 7 0	100 "	15	
17.80 "	Plastering with cement, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	120	
11.00 "	Road metalling lead 14 miles ..	17 4 0	100 c. ft.	190	
3.70 "	Gravelling ..	4 7 0	100 "	16	
	Earthwork excavation and forming approaches ..	Lump sum.		50	
No. 8	Guard stones ..	3 0 0	Each.	24	
56 r. ft.	Roadway including Westwood's trough plate, cement concrete, road, metalling, gravelling, including standards, wheelguards and hand rails.	31 6 0	R. ft.	1,757	
62 cwt.	Roller steel beams, 16" $\times$ 6" $\times$ 62 lb. at Rs. 8 per cwt.	8 0 0	Cwt.	496	
	Shed for materials ..			4,317	
	Contingencies ..			43	
	Petty supervision ..			110	
	Petty supervision ..			50	
	Total ..				4,520

Estimate No. 105-G.

Girder bridge "C" class at R.D. 35/6900.

15.12 units.	Concrete broken brick in surki mortar ..	23 13 0	100 c. ft.	360	
36.10 "	Table moulded brick in lime mortar ..	26 9 0	160 "	906	
6 "	Outstone work ..	1 12 0	C. ft.	11	
12.60 "	Revetment with concrete blocks ..	24 12 0	100 c. ft.	312	
3.40 "	Gravel backing ..	3 9 0	100 "	12	
17.80 "	Plastering with cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	120	
8.15 "	Road metalling ..	16 4 0	100 c. ft.	132	
2.72 "	Gravelling ..	3 9 0	100 "	10	
	Earthwork excavating foundations ..	Lump sum.		25	
	Guard stones ..	3 0 0	Each.	24	
56 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling, gravelling, including standard wheel guards and hand rails.	31 6 0	R. ft.	1,757	
62 cwt.	Roller steel beams 16" $\times$ 6" $\times$ 62 lb.	8 0 0	Cwt.	496	
	Shed for materials ..			50	
	Contingencies at 5 per cent ..			105	
	Petty supervision at 2½ per cent ..			50	
	Total ..				4,370

Estimate No. 106-G.

Girder bridge "C" class at R.D. 37/7000.

Abutment and wings.					
15.64 units.	Concrete broken brick jelly in surki mortar ..	20 6 0	100 c. ft.	319	
25.20 "	Table moulded brick in mortar ..	24 0 0	100 "	605	
11.00 "	Concrete block revetment ..	21 8 0	100 "	237	
3.64 "	Gravel backing ..	3 9 0	100 "	13	
14.00 "	Plastering with portland cement ..	6 12 0	100 sq. ft.	95	
9.30 "	Road metalling lead 10 miles ..	15 4 0	100 c. ft.	142	
3.10 "	Gravelling ..	4 0 0	100 "	12	
5 "	Outstone work ..	1 12 0	C. ft.	5	
Lump sum.	Earthwork excavating foundations and forming approaches ..	Lump sum.		50	
No. 3	Guard stones ..	3 0 0		24	
	Total ..				1,502
	Contingencies ..				75
	Petty supervision ..				43
	Carried over ..				1,622
	Carried over ..				5,54,708

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
G. BRIDGES—cont.					
Estimate No. 106-G.—cont.					
Girder bridge "C" class at R.D. 37/7000—cont.					
One pier.					
3.00 units.	Concrete broken brick in surki mortar ..	20 6 0	100 c. ft.	61	
3.34 "	Table moulded brick in mortar ..	24 0 0	100 "	80	
3.00 "	Plastering with portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	20	
3 "	Outstone work ..	1 12 0	C. ft.	5	
	Earthwork excavating foundations ..	Lump sum.		4	
	Total ..				170
	Contingencies ..				8
	Petty supervision ..				4
	Total ..				182
	Total ..				1,802
56 units.	Roadway including Westwood's trough plate, cement concrete, etc. ..	31 2 0	R. ft.	1,743	
62 "	Roller steel beams 2 $\times$ 56" $\times$ 16" $\times$ 62 lb. ..	8 0 0	Cwt.	496	
	Shed for materials ..			59	
	Total ..				2,298
	Grand total ..				4,100
Estimate No. 107-G.					
"B" Class bridge at R.D. 38/8000.					
Abutments and wings.					
1,650 c. ft.	Concrete broken brick in surki mortar ..	22 13 0	100 c. ft.	376	
2,510 "	Table moulded brick in lime mortar ..	26 0 0	100 "	652	
1,100 "	Concrete block revetment ..	23 12 0	100 "	261	
354 "	Gravel backing ..	3 9 0	100 "	13	
1,380 sq. ft.	Plastering with cement ..	6 12 0	100 sq. ft.	93	
2,142 "	Road metalling ..	15 4 0	100 c. ft.	327	
714 "	Gravelling ..	3 9 0	100 "	26	
5 "	Outstone work ..	1 12 0	C. ft.	9	
No. 8	Earthwork excavating and forming approaches ..	Lump sum.		50	
	Guard stones ..	3 0 0	Each.	24	
	Total ..				1,831
	Contingencies ..				90
	Petty supervision ..				49
	Total ..				1,970
One pier.					
330 c. ft.	Concrete broken brick in surki mortar ..	22 13 0	100 c. ft.	75	
412 "	Table moulded brick in mortar ..	26 0 0	100 "	107	
300 s. ft.	Plastering with cement ..	6 12 0	100 sq. ft.	20	
	Earthwork excavating foundation ..			4	
	Total ..				206
	Contingencies ..				9
	Petty supervision ..				5
	Total ..				220
56 units.	Roadway including Westwood's trough plate, etc. ..	39 10 0	R. ft.	2,219	
93 cwt.	Roller steel beam 16" $\times$ 6" $\times$ 62 lb. for roadway ..	8 0 0	Cwt.	744	
	Shed for materials ..			57	
	Total ..				3,020
	Add for a road culvert to pass cross drainage ..	Lump sum.			750
	Total ..				5,960
	Carried over ..				5,64,768

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

G. BRIDGES—cont.

Brought forward 5,64,768

Estimate No. 108-G.

"C" Class bridge at R.D. 39/7500.

Abutments and wings.					
15-64 units.	Concrete in surki mortar ..	23 4 0	100 c. ft.	364	
25-20 "	Table moulded brick in mortar ..	26 4 0	100 "	662	
11-00 "	Concrete block revetment ..	24 3 0	100 "	266	
3-64 "	Gravel backing ..	4 7 0	100 "	16	
14-00 "	Plastering with cement ..	6 12 0	100 "	95	
9-30 "	Road metalling lead 10 miles ..	13 4 0	100 "	123	
3-10 "	Gravelling ..	4 7 0	100 "	14	
3 c. ft.	Outstone work ..	1 12 0	C. ft.	5	
L. S.	Earthwork including forming approaches ..		Lump sum.	50	
No. 8.	Guard stones ..	3 0 0	Each.	24	
Total ..				1,619	
Contingencies and petty supervision ..				121	
Total ..					1,740
One pier.					
3-00 units.	Concrete in surki mortar ..	23 4 0	100 c. ft.	70	
3-34 "	Table moulded brick in mortar ..	26 4 0	100 "	88	
3-00 "	Plastering with portland cement ..	6 12 0	100 sq. ft.	20	
3 c. ft.	Outstone work ..	1 12 0	C. ft.	5	
L. S.	Earthwork including forming approaches ..		Lump sum.	4	
	Contingencies and supervision ..			13	
Total ..					200
50 r. ft.	Roadway including Westwood's trough plate metalling and gravelling ..	31 3 0	R. ft.	1,559	
37-6 units.	Roller steel beams 2 X 50 X 15" X 5" 42 lb. ..	8 0 0	Cwt.	309	
	Shed for materials ..			41	
Total ..					1,900
Total ..					3,840

Estimate No. 109-G.

Foot bridge at R.D. 40/2500 (3 spans of 25 feet).

For abutment, etc.					
1-30 units.	Concrete broken brick in surki mortar ..	23 4 0	100 c. ft.	30	
1-40 "	Table moulded brick in mortar ..	26 4 0	100 "	37	
5 c. ft.	Outstone work ..	1 12 0	C. ft.	9	
	Earthwork excavating foundations and forming ramps ..		Lump sum.	16	
	Contingencies ..			5	
	Petty supervision ..			3	
Total ..				100	
For one pier.					
1-60 units.	Concrete in surki mortar ..	23 4 0	100 c. ft.	37	
1-10 "	Table moulded brick in mortar ..	26 4 0	Do.	29	
3 c. ft.	Outstone work ..	1 12 0	C. ft.	5	
1-40 units.	Cement plastering ..	6 12 0	100 sq. ft.	9	
	Earthwork excavating foundation ..		Lump sum.	10	
	Contingencies and petty supervision ..			10	
Total ..				100	
Carried over ..					5,68,608

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

G. BRIDGES—cont.

Estimate No. 109-G—cont.

Foot bridge at R.D. 40/2500 (3 spans of 25 feet)—cont.

46-87 cwt.	Roller steel girder ..	8 0 0	Cwts.	375	
82 r. ft.	Roadway including standards, hand-rails, cleats and corrugated sheets ..	6 5 0	R. ft.	518	
Abstract.					
No. 1.	Abutments ..	460 0 0	Each.	100	
No. 2.	Piers ..	100 0 0		200	
46-87 cwt.	Roller steel girder ..	0 0 8	Cwt.	375	
82	Roadway including standards, etc. ..	6 5 0	R. ft.	518	
Total ..				1,193 or 1,200	

Estimate No. 110-G.

"C" Class bridge at R.D. 42/2000 (1 span of 40 feet).

15-64 units.	Concrete in surki mortar ..	24 4 0	100 c. ft.	380	
25-20 "	Table moulded brick in mortar ..	27 2 0	100 "	684	
11-00 "	Laterite block revetment and pitching ..	19 4 0	100 "	212	
3-64 "	Gravel backing ..	7 1 0	100 "	26	
14-00 "	Plastering with cement ..	6 12 0	100 sq. ft.	95	
9-30 "	Road metalling, lead 9 miles ..	12 4 0	100 c. ft.	114	
3-10 "	Gravelling ..	7 1 0	100 "	22	
3 c. ft.	Outstone work ..	1 12 0	C. ft.	5	
No. 8.	Earthwork including forming approaches ..		Lump sum.	50	
	Guard stones ..	3 0 0	Each.	24	
	Contingencies ..			80	
	Petty supervision ..			40	
Total ..					1,732
43 r. ft.	Roadway including Westwood's trough plates, metalling, etc., complete ..	31 2 0	R. ft.	1,338	
78-6 cwt.	Roller steel girders, 2 X 44 X 24" X 7 1/2" X 100 lb. ..	8 0 0	Cwt.	629	
No. 72	Stiffening frames ..	22 12 0		46	
	Shed for materials ..			35	
Total ..					2,048
Total ..					3,780

Estimate No. 111-G.

"C" Class bridge at R.D. 43/2750.

Abutments.					
15-64 units.	Concrete in surki mortar ..	26 5 0	100 c. ft.	412	
25-20 "	Table moulded brick in lime mortar ..	28 15 0	100 "	729	
11-00 "	Laterite block revetment ..	19 4 0	100 "	212	
3-64 "	Gravel backing ..	8 13 0	100 "	32	
14-00 "	Plastering with cement 3/4" thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	95	
9-30 "	Road metalling ..	12 4 0	100 c. ft.	114	
3-10 "	Gravelling ..	8 13 0	100 "	27	
3 c. ft.	Outstone work ..	1 12 0	C. ft.	5	
No. 8.	Earthwork including approaches ..		Lump sum.	50	
	Guard stones ..	3 0 0		24	
	Contingencies ..			85	
	Petty supervision ..			45	
Total ..					1,830
41 r. ft.	Roadway including Westwood's trough plate, metalling, gravelling, etc., complete ..	31 3 0	R. ft.	1,279	
73-2 units.	Roller steel girders 41 X 2 X 24" X 7 1/2" X 100 lb. ..	8 0 0	Cwt.	586	
No. 2.	Stiffening frames ..	22 12 0		46	
	Shed for materials ..			39	
Total ..					1,950
Total ..					3,780
Carried over ..					5,77,368

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

G. BRIDGES—cont.

Brought forward .. 5,77,368

Estimate No. 112-G.

"B" Class bridge at R.D. 44/5000.

Abutments and wings.					
16.50 units.	Concrete broken brick in surki mortar ..	27 12 0	100 c. ft.	548	
25.10 "	Table moulded brick in mortar ..	30 7 0	100 "	770	
11.00 "	Laterite block revetment ..	18 4 0	100 "	201	
3.64 "	Gravel backing ..	10 9 0	100 "	38	
13.80 "	Plastering with cement ..	6 12 0	100 "	93	
21.42 "	Road metalling, lead 8 miles ..	11 4 0	100 "	241	
7.14 c. ft.	Gravelling ..	10 9 0	100 "	75	
5 units.	Cutstone work ..	1 12 0	100 "	9	
No. 8	Earthwork including forming approaches ..	L. S.	100 "	50	
	Guard stones ..	3 0 0	Each.	24	
	Contingencies ..			99	
	Supervision ..			42	
	Total ..				2,100
41 r. ft.	Roadway including Westwood's trough plate ..	39 7 0	R. ft.	1,617	
109.73 cwt.	Roller steel beams 3 × 4' × 24" × 7½ × 100 lb. ..	8 0 0	Cwt.	878	
No. 2	Stiffening frames, 2 pairs ..	35 8 0		71	
	Shed for materials ..			54	
	Total ..				2,620
	Total ..				4,720

Estimate No. 113-G.

Railway girder bridge at R.D. 44/5500.

No. 1	Constructing a steel girder bridge at the crossing of the Arantangi-Pattukkota line of South Indian Railway ..	Lump sum.		18,000
	Total, G. Bridges ..			6,00,088

H. ESCAPES.

Estimate No. 114-G. (Plan No. G. 96).

Surplus sluice at R.D. 15/9050.

131.75 units.	Concrete broken brick in surki mortar ..	21 11 0	100 c. ft.	2,857
84.30 "	Table moulded brick in surki mortar ..	24 14 0	100 "	2,037
15.20 "	Archwork brick in surki mortar ..	25 14 0	100 "	393
79.80 "	Plastering with cement ¾" thick ..	6 12 0	100 sq. ft.	539
56.90 "	Concrete blocks for revetments ..	22 12 0	100 c. ft.	1,294
8.50 "	Brick jelly backing ..	10 10 0	100 "	90
175 c. ft.	Cutstone ..	1 12 0	C. ft.	308
28 "	Teakwood work ..	4 0 0		112
	Earthwork excavation ..		Lump sum.	81
308.400 units.	Cutting channels in rear ..	3 12 0	1,000 c. ft.	1,149
No. 8	Screw gearing shutter including screw shaft and etc. ..	185 4 0	Each	1,482
	Shed for materials ..			100
	Centering for archwork ..			100
	Total ..			10,600
	Contingencies 5 per cent ..			530
	Supervision 3 per cent ..			320
	Total of estimate ..			11,450
	Carried over ..			11,450

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

Brought forward .. 11,450

H. ESCAPES—cont.

Estimate No. 115-G. (Plan No. G. 97).

Surplus Sluice at R.D. 26/7428.

67.35 units.	Concrete broken brick in surki mortar ..	22 13 0	100 c. ft.	1,536
52.45 "	Table moulded brick in lime mortar ..	25 6 0	100 "	1,331
9.85 "	Archwork do. ..	26 6 0	100 "	259
52.30 "	Plastering with portland cement, ¾" thick ..	6 12 0	100 sq. ft.	353
18.70 "	Concrete blocks for revetments and apron ..	23 15 0	100 c. ft.	448
2.65 "	Gravel backing to revetment ..	5 5 0	100 "	14
137.06 c. ft.	Cutstone work ..	1 12 0	C. ft.	240
No. 5	Teakwood screw gearing shutter including iron fittings, etc., complete ..	184 4 0	No.	921
17.77 c. ft.	Teakwood wrought and put up ..	4 0 0	C. ft.	71
	Earthwork excavation, etc., complete ..		Lump sum.	100
	Shed for materials ..			50
	Centering for archwork ..			70
	Total ..			5,393
	Contingencies 5 per cent ..			27
	Petty supervision 2½ per cent ..			132
	Total ..			5,800

Estimate No. 116-G. (Plan No. G. 98).

Surplus Sluice at R.D. 36/2000 of the Grand Anicut Canal (Rates are same as per masonry work at R.D. 36/1570).

52.10 units.	Concrete brick jelly in surki mortar ..	22 5 0	100 c. ft.	1,163
45.70 "	Table moulded brick in lime mortar ..	25 6 0	100 "	1,160
7.90 "	Archwork table moulded brick in lime mortar ..	26 6 0	100 "	208
41.80 "	Plastering with portland cement, ¾" thick (1 cement 3 sand) ..	6 12 0	100 sq. ft.	282
63 c. ft.	Cutstone work ..	1 12 0	C. ft.	110
23.20 units.	Concrete block for revetment and pitching ..	23 5 0	100 c. ft.	541
4.80 "	Gravel backing, 6" under revetment ..	3 9 0	100 "	17
30.75 c. ft.	Teakwood wrought and put up ..	4 4 0	C. ft.	130
No. 4	Teakwood shutters with planks 3" thick screw shafts 2½" diameter including screw box holding down bolts, brackets, angle irons, etc., complete including conveyance and fixing ..	200 0 0	Each.	800
	Earthwork excavating and filling in ..		Lump sum.	100
	Shed for materials ..			50
	Centering for archwork ..			80
	Total ..			4,651
	Contingencies at 5 per cent ..			234
	Petty supervision at 2½ per cent ..			115
	Total ..			5,000

Estimate No. 117-G.

Surplus Sluice at R.D. 44/2800 of the Grand Anicut Canal.

38.78 units.	Concrete broken brick in surki mortar ..	27 12 0	100 c. ft.	1,075
32.95 "	Table moulded brick in mortar ..	30 7 0	100 "	1,003
5.91 "	Archwork brick in mortar ..	31 7 0	100 "	186
28.61 "	Cement plastering, ¾" thick ..	6 12 0	100 sq. ft.	193
19.74 "	Laterite block revetment ..	18 4 0	100 c. ft.	360
4.39 "	Gravel backing ..	10 9 0	100 "	46
23.06 c. ft.	Teakwood wrought and put up ..	4 0 0	C. ft.	92
47.25 "	Cutstone work ..	1 12 0		83
No. 3.	Teakwood shutters 3" thick with screw shafts, etc., including conveyance and fitting ..	160 0 0	Each.	480
	Carried over ..			22,250

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
	GRAND ANICUT CANAL—cont.				
	H. ESCAPES—cont.				
	Estimate No. 117-G.—cont.				
	Surplus sluice at R.D. 44/2800—cont.				
L.S.	Earthwork		Lump sum.	50	
	Centering for arches			80	
	Shed for materials			40	
	Baling			30	
	Total				3,718
	Contingencies				184
	Petty supervision				98
	Total of estimate				4,000
	Total, H. Escapes				26,250

K. BUILDINGS.

Estimate No. 118-G. (Plan No. G. 99).

Inspection Bungalows and Staff Quarters Grand Anicut Canal.

1	Permanent quarters for the Executive Engineer at Tanjore	17,970	Each.	17,970
1	Temporary quarters for the Superintendent of Works at Tanjore	7,000	"	7,000
1	Permanent quarters for Assistant Engineer at Tanjore	9,780	"	9,780
1	Permanent Office for Executive Engineer and Assistant Engineer combined at Tanjore	15,000	"	15,000
8	Inspection bungalows (permanent)	4,000	"	32,000
4	Inspection bungalows (temporary)	600	"	2,400
20	Quarters for subordinates at sites of important works (temporary)	400	"	8,000
9	Blocks of lascars' huts (permanent)	1,500	"	13,500
9	Store sheds (permanent)	600	"	5,400
	Total			1,11,050
	Total, K. Buildings			1,11,050

L. EARTHWORK.

Estimate No. 119-G.

Grand Anicut Canal.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
	Earthwork.				
1,536.5 units.	Excavating in sandy loam soil and forming banks in layers including breaking clods and sectioning from head to R.D. 0/53-30 for right bank with an extra lead 10 yards and lift 1 yard	4 5 0	1,000 c. ft.	6,625	
5,009.7 "	Excavating in sandy loam soil and forming banks in layers including breaking clods and sectioning from head to R.D. 0/53-30 for left bank with an extra lead of 50 yards and lift of 2 yards	5 12 0	"	28,806	
930.0 "	Excavating in sandy loam soil and forming banks in layers including breaking clods and sectioning for right bank from R.D. 0/53-30 to R.D. 1/06-40	3 12 0	"	3,488	
5,334.0 "	Excavating in sandy loam soil and forming banks in layers including breaking clods and sectioning for left bank with an extra lead 40 yards and lift 1 yard	5 3 0	"	27,670	
2,146.7 "	Excavating in sandy loam soil and forming banks in layers including breaking clods and sectioning for right bank with an extra 10 yards from R.D. 1/06-10 to 1/27-20	4 0 6	"	8,654	
3,466.9 "	Excavating in sandy loam soil and forming banks in layers including breaking clods and sectioning for left bank from R.D. 1/06-10 to 1/58-90 with extra lead 30 yards and lift 1 yard	4 14 0	"	16,901	
	Carried over				92,145

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
	GRAND ANICUT CANAL—cont.				
	L. EARTHWORK—cont.				
	Estimate No. 119-G.—cont.				
	Grand Anicut Canal—cont.				
	Earthwork.				
1,279.2 units	Excavating in sandy loam soil and forming banks in layers including breaking clods and sectioning for left bank from R.D. 1/58-00 to 1/97-20 with extra lead 20 yards	4 5 0	1,000 c. ft.	5,517	
7,180.0 "	Excavating in sandy loam soil and forming banks in layers including breaking clods and sectioning for both banks with extra lead 20 yards.	4 5 0	1,000 "	30,653	
762.30 "	Rough stone dry packing	13 12 0	100 c. ft.	10,482	
324.50 "	Gravel backing	4 7 0	100 "	1,440	
31,855.0 "	Excavating in black loam and forming banks in layers including breaking clods and sectioning from R.D. 2/92-20 to R.D. 11/57-19.	4 5 0	1,000 "	1,50,312	
2,857.0 "	Excavating in black cotton soil and forming banks in layers including breaking clods and sectioning from R.D. 9/02-17 to 9/47-47	4 10 0	1,000 "	13,214	
3,529.0 "	Excavating in yellow clay mixed with limekunkur or red earth mixed with gravel and forming banks in layers including breaking clods and sectioning from R.D. 4/42-20 to R.D. 11/97-19.	5 9 0	1,000 "	47,443	
22,230.0 "	Excavating in red earth mixed with gravel and forming banks in layers including breaking clods and sectioning from R.D. 6/62-20 to R.D. 9/02-47.	5 14 0	1,000 "	1,30,601	
4,504.0 "	Excavating in indurated mud or morrum gravel and forming banks in layers including breaking clods and sectioning from R.D. 9/02-47 to R.D. 9/47-47.	6 2 0	1,000 "	27,587	
4,875.0 "	Excavating in horn-blende schists at bottom portion of Budalur cutting and forming banks in layers including breaking clods and sectioning from R.D. 6/72-20 to R.D. 7/27-47.	10 7 0	1,000 "	50,883	
4,218.0 "	Excavating in yellow clay and gravel and forming banks in layers including breaking clods and sectioning from R.D. 11/97-19 to R.D. 12/37-19	5 14 0	1,000 "	24,781	
6,996.0 "	Excavating in hard gravel and laterite and forming banks in layers including breaking clods and sectioning from R.D. 12/12-19 to R.D. 12/82-9	9 2 0	1,000 "	63,839	
2,015.0 "	Excavating in red clay and gravel and forming banks in layer including breaking clods and sectioning from R.D. 12/62-19 to R.D. 12/88-99	5 9 0	1,000 "	11,209	
4,723.0 "	Excavating in red clay and forming banks in layers including breaking clods and sectioning from R.D. 12/88-99 to R.D. 13/31-99.	6 2 0	1,000 "	28,928	
3,124.0 "	Excavating in Vallam sand stone and forming banks in layers including breaking clods and sectioning from R.D. 12/93-39 to R.D. 13/31-91	10 11 0	1,000 "	33,388	
3,670.0 "	Excavating in Vallam sand stone and carting excavated earth to a distance of 6,500 feet including loading and unloading from R.D. 13/31-99 to R.D. 13/76-40.	23 14 0	1,000 "	87,620	
1,448.0 "	Excavating in red clay and carting within 6,500 feet including loading and unloading from R.D. 13/31-99 to R.D. 13/76-40.	20 2 0	1,000 "	29,141	
6,388.0 "	Excavating in red clay and carting to a distance of one mile including loading and unloading from R.D. 13/76-40 to the R.D. 14/43-55.	17 9 0	1,000 "	1,12,189	
689.0 "	Excavating in red clay and forming banks in layers including breaking clods and sectioning with an extra lead of 10 yards and lift one yard	5 9 0	1,000 "	3,833	
743.76 "	Lining with brick on end laid dry to 9" thickness along slope of the canal through narrow section including provision for weep holes for every square yard of lining.	19 5 0	100 c. ft.	14,364	
200.71 "	Constructing skin wall through Muhammadan graveyard.	27 9 0	100 "	5,532	
3,221.7 "	Plastering with portland cement, 3" thick	6 12 0	100 sq. ft.	21,747	
5,431.0 "	Excavating in red loam and forming banks in layers including breaking clods and sectioning with an extra lead 20 yards from R.D. 14/45-55 to 15/40-00.	4 5 0	1,000 c. ft.	23,421	
	Carried over				10,20,269

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
L. EARTHWORK—cont.				Brought forward ..	10,20,269
Estimate No. 119-G.—cont.					
Grand Anicut Canal—cont.					
Earthwork.					
18,301.0 units	Excavating in red loam and forming banks in layers including breaking clods and sectioning with 10 yards extra lead from R.D. 15/55-00 to 19/25-00.	4 0 6	1,000 c.ft.	73,776	
1,137.0 "	Excavating in red loam and forming banks in layers including breaking clods and sectioning with 10 yards extra lead and one yard extra lift.	4 5 0	1,000 "	4,903	
4,012.0 "	Excavating in red loam and forming banks in layers including breaking clods and sectioning with one yard extra lift from R.D. 19/70-00 to 23/30-00.	4 0 6	1,000 "	16,174	
15,280.0 "	Excavating in red loam and forming banks in layers including breaking clods and sectioning with one yard extra lift from R.D. 19/25-00 to R.E. 23/10-00.	3 12 0	1,000 "	57,300	
15,380.0 "	Excavating in sand loam and forming banks in layers including breaking clods and sectioning with an extra lift of one yard.	4 0 6	1,000 "	62,000	
4,470.0 "	Excavating in sand loam and forming banks in layers including breaking clods and sectioning with extra lead 10 yards and lift one yard from R.D. 30/24-35 to 30/74-35.	4 5 0	1,000 "	19,277	
22,293.0 "	Excavating in sand loam and forming banks in layers including breaking clods and sectioning with extra lead 10 yards and lift one yard from R.D. 23/30-00 to R.D. 31/26-76.	3 12 0	1,000 "	83,598	
16,112.0 "	Excavating in sand loam and forming banks in layers including breaking clods and sectioning with extra lead 10 yards from R.D. 31/26-76 to 57/25-00.	4 0 6	1,000 "	64,952	
14,806.75 "	Excavating in sand loam and forming banks in layers including breaking clods and sectioning with extra lead 10 yards and lift one yard from R.D. 37/25-00 to 45/05-00.	3 12 0	1,000 "	55,526	
	Contingencies about 5 per cent ..	..	..	73,200	14,57,775
	Petty supervision about 2½ per cent ..	..	..	36,875	
	Total ..	..	..	..	16,67,650
	Total, L. Earthwork ..	..	..	..	16,67,650

M. PLANTATIONS.

Estimate No. 120-G.

Grand Anicut Canal.

85½ miles	Plantations	300 0 0	Mile.	25,650	
	Total, M. Plantations ..	..	..	..	25,650

O. MISCELLANEOUS.

Estimate No. 121-G. (Plan No. G-102).

Extension of Togur Irrigation syphon across the Vennar, R.D. 0/1300.

131.50	Concrete broken stone in surki mortar ..	20 9 0	100 c. ft.	2,704	
116.80	Table moulded brick in surki mortar ..	25 10 0	100 "	2,993	
92.2	Arch work in surki mortar ..	26 10 0	100 "	2,455	
L.S.	Centering for arches ..	..	..	400	
17 c.ft.	Cutstone work ..	1 12 0	C. ft.	30	
111.50 units	Cement plastering (one cement, three sand) 3" thick ..	6 12 0	100 sq. ft.	753	
L.S.	Earthwork excavating foundations ..	..	..	800	
	Shed for materials ..	..	..	100	
	Demolishing existing cistern (Vennar left bank).	..	..	100	
	Total ..	..	..	10,335	
	Contingencies at 5 per cent ..	..	..	510	
	Petty supervision at 2½ per cent ..	..	..	255	
	Total ..	..	..	..	11,100
	Carried over ..	..	..	..	11,100

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
				Brought forward ..	11,100

O. MISCELLANEOUS—cont.

Estimate No. 122-G. (Plan No. G. 103.)

Constructing a tank supply sluice with arched tunnel 2' 6" x 2' 0" at R.D. 2/1580 on right bank of the Grand Anicut Canal.

7.7 units.	Concrete broken brick in surki mortar ..	21 2 0	100 c. ft.	163	
6.50 "	Table moulded brick in lime mortar ..	24 4 0	100 "	168	
2.61 "	Arch work ..	25 4 0	100 "	66	
6 c. ft.	Cutstone work ..	1 12 0	100 "	11	
6.53 squares.	Plastering with Portland cement, ¾" thick, 1:3 ..	6 12 0	100 sq. ft.	44	
1.9 units.	Laterite block revetment ..	12 4 0	100 c. ft.	24	
0.6 unit.	Gravel backing, 6" thick ..	2 4 0	100 "	1	
	Earthwork excavating foundations, etc. ..	..	Lump sum.	10	
No. 1.	Shutter (teakwood) with screw shaft ..	..	..	90	
	Turners, belts and nuts, etc., complete ..	..	..	10	
	Shed for materials ..	..	..	30	
	Centerings for the arch ..	..	..	29	
	Contingencies at 5 per cent ..	..	..	14	
	Supervision at 2½ ..	..	..	..	650
	Total ..	..	..	..	650

Estimate No. 123-G.

Constructing an irrigation pipe sluice at R.D. 2/2220 on left bank of the Grand Anicut Canal.

3.20 units.	Concrete broken bricks in surki mortar ..	21 2 0	100 c. ft.	63	
2.8 "	Table moulded bricks in chunam ..	24 4 0	100 "	68	
3 c. ft.	Cutstone work ..	1 12 0	C. ft.	6	
45 r. ft.	Cast-iron pipe, 6" diameter ..	3 0 0	R. ft.	135	
35 units.	Laterite block revetment ..	12 4 0	100 c. ft.	4	
12 "	Gravel backing ..	2 4 0	..	1	
2.17 units.	Plastering with Portland cement, ¾" thick, 1:3 ..	6 12 0	100 sq. ft.	15	
	Spindle shutter complete ..	..	Lump sum.	20	
	Excavating foundations ..	..	..	8	
	Sheds for materials ..	..	..	10	
	Contingencies at 5 per cent ..	..	..	334	
	Petty supervision ..	..	..	17	
	Total ..	..	..	..	360

Estimate No. 124. (Plan No. G. 104.)

Constructing a syphon culvert at R.D. 2/4200 across the Grand Anicut Canal.

81 units.	Concrete broken brick in surki mortar ..	21 11 0	100 c. ft.	1,767	
66.35 "	Table moulded brick in surki mortar ..	25 13 0	100 "	1,713	
42.63 "	Archwork ..	26 13 0	100 "	1,143	
44.35 "	Plastering with Portland cement, ¾" thick, 1:3 ..	6 12 0	100 "	303	
1.75 c. ft.	Teakwood-wrought and put up, needle shutters ..	4 0 0	C. ft.	7	
10.30 units.	Laterite block apron ..	12 4 0	..	4	
	Earthwork excavation ..	..	..	315	
	Baling charges ..	..	..	80	
	Shed for materials ..	..	..	50	
	Contingencies at 5 per cent ..	..	..	5,372	
	Supervision ..	..	..	263	
	Total ..	..	..	..	5,770
	Carried over ..	..	..	..	17,880

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—*cont.*

Brought forward .. 17,880

O. MISCELLANEOUS—*cont.*

Estimate No. 125-G. (Plan No. G. 105.)

Constructing a tank supply sluice on the left bank of the Grand Anicut Canal at R.D. 2/7600 for 180 acres.

11.8 units.	Concrete broken brick in surki mortar	21 15 0	100 c. ft.	259	
10 "	Table moulded brick in lime mortar	24 14 0	100 "	249	
4.5 "	Table arch work in lime mortar	25 14 0	100 "	116	
17 c. ft.	Cutstone work	1 12 0	C. ft.	30	
1.7 units.	Revetment with laterite stones	12 4 0	100 c. ft.	21	
0.5 "	Gravel backing	2 4 0	100 "	1	
11 squares.	Plastering with cement, $\frac{3}{4}$ " thick, 1 : 3	6 12 0	Square.	74	
2 c.ft.	Woodwork	4 0 0	C. ft.	8	
	Earthwork excavating foundations filling in and forming banks, etc.			15	
	Screw-gearing shutter with locking arrangements, etc., complete			100	
	Centering			32	
	Shed for materials			15	
	Contingencies			46	
	Petty supervision			24	
	Total				990

Estimate No. 126-G. (Plan No. G. 106.)

Tank supply sluice at R.D. 4/6720.

15.10 units.	Concrete broken brick in surki mortar	22 12 0	100 c. ft.	344	
18.41 "	Brickwork in lime mortar	25 10 0	100 "	344	
3.94 "	Archwork in lime mortar	26 10 0	100 "	105	
11.19 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1 : 3	6 12 0	100 sq. ft.	76	
19 $\frac{1}{2}$ c. ft.	Cutstone work	1 12 0	C. ft.	35	
	Screw-gearing shutter, etc., complete			75	
	Excavating foundations			20	
	Forming, centering, removing			15	
1.68 units.	Laterite block revetment	14 4 0	100 c. ft.	24	
56 "	Gravel backing, 6" thick	5 5 0	100 "	3	
	Shed for materials			10	
	Contingencies			53	
	Petty supervision			26	
	Total				1,130

Estimate No. 127-G. (Plan No. G. 107.)

Irrigation pipe sluice at R.D. 5/0520.

3.25 units.	Concrete broken brick in surki mortar	23 9 0	100 c. ft.	76	
2.80 "	Table moulded brickwork in lime mortar	26 7 0	100 "	74	
45 r. ft.	Cast-iron pipe, 6" diameter	3 0 0	R. ft.	135	
3 c. ft.	Cutstone work	1 12 0	C. ft.	5	
2.2 units.	Plastering with cement, $\frac{3}{4}$ " thick, 1 : 3	6 12 0	100 sq. ft.	15	
35 "	Laterite block revetment	15 4 0	100 c. ft.	1	
12 "	Gravel backing	6 3 0	100 "	1	
	Earthwork			3	
	Spindle shutter			20	
	Shed for materials			2	
	Contingencies at 5 per cent.			15	
	Petty supervision at 2 $\frac{1}{2}$ per cent.			8	
	Total				380
	Carried over				20,380

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—*cont.*

Brought forward .. 20,360

O. MISCELLANEOUS—*cont.*

Estimate No. 128-G. (Plan No. G. 108.)

Tank supply sluice of masonry tunnel 2' x 2' at R.D. 5/2900.

8.45 units.	Concrete broken brick in surki mortar	23 9 0	100 c. ft.	199	
7.70 "	Table moulded brick in lime mortar	26 7 0	100 "	203	
2.95 "	Archwork brick in lime mortar	27 7 0	100 "	81	
43 c. ft.	Cutstone work	1 12 0	100 "	7	
7.00 units.	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1 : 3	6 12 0	100 sq. ft.	47	
2.25 "	Laterite block revetment	15 4 0	100 "	34	
75 "	Gravel backing	6 3 0	100 "	5	
	Earthwork excavating foundations			10	
	Screw shutter with screw-gearing, screw shaft angle iron holding down bolts, etc., complete			75	
	Shed for materials			60	
	Contingencies			33	
	Petty supervision			16	
	Total				770

Estimate No. 129-G (Plan No. 109.)

Irrigation syphon at R.D. 5/6220.

9.5 units.	Concrete broken brick in surki mortar	23 3 0	100 c. ft.	220	
2.6 "	Table moulded brick work in lime mortar	27 7 0	100 "	71	
2.75 "	Plastering with cement two coats, $\frac{3}{4}$ " thick, 1 : 3	6 12 0	100 sq. ft.	19	
50 sq. ft.	Cuddapah slab, 2" thick	0 5 0	Sq. ft.	16	
2.7 units.	Brick on edge, 9" thick	1 12 0	100 c. ft.	51	
20.0 r. ft.	Stoneware pipe, 1" diameter	18 15 0	R. ft.	350	
8.4 "	Cast-iron pipes under banks (straight)	8 0 0	100 "	672	
3 "	Do. bend pipes	10 0 0	10 "	30	
1.6 "	Gravel backing to revetments	4 7 0	10 c. ft.	7	
	Shed for materials			15	
	Contingencies			72	
	Petty supervision			37	
	Total				1,560

Estimate No. 130-G.

Irrigation pipe sluice at R.D. 5/7450.

3.20 units.	Concrete broken brick in surki mortar	23 3 0	100 c. ft.	74	
2.80 "	Table moulded brick work in lime mortar	26 4 0	100 "	71	
4.0 r. ft.	Cast-iron pipe (of pipe 1 foot)	8 0 0	R. ft.	320	
3 c. ft.	Cutstone work	1 12 0	C. ft.	5	
2.16 units.	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1 : 3	6 12 0	100 sq. ft.	15	
35 "	Laterite blocks for revetment	16 4 0	100 c. ft.	16	
12 "	Gravel backing	4 7 0	100 "	11	
	Earthwork excavating foundations			14	
No. 1.	Spindle shutter, etc., complete			20	
	Shed for materials			5	
	Contingencies			30	
	Petty supervision			16	
	Total				570
	Carried over				23,260

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

Brought forward .. 23,260

O. MISCELLANEOUS—cont.

Estimate No. 1131-G.

Tank supply sluice of masonry tunnel 2' x 2' at R.D. 6/2000.

8.45 units.	Concrete broken brick in surki mortar	23 2 0	100 c. ft.	195	
7.70 "	Brickwork in surki mortar	26 2 0	100 "	201	
2.95 "	Archwork brick in surki mortar	27 2 0	100 "	80	
4 c. ft.	Cutstone work	1 12 0	C. ft.	7	
7.10 units.	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3 ..	23 12 0	100 sq. ft.	48	
2.25 "	Laterite block for revetment	17 4 0	100 c. ft.	39	
.75 "	Gravel backing	23 9 0	100 "	3	
	Earthwork excavating foundations		Lump sum.	10	
No. 1.	Shutter with screw gearing, screw shaft turning, teakwood shutter bolt, etc. ..			75	
	Shed for materials			7	
	Contingencies			35	
	Petty supervision			20	
	Total				720

Estimate No. 132-G.

Irrigation pipe sluice at R.D. 6/6720.

3.20 units.	Concrete broken brick in surki mortar	23 11 0	100 c. ft.	76	
2.80 "	Table moulded brick in lime mortar	26 8 0	100 "	74	
40 r. ft.	Cast-iron pipes, 1' diameter	8 0 0	R. ft.	32	
3 c. ft.	Cutstone work	1 12 0	C. ft.	5	
2.16 units.	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	15	
.35 "	Laterite blocks for revetment	19 4 0	100 c. ft.	7	
.12 "	Gravelling or gravel backing	1 8 0	100 "	1	
	Earthwork excavating foundations		Lump sum.	4	
No. 1.	Spinde shutter, etc., complete			20	
	Shed for materials			7	
	Contingencies			26	
	Petty supervision			15	
	Total				570
	Grand Total				570

Estimate No. 133-G.

Tank supply sluice of Masonry tunnel 2' x 2' at R.D. 7/6197.

8.45 units.	Concrete broken brick in surki mortar	23 7 0	100 c. ft.	193	
7.70 "	Brickwork in surki mortar	26 11 0	100 "	201	
2.95 "	Archwork brick in surki mortar	27 11 0	100 "	82	
4 c. ft.	Cutstone work	1 12 0	C. ft.	7	
7.10 units.	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	48	
2.25 "	Laterite blocks for revetment	21 4 0	100 c. ft.	48	
.75 "	Gravel backing	3 9 0	100 "	3	
	Earthwork excavating foundations		Lump sum.	10	
No. 1.	Screw-gearing shutter, etc., complete			75	
	Shed for materials			7	
	Contingencies			34	
	Petty supervision			17	
	Total				730
	Carried over				25,280

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS.	RS.

Brought forward .. 25,280

GRAND ANICUT CANAL—cont.

O. MISCELLANEOUS—cont.

Estimate No. 134-G.

Tank supply sluice of masonry tunnel 2' x 2' at R.D. 10/4050.

8.45 units.	Concrete broken brick in surki mortar	24 11 0	100 c. ft.	209	
7.70 "	Table moulded brick in lime mortar	27 12 0	100 "	214	
2.95 "	Archwork broken brick in lime mortar	28 12 0	100 "	85	
4 c. ft.	Cutstone work	1 12 0	C. ft.	7	
2.16 units.	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	48	
2.26 "	Laterite blocks for revetment	20 4 0	100 c. ft.	46	
.75 "	Gravel backing	4 7 0	100 "	3	
No. 1.	Earthwork excavating foundations		Lump sum.	10	
	Screw-gearing shutter, etc., complete			75	
	Shed for materials			10	
	Contingencies			35	
	Petty supervision			18	
	Total				760

Estimate No. 135-G.

Constructing gate and compound wall to the Muhammadan grave yard.

2,875 r. ft.	Constructing compound wall	2.083	R. ft.	4,947	
	Removing and reconstructing buildings absorbed in the compound of the Collector's office ..		Lump sum.	800	
	Removing and reconstructing latrine			450	
	Removing and reconstructing engine room			1,000	
	Removing and reconstructing latrine			50	
	Zinc shed attached to the above			50	
	Constructing an iron gate			700	
	Do. a flight of steps into the canal			80	
	Shed for materials			393	
	Contingencies at 5 per cent			190	
	Petty supervision at 2½ per cent				
	Total				8,660

Estimate No. 136-G.

Tank supply sluice at R.D. 14/7500. (Details same as for tank sluice at 15/0280.)

6.55 units.	Concrete broken in surki mortar	21 1 0	100 c. ft.	138	
5.5 "	Table-moulded brick in lime mortar	24 6 0	100 "	134	
0.75 "	Do. archwork in lime mortar	25 6 0	100 "	19	
8 c. ft.	Cutstone work	1 12 0	C. ft.	14	
2.58 units.	Concrete block revetment	22 3 0	100 c. ft.	57	
0.65 "	Brick jelly backing to revetment	10 4 0	100 "	7	
2.33 c. ft.	Teakwood wrought and put up	4 0 0	C. ft.	9	
4.75 units.	Plastering with cement, $\frac{3}{4}$ " thick (1:3)	6 12 0	100 sq. ft.	32	
0.12 "	Laterite stone steps	26 4 0	100 c. ft.	3	
	Total				413
	27-12' R.F. of tunnel (of 7' F.S.L.).				
7.05 units.	Concrete broken brick in surki mortar	21 1 0	100 c. ft.	148	
5.45 "	Table-moulded brick in lime mortar	24 6 0	100 "	133	
3.25 "	Do. archwork in lime mortar	25 6 0	100 "	83	
L.S.	Centering for archwork			43	
4.05 units.	Plastering with cement, $\frac{3}{4}$ " thick, 1:3	6 12 0	100 sq. ft.	27	
	Total				431
	Total				844
	Carried over				34,700

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS.	RS.
	GRAND ANICUT CANAL—cont.			Brought forward ..	34,700
	O. MISCELLANEOUS—cont.				
	Estimate No. 136-G—cont.				
	Tank supply Sluice at R.D. 14/7500. (Details same as for tank sluice at 15/0280)—cont.				
				Brought forward ..	844
	Screw-gearing shutter arrangements including screw, shaft, etc., complete		Lump sum.	90	
	Conveyance and cartage		"	20	
	Earthwork excavations, etc.		"	20	
	Shed for materials		"	20	
	Contingencies at 5 per cent		"	65	150
	Petty supervision at 3 per cent		"	41	
	Total		"		106
	Grand Total		"		1,100

Estimate No. 137-G.

Tank supply sluice (7' F.S.L.) at R.D. 15/0280.

Front and rear heads

6.55 units.	Concrete broken brick in surki mortar	21 1 0	100 c. ft.	138	
5.60 "	Brick in lime mortar	24 6 0	100 "	137	
0.75 unit.	Archwork brick in lime mortar	25 6 0	100 "	19	
8 c. ft.	Cutstone work	1 12 0	C. ft.	14	
2.58 units.	Concrete block revetment	22 3 0	100 c. ft.	67	
0.65 unit.	Brick jelly backing for revetment	10 4 0	100 "	7	
2.33 units.	Teakwood wrought and put up	4 0 0	C. ft.	9	
4.75 "	Plastering with cement, $\frac{3}{4}$ " thick	6 12 0	100 sq. ft.	32	
0.12 unit.	Laterite stone steps	26 4 0	100 "	3	
	Total				416
	27.17 R. ft. of tunnel (of 7' F.S.L.).				
7.05 units.	Concrete broken brick in surki mortar	21 1 0	100 c. ft.	148	
5.45 "	Table-moulded brick in lime mortar	24 6 0	100 "	133	
3.25 "	Do. archwork in lime mortar	25 6 0	100 "	83	
	Centering for archwork		Lump sum.	40	
4.05 c. ft.	Plastering with cement, $\frac{3}{4}$ " thick	6 12 0	100 sq. ft.	27	
	Total				431
	Screw-gearing shutter, etc.		Lump sum.	95	
	Earthwork excavation, etc.		"	20	
	Cartage and conveyance charges		"	20	
	Shed for materials		"	20	
	Total				155
	Contingencies at 5 per cent		"	67	
	Petty supervision at 3 per cent		"	41	
	Total				108
	Grand Total				1,110

Estimate No. 138-G.

Tank supply sluice at R.D. 15/3700 (7' F.L.S.). (Details same as for tank sluice at 15/0280.)

Front and rear heads

6.55 units.	Concrete broken brick in surki mortar	20 8 0	100 c. ft.	134	
5.60 "	Table-moulded brick in lime mortar	24 0 0	100 "	134	
0.75 unit.	Do. archwork in lime mortar	25 0 0	100 "	19	
8 c. ft.	Cutstone work	1 12 0	C. ft.	14	
2.58 units.	Concrete block revetment	21 11 0	100 c. ft.	56	
0.65 unit.	Brick jelly backing	9 12 0	100 "	6	
2.33 units.	Teakwood wrought and put up	4 0 0	C. ft.	9	
4.75 "	Plastering with cement, $\frac{3}{4}$ " thick, 1:3	6 12 9	100 sq. ft.	32	
0.12 unit.	Laterite stone steps	26 4 0	100 c. ft.	3	
	Total				407
			Carried over ..		407
			Carried over ..		36,910

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per. (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

O. MISCELLANEOUS—cont.

Brought forward .. 36,910

Estimate No. 138-G—cont.

Tank supply sluice at R.D. 15/3700 (7' F.L.S.). Details same as for tank sluice at 15/0280.

Brought forward .. 407

	For 27.12 R. ft. of tunnel (7' F.S.L.)				
7.05 units.	Concrete broken brick in surki mortar	20 8 0	100 c. ft.	145	
5.45 "	Table-moulded brick in lime mortar	24 0 0	100 "	131	
3.25 "	Archwork in lime mortar	25 0 0	100 "	82	
4.05 "	Plastering with cement, $\frac{3}{4}$ " thick 1:3	6 12 0	100 "	27	
	Centering for archwork		Lump sum.	40	
	Total				425
	Screw-gearing shutter arrangement with screw shaft key, etc., complete		Lump sum.	90	
	Cartage and conveyance charges		"	20	
	Earthwork excavation, etc.		"	30	
	Shed for materials		"	30	
	Total				1,002
	Contingencies at 5 per cent		"	55	
	Supervision at 3 per cent		"	33	
	Grand Total				1,090

Estimate No. 139-G.

Tank supply sluice at R.D. 16/5400. (Details same as for sluice at 17/4900.)

Front and rear heads

6.55 units.	Concrete broken brick in surki mortar	23 2 0	100 c. ft.	151	
5.50 "	Table-moulded brick in lime mortar	26 3 0	100 "	147	
0.75 unit.	Do. archwork in lime mortar	27 3 0	100 "	20	
8 c. ft.	Cutstone work	1 12 0	C. ft.	14	
2.58 units.	Concrete block revetment	24 1 0	100 c. ft.	62	
0.65 unit.	Brick jelly backing	11 15 0	100 "	8	
2.33 c. ft.	Teakwood wrought and put up	4 0 0	C. ft.	9	
4.70 units.	Plastering with cement, $\frac{3}{4}$ " thick (1 cement to 3 sand)	6 12 0	100 sq. ft.	32	
0.12 unit.	Laterite stone steps	26 4 0	100 c. ft.	3	
	Total				446
	For 27.12 R. ft. of tunnel (6 $\frac{1}{2}$ ' F.S.L.).				
7.05 units.	Concrete broken brick in surki mortar	23 2 0	100 c. ft.	163	
5.45 "	Table-moulded brick in lime mortar	26 3 0	100 "	142	
3.25 "	Archwork in lime mortar	27 3 0	100 "	89	
	Centering for archwork		Lump sum.	20	
4.05 "	Plastering with cement, $\frac{3}{4}$ " thick 1:3	6 12 0	100 sq. ft.	27	
	Total				441
	Screw gearing shutter arrangement, etc., complete		Lump sum.	90	
	Earthwork excavation, etc.		"	20	
	Shed for materials		"	20	
	Carting and conveyance charges for the iron articles		"	20	
	Contingencies at 5 per cent		"	55	
	Petty supervision at $2\frac{1}{2}$ per cent		"	27	
	Total				1,120
			Carried over ..		39,120

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
RS. A. P. RS. RS.					
GRAND ANICUT CANAL—cont.					
O. MISCELLANEOUS—cont. Brought forward .. 39,120					
Estimate No. 140-G.					
Tank supply sluice at R.D. 16/67'40 (6½' F.S.L.). (Details same as for sluice at R.D. 17/4900.)					
<i>Front and rear heads.</i>					
6.55 units.	Concrete broken brick in surki mortar ..	23 2 0	100 c.ft.	151	
5.5 "	Table-moulded brick in lime mortar ..	26 3 0	100 "	147	
0.75 unit.	Do. archwork in lime mortar ..	27 3 0	100 "	90	
8 c.ft.	Outstone work ..	1 12 0	C. ft.	14	
2.58 units.	Concrete block revetment ..	24 1 0	100 c.ft.	62	
0.65 unit.	Brick jelly backing ..	11 15 0	100 "	7	
2.33 c.ft.	Teakwood wrought and put up ..	4 0 0	C. ft.	9	
4.70 units.	Plastering with cement, ¾" thick (1 cement 3 sand) ..	6 12 0	100 sq. ft.	32	
0.12 unit.	Laterite stone steps ..	25 4 0	100 c. ft.	3	
	Total ..				445
<i>For 27.12 R. ft. of tunnel 6½' F.S.L.</i>					
7.05 units.	Concrete broken brick in surki mortar ..	23 2 0	100 c. ft.	163	
5.45 "	Table-moulded brick in lime mortar ..	26 3 0	100 "	142	
3.25 "	Archwork in lime mortar ..	27 3 0	100 "	89	
4.05 "	Centering for archwork ..	Lump sum.		40	
	Plastering with cement, ¾" thick (1 : 3) ..	6 12 0	100 sq. ft.	27	
	Total ..				461
	Screw gearing shutter arrangement with screw shaft key, etc., complete ..	Lump sum.		90	
	Earthwork excavation, etc. ..	"		20	
	Shed for materials ..	"		20	
	Carting and conveyance charges for screw gearing articles ..	"		20	
	Total ..				150
	Contingencies at 5 per cent ..				56
	Petty supervision at 2½ per cent ..				28
	Total ..				1,140

Estimate No. 141-G (Plan No. G-110).

Tank supply sluice at R.D. 17/0820 (F.S.L. 6½'). (Details same as for sluice at R.D. 17/4900.)

<i>Front and rear heads.</i>					
6.55 units.	Concrete broken brick in surki mortar ..	24 0 0	100 c.ft.	157	
5.5 "	Table-moulded brick in lime mortar ..	27 0 0	100 "	150	
0.75 unit.	Do. archwork in lime mortar ..	28 0 0	100 "	21	
8 c.ft.	Outstone work ..	1 12 0	C. ft.	14	
2.70 units.	Laterite stone revetment ..	24 4 0	100 c.ft.	65	
0.65 unit.	Brick jelly backing ..	12 13 0	100 "	8	
4.70 units.	Plastering with cement, ¾" thick ..	6 12 0	100 sq. ft.	32	
2.33 "	Teakwood wrought and put up ..	4 0 0	C.ft.	9	
	Total ..				456
<i>For 27.12 R. ft. of tunnel (F.S.L. 6½').</i>					
7.05 units.	Concrete broken brick in surki mortar ..	24 0 0	100 c.ft.	169	
5.45 "	Table-moulded brick in lime mortar ..	27 0 0	100 "	147	
3.25 "	Archwork in lime mortar ..	28 0 0	100 "	91	
4.05 "	Plastering with cement, ¾" thick ..	6 12 0	100 sq. ft.	27	
	Total ..				434
	Centering for archwork ..	Lump sum.		40	
	Screw gearing shutter arrangements, including screw shafts, etc. ..	"		90	
	Earthwork excavation, etc. ..	"		20	
	Shed for materials ..	"		20	
	Conveyance of iron articles to site ..	"		20	
	Total ..				190
	Contingencies at 5 per cent ..				54
	Petty supervision at 3 per cent ..				26
	Total ..				80
	Total ..				1,160
	Carried over ..				41,420

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
RS. A. P. RS. RS.					
GRAND ANICUT CANAL—cont.					
O. MISCELLANEOUS—cont. Brought forward .. 41,420					
Estimate No. 142-G.					
Tank supply sluice at R.D. 17/2900 (6½' F.S.L.).					
<i>Front head and rear.</i>					
6.55 units.	Concrete broken brick in surki mortar ..	25 0 0	100 c. ft.	164	
5.5 "	Table-moulded brick in lime mortar ..	27 14 0	100 "	153	
0.75 unit.	Do. archwork in lime mortar ..	38 14 0	100 "	21	
8 c. ft.	Outstone work ..	1 12 0	C. ft.	14	
2.70 units.	Laterite stone revetment ..	23 4 0	100 c. ft.	63	
0.65 unit.	Brick jelly backing ..	13 11 0	100 "	9	
4.70 units.	Plastering with cement, ¾" thick ..	6 12 0	100 sq. ft.	32	
2.33 c. ft.	Teakwood work ..	4 0 0	C. ft.	9	
	Total ..				456
<i>For 27.12 r. ft. of tunnel (F. S. L. 6½').</i>					
7.05 units.	Concrete broken brick in surki mortar ..	25 0 0	100 c. ft.	176	
5.45 "	Brickwork in lime mortar ..	27 14 0	100 "	153	
3.25 "	Archwork in lime mortar ..	28 14 0	100 "	97	
4.05 "	Plastering with cement, ¾" thick ..	6 12 0	100 sq. ft.	27	
	Centering for archwork ..	Lump sum.		40	
	Total ..				493
	Screw gearing shutter arrangement including screw shaft, etc., complete ..	Lump sum.		90	
	Earthwork excavation ..	"		20	
	Shed for materials ..	"		20	
	Conveyance of iron articles to site ..	"		20	
	Total ..				150
	Contingencies at 5 per cent ..				53
	Petty supervision at 3 per cent ..				34
	Total ..				1,200

Estimate No. 143-G.

Irrigation syphon at R.D. 17/8580.

6.9 units.	Concrete broken brick in surki mortar ..	25 0 0	100 c. ft.	173	
2.6 "	Table moulded brick in ..	28 14 0	100 "	75	
1.21 "	Gravel backing to revetment ..	13 3 0	100 "	16	
2.7 "	Cement plastering, ¾" thick (1 : 3) ..	6 12 0	100 sq. ft.	18	
39 unit.	Cuddapah slab, 2" thick ..	30 0 0	100 "	12	
2.1 units.	Brick on edge dry packing ..	16 9 0	100 "	35	
132 "	Stoneware pipe, 6" diameter ..	0 12 0	R. ft.	100	
	Fixing pipes with cement ..	Lump sum.		10	
	Earthwork excavating foundations, etc. ..	"		24	
81 r. ft.	Cast-iron pipes, 6" diameter ..	8 0 0	R. ft.	243	
	Shed for materials ..	Lump sum.		10	
	Cast-iron bend pipes ..	"		10	
	Total ..				726
	Contingencies at 5 per cent ..				35
	Petty supervision at 2½ per cent ..				19
	Total ..				780

Estimate No. 144-G.

Irrigation sluice at R.D. 18/9000 for 340 acres.

3.40 units.	Concrete broken brick in surki mortar ..	25 0 0	100 c. ft.	85	
3.60 "	Table-moulded brick in lime mortar ..	27 14 0	100 "	100	
8 c. ft.	Outstone ..	1 12 0	C. ft.	14	
2.40 units.	Brick on end 9" thick ..	20 11 0	100 c. ft.	50	
1.80 "	Plastering with portland cement, ¾" thick (1:3) ..	6 12 0	100 sq. ft.	12	
48 r. ft.	Cast iron pipe, 12" diameter ..	8 0 0	R. ft.	384	
	Teakwood stem shutter including iron fittings, etc. ..	Lump sum.		35	
	Shed for materials ..	"		30	
2 units.	Earthwork excavation, etc. ..	"		10	
	Total ..				730
	Contingencies at 5 per cent ..				39
	Petty supervision 2½ per cent ..				21
	Total ..				780
	Carried over ..				44,180

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
O. MISCELLANEOUS—cont.					
Estimate No. 145-G.				Brought forward .. 44,180	
Irrigation sluice at R.D. 19/3500 of the Grand anicut canal.					
3.00 units.	Concrete broken brick in surki mortar	25 0 0	100 c. ft.	75	
3.30 „	Table-moulded brick in lime mortar	27 14 0	100 „	92	
9 c. ft.	Cutstone	1 12 0	C. ft.	16	
1.80 units.	Plastering with Portland cement, $\frac{3}{4}$ " thick (1 : 3).	6 12 0	100 sq. ft.	12	
2.60 „	Brick on end 9" thick	20 11 0	100 c. ft.	54	
45 r. ft.	Cast-iron pipe, 9" diameter	5 0 0	R. ft.	225	
	Teakwood stem shutter including iron fittings, etc.				
	Lump sum. *			35	
	Shed for materials			40	
2.000	Earthwork excavation, etc.	5 0 0	1,000 c. ft.	10	
	Total .. ..	.. ..	..	559	
	Contingencies at 5 per cent. .. ..	.. ..	..	27	
	Petty supervision at $2\frac{1}{2}$ per cent .. ..	.. ..	..	14	
	Total .. ..	.. ..	..	..	600

Estimate No. 146-G.

Irrigation syphon at R. D. 207/000.

6.5 units.	Concrete broken brick in surki mortar ..	22 3 0	100 c. ft.	144	
2.6 "	Table-moulded brick in lime mortar ..	26 5 0	100 "	69	
1.21 "	Brick jelly backing to revetment ..	11 1 1	100 "	13	
2.7 "	Cement plastering $\frac{3}{4}$ " thick (1 : 3) ..	6 12 0	100 sq. ft.	18	
0.39 unit.	Caddapah slab flooring, 2" thick ..	30 0 0	100 "	12	
2.1 "	Brick on edge dry packing ..	13 5 0	100 c. ft.	28	
118 r. ft.	Stoneware pipes, 6" diameter ..	0 12 0	R. ft.	88	
81 "	Cast-iron pipes ..	3 0 0	"	243	
	Earthwork excavating foundations ..			25	
	Fitting pipes with cement ..			12	
	Cast-iron pipe, $\frac{1}{4}$ " bends ..			10	
	Shed for materials ..			10	
	Total ..			672	
	Contingencies at 5 per cent. ..			22	
	Petty supervision at $2\frac{1}{2}$ per cent ..			16	
	Total ..				720

Estimate No. 147-G.

Tank supply sluice at R.D. 22/3200 (6' F.S.L.).

6.55 units.	Concrete broken brick in surki mortar ..	21 4 0	160 c. ft.	139	
5.40 "	Table-moulded brick in lime mortar ..	24 8 0	100 "	132	
.75 unit.	Do. archwork in lime mortar ..	25 8 0	100 "	19	
.8 c. ft.	Cutstone work ..	1 12 0	C. ft.	14	
2.70 units.	Laterite stone revetment ..	22 4 0	100 c. ft.	60	
.65 unit.	Brick jelly backing to revetment ..	10 4 0	100 "	7	
2.33 units.	Teakwood wrought and put up ..	4 0 0	C. ft.	9	
4.70 "	Plastering with cement $\frac{3}{4}$ " thick (1 : 3) ..	6 12 0	100 sq. ft.	32	
	Total ..				412
27-12 r. ft. of tunnel 6' F.S.L.					
7.05 units.	Concrete broken brick in surki mortar ..	21 4 0	100 c. ft.	150	
5.45 "	Table-moulded brick in lime mortar ..	24 8 0	100 "	134	
3.25 "	Do. archwork in lime mortar ..	25 8 0	100 "	19	
	Centering for archwork ..			40	
4.95 "	Plastering with cement $\frac{3}{4}$ " thick (1 : 3) ..	6 12 0	100 sq. ft.	27	
	Total ..				434
	Screw gearing shutter, etc., complete including screw shaft, etc. ..			90	
	Earthwork excavation, etc. ..			26	
	Shed for materials ..			20	
	Conveyance of iron articles to site ..			20	
	Total ..				156
	Contingencies at 5 per cent. ..			50	
	Petty supervision at 3 per cent ..			28	
	Total ..				78
	Carried over ..				1,080
					46,580

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
O. MISCELLANEOUS—cont.					
Estimate No. 148-G.				Brought forward .. 46,580	

Estimates for a tank supply sluice at R.D. 22/5000 (6' F.S.L.)

		RS. A. P.		RS.	RS.
Front and rear heads.					
6.55 units.	Concrete broken brick in surki mortar ..	21 11 0	100 c. ft.	142	
5.50 "	Table-moulded brick mortar ..	24 14 0	100 "	137	
.75 unit.	Do. archwork in lime mortar ..	25 14 0	100 "	19	
.8 c. ft.	Cutstone work ..	1 12 0	C. ft.	14	
2.70 units.	Laterite stone revetment ..	22 4 0	100 c. ft.	60	
.65 unit.	Brick jelly backing to revetment ..	10 10 0	100 "	7	
2.33 units.	Teakwood wrought and put up ..	4 0 0	C. ft.	9	
4.70 "	Plastering with cement, $\frac{3}{4}$ " thick (1 : 3) ..	6 12 0	100 sq. ft.	32	
	Total ..				420
27-12 r. ft. of tunnel 6' F.S.L.					
7.05 units.	Concrete broken brick in surki mortar ..	21 11 0	100 c. ft.	154	
5.45 "	Table-moulded brick in lime mortar ..	24 14 0	100 "	136	
3.25 "	Do. archwork in lime mortar ..	25 14 0	100 "	84	
	Centering for archwork ..			40	
4.95 "	Plastering with cement, $\frac{3}{4}$ " thick (1 : 3) ..	6 12 0	100 sq. ft.	27	
	Total ..				441
	Screw gearing shutters, etc., including screw shaft, etc., complete ..			90	
	Earthwork excavation, etc. ..			20	
	Shed for materials ..			20	
	Conveyance of iron articles to site ..			20	
	Total ..				150
	Contingencies at 5 per cent. ..			55	
	Petty supervision at 3 per cent. ..			24	
	Total ..				79
					1,090

Estimate No. 149-G. (Plan No. G. 111).

Tank supply sluice at R.D. 22/9000 of the Grand Anicut Canal to supply Keerathur tank.

13.40 units.	Concrete broken brick in surki mortar ..	22 3 0	100 c. ft.	297	
11.00 "	Table-moulded brick in lime mortar ..	25 5 0	100 "	301	
3.93 "	Do. archwork in lime mortar ..	26 5 0	100 "	103	
	Centering for archwork, 40 per cent. ..			41	
21.20 "	Cutstone work ..	1 12 0	C. ft.	37	
5.60 "	Laterite stone revetment ..	22 4 0	100 c. ft.	125	
1.30 "	Brick jelly backing to revetment ..	11 1 0	100 "	14	
2.9 "	Teakwood wrought and put up ..	4 0 0	C. ft.	12	
10.10 "	Plastering with cement, $\frac{3}{4}$ " thick (1 : 3) ..	6 12 0	100 sq. ft.	68	
	Screw gearing shutter arrangement, etc., including screw shaft, etc., complete ..			100	
	Cartage and conveyance charges ..			20	
	Earthwork excavation, etc. ..			25	
	Shed for materials ..			20	
	Total ..				1,163
	Contingencies at 5 per cent. ..			58	
	Petty supervision at $2\frac{1}{2}$ per cent. ..			29	
	Total ..				1,250
	Carried over ..				48,920

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

O. MISCELLANEOUS—cont.

Brought forward .. 48,920

Estimate No. 150-G. (Plan No. G-112).

An irrigation syphon at R.D. 23/71-30.

10-35 units.	Concrete brick jelly in surki mortar ..	21 15 0	100 c. ft.	227	
3-30 "	Table-moulded brick work in surki mortar ..	25 15 0	100 "	83	
43 "	Cuddapah slab, 2" thick ..	30 0 0	100 sq. ft.	13	
320 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	160 "	22	
165 "	Brick on end revetment and apron, 9" thick ..	17 4 0	160 c. ft.	28	
70 "	Brick jelly backing to revetment ..	10 4 0	100 "	7	
99 r. ft.	Cast-iron pipes, 6" diameter ..	3 0 0	R. ft.	297	
98 "	Stoneware pipes, 6" diameter ..	0 12 0	"	24	
	Earthwork, etc. ..			24	
	Shed for materials ..			20	
	Lump sum. ..				
	Total ..			795	
	Contingencies at 5 per cent. ..			40	
	Petty supervision at $2\frac{1}{2}$ per cent. ..			25	
	Total ..				860

Estimate No. 151-G.

An irrigation syphon at R.D. 23/77-00.

1,055 units.	Concrete brick jelly in surki mortar ..	21 15 0	100 c. ft.	231	
2-50 "	Table-moulded brick work in surki mortar ..	26 2 0	100 "	65	
43 "	Cuddapah slab, 2" thick ..	30 0 0	100 sq. ft.	13	
270 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 "	18	
165 "	Brick on end revetment and apron ..	17 4 0	100 c. ft.	28	
70 "	Brick jelly backing to revetment ..	10 4 0	100 "	7	
99 r. ft.	Cast iron pipes, 6" diameter ..	3 0 0	R. ft.	297	
104 "	Stoneware pipes, 6" diameter ..	0 12 0	"	24	
	Earthwork ..			24	
	Shed for materials ..			20	
	Total ..			781	
	Contingencies at 5 per cent. ..			40	
	Petty supervision at $2\frac{1}{2}$ per cent. ..			19	
	Total ..				840

Estimate No. 152-G.

An irrigation syphon at R.D. 24/56-30.

9-95 units.	Concrete brick jelly in surki mortar ..	23 3 0	100 c. ft.	231	
4-90 "	Table-moulded brick work in surki mortar ..	27 0 0	100 "	132	
43 unit.	Cuddapah slab, 2" thick ..	30 0 0	100 sq. ft.	13	
4-40 units.	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 "	30	
165 "	Brick on end revetment and apron 9" thick ..	18 1 0	100 c. ft.	30	
70 "	Gravel backing to revetment ..	9 11 0	100 "	7	
81 r. ft.	Cast iron pipes, 6" diameter ..	3 0 0	R. ft.	243	
104 "	Stoneware pipes, 6" diameter ..	0 12 0	"	24	
	Earthwork ..			24	
	Shed for materials ..			20	
	Lump sum. ..				
	Total ..			808	
	Contingencies at 5 per cent. ..			42	
	Petty supervision at $2\frac{1}{2}$ per cent ..			20	
	Total ..				870
	Carried over ..				51,490

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

O. MISCELLANEOUS—cont.

Brought forward .. 51,490

Estimate No. 153-G. (Plan No. G. 113).

A pipe sluice at R.D. 24/5780.

4-20 units.	Concrete broken brick in surki mortar ..	23 3 0	100 c. ft.	97	
6-00 "	Table-moulded brick in lime mortar ..	25 14 0	100 "	155	
10 c. ft.	Cutstone ..	1 12 0	C.ft.	18	
1-80 units.	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	12	
5-40 "	Brick on end, 9" thick ..	18 1 0	100 c. ft.	98	
32 R. ft.	Cast-iron pipe, 15" diameter ..	12 0 0	R. ft.	384	
	Teakwood stem shutter including iron fittings, etc. ..		Lump sum.	30	
	Shed for materials ..			10	
5 units	Earthwork excavation, etc. ..	5 0 0	1,000 c. ft.	25	
	Total ..				929
	Contingencies at 5 per cent ..			41	
	Petty supervision at $2\frac{1}{2}$ per cent ..			20	
	Total ..				890

Estimate No. 154-G.

An irrigation syphon at R.D. 25/26-30.

10-92 units.	Concrete brick jelly in surki mortar ..	24 7 0	100 c. ft.	267	
2-90 "	Table-moulded brick in surki mortar ..	28 2 0	100 "	81	
43 "	Cuddapah slab, 2" thick ..	30 0 0	100 sq. ft.	13	
300 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 "	20	
165 "	Brick on end revetment and apron, 9" thick ..	18 15 0	100 c. ft.	31	
70 "	Brick jelly backing to revetment ..	8 12 0	100 "	6	
84 R. ft.	Gravel-backing to revetment ..	8 0 0	R. ft.	672	
112 "	Cast iron pipes, 12" diameter ..	1 12 0	"	196	
	Stoneware pipes, 12" diameter ..			25	
	Earthwork ..			20	
	Shed for materials ..				
	Lump sum. ..				
	Total ..			1,331	
	Contingencies at 5 per cent ..			66	
	Petty supervision at $2\frac{1}{2}$ per cent ..			33	
	Total ..				1,430

Estimate No. 155-G.

Pipe sluice at R.D. 25/6200.

3-00 units.	Concrete broken brick in surki mortar ..	23 6 0	100 c. ft.	70	
3-30 "	Table-moulded brick in lime mortar ..	26 0 0	100 "	86	
9 c. ft.	Cutstone work ..	1 12 0	C.ft.	16	
1-80 units.	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	12	
2-60 "	Brick on end, 9" thick ..	18 1 0	100 c. ft.	47	
36 R. ft.	Cast-iron pipe, 15" diameter ..	12 0 0	R. ft.	432	
	Teakwood stem shutter including iron fittings, etc. ..		Lump sum.	32	
	complete. ..			40	
	Shed for materials ..			10	
2-000 units.	Earthwork excavating foundations, etc. ..	5 0 0	1,000 c. ft.		
	Total ..			745	
	Contingencies at 5 per cent ..			37	
	Petty supervision at $2\frac{1}{2}$ per cent ..			18	
	Total ..				800
	Carried over ..				54,610

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

O. MISCELLANEOUS—cont.

Estimate No. 156-G.

Brought forward .. 54,610

Tank supply sluice at R.D. 26/1730.

10-65 units.	Concrete broken brick in surki mortar ..	22 13 0	100 c.ft.	243	
11-30 "	Table moulded brick in lime mortar ..	25 2 0	100 "	284	
3-60 "	Do. archwork do. ..	26 2 0	100 "	91	
7 c.ft.	Cutstone ..	1 12 0	C.ft.	12	
2-00 units.	Brick on end, 9" thick ..	12 9 0	100 sq. ft.	25	
5-4 c.ft.	Teakwood wrought and put up ..	4 0 0	C.ft.	22	
7-80 units.	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3).	6 12 0	100 sq. ft.	53	
	Shed for materials ..			44	
	Teakwood screw gearing including screw shaft, etc.				
4-000	Earthwork excavation, etc., complete ..	5 0 0	1,000 c.ft.	120	
	Contingencies at 5 per cent ..			914	
	Petty supervision at $2\frac{1}{2}$ per cent ..			50	
	Total ..			26	
	Total ..				990

Estimate No. 157-G. (Plan No. G. 114).

Pipe sluice at R.D. 27/9428.

3-20 units.	Concrete broken brick in surki mortar ..	22 13 0	100 c.ft.	73	
3-60 "	Table moulded brick in lime mortar ..	25 5 0	100 "	91	
9 c.ft.	Cutstone work ..	1 12 0	C.ft.	16	
1-6 units.	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3).	6 12 0	100 sq. ft.	11	
2-6 "	Brick on end, 9" thick ..	17 4 0	100 c.ft.	45	
36 R. ft.	Cast iron pipe, 15" diameter ..	12 0 0	R. ft.	432	
	Teakwood stem shutter ..			30	
	Shed for materials ..			10	
	Earthwork excavation, etc. ..			5	
	Total ..			713	
	Contingencies at 5 per cent ..			37	
	Petty supervision at $2\frac{1}{2}$ per cent ..			20	
	Total ..				770

Estimate No. 158-G.

Irrigation under tunnel at R.D. 29/0135.

35-00 units.	Concrete brick jelly in surki mortar ..	22 13 0	100 c.ft.	798	
23-1 "	Table moulded brick in surki mortar ..	26 13 0	100 "	617	
14-6 "	Archwork moulded brick in surki mortar ..	27 13 0	100 "	403	
15-9 "	Plastering with cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	107	
	Centering for arches ..			50	
	Earthwork ..			30	
	Shed for materials ..			20	
	Total ..			2,025	
	Contingencies at 5 per cent ..			102	
	Petty supervision at $2\frac{1}{2}$ per cent ..			53	
	Total ..				2,180

Estimate No. 159-G.

Pipe sluice at R.D. 29/9435.

3-25 units.	Concrete broken brick in surki mortar ..	21 8 0	100 c.ft.	70	
3-60 "	Table moulded brick in lime mortar ..	24 10 0	100 "	89	
9 c.ft.	Cutstone work ..	1 12 0	C.ft.	16	
1-70 units.	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	11	
2-80 "	Brick on end, 9" thick ..	17 4 0	100 c.ft.	48	
36 R. ft.	Cast iron pipe, 12" diameter ..	8 0 0	R. ft.	288	
	Teakwood stem shutter including iron fittings, etc., complete.			50	
	Shed for materials ..			10	
	Earthwork excavation, etc. ..			10	
	Total ..			572	
	Contingencies at 5 per cent ..			30	
	Petty supervision at $2\frac{1}{2}$ per cent ..			18	
	Total ..				620
	Carried over ..				59,170

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

O. MISCELLANEOUS—cont.

Estimate No. 160-G.

Brought forward .. 59,170

An irrigation syphon at R.D. 30/41-35.

15-15 units.	Concrete broken brick jelly in surki mortar ..	20 12 0	100 c. ft.	314	
2-90 "	Table moulded brickwork in surki mortar ..	25 1 0	100 "	73	
43 sq. ft.	Cuddapah slab, 2" thick ..	30 0 0	100 sq. ft.	13	
300 units.	Plastering with cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 "	20	
165 "	Brick on end revetment and apron ..	16 12 0	100 c. ft.	28	
81 r. ft.	Cast-iron pipes, 6" diameter ..	3 0 0	R. ft.	243	
226 "	Stoneware pipes, 6" diameter ..	0 12 0	"	170	
70 units.	Gravel backing to revetment ..	3 9 0	100 c. ft.	3	
	Earthwork, etc. ..			30	
	Shed for materials ..			19	
	Total ..			913	
	Contingencies at 5 per cent ..			44	
	Petty supervision at 3 per cent ..			23	
	Total ..				980

Estimate No. 161-G.

An irrigation syphon at R.D. 30/59-35.

15-89 units.	Concrete broken brick jelly in surki mortar ..	20 12 0	100 c. ft.	330	
280 "	Table moulded brick in surki mortar ..	25 1 0	100 "	70	
43 sq. ft.	Cuddapah slab, 2" thick ..	30 0 0	100 sq. ft.	13	
290 units.	Plastering with cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 "	20	
165 "	Brick on end revetment and apron ..	16 12 0	100 c. ft.	28	
81 r. ft.	Cast-iron pipes, 9" diameter ..	5 0 0	R. ft.	405	
226 "	Stoneware pipes, 9" diameter ..	1 2 0	"	254	
70 units.	Gravel backing to revetment ..	3 9 0	100 c. ft.	3	
	Earthwork ..			24	
	Shed for materials ..			19	
	Total ..			1,168	
	Contingencies at 5 per cent ..			56	
	Petty supervision at $2\frac{1}{2}$ per cent ..			28	
	Total ..				1,250

Estimate No. 162-G.

Irrigation sluice at R.D. 30/6180.

3-40 units.	Concrete broken brick in surki mortar ..	20 12 0	100 c. ft.	71	
3-80 "	Table moulded brick in lime mortar ..	24 0 0	100 "	91	
7 sq. ft.	Cuddapah slab ..	30 0 0	100 sq. ft.	2	
6 c. ft.	Cutstone ..	1 12 0	C. ft.	11	
9-90 units.	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	13	
38 R. ft.	Cast-iron pipes, 9" diameter ..	5 0 0	R. ft.	190	
	Teakwood stem shutters including iron fittings, etc. ..			30	
	Shed for materials ..			10	
	Earthwork excavation, etc., complete ..			5	
	Total ..			423	
	Contingencies at 5 per cent ..			25	
	Petty supervision at $2\frac{1}{2}$ per cent ..			12	
	Total ..				460
	Carried over ..				61,860

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

Brought forward .. 61,860

O. MISCELLANEOUS—cont.

Estimate No. 163-G.

An irrigation syphon at R.D. 30/9935.

946 units.	Concrete brick jelly in surki mortar ..	20 12 0	100 c. ft.	196	
296 "	Table moulded brick in surki mortar ..	25 1 0	100 "	73	
43 sq. ft.	Cuddapah slab, 2" thick ..	30 0 0	100 sq. ft.	13	
306 units.	Plastering with Portland cement, 3/4" thick, 1 cement to 3 sand ..	6 12 0	100 "	21	
165 "	Brick on end revetment ..	16 12 0	100 c. ft.	28	
70 r. ft.	Gravel backing to revetment ..	3 9 9	100 "	3	
11 "	Cast-iron pipes, 6" diameter ..	3 0 0	R. ft.	243	
94 units.	Stoneware pipes, 6" diameter ..	0 12 0	"	71	
	Earthwork, etc. ..		Lump sum.	24	
	Shed for materials ..		"	19	
	Contingencies at 5 per cent ..			692	
	Petty supervision at 2 1/2 per cent ..			38	
				20	
	Total ..				760

Estimate No. 164-G.

Pipe sluice at R.D. 31/1435.

490 units.	Concrete broken brick in surki mortar ..	20 12 0	100 c. ft.	102	
460 "	Table moulded brick in lime mortar ..	24 0 0	100 "	110	
8 c. ft.	Cutstone ..	1 12 0	C. ft.	14	
205 units.	Plastering with Portland cement, 3/4" thick (1:3) ..	6 12 0	100 sq. ft.	14	
365 "	Brick on end, 9" thick ..	16 12 0	100 c. ft.	61	
30 r. ft.	Cast-iron pipe, 9" diameter ..	5 0 0	R. ft.	150	
	Teakwood stem shutters including iron fittings, etc. ..		Lump sum.	30	
	Shed for materials ..		"	10	
	Earthwork excavation, etc., complete ..		"	5	
	Contingencies at 5 per cent ..			496	
	Petty supervision at 2 1/2 per cent ..			24	
				10	
	Total ..				530

Estimate No. 165-G.

An irrigation syphon at R.D. 31/2435.

908 units.	Concrete broken brick jelly in surki mortar ..	20 12 0	100 c. ft.	188	
420 "	Table moulded brickwork in surki mortar ..	25 1 0	100 "	106	
43 sq. ft.	Cuddapah slab, 2" thick ..	30 0 0	100 sq. ft.	13	
390 units.	Plastering with Portland cement, 3/4" thick (1:3) ..	6 12 0	100 "	26	
165 "	Brick on end revetment and apron, 9" thick ..	16 12 0	100 c. ft.	28	
70 "	Gravel backing to revetment ..	3 9 0	100 "	3	
80 r. ft.	Cast-iron pipes, 9" diameter ..	5 0 0	R. ft.	405	
80 "	Stoneware pipes, 9" diameter ..	1 2 0	"	90	
	Earthwork, etc. ..		Lump sum.	25	
	Shed for materials ..		"	18	
	Contingencies at 5 per cent ..			902	
	Petty supervision at 2 1/2 per cent ..			45	
				23	
	Total ..				970
	Carried over ..				64,110

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

O. MISCELLANEOUS—cont.

Brought forward .. 64,110

Estimate No. 166-G. (Plan No. G. 115).

Sluice at R.D. 31/6000.

(Rates same as for bridge at 31/7325).

1100 units.	Concrete brick jelly in surki mortar ..	24 2 0	100 c. ft.	285	
1080 "	Table moulded brick in lime mortar ..	26 12 0	100 "	289	
370 "	Archwork table moulded brick in lime ..	27 12 0	100 "	103	
9 "	Cutstone work ..	1 12 0	C. ft.	16	
76 "	Plastering with Portland cement, 3/4" thick (1:3) ..	6 12 0	100 sq. ft.	51	
200 "	Teakwood wrought and put up ..	4 4 0	C. ft.	9	
No. 1	Do. shutter with planks, 2" thick, screw shafts 2" diameter, including screw box, brackets, holding down bolts, angle irons, etc., complete, including trainage ..		Lump sum.	Each.	100
	Brick on end for revetment and pitching ..	19 0 0	100 c. ft.	48	
25 units.	Gravel backing under revetment ..	7 1 0	"	10	
142 "	Earthwork excavating for foundation and filling in ..		Lump sum.	19	
	Centering for archwork ..		"	17	
	Shed for materials ..		"	12	
	Contingencies at 5 per cent ..			939	
	Petty supervision at 3 per cent ..			47	
				24	
	Total ..				1,010

Estimate No. 167-G. (Plan No. G. 116).

Sluice at R.D. 32/0500.

(Rates same as for bridge at 31/7325).

300 units.	Concrete brick jelly in surki mortar ..	24 2 0	100 c. ft.	72	
320 "	Table moulded brick in lime mortar ..	26 12 0	100 "	86	
14 "	Cutstone work, cubic feet ..	1 12 0	C. ft.	25	
17 "	Plastering with Portland cement, 3/4" thick (1:3) ..	6 12 0	100 sq. ft.	12	
40 r. ft.	Cast-iron pipe, 15" diameter ..	12 0 0	R. ft.	480	
	Needle shutter with planks, 2" thick, hooks, etc., complete ..		Lump sum.	30	
320 units.	Brick on end 9" for revetment and pitching ..	19 0 0	100 c. ft.	61	
210 "	Gravel backing 6" under revetment ..	7 1 0	100 "	15	
	Earthwork ..		"	35	
	Shed for materials ..		"	10	
	Contingencies at 5 per cent ..			826	
	Petty supervision at 3 per cent ..			40	
				24	
	Total ..				890

Estimate No. 168-G.

Sluice at R.D. 32/1750.

(Rates same as for bridge at 31/7325).

1284 units.	Concrete brick jelly in surki mortar ..	24 2 0	100 c. ft.	310	
1514 "	Table moulded brick in lime mortar ..	26 12 0	100 "	404	
519 "	Archwork table moulded brick in lime mortar ..	27 12 0	100 "	144	
16 c. ft.	Cutstone work ..	1 12 0	C. ft.	19	
990 units.	Plastering with Portland cement, 3/4" thick, 1 cement to 3 sand ..	6 12 0	Sq. ft.	67	
233 "	Teakwood wrought and put up ..	4 4 0	C. ft.	10	
No. 1	Teakwood shutter with planks, 2" thick, screw shafts 2" diameter, including screw box brackets, holding down bolts, angle irons, etc., complete, including railway fare and cartage ..		Lump sum.	Each.	100
325 units.	Brick on end for revetment and pitching ..	19 0 0	100 c. ft.	62	
192 "	Gravel backing under revetment ..	7 1 0	100 "	14	
	Earthwork excavating for foundations and filling in ..		Lump sum.	49	
	Centering for archwork ..		"	15	
	Shed for materials ..		"	16	
	Contingencies at 5 per cent ..			1,210	
	Petty supervision at 3 per cent ..			60	
				30	
	Total ..				1,300
	Carried over ..				67,310

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

O. MISCELLANEOUS—cont.

Brought forward .. 67,310

Estimate No. 169-G. (Plan No. G. 117).

Irrigation syphon at R.D. 32/7500.

6.40 units.	Concrete brick jelly in surki mortar ..	24 4 0	100 c. ft.	155	
3.20 "	Table moulded brick in lime mortar ..	28 6 0	100 "	91	
0.50 sq. ft.	Cuddapah slab, 2" thick ..	26 0 0	100 sq. ft.	13	
2.90 "	Plastering with Portland cement, 3" thick (1:3) ..	6 12 0	100 "	20	
1.6 "	Brick on end revetment and apron, 9" ..	19 13 0	100 c. ft.	32	
0.9 "	Gravel backing to revetment ..	6 3 0	100 "	6	
84 r. ft.	Cast-iron pipes, 12" ..	8 0 0	R. ft.	672	
84 "	Stoneware pipes, 12" diameter ..	1 12 0	"	147	
	Earthwork, etc. ..		Lump sum.	10	
No. 1	Cast-iron bend for front well ..	30 0 0	Each.	30	
	Shed for materials ..		Lump sum	14	
	Total ..			1,190	
	Contingencies at 5 per cent ..			60	
	Petty supervision at 2½ per cent ..			30	
	Total ..				1,280

Estimate No. 170-G.

Sluice at R.D. 32/9000

(Rates as for syphon aqueduct at 32/6400).

11.15 units.	Concrete brick jelly in surki mortar ..	24 4 0	100 c. ft.	270	
12.50 "	Table moulded brick in lime mortar ..	27 6 0	100 "	342	
3.95 "	Archwork table moulded brick in lime mortar ..	28 6 0	100 "	112	
11.0 "	Cutstone work ..	1 12 0	C. ft.	19	
8.80 "	Plastering with Portland cement ¾" thick, 1 cement, 3 sand ..	6 12 0	100 sq. ft.	59	
2.33 "	Teakwood wrought and put up ..	4 0 0	C. ft.	9	
No. 1	Teakwood shutter with planks, 2" thick, screw shafts 2" diameter, including screw box, brackets, holding down bolts, angle irons, etc., complete ..	100 0 0	Each.	100	
2.60 units.	Brick on end revetment and pitching ..	19 13 0	100 c. ft.	52	
1.50 "	Gravel backing under revetment ..	6 3 0	100 "	10	
	Earthwork excavating for foundation and filling in ..		Lump sum.	33	
	Centering for archwork ..		"	25	
	Shed for materials ..		"	15	
	Total ..			1,046	
	Contingencies at 5 per cent ..			50	
	Petty supervision at 3 per cent ..			24	
	Total ..				1,120

Estimate No. 171-G.

An irrigation syphon at R.D. 32/9200.

Same as per estimate for the irrigation syphon at R.D. 32/7500 ..				1,280	1,280
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Estimate No. 172-G.

Irrigation syphon at R.D. 33/0500

(Rates same as for syphon at R.D. 32/6400).

Same as per estimate of an irrigation syphon at R.D. 32/7500 ..				1,280	1,280
Carried over ..					72,270

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—cont.

Brought forward .. 72,270

O. MISCELLANEOUS—cont.

Estimate No. 173-G.

Sluice at R.D. 33/2500.

9.74 units.	Concrete brick jelly in surki mortar ..	26 10 0	100 c. ft.	259	
11.60 "	Table moulded brick in lime mortar ..	29 2 0	100 "	338	
3.24 "	Archwork table moulded brick in lime mortar ..	30 2 0	100 "	98	
9 "	Cutstone work ..	1 12 0	C. ft.	16	
7.50 "	Plastering with Portland cement, ¾" thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	51	
2.00 "	Teakwood wrought and put up ..	4 4 0	C. ft.	9	
No. 1	Teakwood shutter with planks, 2½" thick, screw shafts 2" diameter, including screw box, holding down bolts, angle irons, etc., complete, including trainage ..		Lump sum.	100	
3.20 units.	Brick on end for revetment and pitching ..	21 9 0	100 c. ft.	69	
1.90 "	Gravel backing under revetment ..	5 5 0	100 "	10	
No. 1	Earthwork excavation and filling ..		Lump sum	40	
	Centering for archwork ..		"	14	
	Shed for materials ..		"	10	
	Total ..			1,014	
	Contingencies at 5 per cent ..			52	
	Petty supervision at 2½ per cent ..			24	
	Total ..				1,090

Estimate No. 174-G.

Irrigation syphon at R.D. 33/6000 feet.

6.40 units.	Concrete brick jelly in surki mortar ..	26 10 0	100 c. ft.	170	
3.20 "	Table moulded brick in surki mortar ..	30 7 0	100 "	97	
50 "	Cuddapah slab, 2" ..	26 14 0	100 sq. ft.	13	
2.90 "	Plastering with Portland cement, ¾" thick, 1 cement and 3 sand ..	6 12 0	100 "	20	
1.60 "	Brick on end revetment and apron ..	21 9 0	100 c. ft.	35	
0.90 "	Gravel backing to revetment ..	6 5 0	100 "	5	
84 R. ft.	Cast-iron pipes, 12" diameter ..	8 0 0	R. ft.	672	
	Stoneware pipes, 12" diameter ..	1 12 0	100 "	147	
No. 1	Cast-iron bend ..	30 0 0	Each.	30	
	Earthwork, etc. ..		"	14	
	Shed for materials ..		"	17	
	Total ..			1,220	
	Contingencies at 5 per cent ..			60	
	Petty supervision at 2½ per cent ..			30	
	Total ..				1,310

Estimate No. 175-G.

Sluice at R.D. 33/9500.

(Rates same as for syphon aqueduct at R.D. No. 33/8334).

6.22 units.	Concrete brick jelly in surki mortar ..	26 10 0	100 c. ft.	219	
7.98 "	Table moulded brick in lime mortar ..	29 2 0	100 "	233	
2.39 "	Archwork table moulded brick in lime mortar ..	30 2 0	100 "	72	
9 "	Cutstone work ..	1 12 0	C. ft.	16	
5.80 "	Plastering with Portland cement, ¾" thick, 1 cement and 3 sand ..	6 12 0	Sq. ft.	39	
2 c. ft.	Teakwood wrought and put up ..	4 4 0	C. ft.	9	
No. 1	Teakwood shutter with planks, 2" thick, screw shafts 2" diameter, including screw box, brackets, holding bolts, angle irons, etc. ..		Lump sum.	100	
1.88 "	Brick on end for revetment and pitching ..	21 9 0	100 c. ft.	41	
1.05 "	Gravel backing under revetment ..	5 5 0	100 "	5	
	Earthwork excavation and filling in ..		Lump sum.	40	
	Centering for archwork ..		"	15	
	Shed for materials ..		"	11	
	Total ..			800	
	Contingencies at 5 per cent ..			40	
	Petty supervision at 2½ per cent ..			20	
	Total ..				
	Carried over ..				75,530

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
GRAND ANICUT CANAL—cont.					
	Brought forward ..			75,530	

O. MISCELLANEOUS—cont.

Estimate No. 176-G.

A Pipe Sluice at R.D. 34/3250.

(Rates same as for syphon aqueduct at R.D. 34/24).

2-85 units.	Concrete brick jelly in surki mortar ..	26 8 0	100 c. ft.	76	
2-35 "	Table moulded brick in lime mortar ..	29 15 0	100 "	71	
12 c. ft.	Cutstone work ..	1 12 0	C. ft.	21	
No. 1.	Needle shutter with planks 2" thick hooks, etc., complete			25	
	Lump sum.			10	
1-50 units.	Plastering with Portland cement, 3/4" thick (1:3) ..	6 12 0	100 sq. ft.		
0-80 "	Brick on end for revetment and pitching ..	21 13 0	100 c. ft.	17	
0-50 "	Gravel backing under revetment ..	5 5 0	100 "	3	
	Earthwork excavation and cutting rear channel ..			26	
	Lump sum.			6	
28 R. ft.	Shed for materials ..			32	
	Stoneware pipe, 9" diameter ..	1 2 0	R. ft.		
	Total ..			287	
	Contingencies ..			15	
	Petty supervision ..			8	
	Total ..				310

Estimate No. 177-G.

Sluice at R.D. 36/8500.

3-10 units.	Concrete brick jelly in surki mortar ..	22 15 0	100 c. ft.	71	
2-80 "	Table moulded brick in lime mortar ..	26 1 0	100 "	73	
12 "	Cutstone work ..	1 12 0	C. ft.	21	
1-40 "	Plastering with Portland cement, 3/4" thick (1:3) ..	6 12 0	100 sq. ft.	10	
1-40 "	Stoneware pipe 15" diameter ..	2 10 0	R. ft.	68	
26 R. ft.	Stem shutter with planks, 2" thick, hooks etc., complete			20	
	Lump sum.			44	
2-30 units.	Brick on end revetment and pitching ..	18 15 0	100 c. ft.		
1-50 "	Gravel backing under revetment ..	2 12 0	100 "	4	
	Earthwork ..			17	
	Lump sum.			10	
	Shed for materials ..				
	Total ..			338	
	Contingencies at 5 per cent ..			20	
	Petty supervision at 3 per cent ..			12	
	Total ..				370

Estimate No. 178-G.

Irrigation syphon at R.D. 37/2000.

(Rates same as for an irrigation syphon at 37/0800.)

5-20 units.	Concrete brick jelly in surki mortar ..	22 15 0	100 c. ft.	119	
1-90 "	Table moulded brick in surki mortar ..	27 4 0	100 "	51	
0-50 "	Cuddapah slab, 2" thick ..	25 8 0	100 sq. ft.	13	
2-1 "	Plastering with Portland cement, 3/4" thick (1:3) ..	6 12 0	100 "	14	
1-6 "	Brick on end revetment and pitching ..	18 15 0	100 c. ft.	30	
0-9 "	Gravel backing to revetment ..	2 12 0	100 "	3	
No. 1	Stoneware pipes bents ..	9 0 0	Each.	9	
126 R. ft.	Do. 12" ..	1 12 0	R. ft.	221	
	Earthwork ..			10	
	Lump sum.			13	
	Shed for materials ..				
	Total ..			484	
	Contingencies at 5 per cent ..			25	
	Petty supervision at 2 1/2 per cent ..			11	
	Total ..				520
	Carried over ..				76,730

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL—cont.					
	Brought forward ..			76,730	

O. MISCELLANEOUS—cont.

Estimate No. 179-G.

Sluice at R.D. 37/2500.

(Rates same as for syphon at R.D. 37/0800.)

2-70 units.	Concrete brick jelly in surki mortar ..	22 15 0	100 c. ft.	62 0 0	
1-50 "	Table moulded brick in lime mortar ..	25 1 0	100 "	39 0 0	
12 "	Cutstone ..	1 12 0	C. ft.	21 0 0	
1-40 "	Plastering with Portland cement, 3/4" thick, 1 cement 3 sand ..	6 12 0	100 sq. ft.	9 0 0	
28 "	Stoneware pipe, 9" diameter ..	1 12 0	R. ft.	32 0 0	
No. 1	Stem shutter with planks, 2" thick, hooks, etc., complete			20 0 0	
	Lump sum.			10 0 0	
0-50 units.	Brick on end revetment and pitching ..	18 15 0	100 c. ft.		
0-20 "	Gravel backing under revetment ..	2 12 0	100 "	1 0 0	
	Earthwork ..			16 0 0	
	Lump sum.			10 0 0	
	Shed for materials ..				
	Total ..			220 0 0	
	Contingencies ..			12 0 0	
	Petty supervision ..			8 0 0	
	Total ..				240

Estimate No. 180-G. (Plan No. G. 118).

Sluice at R.D. 37/5000.

2-20 units.	Concrete brick jelly in surki mortar ..	21 1 0	100 c. ft.	46 0 0	
2-00 "	Table moulded brick in lime mortar ..	24 6 0	100 "	49 0 0	
13 "	Cutstone work ..	1 12 0	C. ft.	23 0 0	
1-8 "	Plastering with Portland cement, 3/4" thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	9 0 0	
1 "	Stem shutter with planks, 2" thick, hooks, etc., complete			30 0 0	
	Lump sum.			31 0 0	
1-80 "	Brick on end for revetment and pitching ..	17 4 0	100 c. ft.		
1-20 "	Gravel backing, 6" under revetment ..	3 9 0	100 "	4 0 0	
28 "	Stoneware pipe, 1' 0" diameter, including cartage, fixing, etc., complete ..	1 11 0	R. ft.	47 0 0	
	Earthwork excavating for foundations and cutting rear channel ..			22 0 0	
	Lump sum.			15 0 0	
	Shed for materials ..				
	Total ..			276 0 0	
	Contingencies at 5 per cent ..			15 0 0	
	Petty supervision at 3 per cent ..			9 0 0	
	Total ..				300

Estimate No. 181-G.

Irrigation syphon at R.D. 37/9500.

2-20 c. ft.	Concrete broken brick in surki mortar ..	22 13 0	100 c. ft.	50 0 0	
3-40 "	Table moulded brick in mortar ..	27 3 0	100 "	92 0 0	
43 sq. ft.	Cuddapah slabs, 2" thick ..	30 0 0	100 sq. ft.	13 0 0	
3-40 units	Plastering with Portland cement, 3/4" thick, (1:3) ..	6 12 0	100 "	23 0 0	
1-90 "	Brick on end revetment ..	9 0 0	100 c. ft.	36 0 0	
125 "	Gravel backing to revetment ..	3 9 0	100 "	4 0 0	
L. S.	Earthwork, etc. ..			20 0 0	
	Lump sum.			10 0 0	
	Shed for materials ..				
	Total ..			248 0 0	
	Contingencies ..			15 0 0	
	Petty supervision ..			7 0 0	
	Total ..				270
3 c. ft.	Cost of stoneware piping per running foot—				
R. ft.	Concrete in surki mortar ..	22 13 0	100 c. ft.	0 11 0	
	Cost of 1-ft. pipe including fixing ..	1 11 0		1 11 0	
	Total ..			2 6 0	
	Contingencies, petty supervision ..			0 2 0	
	Total per running foot ..			2 8 0	
110 r. ft.	Stoneware piping including fixing ..	2 8 0	R. ft.		
	Total ..				280
	Carried over ..				77,820

GRAND ANICUT CANAL SYSTEM—MAIN CANAL AND BRANCHES—*cont.*

Quantity	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—*cont.*O. MISCELLANEOUS—*cont.*

Brought forward .. 77,820

Estimate No. 182-G.

Irrigation syphon at R.D. 38/1000.

No. 1	Front and rear walls as per detail estimate enclosed to the one at R.D. 37/9500	270 0 0	Each.	270	
110 units.	Stoneware pipes including carting to site and fixing	2 8 0	R. ft.	280	
	Total				550

Estimate No. 183-G.

Sluice at R.D. 38/3500 of the Grand Anicut Canal, details same as for sluice R.D. 37/5000.

2-20 units.	Concrete brick jelly in surki mortar ..	22 13 0	100 c. ft.	50	
2-00 "	Table moulded brick in lime mortar ..	26 0 0	100 "	52	
13 "	Cutstone work	1 12 0	C. ft.	23	
1 "	Needle shutter with planks, 2" thick, hooks, etc., complete.		Lump sum.	30	
1-4 "	Plastering with Portland cement, 3" thick, 1 cement and 3 sand.	6 12 0	100 sq. ft.	9	
1-80 "	Brick on end for revetment and pitching ..	19 0 0	100 c. ft.	34	
1-20 "	Gravel backing, 6" under revetment ..	3 9 0	100 "	4	
28 r. ft.	Stoneware pipe, 1' 3" diameter, including cartage, fixing, etc., complete.	2 10 0	R. ft.	75	
	Earthwork excavating for foundations and cutting rear channel.		Lump sum.	24	
	Shed for materials			15	
	Total				316
	Contingencies at 5 per cent				15
	Petty supervision				9
	Total				340
	Data same as per work at R.D. 38/7800.				340

Estimate No. 184-G. (Plan No. G. 119.)

A sluice to supply tank at R.D. 38/9060 of the Grand Anicut Canal.

7-90 units.	Concrete brick jelly in surki mortar ..	22 13 0	100 c. ft.	180	
7-60 "	Table-moulded brick in lime mortar ..	26 0 0	100 "	198	
2-20 "	Archwork table-moulded brick in lime mortar ..	27 0 0	100 "	59	
11 "	Cutstone work	1 12 0	C. ft.	19	
5-70 "	Plastering with Portland cement, 3" thick, 1 cement and 3 sand.	6 12 0	100 sq. ft.	38	
2-33 "	Teakwood wrought and put up	4 4 0	C. ft.	10	
No. 1.	Teakwood shutter with planks, 2 1/2" thick, screw-shafts 2" diameter, screw-box brackets holding down bolts, etc., complete.	80 0 0	Lump sum.	80	
1-80 units.	Brick on end 9" for revetment and pitching ..	19 0 0	160 c. ft.	34	
1-10 "	Gravel backing, 6" under revetment	3 9 0	"	4	
	Earthwork excavating for foundation, cutting, rear channel, etc.		Lump sum.	20	
	Shed for materials			10	
	Total				652
	Contingencies at 5 per cent				33
	Petty supervision at 2 1/2 per cent				15
	Total				700
	Carried over				79,410

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

GRAND ANICUT CANAL—*cont.*O. MISCELLANEOUS—*cont.*

Brought forward .. 79,410

Estimate No. 185-G.

Sluice at R.D. 40/3000.

2-20 units.	Concrete brick jelly in surki mortar ..	23 4 0	100 c. ft.	51	
2-20 "	Table-moulded brick in lime mortar ..	26 4 0	100 "	53	
13 "	Cutstone work	1 12 0	C. ft.	23	
1 "	Needle shutter with planks, 2" thick, hooks, etc., complete.		Lump sum.	30	
1-3 "	Plastering with Portland cement, 3" thick, 1 cement and 3 sand.	6 12 0	100 sq. ft.	9	
1-80 "	Brick on end for revetment and pitching ..	19 0 0	100 c. ft.	34	
1-20 "	Gravel backing, 6" thick under revetment ..	4 7 0	100 "	5	
28 r. ft.	Stoneware pipe, 1' diameter, including cartage, fixing, etc., complete.	1 11 0	R. ft.	47	
	Earthwork excavating foundation and cutting rear channel.		Lump sum.	22	
	Shed for materials			11	
	Total				285
	Contingencies at 5 per cent				15
	Petty supervision at 3 per cent				10
	Total				310
					310

Estimate No. 186-G.

Sluice at R.D. 40/8250.

2-00 units.	Concrete brick jelly in surki mortar ..	22 6 0	100 c. ft.	49	
2-00 "	Table-moulded brick in lime mortar ..	25 7 0	100 "	51	
13 "	Cutstone work	1 12 0	C. ft.	23	
1 "	Needle shutter with planks, 2" thick, hooks, etc., complete.		Lump sum.	30	
1-4 "	Plastering with Portland cement, 3" thick, 1 cement and 3 sand.	6 12 0	100 sq. ft.	9	
1-80 "	Brick on end for revetment and pitching ..	18 1 0	100 c. ft.	33	
1-20 "	Gravel backing, 6" under revetment ..	4 7 0	100 "	5	
32 "	Stoneware pipe, 9" diameter, including cartage, fixing, etc., complete.	1 0 0	R. ft.	32	
	Earthwork excavating for foundations and cutting rear channel.		Lump sum.	24	
	Shed for materials			13	
	Total				289
	Contingencies at 5 per cent				13
	Petty supervision				8
	Total				290
					290

Estimate No. 187-G.

Pipe sluice at R.D. 43/0500.

2-50 units.	Concrete brick jelly in surki mortar ..	26 5 0	100 c. ft.	66	
2-40 "	Table-moulded brick in lime mortar ..	28 15 0	100 "	70	
13 c. ft.	Cutstone work	1 12 0	C. ft.	23	
No. 1	Stem shutter with pins and locking arrangements.		Lump sum.	30	
1-30 units.	Plastering with Portland cement, 3" thick, 1 cement and 3 sand.	6 12 0	100 sq. ft.	9	
1-70 "	Brick on end for revetment and pitching ..	21 9 0	100 c. ft.	37	
1-10 "	Gravel backing to revetment	9 5 0	100 "	10	
26 "	Running foot of stoneware pipe, 9" diameter, including cartage and fixing.	1 0 0	R. ft.	26	
	Earthwork excavating foundations			10	
	Shed for materials			12	
	Total				293
	Contingencies				17
	Petty supervision				10
	Total				320
	Carried over				80,330

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.

GRAND ANICUT CANAL—cont.

O. MISCELLANEOUS—cont. Brought forward .. 80,533

Estimate No. 183-G.

Sluice at R.D. 43/2500.

2.50 units.	Concrete brick jelly in surki mortar ..	26 5 0	100 c. ft.	66 0 0	
2.40 "	Table-moulded brick in lime mortar ..	28 15 0	100 "	70 0 0	
13 "	Cutstone work ..	1 12 0	C. ft.	23 0 0	
1 "	Stem shutter with planks, 2" thick, hooks, etc., complete.		Lump sum.	30 0 0	
1.30 "	Plastering with Portland cement, 3/4" thick, 1 cement and 3 sand.	6 12 0	100 sq. ft.	9 0 0	
1.70 "	Brick on end for revetment and pitching ..	21 9 0	100 c. ft.	37 0 0	
1.10 "	Gravel backing, 6" under revetment ..	9 5 0	100 "	10 0 0	
26 r. ft.	Stoneware pipe, 1' diameter, including cartage, fixing, etc., complete.	1 11 0	R. ft.	44 0 0	
	Earthwork excavating for foundation and cutting rear channel.		Lump sum.	10 0 0	
	Shed for materials ..			10 0 0	
	Contingencies ..			309 0 0	
	Petty supervision ..			61 0 0	
	Total ..			15 0 0	
	Total ..			349 0 0	349

Estimate No. 189-G.

Irrigation syphon at R.D. 43/5000.

2.20 units.	Concrete broken brick in surki mortar ..	26 5 0	100 c. ft.	58 0 0	
3.40 "	Table-moulded brick in mortar ..	28 15 0	100 "	98 0 0	
43 "	Cuddapah slabs, 2" thick ..	30 0 0	100 sq. ft.	13 0 0	
340 "	Plastering with Portland cement, 3/4" thick 1:3.	6 12 0	100 "	23 0 0	
1.90 "	Brick on end revetment ..	21 9 0	100 c. ft.	41 0 0	
1.25 "	Gravel backing to revetment ..	9 5 0	100 "	12 0 0	
Lump sum.	Earthwork, excavating, etc. ..			20 0 0	
Do.	Shed for materials ..			10 0 0	
	Total ..			275 0 0	
	Contingencies ..			15 0 0	
	Petty supervision ..			10 0 0	
	Total ..			300	
3 c. ft.	Cost of stoneware pipes per running foot—				
R. ft.	Concrete in surki mortar ..	26 5 0	100 c. ft.	0 13 0	
	Cost of 1 foot pipe including fixing ..	1 11 0	R. ft.	1 11 0	
	Total ..			2 8 0	
	Contingencies ..			0 3 0	
	Petty supervision ..				
	Total ..			2 11 0	
11 1/2 r. ft.	Stoneware pipes including carting to site and fixing.	2 11 0	R. ft.		
	Total ..				503
	Carried over ..				81,270

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.

GRAND ANICUT CANAL—cont.

O. MISCELLANEOUS—cont.

Brought forward .. 81,270

Estimate No. 190-G.

Sluice at R.D. 43/6000.

2.50 units.	Concrete brick jelly in surki mortar ..	26 5 0	100 c. ft.	66 0 0	
2.40 "	Table-moulded brick in lime mortar ..	28 15 0	100 "	70 0 0	
13 "	Cutstone work ..	1 12 0	C. ft.	23 0 0	
1.30 "	Plastering with Portland cement, 3/4" thick, 1 cement and 3 sand.	6 12 0	100 sq. ft.	9 0 0	
1 "	Needle shutter with planks, 2" thick, hooks, etc., complete.		Lump sum.	30 0 0	
1.70 "	Brick on end, 9" for revetment and pitching ..	21 9 0	100 c. ft.	37 0 0	
1.10 "	Gravel backing, 6" under revetment ..	9 5 0	100 "	10 0 0	
26 "	Stoneware pipe, 1' diameter, including cartage, fixing, etc., complete.	1 11 0	R. ft.	44 0 0	
	Earthwork ..		Lump sum.	10 0 0	
	Shed for materials ..			10 0 0	
	Total ..			309 0 0	
	Contingencies at 5 per cent ..			16 0 0	
	Petty supervision ..			15 0 0	
	Total ..			340 0 0	340

Estimate No. 191-G.

Irrigation syphon at R.D. 43/8500.

2.20 units.	Concrete broken brick in surki mortar ..	26 5 0	100 c. ft.	58 0 0	
3.40 "	Table-moulded brick in mortar ..	28 15 0	100 "	98 0 0	
0.43 "	Cuddapah slabs, 2" thick ..	30 0 0	100 sq. ft.	13 0 0	
3.40 "	Plastering with Portland cement ..	6 12 0	100 "	24 0 0	
1.90 "	Brick on end revetment ..	21 9 0	100 c. ft.	41 0 0	
1.25 "	Gravel backing to revetment ..	9 5 0	"	12 0 0	
L.S. "	Earthwork, excavating, etc. ..			20 0 0	
"	Shed for materials ..			10 0 0	
	Total ..			275 0 0	
	Contingencies ..			15 0 0	
	Petty supervision ..			10 0 0	
	Total ..			300	
3 c. ft.	Cost of stoneware pipes per running foot—				
R. ft.	Concrete in surki mortar ..	26 5 0	100 c. ft.	0 13 0	
	Cost of 1 foot pipe, including fixing ..	1 11 0	R. ft.	1 11 0	
	Total ..			2 8 0	
	Contingencies ..			0 3 0	
	Petty supervision ..				
	Total ..			2 11 0	
116 r. ft.	Of pipe-laying ..	2 11 0	R. ft.		
	Total ..				310
	Carried over ..				610

Estimate No. 192-G.

Irrigation syphon at R.D. 44/1500.

2.20 c. ft.	Concrete broken brick in surki mortar ..	26 5 0	100 c. ft.	58 0 0	
3.40 units.	Table-moulded brick in lime mortar ..	28 15 0	100 "	98 0 0	
43 sq. ft.	Cuddapah slabs, 2" thick ..	30 0 0	100 sq. ft.	13 0 0	
3.40 units.	Plastering with Portland cement, 3/4" thick, 1 cement and 3 sand ..	6 12 0	100 "	23 0 0	
1.90 "	Brick on end revetment ..	21 9 0	100 c. ft.	41 0 0	
1.25 "	Gravel backing to revetment ..	9 5 0	100 "	12 0 0	
L.S. "	Earthwork, excavating, etc. ..			20 0 0	
"	Shed for materials ..			10 0 0	
	Total ..			275 0 0	
	Contingencies ..			15 0 0	
	Petty supervision ..			10 0 0	
	Carried over ..				300
	Carried over ..				82,520

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL— <i>cont.</i>					
O. MISCELLANEOUS— <i>cont.</i>					
			Brought forward ..		300
			Estimate No. 192-G.— <i>cont.</i>		
			Brought forward ..		82,520
Irrigation syphon at R.D. 44/1500— <i>cont.</i>					
3 c. ft.	Cost of stoneware pipes per running foot—				
R. ft.	Concrete in surki mortar	26 5 0	100 c. ft.	0 13 0	
	Cost of 1 foot pipe including fixing	1 11 0	R. ft.	1 11 0	
	Total			2 8 0	
	Contingencies			0 3 0	
	Petty supervision				
	Total			2 11 0	
102 r. ft.	Stoneware pipes including carting to site and fixing.	2 11 0	R. ft.	280 0 0	280
	Total				580

Estimate No. 193-G.

Pipe sluice at R.D. 44/4500.

2-50 units.	Concrete brick jelly in surki mortar	27 13 0	100 c. ft.	70 0 0	
2-40 "	Table-moulded brick in lime mortar	30 7 0	100 "	73 0 0	
13 "	Cutstone work	1 12 0	C. ft.	23 0 0	
1-30 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1 cement and 3 sand.	6 12 0	100 sq. ft.	9 0 0	
1 "	Needle shutter with planks, 2" thick, hooks, etc., complete.		Lump sum.	30 0 0	
1-70 "	Brick on end for revetment and pitching	23 5 0	100 c. ft.	40 0 0	
1-10 "	Gravel backing, 6" under revetment	11 1 0	100 "	12 0 0	
26 "	Stoneware pipe, 1' diameter, including cartage, fixing, etc., complete.	1 11 0	R. ft.	44 0 0	
	Earthwork		Lump sum.	10 0 0	
	Shed for materials			12 0 0	
	Total			323 0 0	
	Contingencies at 5 per cent			17 0 0	
	Petty supervision at 3 per cent			10 0 0	
	Total				350

Estimate No. 194-G.

Irrigation syphon at R.D. 44/8000.

2-20 units	Concrete broken brick in surki mortar	28 7 0	100 c. ft.	62 0 0	
3-40 "	Table-moulded brick in lime mortar	30 13 0	100 sq. ft.	105 0 0	
0-43 "	Cuddapan slab, 2" thick	30 0 0	100 "	13 0 0	
3-40 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:1)	6 12 0	100 "	23 0 0	
1-90 "	Brick on end revetment	23 5 0	100 c. ft.	44 0 0	
1-25 "	Gravel backing to revetment	10 9 0	100 "	13 0 0	
L.S.	Earthwork, excavating, etc.		Lump sum.	20 0 0	
	Shed for materials			10 0 0	
	Total			290 0 0	
	Contingencies			15 0 0	
	Petty supervision			10 0 0	
	Total			315 0 0	
8 c. ft.	Cost of stoneware pipes per running foot—				
R. ft.	Concrete in surki mortar	28 7 0	100 c. ft.	0 13 4	
	Cost of 1 foot pipe including fixing	1 11 0	R. ft.	1 11 0	
	Total			2 8 4	
	Contingencies			0 2 8	
	Petty supervision				
	Total			2 11 0	
No. 1	Front and rear walls as per detail estimate enclosed 37/95.	315 0 0	Each.		
106 r. ft.	Stoneware pipes including carting to site and fixing.	2 11 0	R. ft.		285
	Total				600
	Carried over				83,750

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
GRAND ANICUT CANAL— <i>cont.</i>					
O. MISCELLANEOUS— <i>cont.</i>					
			Brought forward ..		83,750
Estimate No. 195-G.					
Fixing demarcation stones, bench mark stones and R.D. stones for the Grand Anicut Canal.					
2,736 No.	Demarcation stones	0 8 0	Each.	1,368 0 0	
150 "	Bench mark stones	2 10 0	"	473 0 0	
900 "	R.D. stones	1 10 0	"	1,483 0 0	
	Sundries			226 0 0	
	Total				3,530
	Total, O. Miscellaneous				87,280

P. MAINTENANCE.

Estimate No. 196-G.

Maintenance of the Grand Anicut Canal during construction.

Maintenance of the Grand Anicut canal during construction	Lump sum.	40,000 0 0	
Total		40,000 0 0	
Total, P. Maintenance			40,000

KALIANODAI BRANCH CANAL.

A. PRELIMINARY EXPENSES.

Estimate No. 197-G.

Preliminary expenses for Kalianodai Branch.

18 miles.	Cost of preliminary surveys	Lump sum.	7,000 0 0	
	Setting out canal alignments during execution.	30 0 0	Mile	1,440 0 0
	Contingencies			60 0 0
	Total			8,500 0 0
	Total, A. Preliminary Expenses			8,500

B. LAND.

Estimate No. 198-G.

Land compensation for Kalianodai Branch Canal.

			RS.	
113 acres.	Garden lands to be acquired permanently for the canal	200 0 0	Acre.	22,600
227 "	Dry lands to be acquired permanently for the canal	50 0 0	"	11,350
	Add for compulsory acquisition 15 per cent of the value of lands			5,023
15,909 units.	Compensation for earth to be taken from lands adjoining the canal in place where the canal runs in banking	0 10 0	1,000 c. ft.	9,943
	Total			48,986
	Sundries			364
	Total			49,350
	Total, B. Land			49,350

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
KALIANODAI BRANCH CANAL—cont.					
D. REGULATORS.					
Estimate No. 199-G. (Plan No. G. 177.)					
A head sluice for the Kalianodai Branch Canal at R.D. 15/9800 of the Grand Anicut Canal, left bank.					
123.50 units.	Concrete broken brick in surki mortar ..	22 9 0	100 c. ft.	2,786	
147.80 "	Table-moulded stock bricks in lime mortar ..	25 8 0	100 "	3,769	
21.10 "	Archwork table-moulded stock bricks in lime mortar ..	26 8 0	100 "	559	
49.00 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	848	
76.60 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	1 12 0	C. ft.	491	
280.5 c. ft.	Concrete blocks for apron and revetment ..	23 9 0	100 c. ft.	2,008	
85.20 "	Brick jelly backing ..	11 1 0	100 "	153	
13.80 "	Teakwood wrought and put up ..	4 0 0	C. ft.	385	
96.25 "	Clay puddle ..	10 0 0	100 c. ft.	23	
2.330 "	Teakwood shutters with $\frac{1}{2}$ " planks, screw box ..				
No. 11	24" shafts, including holding down bolts, brackets, angles, etc., complete ..	150 0 0	Each.	1,650	
	Earthwork, excavating foundations and filling in ..				
	Shed for materials ..		Lump sum.	225	
	Centering for arches ..			120	
	Railway charges for shutters ..			125	
				50	
	Total ..			13,182	
	Contingencies at 5 per cent ..			658	
	Petty supervision at $2\frac{1}{2}$ per cent ..			330	
	Total ..				14,180

Estimate No. 200-G.

A regulator at R.D. 1/6940 of Kalianodai Branch Canal.

86.1 units.	Concrete broken brick in surki mortar ..	25 15 0	100 c. ft.	2,233	
76.1 "	Table-moulded stock brick in lime mortar ..	28 4 0	100 "	2,150	
71.5 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	483	
12.4 "	Archwork in lime mortar ..	29 4 0	100 c. ft.	363	
132 "	Cutstone work ..	1 12 0	C. ft.	231	
61 "	Teakwood wrought and put up ..	4 0 0		244	
44.0 "	Concrete block apron and revetment ..	26 11 0	100 c. ft.	1,174	
8.6 "	Brick jelly backing ..	13 4 0	100 "	114	
No. 7	Teakwood shutters with $2\frac{1}{2}$ " planks, screw shaft ..				
	24" diameter including screw box, holding down bolts, angles, etc., complete ..	180 0 0	Each.	1,260	
	Railway charges and cartage to site for shutters ..		Lump sum.	40	
	Centering for arches ..			122	
	Excavating foundations and filling in ..			196	
	Sheds for materials ..			100	
	Total ..			8,710	
	Contingencies at 5 per cent ..			437	
	Petty supervision at $2\frac{1}{2}$ per cent ..			223	
	Total ..				9,370

Estimate No. 201-G.

A regulator with 3' drop at R.D. 6/7830 of Kalianodai Branch Canal.

36.60 units.	Concrete broken brick in surki mortar ..	23 6 0	100 c. ft.	856	
40.8 "	Table-moulded stock bricks in lime mortar ..	26 0 0	100 "	1,061	
1.9 "	Archwork table-moulded stock bricks in lime mortar ..	27 0 0	100 "	51	
6.5 "	Cement plastering, 3 to 1, $\frac{3}{4}$ " thick ..	5 12 0	100 sq. ft.	14	
18.1 "	Cement plastering, $\frac{3}{4}$ " thick, 2 to 1 ..	6 12 0	100 "	122	
34.3 "	Cutstone work ..	1 12 0	C. ft.	60	
34.2 "	Concrete blocks for revetment and pitching ..	24 7 0	100 c. ft.	836	
7.2 "	Brick jelly backing for revetments ..	11 1 0	100 "	80	
12.4 "	Teakwood wrought and put up ..	4 0 0	C. ft.	50	
No. 2	Teakwood shutters with planks $2\frac{1}{2}$ " thick, screw shafts 2" diameter including screw box, holding down bolts, brackets, angle irons, etc., complete ..	150 0 0	Each.	300	
	Carried over ..				22,550

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
KALIANODAI BRANCH CANAL—cont.					
D. REGULATORS—cont.					
Estimate No. 201-G. (Plan No. G. 184)—cont.					
A regulator with 3' drop at R.D. 6/7830—cont.					
	Railway charges, cartage, etc., for shutters ..		Lump sum.	10	
	Centering for arches ..			18	
	Earthwork, excavating and filling in ..			100	
	Clay puddle ..			10	
	Shed for materials ..			40	
	Total ..			3,638	
	Contingencies at 5 per cent ..			182	
	Petty supervision at $2\frac{1}{2}$ per cent ..			90	
	Total ..				3,910
	Total, D. Regulators ..				27,460

Brought forward .. 23,550

D. REGULATORS—cont.

Estimate No. 201-G. (Plan No. G. 184)—cont.

A regulator with 3' drop at R.D. 6/7830—cont.

	Railway charges, cartage, etc., for shutters ..		Lump sum.	10	
	Centering for arches ..			18	
	Earthwork, excavating and filling in ..			100	
	Clay puddle ..			10	
	Shed for materials ..			40	
	Total ..			3,638	
	Contingencies at 5 per cent ..			182	
	Petty supervision at $2\frac{1}{2}$ per cent ..			90	
	Total ..				3,910
	Total, D. Regulators ..				27,460

E. FALLS AND WEIRS.

Estimate No. 202-G. (Plan No. G. 178).

A 3' drop at R.D. 1730.

35.00 units.	Concrete broken brick in surki mortar ..	22 14 0	100 c. ft.	818	
36.10 "	Table moulded stock brick in lime mortar ..	25 11 0	100 "	945	
3.25 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	219	
1.00 "	Cuddapah slabs, 2" thick ..	18 15 0	100 "	19	
74.10 "	Concrete blocks for apron and revetment ..	23 14 0	100 c. ft.	1,769	
12.10 "	Brick jelly backing ..	11 1 0	100 "	134	
L.S.	Earthwork, excavating foundations, etc. ..		Lump sum.	60	
"	Shed for materials ..			50	
	Total ..			3,979	
	Contingencies at 5 per cent ..			200	
	Petty supervision at $2\frac{1}{2}$ per cent ..			101	
	Total ..				4,280

Estimate No. 203-G.

A 3' drop at R.D. 4700.

35.00 units.	Concrete broken brick in surki mortar ..	23 6 0	100 c. ft.	818	
36.10 "	Table moulded stock brick in lime mortar ..	26 3 0	100 "	945	
32.5 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	219	
1.00 "	Cuddapah stones, 2" thick ..	18 15 0	100 "	19	
74.10 "	Concrete blocks for apron and revetment ..	24 6 0	100 c. ft.	1,806	
12.10 "	Brick jelly backing ..	11 8 0	100 "	139	
L.S.	Earthwork, excavating foundations, etc. ..			60	
"	Shed for materials ..			50	
	Total ..			4,056	
	Contingencies at 5 per cent ..			203	
	Petty supervision at $2\frac{1}{2}$ per cent ..			101	
	Total ..				4,360
	Carried over ..				8,610

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
KALIANODAI BRANCH CANAL—cont.					
E. FALLS AND WEIRS—cont. Brought forward ..					
Estimate No. 204-G.					
A 3' drop at R.D. 7340 of Kalianodai Branch Canal.					
34.6 units.	Concrete broken brick in surki mortar ..	24 2 0	100 c. ft.	835	
35.8 "	Table moulded stock brick in lime mortar ..	26 12 0	100 "	958	
32.1 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3).	6 12 0	100 sq. ft.	217	
0.96 "	Cuddapah slabs, 2" thick ..	18 0 0	100 "	19	
73.5 "	Concrete block for apron and revetment ..	25 1 0	100 c. ft.	1,842	
12.1 "	Brick jelly backing ..	11 15 0	100 "	144	
	Earthwork, excavating foundations, etc.			60	
	Shed for materials ..			30	
	Total ..			4,105	
	Contingencies at 5 per cent ..			205	
	Petty supervision at $2\frac{1}{2}$ per cent ..			100	
	Total ..				4,410

Estimate No. 205-G. (Plan No. G. 180.)

A 6' drop at R.D. 2/9450 of the Kalianodai Branch Canal.

52.00 units.	Concrete broken brick in surki mortar ..	24 2 0	100 c. ft.	1,254	
90.00 "	Table moulded stock brick in lime mortar ..	26 9 0	100 "	2,391	
75.8 "	Concrete block for apron and revetment ..	25 1 0	100 "	1,900	
13.00 "	Brick jelly backing ..	11 8 0	100 "	150	
1.3 "	Cuddapah slabs, 2" thick ..	19 12 0	100 sq. ft.	26	
38.37 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3).	6 12 0	100 "	259	
	Earthwork, excavating foundations and filling in ..			Lump sum.	200
	Shed for materials ..			60	
	Clay puddle ..			40	
	Total ..			6,280	
	Contingencies at 5 per cent ..			314	
	Petty supervision at $2\frac{1}{2}$ per cent ..			156	
	Total ..				6,750

Estimate No. 206-G. (Plan No. G. 181.)

A 4' drop at R.D. 4/9250 of Kalianodai Branch Canal.

41.24 units.	Concrete broken brick in surki mortar ..	22 14 0	100 c. ft.	943	
61.40 "	Table moulded stock brick in lime mortar ..	25 9 0	100 "	1,570	
40.61 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3).	6 12 0	100 sq. ft.	274	
1.28 "	Cuddapah slabs, 2" thick ..	20 7 0	100 "	27	
61.39 "	Concrete blocks for apron and revetment ..	23 15 0	100 c. ft.	4,470	
9.92 "	Brick jelly backing ..	10 10 0	100 "	105	
L.S.	Earthwork, excavating foundations ..			Lump sum.	100
	Shed for materials ..			45	
	Clay puddle ..			100	
	Total ..			4,634	
	Contingencies at 5 per cent ..			232	
	Petty supervision at $2\frac{1}{2}$ per cent ..			114	
	Total ..				4,980

Estimate No. 207-G.

A 4' drop at R.D. 5/1230 of Kalianodai Branch Canal.

41.24 units.	Concrete broken brick in surki mortar ..	22 6 0	100 c. ft.	923	
61.40 "	Table moulded stock brick in lime mortar ..	25 2 0	100 "	1,543	
40.61 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3).	6 12 0	100 sq. ft.	274	
1.28 "	Cuddapah slabs, 2" thick ..	20 10 0	100 "	27	
61.39 "	Concrete blocks for apron and revetment ..	23 8 0	100 c. ft.	1,443	
9.92 "	Brick jelly backing ..	10 10 0	100 "	105	
L.S.	Earthwork, excavating foundations and filling in, etc.			Lump sum.	100
	Shed for materials ..			45	
	Clay puddle ..			100	
	Total ..			4,560	
	Contingencies at 5 per cent ..			228	
	Petty supervision at $2\frac{1}{2}$ per cent ..			112	
	Total ..				4,900
	Carried over ..				29,680

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
KALIANODAI BRANCH CANAL—cont.					
E. FALLS AND WEIRS—cont. Brought forward ..					
Estimate No. 208-G. (Plan No. G. 182).					
A 2' drop at R.D. 5/3210 of Kalianodai Branch Canal.					
26.25 units.	Concrete broken brick in surki mortar ..	22 5 0	100 c. ft.	586	
25.30 "	Table moulded stock brick in lime mortar ..	25 2 0	100 "	636	
24.4 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3).	6 12 0	100 sq. ft.	165	
1.0 "	Cuddapah slabs, 2" thick ..	20 10 0	100 "	21	
55.6 "	Concrete blocks for apron and revetment ..	23 7 0	100 c. ft.	1,303	
9.60 "	Brick jelly backing ..	10 4 0	100 "	98	
	Earthwork, excavating foundations, etc.			Lump sum.	40
	Shed for materials ..			30	
	Total ..			2,879	
	Contingencies at 5 per cent ..			145	
	Petty supervision at $2\frac{1}{2}$ per cent ..			76	
	Total ..				3,100

Estimate No. 209-G.

A 4' drop at R.D. 5/6840 of Kalianodai Branch Canal.

40.65 units.	Concrete broken brick in surki mortar ..	22 4 0	100 c. ft.	904	
60.80 "	Table moulded stock brick in lime mortar ..	25 1 0	100 "	1,524	
1.28 "	Cuddapah slabs, 2" thick ..	20 10 0	100 sq. ft.	26	
40.09 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3).	6 12 0	100 "	270	
60.90 "	Concrete blocks for apron and revetment ..	23 6 0	100 c. ft.	1,423	
9.90 "	Brick jelly backing ..	10 10 0	100 "	105	
	Earthwork, excavating foundations and filling in, etc.			Lump sum.	80
	Shed for materials ..			100	
	Clay puddle ..			49	
	Total ..			4,481	
	Contingencies at 5 per cent ..			224	
	Petty supervision at $2\frac{1}{2}$ per cent ..			115	
	Total ..				4,820

Estimate No. 210-G.

A 6' drop at R.D. 6/1130 of Kalianodai Branch Canal.

49.95 units.	Concrete broken brick in surki mortar ..	22 9 0	100 c. ft.	1,127	
87.17 "	Table moulded stock brick in lime mortar ..	25 4 0	100 "	2,201	
73.82 "	Concrete blocks for apron and revetment ..	23 11 0	100 "	1,749	
13.0 "	Brick jelly backing ..	10 4 0	100 "	134	
1.3 "	Cuddapah slabs, 2" thick ..	20 12 0	100 sq. ft.	27	
36.64 "	Plastering with Portland cement, $\frac{3}{4}$ " thick ..	5 12 0	100 "	247	
	Clay puddle ..			40	
	Excavating foundations and filling in ..			Lump sum.	200
	Shed for materials ..			60	
	Total ..			5,785	
	Contingencies at 5 per cent ..			289	
	Petty supervision at $2\frac{1}{2}$ per cent ..			146	
	Total ..				6,220

Estimate No. 211-G. (Plan No. G. 185.)

A 4' drop at R.D. 7/0870 of Kalianodai Branch Canal.

23.87 units.	Concrete broken brick in surki mortar ..	24 4 0	100 c. ft.	579	
36.31 "	Table moulded stock brick in lime mortar ..	26 13 0	100 "	974	
22.46 "	Plastering with Portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	152	
0.87 "	Cuddapah slabs, 2" thick ..	20 2 0	100 "	17	
37.13 "	Concrete blocks for apron and revetment ..	25 3 0	100 c. ft.	935	
7.18 "	Brick jelly backing ..	11 15 0	100 "	86	
	Earthwork, excavating foundations and filling in ..			Lump sum.	60
	Shed for materials ..			30	
	Clay puddle ..			15	
	Total ..			2,848	
	Contingencies at 5 per cent ..			142	
	Petty supervision at $2\frac{1}{2}$ per cent ..			70	
	Total ..				3,060
	Carried over ..				46,880

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
KALIANODAI BRANCH CANAL—cont.					
E. FALLS AND WEIRS—cont.					
Estimate No. 212-G. (Plan No. G. 186.)					
A 2' drop at R.D. 7/3340 of Kalianodai Branch Canal.					
15.8 units.	Concrete broken brick in surki mortar ..	24 4 0	100 c. ft.	383	
15.2 "	Table moulded stock brick in lime mortar ..	26 13 0	100 "	408	
14.0 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	95	
0.60 "	Cuddapah slabs, 2" thick ..	20 2 0	100 "	12	
31.7 "	Concrete blocks for apron and revetment ..	25 3 0	100 c. ft.	798	
6.10 "	Brick jelly backing ..	11 15 0	100 "	73	
	Earthwork, excavating foundations, etc. ..	Lump sum.		30	
	Shed for materials ..			30	
	Total ..			1,829	
	Contingencies at 5 per cent ..			94	
	Petty supervision at $2\frac{1}{2}$ per cent ..			47	
	Total ..				1,970

Estimate No. 213-G.

A 4' drop at R.D. 8/7270 of Kalianodai Branch Canal.

22.9 units.	Concrete broken brick in surki mortar ..	26 5 0	100 c. ft.	603	
35.3 "	Table moulded stock brick in lime mortar ..	28 10 0	100 "	1,010	
21.6 "	Plastering with Portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	146	
0.9 "	Cuddapah slabs, 2" thick ..	20 4 0	100 "	18	
36.24 "	Concrete blocks for apron and revetment ..	27 1 0	100 c. ft.	980	
7.2 "	Brick jelly backing ..	13 11 0	100 "	99	
L.S.	Earthwork, excavating foundations, etc. ..	Lump sum.		69	
	Clay puddle ..			15	
	Shed for materials ..			30	
	Total ..			2,961	
	Contingencies at 5 per cent ..			148	
	Petty supervision at $2\frac{1}{2}$ per cent ..			81	
	Total ..				3,190
	Total E. Falls and Weirs ..				52,040

G. BRIDGES.

Estimate No. 214-G. (Plan No. G. 179.)

A 3' drop and bridge at R.D. 5855 of Kalianodai Branch Canal.

51.79 units.	Concrete broken brick in surki mortar ..	24 2 0	100 c. ft.	1,249	
62.48 "	Table moulded stock brick in lime mortar ..	26 12 0	100 "	1,672	
10.0 "	Cutstone work ..	1 12 0	C. ft.	18	
0.96 "	Cuddapah slabs, 2" thick ..	19 0 0	100 sq. ft.	19	
32.46 "	Plastering with Portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 "	219	
74.31 "	Concrete blocks for apron and revetment ..	25 1 0	100 c. ft.	1,862	
12.19 "	Brick jelly backing ..	11 15 0	100 "	146	
28.1 "	Metalling ..	18 4 0	100 "	513	
9.6 "	Gravelling ..	14 15 0	100 "	143	
No. 6.	Guard stones ..	3 0 0	Each.	18	
	Excavating foundations and forming approaches ..	Lump sum.		183	
	Total ..			6,042	
	Contingencies at 5 per cent ..			302	
	Petty supervision at $2\frac{1}{2}$ per cent ..			151	
71 r. ft.	Roadway, including Westwood's through plate cement concrete, standards, wheel guards and hand rails ..	40 2 0	R. ft.	2,849	
176.08 cwt.	Rolled steel beams ..	8 0 0	Cwt.	1,409	
No. 8.	Stiffening frames, B. class ..	17 12 0	Each.	142	
	Shed for materials ..	Lump sum.		105	
	Total ..				11,000
	Carried over ..				11,000

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
KALIANODAI BRANCH CANAL—cont.					
G. BRIDGES—cont.					
Estimate No. 215-G.					
A 3' drop and "C" class bridge at R.D. 9650.					
49.05 units.	Concrete broken brick in surki mortar ..	24 11 0	100 c. ft.	1,211	
57.8 "	Table moulded stock brick in lime mortar ..	27 4 0	100 "	1,575	
6.0 "	Cutstone work ..	1 12 0	C. ft.	11	
1.0 "	Cuddapah slabs, 2" thick ..	19 2 0	100 sq. ft.	19	
30.62 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 "	207	
73.3 "	Concrete block for apron and revetment ..	25 9 0	100 c. ft.	1,886	
12.2 "	Brick jelly backing ..	12 6 0	100 "	151	
3.1 "	Road metalling ..	19 4 0	100 "	60	
1.1 "	Gravelling ..	15 13 0	100 "	17	
No. 6.	Guard stones ..	3 0 0	Each.	18	
	Excavating foundations and forming approaches, etc. ..	Lump sum.		150	
	Total ..			5,305	
	Contingencies at 5 per cent ..			265	
	Petty supervision at $2\frac{1}{2}$ per cent ..			133	
70 r. ft.	Roadway, including Westwood's trough plate cement concrete, standards, wheel guards and hand rails ..	31 10 0	R. ft.	2,213	
111.25 cwt.	Rolled steel beams ..	8 0 0	Cwt.	890	
No. 4.	Stiffening frames, C class ..	22 12 0	Each.	91	
	Shed for materials ..			83	
	Total ..				8,980

Estimate No. 216-G.

A "B" class bridge of 2 spans of 30 feet each at R.D. 2/0280.

For abutments and wings 7.5' high to bed plate.					
17.40 units.	Concrete broken brick in surki mortar ..	25 15 0	100 c. ft.	451	
31.50 "	Table moulded stock brick in lime mortar ..	28 4 0	100 "	890	
13.50 "	Concrete block for revetment ..	26 12 0	100 "	861	
4.50 "	Brick jelly backing ..	13 4 0	100 "	60	
14.10 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	95	
28.30 "	Road metalling ..	19 4 0	100 c. ft.	545	
9.43 "	Gravelling ..	15 13 0	100 "	149	
5.0 "	Cutstone work ..	1 12 0	C. ft.	9	
L.S.	Earthwork, excavating foundations, etc. ..	Lump sum.		170	
No. 8	Guard stones ..	3 0 0	Each.	24	
	Total ..			2,754	
	Contingencies at 5 per cent ..			137	
	Petty supervision at $2\frac{1}{2}$ per cent ..			69	
	Total ..				2,960
For one Pier 7.5' high to bed plate.					
3.30 units.	Concrete in surki mortar ..	25 15 0	100 c. ft.	86	
4.30 "	Brickwork in lime mortar ..	28 4 0	100 "	121	
3.70 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	25	
5.0 "	Cutstone work ..	1 12 0	Each.	9	
L.S.	Earthwork, excavating foundations ..	Lump sum.		2	
	Total ..			243	
	Contingencies at 5 per cent ..			12	
	Petty supervision at $2\frac{1}{2}$ per cent ..			5	
	Total ..				260
66 r. ft.	Roadway, including Westwood's trough plate, cement concrete, road metalling, gravelling, including standards, wheel guards and hand rails, etc. ..	40 7 0	R. ft.	2,689	
140.84 "	Rolled steel beams 18" x 7" x 75 lb. for two sides, 20" x 7 $\frac{1}{2}$ " x 89 lb. for the centre (66 ft.). ..	3 0 0	Cwt.	1,127	
	Shed for materials ..	Lump sum.		74	
	Total ..				3,870
	Total ..				7,090
	Carried over ..				27,070

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

KALIANODAI BRANCH CANAL—cont.

G. BRIDGES—cont.

Brought forward .. 27,070

Estimate No. 217-G.

A "C" class bridge of two spans of 29 feet at R.D. 2/8730.

<i>For abutments and wings 7-5' high from bed.</i>					
16-40 units.	Concrete broken brick in surki mortar ..	24 2 0	100 c. ft.	396	
31-25 "	Table moulded stock brick in lime mortar ..	25 9 0	100 "	830	
13-50 "	Concrete blocks for revetment ..	25 1 0	100 "	338	
4-50 "	Brick jelly backing ..	11 8 0	100 "	52	
14-40 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	97	
6-30 "	Road metalling ..	20 4 0	100 c. ft.	128	
2-10 "	Gravelling ..	15 11 0	100 "	35	
3 "	Cutstone work ..	1 12 0	C. ft.	5	
L.S.	Earthwork, excavating foundations ..	Lump sum.		125	
No. 8	Guard stones ..	3 0 0	Each.	24	
	Total ..			2,030	
	Contingencies at 5 per cent ..			100	
	Petty supervision at $2\frac{1}{2}$ per cent ..			50	
	Total ..				2,180
<i>For one Pier 7-5' high from bed.</i>					
3-00 units.	Concrete broken brick in surki mortar ..	24 2 0	100 c. ft.	72	
3-90 "	Table moulded stock brick in lime mortar ..	25 9 0	100 "	104	
3-00 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	20	
L.S.	Earthwork, excavating foundations ..	Lump sum.		2	
3 units.	Cutstone work ..	1 12 0	C. ft.	5	
	Total ..			203	
	Contingencies at 5 per cent ..			1	
	Petty supervision at $2\frac{1}{2}$ per cent ..			7	
	Total ..				220
64 r. ft.	Roadway, including Westwood's trough plate, cement concrete, road metalling and gravelling, including standards, wheel guards and hand rails, etc.	31 8 0	R. ft.	2,016	
85-71 cwt.	Rolled steel beams 18" x 7" x 75 lb. for two sides.	8 0 0	Cwt.	686	
	Shed for materials ..	Lump sum.		68	
	Total ..				2,770
	Total ..				5,170

Estimate No. 218-G.

A "C" class bridge of two spans of 29 feet at R.D. 4/5870.

<i>For abutments and wings 7-5' above bed.</i>					
16-40 units.	Concrete broken brick in surki mortar ..	22 14 0	100 c. ft.	375	
31-25 "	Table moulded stock brick in lime mortar ..	25 9 0	100 "	799	
13-50 "	Concrete block for revetment ..	23 15 0	100 "	323	
4-50 "	Brick jelly backing ..	10 10 0	100 "	48	
14-40 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	97	
6-30 "	Road metalling ..	20 4 0	100 c. ft.	128	
2-10 "	Gravelling ..	15 11 0	100 "	35	
3 "	Cutstone work ..	1 12 0	C. ft.	5	
L.S.	Earthwork, excavating foundations and forming approaches.	Lump sum.		125	
No. 8	Guard stones ..	3 0 0	Each.	24	
	Total ..			1,959	
	Contingencies at 5 per cent ..			100	
	Petty supervision at $2\frac{1}{2}$ per cent ..			51	
	Total ..				2,110
	Carried over ..				32,240

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

KALIANODAI BRANCH CANAL—cont.

G. BRIDGES—cont.

Brought forward .. 32,240

Estimate No. 218-G—cont.

Brought forward .. 2,110

A "C" class bridge of two spans of 29 feet at R.D. 4/5870—cont.

<i>For one Pier 7-5' high above bed.</i>					
3-00 units.	Concrete broken brick in surki mortar ..	22 4 0	100 c. ft.	69	
3-90 "	Table moulded stock brick in lime mortar ..	25 9 0	100 "	100	
3-00 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	20	
3 "	Cutstone work ..	1 12 0	C. ft.	5	
L.S.	Earthwork, excavating foundations, etc.	Lump sum.		2	
	Total ..			196	
	Contingencies at 5 per cent ..			9	
	Petty supervision at $2\frac{1}{2}$ per cent ..			5	
	Total ..				210
64 r. ft.	Roadway, including Westwood's trough plate, road metalling and gravelling, including standards, wheel guards and hand rails, etc.	31 8 0	R. ft.	2,016	
85-71 cwt.	Rolled steel beams, 18" x 7" x 75 lb. 2" x 75" x 65 lb. = 85-71 for two sides (64 r. ft. each).	8 0 0	Cwt.	686	
	Shed for materials ..	Lump sum.		58	
	Total ..				2,760
	Total ..				5,080

Estimate No. 219-G.

A "C" class bridge of two spans of 28 feet at R.D. 5/4728.

<i>For abutments and wings 7-5' high from bed.</i>					
16-40 units.	Concrete broken brick in surki mortar ..	22 5 0	100 c. ft.	366	
31-25 "	Table moulded stock brick in lime mortar ..	25 2 0	100 "	785	
13-50 "	Concrete blocks for revetment ..	23 7 0	100 "	316	
4-50 "	Brick jelly backing ..	10 4 0	100 "	48	
14-40 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	97	
6-30 "	Road metalling ..	20 4 0	100 c. ft.	128	
2-10 "	Gravelling ..	15 11 0	100 "	35	
3 "	Cutstone work ..	1 12 0	C. ft.	5	
L.S.	Earthwork, excavating foundations, forming approaches, etc.	Lump sum.		125	
No. 8	Guard stones ..	3 0 0	Each.	24	
	Total ..			1,927	
	Contingencies at 5 per cent ..			96	
	Petty supervision at $2\frac{1}{2}$ per cent ..			47	
	Total ..				2,070
<i>For one Pier 7-5' high from bed.</i>					
3-00 units.	Concrete broken brick in surki mortar ..	22 5 0	100 c. ft.	67	
3-90 "	Table moulded stock brick in lime mortar ..	25 2 0	100 "	98	
3-00 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	20	
3 "	Cutstone work ..	1 12 0	C. ft.	5	
L.S.	Earthwork, excavating foundations and filling in ..	Lump sum.		2	
	Total ..			192	
	Contingencies at 5 per cent ..			10	
	Petty supervision at $2\frac{1}{2}$ per cent ..			5	
	Total ..				207
62 r. ft.	Roadway, including Westwood's trough plate, cement concrete, road metalling and gravelling, including standards, wheel guards and hand rails, etc.	31 8 0	R. ft.	1,953	
83-04 cwt.	Rolled steel beams 18" x 7" x 75 lb. 2" x 75" x 62 lb. for two sides (62 r. ft.)	8 0 0	Cwt.	664	
	Shed for materials ..	Lump sum.		56	
	Total ..				2,673
	Total ..				4,950
					42,270

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
KALIANODAI BRANCH CANAL—cont.					
G. BRIDGES—cont.					
Estimate No. 220—G.					
A "B" class bridge of 1 span of 35 feet at R.D. 7/1690.					
15.50 units.	Concrete broken bricks in surki mortar	24 4 0	100 c. ft.	376	
24.00 "	Table moulded brick in lime mortar	28 13 0	100 "	644	
11.00 "	Concrete blocks for revetment	25 3 0	100 "	277	
3.70 "	Brick jelly backing	11 15 0	100 "	44	
12.50 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3.	6 12 0	100 sq. ft.	84	
25.90 "	Road metalling	23 4 0	100 c. ft.	602	
8.6 "	Gravelling	19 5 0	"	166	
5 "	Cutstone work	1 12 0	C. ft.	9	
	Earthwork excavating foundations, etc.	Lump sum.		100	
No. 8	Guard stones	3 0 0	Each.	24	
	Total			2,326	
	Contingencies at 5 per cent			116	
	Petty supervision at $2\frac{1}{2}$ per cent			58	
	Total			2,500	
38 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling, gravelling, including standards, wheel guards and hand rails.	40 9 0		1,541	
94.24 cwt.	2 X 38 r. ft. of rolled steel beams 20" X $7\frac{1}{2}$ " X 89 lb.				
2 pairs.	38 r. ft. of 24" X $7\frac{1}{2}$ " X 100 lb. Stiffening frames B class	8 0 0	Cwt.	754	
	Shed for materials	35 8 0	Pair.	71	
				44	
	Total			2,410	
	Total			4,910	

Estimate No. 221—G.

A "C" class bridge of 1 span of 33 feet at R.D. 8/5230.

14.70 units.	Concrete broken brick in surki mortar	26 5 0	100 c. ft.	387	
24.25 "	Table, moulded stock brick in lime mortar	28 10 0	100 "	694	
11.00 "	Concrete block apron and revetment	27 1 0	100 "	298	
3.70 "	Brick jelly backing	13 11 0	100 "	51	
12.40 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3.	6 12 0	100 sq. ft.	84	
6.30 "	Road metalling	25 4 0	100 c. ft.	159	
2.10 "	Gravelling	21 1 0	100 "	44	
3 "	Cutstone work	1 12 0	C. ft.	5	
	Earthwork excavating foundations, etc.	Lump sum.		85	
No. 8	Guard stones	3 0 0	Each.	24	
	Total			1,831	
	Contingencies at 5 per cent			92	
	Petty supervision at $2\frac{1}{2}$ per cent			46	
36 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling, gravelling, including standards, wheel guards, etc.	32 0 0	R. ft.	1,152	
57.21 cwt.	Roller steel beams 20" X $7\frac{1}{2}$ " X 89 lb.	8 0 0	Cwt.	458	
No. 2	Stiffening frames C class	22 12 0	Each.	46	
	Shed for materials	Lump sum.		55	
	Total			3,680	
	Grand Total, G Bridges			50,860	

K. BUILDINGS.

Estimate No. 222—G.

Inspection bungalows and staff quarters, Kalianodai Branch Canal.

2	Inspection bungalows, permanent	4,000 0 0	Each.	8,000	
4	Inspection sheds, temporary	600 0 0	"	2,400	
4	Blocks of lascars' huts, permanent	1,500 0 0	"	6,000	
4	Store sheds	600 0 0	"	2,400	
5	Quarters for subordinates at sites of important works (temporary).	400 0 0	"	2,000	
	Total			20,800	
	Grand Total, K. Buildings			20,800	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
KALIANODAI BRANCH CANAL—cont.					
L. EARTHWORK.					
Estimate No. 223—G. (Plans Nos. G. 169-G. 175.)					
Excavating Kalianodai Branch Canal.					
22,560 units.	Earthwork excavating in ordinary red loamy soil and laying banks in layers and sectioning with an initial lead of 20 yards and a lift of 2 yards.	3 12 0	1,000 c. ft.	84,600	
4,038 "	Earthwork excavating in ordinary red loamy soil and laying banks in layers and sectioning with an extra lead of 10 yards.	4 0 6	1,000 "	16,278	
2,243 "	Earthwork excavating in ordinary red loamy soil and laying banks in layers and sectioning with an extra lead of 20 yards.	4 5 0	1,000 "	9,673	
	Total			1,13,551	
	Contingencies at 5 per cent			5,550	
	Petty supervision at $2\frac{1}{2}$ per cent			2,799	
	Total			1,18,900	
	Total, L. Earthwork			1,18,900	

M. PLANTATIONS.

Estimate No. 224—G.

Providing avenues along roads on canal banks of Kalianodai Branch Canal.

18 miles.	Providing avenues along roads on canal banks	300 0 0	Mile.	5,400	
	Total, M. Plantations			5,400	

O. MISCELLANEOUS.

Estimate No. 225—G.

Fixing demarcation stones along Kalianodai Branch Canal.

No. 600	Fixing demarcation stones	0 8 0	Each.	300	
	Total			300	

Estimate No. 226—G.

Fixing reduced distance stones along Kalianodai Branch Canal.

No. 152	Fixing reduced distance stones	1 12 0	Each.	266	
	Contingencies			13	
	Petty supervision			11	
	Total			290	

Estimate No. 227—G.

Fixing bench mark stones along Kalianodai Branch Canal.

No. 38	Fixing bench mark stones 2' 6" X 0' 8" X 0' 5" in concrete.	2 10 0	Each.	100	
	Contingencies			6	
	Petty supervision			4	
	Total			110	
	Carried over			700	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
KALIANODAI BRANCH CANAL—cont.					
			Brought forward ..		700
O. MISCELLANEOUS—cont.					
Estimate No. 228-G.					
Pipe sluices for Kalianodai Branch Canal.					
A cast iron pipe sluice 12" diameter at R.D. 1,400 right bank Kalianodai Branch Canal.					
3-25 units.	Concrete broken bricks in surki mortar ..	22 14 0	100 c.ft.	74	
3-25 "	Table moulded stock brick in lime mortar ..	25 11 0	"	83	
1-75 "	Plastering with cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	"	12	
5-5 "	Concrete block revetment ..	23 14 0	"	131	
1-3 "	Brick-jelly backing for revetment ..	11 1 0	"	20	
No. 3.	Cast iron pipe 12" diameter 12' long including fixing, cartage, etc., complete.	96 0 0	Each.	268	
	Cuddapah slab 2" x 2' of 2" thick including cutting out 9 5" diameter vent and fixing complete.		Lump sum.	1	
	Earthwork excavation and filling in ..		"	12	
	Steam shutter with flat iron bar, teak beam, holding down bolts, etc., complete.		"	15	
	Shed for materials ..		"	10	
	Total ..			646	
	Contingencies ..			30	
	Petty supervision ..			14	
	Total ..				690
A cast iron pipe sluice at R.D. 1,400 of the Kalianodai Branch Canal.					
3-25 units.	Concrete broken bricks in surki mortar ..	22 14 0	100 c.ft.	74	
3-25 "	Table moulded stock brick in lime mortar ..	25 11 0	"	83	
1-75 "	Plastering with cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	"	12	
5-5 "	Concrete block revetment ..	23 14 0	100 sq. ft.	131	
1-8 "	Brick-jelly backing ..	11 1 0	"	20	
No. 3.	Cast iron pipe 15" diameter, 12' long including fixing, cartage, etc., complete.	132 0 0	Each.	396	
	Cuddapah slab 2" x 2' of 2" thick with 13 1/4" diameter vent out.		Lump sum.	1	
	Earthwork excavation and filling in ..		"	12	
	Steam shutter with flat iron bar, teak beam, holding down bolts, etc., complete.		"	15	
	Shed for materials ..		"	10	
	Total ..			754	
	Contingencies at 5 per cent ..			30	
	Petty supervision at 2 1/2 per cent ..			16	
	Total ..				800
A cast iron pipe of 12" diameter at R.D. 6,680 on the right bank of the Kalianodai Branch Canal.					
3-25 units.	Concrete broken bricks in surki mortar ..	24 2 0	100 c.ft.	78	
3-25 "	Table moulded stock brick in lime mortar ..	26 1 0	"	87	
1-75 "	Plastering with Portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	12	
5-5 "	Concrete blocks for revetment ..	25 1 0	100 c.ft.	138	
1-8 "	Brick-jelly backing ..	11 15 0	"	21	
No. 3.	Cast iron pipe 12" diameter 12' long including fixing cartage, etc., complete.	96 0 0	Each.	288	
	Cuddapah slabs 2" x 2' x 2" thick with vent 10-25 diameter.		Lump sum.	1	
	Earthwork excavating and filling in ..		"	12	
	Steam shutter with flat iron bar, including teak beam, holding down bolts, etc., complete.		"	15	
	Shed for materials ..		"	10	
	Contingencies at 5 per cent ..			33	
	Petty supervision at 2 1/2 per cent ..			15	
	Total ..				710
	Carried over ..				2,200
	Carried over ..				700

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
KALIANODAI BRANCH CANAL—cont.					
			Brought forward ..		2,220
O. MISCELLANEOUS—cont.					
Estimate No. 228-G—cont.					
			Brought forward ..		700
Pipe sluices for Kalianodai Branch Canal—cont.					
An earthenware pipe sluice at R.D. 5/5850 on the left bank of Kalianodai Branch Canal.					
3-75 units.	Concrete broken bricks in surki mortar ..	22 4 0	100 c.ft.	83	
3-0 "	Table moulded bricks in lime mortar ..	25 1 0	100 "	76	
1-6 "	Portland cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	Square.	11	
4-7 "	Concrete block revetment ..	23 6 0	100 c.ft.	110	
1-5 "	Brick-jelly backing ..	10 4 0	100 "	15	
No. 9.	Earthenware pipes 15" diameter including fixing and cartage to site.	5 14 0	Each.	53	
	Cuddapah slabs 2" thick 2' x 2' with circular vent of 12 1/4" diameter.		Lump sum.	1	
	Earthwork excavating and filling in ..		"	10	
	Steam shutter with flat iron bars, teak beam, holding down bolts, etc., complete.		"	10	
	Contingencies ..			20	
	Petty supervision ..			12	
	Total ..				400
An earthenware pipe sluice at R.D. 5/8820 of the left bank of Kalianodai Branch Canal (Plan G. 183).					
3-75 units.	Concrete broken brick in surki mortar ..	22 10 0	100 c.ft.	85	
3-0 "	Table moulded bricks in lime mortar ..	25 4 0	100 "	76	
1-6 "	Portland cement plastering ..	6 12 0	Square.	11	
4-7 "	Concrete block for revetment ..	23 12 0	100 c.ft.	112	
1-5 "	Brick-jelly backing for revetment ..	10 4 0	100 "	15	
No. 9.	Earthenware pipes 15" diameter and 2' long including cartage to site and fixing.	5 14 0	Each.	53	
	Cuddapah slab 2" thick, 2' x 2' with circular vent of 12 1/4" diameter.		Lump sum.	1	
	Earthwork excavation and filling in ..		"	10	
	Steam shutter with flat iron bars, teak beam, holding down bolts, etc., complete.		"	10	
	Total ..			373	
	Contingencies at 5 per cent ..			18	
	Petty supervision at 2 1/2 per cent ..			9	
	Total ..				400
An earthenware pipe sluice 15" diameter at R.D. 6/3440 on the right bank of Kalianodai Branch Canal.					
3-75 units.	Concrete broken bricks in surki mortar ..	23 0 0	100 c.ft.	85	
3-0 "	Table moulded bricks in lime mortar ..	25 10 0	100 "	77	
1-6 "	Portland cement plastering, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	Square.	11	
4-7 "	Concrete block revetment ..	24 1 0	100 c.ft.	113	
1-5 "	Brick-jelly backing ..	10 10 0	100 "	16	
No. 14.	Earthenware pipes 15" diameter and 2' long including cartage to site and fixing.	5 14 0	Each.	82	
	Cuddapah slab 2" thick, 1 1/2' x 1 1/2' with circular vent of 12 1/4" diameter out.		Lump sum.	1	
	Earthwork excavating and filling in ..		"	12	
	Steam shutter with flat iron bars, teak beam, holding down bolts, etc.		"	15	
	Total ..			413	
	Contingencies at 5 per cent ..			21	
	Petty supervision ..				
	Total ..				450
	Carried over ..				3,450
	Carried over ..				700

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

KALIANODAI BRANCH CANAL—*cont.*O. MISCELLANEOUS—*cont.* Brought forward .. 3,450Estimate No. 228-G.—*cont.* Brought forward .. 700Pipe sluices for Kalianodai Branch Canal—*cont.*

<i>A pipe sluice on the left bank of the Kalianodai Branch Canal at R.D. 7/1320.</i>					
2-3 units.	Table moulded stock bricks in lime mortar ..	27 4 0	100 c. ft.	63	
1-4 "	Plastering with Portland cement 3 to 1 1/2" thick ..	6 12 0	100 sq. ft.	9	
No. 1	Cuddapah slab 2" thick and 1' 9" X 1' 9" including cutting out 13 1/2" diameter, circular vent.	1 0 0	Each.	1	
No. 15	Earthenware pipes 2' long and 15" diameter including fixing, etc.	5 14 0	"	88	
	Stem shutter with flat iron bar, teak beam, holding down bolts, etc., complete.				
	Earthwork excavating foundations and filling in ..			10	
	Lump sum.			10	
	Total ..			178	
	Contingencies at 5 per cent ..			9	
	Petty supervision at 2 1/2 per cent ..			5	
	Total ..			190	
<i>A pipe sluice on the right bank of the Kalianodai Branch Canal at R.D. 9/1320.</i>					
2-30 units.	Table moulded stock bricks in lime mortar ..	28 10 0	100 c. ft.	66	
1-4 "	Plastering 3/4" thick with cement 3 to 1 ..	6 12 0	Square	9	
No. 1	Cuddapah slab 2" thick and 18" X 18" including cutting out circular vent 9 1/2" diameter.	1 0 0	Each.	1	
No. 11	Earthenware pipes 2' long and 12" diameter including fixing, etc.	4 2 0	"	45	
	Stem shutter with flat iron bar, teak beam, holding down bolts, etc., complete.				
	Earthwork, excavating foundations and filling in ..			10	
	Lump sum.			10	
	Total ..			141	
	Petty supervision ..			3	
	Contingencies at 5 per cent ..			6	
	Total ..			150	
<i>A pipe sluice on the right bank of the Kalianodai Branch Canal at R.D. 9/1760.</i>					
2-3 units.	Table moulded stock bricks in lime mortar ..	28 10 0	100 c. ft.	66	
1-4 "	Plastering 3/4" thick with Portland cement, 3 to 1 ..	6 12 0	Square	9	
No. 1	Cuddapah slab 2" thick and 1' 6" X 1' 6" including cutting out circular vent 9" diameter.	1 0 0	Each.	1	
No. 11	Earthenware pipes 2' long and 12" diameter including fixing, etc., complete.	4 2 0	"	45	
	Stem shutter with flat iron bar, teak beam, holding down bolts, etc., complete.				
	Earthwork, excavating foundations and filling in ..			10	
	Lump sum.			10	
	Total ..			141	
	Contingencies at 5 per cent ..			6	
	Petty supervision at 2 1/2 per cent ..			3	
	Total ..			150	
	Total, pipe sluices ..			3,940	
	Total, O. Miscellaneous ..			4,640	

P. MAINTENANCE.

Estimate No. 229-G.

Maintenance of Kalianodai Branch Canal during construction.

Maintenance during construction ..	Lump sum.	5,000	
Total, P. Maintenance ..			5,000

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAKADU BRANCH CANAL.

A. PRELIMINARY EXPENSES.

Estimate No. 230-G.

Preliminary expenses for Vadakadu Branch Canal.

10 1/2 miles.	Cost of preliminary surveys ..	Lump sum.	4,400
10 1/2 "	Setting out canal alignments during execution ..	80 0 0 Mile.	850
	Sandries ..		50
	Total ..		5,300
	Total, A. Preliminary Expenses ..		5,300

B. LAND.

Estimate No. 231-G.

Land estimate for Vadakadu Branch Canal.

2,631 units.	Temporary occupation to be taken from lands adjoining the canal in banking portions.	0 10 0	1,000 c. ft.	1,644
80 acres.	Garden lands under wells to be acquired permanently for canal occupation.	200 0 0	Acre.	16,000
80 "	Garden lands under wells to be acquired permanently for dry lands.	50 0 0	"	4,000
	Add 15 per cent for compulsory acquisition ..			3,000
	Sandries ..			56
	Total ..			24,700
	Total, B. Land ..			24,700

D. REGULATORS.

Estimate No. 232-G. (Plan No. 191.)

A regulator with 1-ft. drop at head of the Vadakadu Branch Canal.

52-6 units.	Concrete broken bricks in surki mortar ..	23 6 0	100 c. ft.	1,230
56-7 "	Table moulded stock bricks in lime mortar ..	26 0 0	100 "	1,474
12-4 "	Plastering 3/4" thick with Portland cement, 3 to 1 ..	6 12 0	100 sq. ft.	84
35-6 "	Plastering 3/4" Portland cement, 3 to 1 ..	6 12 0	100 "	240
8-4 "	Archwork, table moulded stock bricks in lime mortar.	27 0 0	100 c. ft.	227
136-7 "	Cutstone work ..	1 12 0	C. ft.	239
48-0 "	Teakwood wrought and put up ..	4 0 0	"	192
37-9 "	Concrete block revetment and pitching ..	24 7 0	100 c. ft.	926
6-6 "	Brick-jelly backing ..	11 1 0	100 "	72
	Earthwork excavations filling in and formation of banks.			120
	Centering for arches			75
No. 6	Teakwood shutters 6' 3" X 3' 3" X 0' 3" with straps and fastenings, screw shafts 2 1/2" diameter, screw box, friction plates, holding down bolts, handles, L. irons, etc., complete.	130 0 0	Each.	780
	Railway freights, cartage, etc., for the shutters.			20
	Clay puddle ..			15
	Sheds for materials ..			100
	Total ..			5,794
	Contingencies at 5 per cent ..			281
	Petty supervision at 2 1/2 per cent ..			145
	Total ..			6,220
	Carried over ..			6,220

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAKADU BRANCH CANAL—cont.

G. BRIDGES.

Estimate No. 239-G.

A "B" Class bridge of 1 span of 40 ft. with 1 ft. drop at R. D. 1/0800 of Vadakadu Branch Canal.

25-90 units.	Concrete broken bricks in surki mortar ..	25 9 0	100 c. ft.	662
31-20 "	Table moulded stock brick in lime mortar ..	28 1 0	100 "	875
0-45 "	Cuddapah slabs 2" thick ..	19 14 0	100 sq. ft.	9
5 "	Cutstone work ..	1 12 0	C. ft.	9
29-60 "	Concrete block apron and revetment ..	26 5 0	100 c. ft.	779
5-10 "	Brick jelly backing ..	13 4 0	100 "	68
12-60 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	85
7-90 "	Do. do. ..	6 12 0	100 "	53
9-50 "	Road metalling ..	24 4 0	100 c. ft.	230
3-20 "	Gravelling ..	20 3 0	100 "	65
No. 8	Guard stones ..	3 0 0	Each.	24
	Earthwork excavating foundations and forming approaches, etc.		Lump sum.	100
	Total ..			2,959
	Contingencies at 5 per cent. ..			148
	Petty supervision ..			73
43 r. ft.	Roadway including Westwood's trough plate, cement concrete, metalling, gravelling, standards, handrails, etc.	40 7 0	R. ft.	1,739
115-18 cwt.	Rolled steel beams ..	8 0 0	Cwt.	921
2 pairs.	Stiffening frames B class ..	25 8 0	Each.	71
	Shed for materials ..		Lump sum.	89
	Total ..			6,000

Estimate No. 240-G.

A "C" Class bridge of 1 span of 40 ft. at R. D. 2/0300 of Vadakadu Branch Canal.

14-70 units.	Concrete broken bricks in surki mortar ..	25 10 0	100 c. ft.	377
25-10 "	Table moulded stock brick in lime mortar ..	28 4 0	100 "	709
11-00 "	Concrete block apron for revetment ..	26 6 0	100 "	290
3-70 "	Brick jelly backing ..	13 11 0	100 "	51
12-40 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	84
3-0 "	Cutstone work ..	1 12 0	C. ft.	5
6-30 "	Road metalling ..	26 4 0	100 c. ft.	165
2-10 "	Gravelling ..	21 15 0	100 "	46
No. 8	Earthwork excavating foundations, etc.		Lump sum.	90
	Guard stones ..	3 0 0	Each.	24
	Total ..			1,841
	Contingencies at 5 per cent. ..			96
	Petty supervision at $\frac{2}{3}$ per cent. ..			47
43 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling, gravelling, including standards, wheel guards and hand-rail.	32 2 0	R. ft.	1,381
76-79 cwt.	Rolled steel beams $24" \times 72" \times 100$ lbs. two in number each 43 r. ft.	8 0 0	Cwt.	614
No. 2	Stiffening frames C class sheds ..	22 12 0	Each.	46
	Sheds for materials ..		Lump sum.	75
	Total ..			4,100
	Carried over ..			10,100

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAKADU BRANCH CANAL—cont.

Brought forward .. Rs. 10,100

G. BRIDGES—cont.

Estimate No. 241-G.

A "C" Class bridge of 1 span of 40 ft. with 1 ft. drop at R.D. 2/6780 of Vadakadu Branch Canal.

25-00 units.	Concrete broken stone in surki mortar ..	24 10 0	100 c. ft.	616
31-00 "	Table-moulded stock brick in lime mortar ..	27 6 0	100 "	849
0-45 "	Cuddapah slabs, 2" thick ..	19 8 0	100 sq. ft.	9
3 "	Cutstone work ..	1 12 0	C. ft.	5
29-40 "	Concrete block apron and revetment ..	25 7 0	100 c. ft.	748
5-00 "	Brick jelly backing ..	12 13 0	100 "	64
12-50 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	84
7-90 "	Do. do. ..	6 12 0	100 "	53
6-30 "	Road metalling ..	27 4 0	100 c. ft.	172
2-10 "	Gravelling ..	22 13 0	100 "	48
	Earthwork, excavating foundations, etc.		Lump sum.	90
No. 8	Guard stones ..	3 0 0	Each.	24
	Total ..			2,752
	Contingencies at 5 per cent. ..			138
	Petty supervision at $2\frac{1}{2}$ per cent. ..			70
43 r. ft.	Roadway including Westwood's trough plate, cement concrete, metalling, gravelling, hand-rails, wheel guards, stands, etc., complete.	32 3 0	R. ft.	1,384
76-80 cwt.	Rolled steel beams $20" \times 7\frac{1}{2}" \times 100$ lb. two in number, each 43 r. ft.	8 0 0	Cwt.	614
No. 2	Stiffening frames C class ..	22 12 0	Each.	46
	Shed for materials ..		Lump sum.	56
	Total ..			5,070

Estimate No. 242-G.

A "C" Class bridge of 1 span of 35 ft. at R.D. 4/3974 of Vadakadu Branch Canal.

14-70 units.	Concrete, broken bricks in surki mortar ..	24 6 0	100 c. ft.	358
24-25 "	Table-moulded stock brick in lime mortar ..	27 3 0	100 "	659
11-00 "	Concrete block revetment ..	25 3 0	100 "	277
3-70 "	Brick jelly backing ..	12 13 0	100 "	47
12-40 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	84
6-30 "	Road metalling ..	29 4 0	100 c. ft.	184
2-10 "	Gravelling ..	24 9 0	100 "	52
3-0 "	Cutstone work ..	1 12 0	100 "	5
No. 8	Earthwork, excavating foundations, etc.		Lump sum.	90
	Guard stones ..	3 0 0	Each.	24
	Total ..			1,780
	Contingencies ..			91
	Petty supervision ..			46
38 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling and gravelling including standards, wheel guards, etc.	32 5 0	R. ft.	1,228
60-36 cwt.	Rolled steel beams $20" \times 7\frac{1}{2}" \times 39$ lb. two in number, each 38 r. ft.	8 0 0	Cwt.	483
No. 2	Stiffening frames C class ..	12 12 0	Each.	46
	Sheds for materials ..		Lump sum.	46
	Total ..			3,720
	Carried over ..			18,890

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAKADU BRANCH CANAL—cont.

Brought forward .. Rs. 18,890

G. BRIDGES—cont.

Estimate No. 243-G.

A "C" Class bridge of 1 span 34 ft. at R.D. 4/9974 of Vadakadu Branch Canal.

14.70 units.	Concrete, broken brick in surki mortar ..	24 5 0	100 c. ft.	357	
24.25 "	Table-moulded stock brick in lime mortar ..	27 3 0	100 "	659	
11.00 "	Concrete block revetment ..	25 2 0	100 "	276	
3.70 "	Brick jelly backing ..	12 13 0	100 "	47	
12.40 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	84	
6.30 "	Road metalling ..	29 12 0	100 c. ft.	188	
2.10 "	Gravelling ..	25 0 0	100 "	53	
3.00 "	Cutstone work ..	1 12 0	C. ft.	5	
	Earthwork, excavating foundations, etc. ..		Lump sum.	90	
No. 8	Guard stones ..	3 0 0	Each.	24	
	Total ..			1,783	
	Contingencies at 5 per cent ..			92	
	Petty supervision at $2\frac{1}{2}$ per cent ..			46	
37 R. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling and gravelling, including standards, wheel guards, etc. ..	32 6 0	R. ft.	1,198	
58.80 cwt.	Rolled steel beams $20'' \times 7\frac{1}{2}'' \times 89$ lb. two in number, each 37 r. ft. ..	8 0 0	Cwt.	470	
No. 2	Stiffening frames C class ..	22 12 0	Each.	46	
	Sheds for materials ..		Lump sum.	75	
	Total ..			3,710	
	Total, G. Bridges ..			23,600	

H. ESCAPES.

Estimate No. 244-G.

A surplus sluice at R.D. 5/2474 of Vadakadu Branch Canal.

30.60 units.	Concrete, broken bricks in surki mortar ..	24 14 0	100 c. ft.	761	
25.20 "	Table-moulded stock brick in lime mortar ..	27 10 0	100 "	696	
3.30 "	Archwork table-moulded stock brick in lime mortar ..	28 10 0	109 "	94	
39.00 "	Cutstone work ..	1 12 0	C. ft.	68	
19.50 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	132	
13.10 "	Concrete block apron and revetment ..	25 10 0	100 c. ft.	336	
2.70 "	Brick jelly backing ..	13 4 0	100 "	36	
18 $\frac{1}{2}$ c. ft.	Teakwood wrought and put up ..	4 0 0	C. ft.	74	
No. 2	Teakwood shutters with $2\frac{1}{2}''$ planks screw shafts $2\frac{1}{2}''$ diameter, including screw box, holding down bolts, angle irons, etc., complete. ..	150 0 0	Each.	300	
	Conveyance of shutters to site ..		Lump sum.	10	
	Centering to archwork ..			32	
	Earthwork, excavating foundations, etc. ..			25	
	Shed for materials ..			32	
	Total ..			2,596	
	Contingencies at 5 per cent ..			129	
	Petty supervision at $2\frac{1}{2}$ per cent ..			65	
	Total ..			2,790	
	Total, H. Escapes ..			2,790	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAKADU BRANCH CANAL—cont.

K. BUILDINGS.

Estimate No. 245-G.

Inspection sheds and staff quarters—Vadakadu Branch Canal.

No. 4	Inspection sheds, temporary ..	600 0 0	Each.	2,400	
" 2	Blocks of lascar's hut, permanent ..	1,500 0 0	"	3,000	
" 2	Store-sheds, permanent ..	600 0 0	"	1,200	
" 2	Quarters for subordinates at sites of important work, temporary ..	400 0 0	"	800	
	Total ..			7,400	
	Total, K. Buildings ..			7,400	

L. EARTHWORK.

Estimate No. 246-G. (Plans Nos. G. 187—D. 190).

Excavating Vadakadu Branch Canal.

2,496 units.	Earthwork, excavating in ordinary red loamy soil and laying banks in layers and sectioning with an initial lead of 20 yards and lift of 2 yards. ..	3 12 0	1,000 c. ft.	35,610	
	Contingencies at 5 per cent ..			1,780	
	Petty supervision ..			910	
	Total ..			38,300	
	Total, L. Earthwork ..			38,300	

M. PLANTATIONS.

Estimate No. 247-G.

Vadakadu Branch Canal.

10 $\frac{1}{2}$ miles.	Providing avenues along roads on canal banks. ..	300 0 0	Mile.	3,188	
	Sundries ..			12	
	Total ..			3,200	
	Total, M. Plantations ..			3,200	

O. MISCELLANEOUS.

Estimate No. 248-G.

Fixing demarcation stones along Vadakadu Branch Canal.

No. 340.	Fixing demarcation stones ..	0 8 0	Each.	170	
	Total ..			170	

Estimate No. 249-G.

Fixing reduced distance stones along Vadakadu Branch Canal.

No. 91.	Fixing R.D. stones $2' 6'' \times 0' 8'' \times 0' 6''$ in earth at every 500 feet. ..	1 12 0	Each.	159	
	Contingencies ..			8	
	Petty supervision ..			3	
	Total ..			170	
	Carried over ..			340	

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAKADU BRANCH CANAL—cont.					
O. MISCELLANEOUS—cont.					
Estimate No. 250-G.					
Fixing bench marks stones along Vadakadu Branch.					
22	Fixing B.M. stones 2' 6" × 0' 6" × 0' 5" in concrete at every 2,500 feet.	2 10 0	Each.	60	
	Petty supervision	..	..	4	
	Contingencies	..	..	6	
	Total	..	..	..	70
	Total	..	..	..	410

Estimate No. 251-G.

Pipe sluices for Vadakadu Branch Canal.

15"-pipe sluice at R.D. 0/6680 at Vadakadu Branch Canal on the left bank.					
2-30 units.	Table-moulded stock brick in lime mortar ..	26 13 0	100 c.ft.	62	
1-40 "	Plastering with portland cement, 3" thick, 1:3 ..	6 12 0	100 sq. ft.	9	
No. 1	Cuddapah slabs, 2" thick, including cutting out 14" diameter circular vent.	1 0 0	Each.	1	
" 15	Earthenware pipes, 2 feet long and 15" diameter, including fixing and cartage to site, etc.	5 14 0	"	88	
	Earthwork, excavating foundations and filling in.		Lump sum.	10	
	Stem shutter with flat iron bar teak, beam holding bolts, etc., complete.		"	10	
	Total	..	..	180	
	Contingencies	..	..	13	
	Petty supervision at 2½ per cent	..	..	7	
	Total	..	..	..	200
15"-pipe sluice at R.D. 6680 on the right bank of Vadakadu Branch Canal.					
2-30 units.	Table-moulded stock brick in lime mortar ..	26 13 0	100 c.ft.	62	
1-40 "	Plastering with portland cement, 3" thick, 1:3 ..	6 12 0	100 sq. ft.	9	
No. 1	Cuddapah slabs, 2" thick, including cutting out, 11½" diameter circular vent.	1 0 0	Each.	1	
" 15	Earthenware pipes, 2 feet long and 15" diameter, including fixing and cartage to site, etc.	5 14 0	"	88	
	Earthwork, excavating foundation, etc.		Lump sum.	10	
	Stem shutter with flat iron bar, teak beam, holding-down bolts, etc.		"	10	
	Total	..	..	180	
	Contingencies at 5 per cent	..	..	13	
	Petty supervision	..	..	7	
	Total	..	..	..	200
A 12"-pipe sluice at R.D. 11/1180 on the left bank of Vadakadu Branch Canal.					
2-30 units.	Table-moulded stock brick in lime mortar ..	28 1 0	100 c.ft.	65	
1-40 "	Plastering with portland cement, 3" thick, 1:3 ..	6 12 0	100 sq. ft.	9	
No. 1	Cuddapah slab, 2" thick 1½ × 1½, including cutting out 8½" diameter circular vent.	1 0 0	Each.	1	
" 15	Earthenware pipes, 2" long and 12½" in diameter, including fixing and cartage to site, etc.	4 2 0	"	62	
	Earthwork, excavating foundation and filling in ..		Lump sum.	10	
	Stem shutter with flat iron bar, teak beam, etc., complete.		"	10	
	Total	..	..	157	
	Contingencies	..	..	8	
	Petty supervision	..	..	5	
	Total	..	..	..	170
Carried over					
570					
Carried over					
410					

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAKADU BRANCH CANAL—cont.					
O. MISCELLANEOUS—cont.					
Estimate No. 251-G—cont.					
Pipe sluices for Vadakadu Branch Canal—cont.					
12" Pipe sluice at R. D. 1/2180 of Vadakadu Branch Canal.					
2-30 units.	Table-moulded stock brick in lime mortar ..	28 1 0	100 c. ft.	65	
1-40 "	Plastering with portland cement, 3" thick, 1:3 ..	6 12 0	100 sq. ft.	9	
No. 1	Cuddapah slab 2" thick 1½ × 1½, including cutting out 8-75" diameter circular vent ..	1 0 0	Each.	1	
" 15	Earthenware pipes, 12" in diameter, including fixing and cartage to site ..	4 2 0	"	45	
	Earthwork excavation and filling ..		Lump sum.	10	
	Stem shutter with flat iron bar teak beams, etc., complete ..		"	10	
	Total	..	..	140	
	Contingencies at 5 per cent	..	..	7	
	Petty supervision at 2½ per cent	..	..	3	
	Total	..	..	..	150
12" Pipe sluice at R. D. 1/2180 left bank of Vadakadu Branch Canal.					
2-30 units.	Table-moulded stock brick in lime mortar ..	28 1 0	100 c. ft.	65	
1-40 "	Plastering with portland cement, 3" thick, 1:3 ..	6 12 0	100 sq. ft.	9	
No. 1	Cuddapah slab 2" thick, 1½ × 1½, including cutting out 9" diameter circular vent ..	1 0 0	Each.	1	
" 15	Earthenware pipes 2' long and 12" in diameter including fixing and cartage to site ..	4 2 0	"	62	
	Earthwork excavation and filling in ..		Lump sum.	10	
	Stem shutter with flat iron bar teak beam, etc., complete ..		"	10	
	Total	..	..	157	
	Contingencies	..	..	8	
	Petty supervision	..	..	5	
	Total	..	..	..	170
12"-Pipe sluice at R. D. 1/5680 right bank of Vadakadu Branch Canal.					
2-30 units.	Table-moulded stock brick in lime mortar ..	28 0 0	100 c. ft.	64	
1-40 "	Plastering with portland cement, 3" thick, 1:3 ..	6 12 0	100 sq. ft.	9	
No. 1	Cuddapah slab 2" thick, 1½ × 1½, including cutting out 10½" diameter circular vent ..	1 0 0	Each.	1	
" 15	Earthenware pipes 12" in diameter, including fixing and cartage to site, etc.	4 2 0	"	62	
	Stem shutter with flat iron bar, teakwood beam, etc., complete ..		Lump sum.	10	
	Earthwork, excavation and filling in ..		"	10	
	Total	..	..	156	
	Contingencies at 5 per cent	..	..	8	
	Petty supervision at 2½ per cent	..	..	6	
	Total	..	..	..	170
15" Pipe sluice at R.D. 1/5680 left bank of Vadakadu Branch Canal.					
2-30 units.	Table-moulded stock brick in lime mortar ..	28 0 0	100 c. ft.	64	
1-40 "	Plastering with portland cement, 3" thick, 1:3 ..	6 12 0	100 sq. ft.	9	
No. 1	Cuddapah slab 2" thick, 1½ × 1½, including cutting out 12½" diameter circular vent ..	1 0 0	Each.	1	
" 15	Earthenware pipes, 15" diameter and 2' long including fixing and cartage to site ..	5 14 0	"	88	
	Stem shutter with flat iron bar, teak beam, holding-down bolts, etc.		Lump sum.	10	
	Earthwork, excavation and filling in ..		"	10	
	Total	..	..	182	
	Contingencies at 5 per cent	..	..	12	
	Petty supervision	..	..	6	
	Total	..	..	..	200
Carried over					
1,260					
Carried over					
410					

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—con

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAKADU BRANCH CANAL—cont.					
	O. MISCELLANEOUS—cont.		Brought forward ..		410
			Brought forward ..		1,260
Estimate No. 251-G—cont.					
Pipe sluices for Vadakadu Branch Canal—cont.					
12" Pipe sluice at R.D. 2/3880 left bank of Vadakadu Branch Canal.					
2-30 units.	Table-moulded stock brick in lime mortar ..	27 13 0	100 c. ft.	64	
1-40 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3.	6 12 0	100 sq. ft.	9	
No. 1.	Cuddapah slabs, 2" thick, $1\frac{1}{2} \times 1\frac{1}{2}$ ", including cutting out 8-5" diameter circular vent ..	1 0 0	Each.	1	
" 15.	Earthenware pipes, 12" diameter and 2' long, including fixing and cartage to site ..	4 2 0	"	62	
	Stem shutter with flat iron bar and teak beam, holding-down bolts, etc. ..				
	Earthwork excavation and filling in ..			10	
			Lump sum.	10	
	Total ..			156	
	Contingencies at 5 per cent ..			8	
	Petty supervision ..			6	
	Total ..				170
18" Pipe sluice at R.D. 2/9180 right bank of Vadakadu Branch Canal.					
2-30 units.	Table-moulded stock brick in lime mortar ..	27 6 0	100 c. ft.	63	
1-40 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3.	6 12 0	100 sq. ft.	9	
No. 1.	Cuddapah slab, 2" thick, $2' \times 2'$, including cutting out 14-25" diameter circular vent ..	1 0 0	"	1	
" 11.	Earthenware pipe 18" diameter of 2 feet long, including fixing and cartage to site ..	6 12 0	Each.	74	
	Stem shutter with flat iron bars teak beams holding-down bolts, etc., complete ..				
	Earthwork excavation and filling in ..			10	
			Lump sum.	10	
	Total ..			167	
	Contingencies ..			8	
	Petty supervision ..			5	
	Total ..				180
18" Pipe sluice at R.D. 3/8974 right bank of the Vadakadu Branch canal.					
2-30 units.	Table-moulded stock brick in lime mortar ..	27 3 0	100 c. ft.	63	
1-40 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3.	6 12 0	100 sq. ft.	9	
No. 1.	Cuddapah slab, 2" thick, $2' \times 2'$, including cutting out 15-75" diameter circular vent ..	1 0 0	Each.	1	
" 11.	Earthenware pipes, 18" diameter 2 feet long, including fixing and cartage to site ..	6 12 0	"	74	
	Stem shutter with flat iron bar teak beam, holding-down bolts, etc. ..				
	Earthwork, excavation and filling in ..			10	
			Lump sum.	10	
	Total ..			167	
	Contingencies at 5 per cent ..			8	
	Petty supervision at $2\frac{1}{2}$ per cent ..			5	
	Total ..				180
	Total, Pipe sluices ..				1,790
	Total, O. Miscellaneous ..				22,000
P. MAINTENANCE.					
Estimate No. 252-G.					
Maintenance of Vadakadu Branch Canal during construction.					
	Maintenance during construction ..		Lump sum.	2,750	
	Total ..				2,750
	Total, P. Maintenance ..				2,750

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
RAJAMADAM BRANCH CANAL.					
A. PRELIMINARY EXPENSES.					
Estimate No. 253-G.					
Preliminary Expenses for Rajamadam Branch Canal.					
7 miles.	Cost of preliminary surveys ..		Lump sum.	2,800	
	Setting out canal alignments during execution ..	80 0 0	Mile.	660	
	Contingencies ..			40	
	Total ..			3,400	
	Total, A. Preliminary Expenses ..				3,400
B. LAND.					
Estimate No. 254-G.					
Land compensation for excavating Rajamadam Branch Canal.					
32-68 acres.	Garden lands ..	200 0 0	Acre.	6,576	
65-66 "	Dry cultivation lands ..	50 0 0	"	3,283	
	Add 15 per cent for compulsory acquisition ..			1,479	
4,715-133 units.	Compensation for borrow pits ..	0 10 0	1,000 c. ft.	2,947	
	Sandries ..			15	
	Total ..			14,300	
	Total, B. Land ..				14,300
D. REGULATORS.					
Estimate No. 255-G. (Plan No. G. 197).					
Head sluice with 4-ft. drop for Rajamadam Branch Canal at R.D. 19/2500 of Grand Anicut Canal, left bank.					
50-40 units.	Concrete broken brick in surki mortar ..	23 13 0	100 c. ft.	1,200	
87-70 "	Table-moulded stock brick in lime mortar ..	26 4 0	100 "	2,302	
3-70 "	Archwork do. do. ..	27 4 0	100 "	101	
31-20 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	211	
52 c. ft.	Cutstone work ..	1 12 0	C. ft.	91	
54-10 units.	Concrete block revetment and pitching ..	24 14 0	100 c. ft.	1,346	
11-00 "	Brick jelly packing ..	11 1 0	100 "	122	
23 c. ft.	Teakwood wrought and put up ..	4 0 0	C. ft.	92	
No. 2	Teakwood shutters with $2\frac{1}{2}$ " planks, screw shaft $2\frac{1}{2}$ " diameter, including holding-down bolts, angle iron, etc., complete ..	150 0 0	Each.	300	
	Conveyance of shutters to site ..		Lump sum.	30	
	Centering to archwork ..			30	
	Earthwork, excavating foundations, etc. ..			150	
	Clay-puddle work ..	10 0 0	1,000 c. ft.	10	
	Shed for materials ..		Lump sum.	60	
	Total ..			6,045	
	Contingencies at 5 per cent ..			302	
	Petty supervision at $2\frac{1}{2}$ per cent ..			153	
	Total ..				6,500
	Carried over ..				6,500

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
			Brought forward ..		6,500

RAJAMADAM BRANCH CANAL—*cont.*D. REGULATORS—*cont.*

Estimate No. 256-G. (Plan No. G. 204).

A regulator with 6-ft. drop at R.D. 3/4795 feet of Rajamadam Branch Canal.

42-6 units.	Concrete broken brick in surki mortar ..	26 14 0	100 c. ft.	1,145	
33-25 "	Table-moulded stock bricks in lime mortar ..	29 2 0	100 "	2,570	
3-60 "	Table-moulded stock bricks, archwork in lime mortar ..	30 2 0	100 "	108	
50 c. ft.	Cutstone work ..	1 12 0	130 "	88	
32-90 units.	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	Sq. ft.	222	
42-00 "	Concrete block revetment and pitching ..	27 9 0	100 c. ft.	1,168	
8 "	Brick jelly backing ..	14 2 0	100 "	113	
21-24 c. ft.	Teakwood wrought and put up ..	4 0 0	C. ft.	85	
No. 5	Teakwood shutters with $\frac{3}{4}$ " planks, screws, shaft $\frac{1}{2}$ " diameter, including screw box, holding-down bolts, angle iron, etc., complete ..	125 0 0	Each.	375	
	Conveyance of shutter to site ..		Lump sum.	20	
	Centering to archworks ..			35	
	Earthwork, excavating foundations ..			60	
	Clay-puddle work ..			40	
	Shed for materials ..			40	
	Total ..			6,059	
	Contingencies at 5 per cent ..			303	
	Petty supervision at $2\frac{1}{2}$ per cent ..			158	
	Total ..				6,520
	Total, D. Regulators ..				13,020

E. FALLS AND WEIRS.

Estimate No. 257-G. (Plan No. G. 198).

A 10-ft. drop at R.D. 0/1320 feet of Rajamadam Branch Canal.

52-50 units.	Concrete broken brick in surki mortar ..	23 13 0	100 c. ft.	1,250	
88-55 "	Table moulded brick in lime mortar ..	26 4 0	100 "	2,324	
32-80 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	221	
0-70 "	Cuddapah slab work, 2" thick ..	20 0 0	100 "	14	
52-98 "	Concrete block revetment and pitching ..	24 14 0	100 c. ft.	1,318	
9-15 "	Brick jelly backing ..	11 1 0	100 "	101	
	Earthwork, excavating foundations ..		Lump sum.	150	
	Clay-puddle work ..			75	
	Shed for materials ..			30	
	Total ..			5,483	
	Contingencies at 5 per cent ..			274	
	Petty supervision at $2\frac{1}{2}$ per cent ..			133	
	Total of estimate ..				5,890

Estimate No. 258-G. (Plan No. G. 200).

A 3-ft. drop at R.D. 1/2370 of Rajamadam Branch Canal.

16-60 units.	Concrete broken bricks in surki mortar ..	24 1 0	100 c. ft.	399	
16-50 "	Table-moulded brick in lime mortar ..	26 9 0	100 "	438	
13-30 "	Plastering with portland cement, $\frac{3}{4}$ " thick, 1:3 ..	6 12 0	Sq. ft.	90	
10-61 "	Cuddapah slab work, 2" thick ..	20 6 0	100 "	12	
34-50 "	Concrete block revetment and pitching ..	25 1 0	100 c. ft.	865	
6-60 "	Brick jelly backing ..	11 8 0	100 "	76	
	Earthwork, excavating foundation and forming bank ..		Lump sum.	50	
	Shed for materials ..			15	
	Total ..			1,945	
	Contingencies at 5 per cent ..			97	
	Petty supervision at $2\frac{1}{2}$ per cent ..			48	
	Total ..				2,090
	Carried over ..				7,980

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
			Brought forward ..		7,980

RAJAMADAM BRANCH CANAL—*cont.*E. FALLS AND WEIRS—*cont.*

Estimate No. 259-G.

A-4 ft. drop at R.D. 1/7620 of Rajamadam Branch Canal.

235-52 units.	Concrete broken brick in surki mortar ..	24 11 0	100 c. ft.	581	
36-00 "	Table-moulded stock brick in lime mortar ..	27 0 0	100 "	972	
22-50 "	Plastering with portland cement $\frac{3}{4}$ " thick 1:3 ..	6 12 0	Square	152	
-61 "	Cuddapah slab 2" thick ..	20 8 0	100 sq. ft.	13	
36-70 "	Concrete block revetment and apron ..	25 10 0	100 c. ft.	940	
7-18 "	Brick jelly backing ..	11 15 0	100 sq. ft.	86	
	Earthwork excavating foundation ..		Lump sum.	15	
	Clay-puddle work ..			30	
	Shed for materials ..				
	Total ..			2,849	
	Contingencies at 5 per cent ..			143	
	Petty supervision at $\frac{1}{2}$ per cent ..			78	
	Total ..				3,070

Estimate No. 260-G. (Plan No. G. 202).

A-6 ft. drop at R.D. 2/0120 of Rajamadam Branch Canal.

27-30 units.	Concrete broken brick in surki mortar ..	24 12 0	100 c. ft.	676	
47-00 "	Table-moulded brick in lime mortar ..	27 4 0	100 "	1,281	
23-25 "	Plastering with portland cement $\frac{3}{4}$ " thick 1:3 ..	6 12 0	100 sq. ft.	157	
-61 "	Cuddapah slab work 2" thick ..	20 9 0	100 "	13	
40-60 "	Concrete block revetments and pitching ..	25 11 0	100 c. ft.	1,043	
7-90 "	Brick jelly backing ..	12 6 0	100 "	98	
	Earthwork excavating foundations ..			80	
	Clay-puddle work ..			20	
	Shed for materials ..			35	
	Total ..			3,403	
	Contingencies ..			170	
	Petty supervision ..			87	
	Total ..				3,660
	Total, E. Falls and Weirs ..				14,710

F. CROSS DRAINAGE WORKS

Estimate No. 261-G. (Plan No. G. 193).

An undertunnel at R.D. 4000 of Rajamadam Branch Canal.

105-00 units.	Concrete broken brick in surki mortar ..	23 14 0	100 c. ft.	2,507	
58-50 "	Table-moulded stock brick in lime mortar ..	26 4 0	100 "	1,536	
31-90 "	Arch work ..	27 4 0	130 "	869	
58-80 "	Plastering with portland cement $\frac{3}{4}$ " thick 1:3 ..	6 12 0	100 sq. ft.	297	
16-10 "	Concrete block revetments and pitching ..	24 14 0	100 c. ft.	404	
2-80 "	Brick jelly backing ..	11 1 0	100 "	31	
	Centering for archwork ..			200	
	Earthwork excavating foundation ..			100	
	Shed for materials ..			60	
	Total ..			6,100	
	Contingencies at 5 per cent ..			300	
	Petty supervision at $2\frac{1}{2}$ per cent ..			150	
	Total ..				6,550
	Total, F. Cross Drainage Works ..				6,550

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
RAJAMADAM BRANCH CANAL—cont.					
G. BRIDGES.					
Estimate No. 262-G.					
A "C" class bridge of one span of 37 feet at R.D. 7700 of Rajamadam Branch Canal.					
14.70 units.	Concrete broken brick in surki mortar ..	23 15 0	100 c. ft.	352	
24.50 "	Table-moulded brick in lime mortar ..	26 4 0	100 "	643	
10.92 "	Concrete block revetment ..	24 15 0	100 "	272	
3.64 "	Brick jelly backing ..	11 1 0	100 "	40	
12.40 "	Plastering with portland cement $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	83	
6.30 "	Road metalling ..	18 4 0	100 "	115	
2.10 "	Gravelling ..	14 15 0	100 "	31	
3 c. ft.	Cutstone work ..	1 12 0	C. ft.	5	
No. 8	Earthwork, excavating foundations ..		Lump sum.	50	
	Guard stones ..	3 0 0	Each.	24	
	Shed for materials ..		Lump sum.	30	
	Total ..			1,645	
	Contingencies at 5 per cent ..			80	
	Petty supervision at $2\frac{1}{2}$ per cent ..			43	
40 r. ft.	Roadway including Westwood's trough plates, cement concrete, road metalling and gravel-ling including standards, wheel guards, etc.	31 10 0	R. ft.	1,265	
71.43 cwt.	Rolling steel beams $24" \times 7\frac{1}{2}" \times 100$ lb.	8 0 0	Cwt.	571	
No. 2	Stiffening frames "C" class ..	22 12 0	Each.	46	
	Total ..				3,650

Estimate No. 263-G (Plan No. G. 201).

A 4-ft. drop and bridge "C" class at R.D. 1/5120 of Rajamadam Branch Canal.

32.15 units.	Concrete broken brick in surki mortar ..	24 10 0	100 c. ft.	792	
53.50 "	Table-moulded brick in lime mortar ..	27 0 0	100 "	1,445	
22.70 "	Plastering with portland cement $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	153	
40.26 "	Concrete block revetment and pitching ..	25 9 0	100 c. ft.	1,029	
7.12 "	Brick jelly backing ..	11 15 0	100 "	85	
6.30 "	Road metalling and gravel-ling ..	19 12 0	100 "	124	
2.10 "	Gravelling ..	16 4 0	100 "	34	
4.5 "	Cutstone work ..	1 12 0	C. ft.	8	
0.61 "	Cuddapah slab 2" thick ..	20 7 0	100 sq. ft.	12	
(F) "	Guard stones ..	3 0 0	Each.	18	
1.000 "	Earthwork, excavating foundations ..		Lump sum.	60	
	Clay-puttle work ..	10 0 0	1,000 c. ft.	10	
	Shed for materials ..		Lump sum.	30	
	Total ..			3,800	
37 r. ft.	Road including Westwood's trough plate, cement concrete, road metalling and gravel-ling ..	31 9 0	R. ft.	1,168	
58.8 cwt.	Rolling steel beams $20" \times 7\frac{1}{2}" \times 89$ lb.	8 0 0	Cwt.	470	
No. 2	Stiffening frames "C" class ..	22 12 0	Each.	46	
	Contingencies ..			186	
	Petty supervision ..			70	
	Total ..				5,690
	Carried over ..				9,340

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
RAJAMADAM BRANCH CANAL—cont.					
Brought forward .. 9,340					
G. BRIDGES—cont.					
Estimate No. 264-G.					
"C" class bridge of one span of 35 feet at R.D. 2/2745 of Rajamadam Branch Canal.					
14.70 units.	Concrete broken brick in surki mortar ..	25 5 0	100 c. ft.	355	
24.25 "	Table-moulded brick work in lime mortar ..	27 12 0	100 "	653	
10.92 "	Concrete block revetment ..	26 3 0	100 "	286	
3.64 "	Brick jelly backing ..	12 13 0	100 "	47	
12.4 "	Plastering with portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	84	
6.3 "	Road metalling ..	21 4 0	100 c. ft.	134	
2.1 "	Gravelling ..	17 9 0	100 "	37	
3 "	Cutstone work ..	1 12 0	100 "	5	
8 "	Guard stones ..	3 0 0	Each.	24	
	Earthwork, excavating foundations ..		Lump sum.	50	
	Shed for materials ..			35	
	Total ..				1,730
	Contingencies at 5 per cent ..			35	
	Petty supervision at $2\frac{1}{2}$ per cent ..			45	
38 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling, gravel-ling including standards, wheel guards and hand-rails ..	31 14 0	R. ft.	1,211	
60.40 units.	Rolling steel beams, $20" \times 7\frac{1}{2}" \times 89$ lb.	8 0 0	Cwt.	483	
2 "	Stiffening frames, C. class ..	22 12 0	Each.	46	
	Total ..				3,600
	Total, G. Bridges ..				12,940

H. ESCAPES.

Estimate No. 265-G (Plan No. G-203.)

A surplus sluice at R.D. 2/8320 feet of Rajamadam Branch Canal, Right bank.

30.60 units.	Concrete broken brick in surki mortar ..	25 15 0	100 c. ft.	794	
25.20 "	Table-moulded stock brick in lime mortar ..	28 4 0	100 "	706	
3.30 "	Archwork table moulded stock brick in lime mortar ..	29 4 0	100 "	97	
39 c. ft.	Cutstone work ..	1 12 0	100 "	68	
19.50 units.	Plastering with portland cement, $\frac{1}{2}$ " thick 1:3 ..	6 12 0	100 sq. ft.	132	
13.10 "	Concrete block revetment and pitching ..	26 11 0	100 c. ft.	350	
2.70 "	Brick jelly backing ..	13 4 0	100 "	36	
18 c. ft.	Teakwood wrought and put up ..	4 0 0	C. ft.	74	
No. 2.	Teakwood shutters with $2\frac{1}{2}$ " planks, screw shaft $2\frac{1}{2}$ " diameter, including screw box, holding-down bolts, angle iron, etc., complete ..	150 0 0	Each	300	
	Conveyance of shutters to site ..		Lump sum.	20	
	Centering to archwork ..			30	
	Earthwork excavating foundations forming approaches, etc. ..			60	
	Shed for materials ..			30	
	Total ..				2,697
	Contingencies at 5 per cent ..			135	
	Petty supervision $2\frac{1}{2}$ per cent ..			68	
	Total ..				2,900
	Total, H. escapes ..				2,900

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
RAJAMADAM BRANCH CANAL—cont.					
K. BUILDINGS.					
Estimate No. 266-G.					
Inspection sheds and staff quarters, Rajamadam Branch Canal.					
1 units.	Quarters for Executive Engineer at Pattukota (temporary)	6,000 0 0	Each.	6,000	
1 "	Office for Assistant Engineer at Pattukota (permanent)	9,780 0 0	"	9,780	
1 "	Quarters for Executive Engineer at Pattukota (temporary)	3,000 0 0	"	3,000	
2 "	Office for Assistant Engineer at Pattukota (permanent)	5,000 0 0	"	5,000	
2 "	Inspection sheds (temporary)	600 0 0	"	1,200	
2 "	Blocks of lascars' huts (permanent)	1,500 0 0	"	3,000	
2 "	Store sheds	600 0 0	"	1,200	
4 "	Quarters for subordinates at sites of important works (temporary)	400 0 0	"	1,600	
	Total ..				30,780
	Total, K. buildings ..				30,780

L. EARTHWORK.

Estimate No. 267-G. (Plan No. G. 194—G.-196).

Excavating Rajamadam Branch Canal starting from R.D. 19/2500 feet of the Grand Anicut Main Canal.

1,167,760 units.	Earthwork excavating in ordinary loamy soil, etc., lead 10 yards	4 0 0	1,000 c. ft.	4,671	
6,477,065 "	Earthwork, excavating in ordinary loamy soil.	3 0 0	1,000 "	24,299	
	Total ..			28,970	
	Petty supervision at 2½ per cent			721	
	Contingencies at 5 per cent			1,449	
	Total ..				31,140
	Total, L. Earthwork ..				31,140

M. PLANTATIONS.

Estimate No. 268-G.

Providing avenues along roads on Canal bank.

7 miles.	Providing avenues along roads on canal bank	200 0 0	Mile.	2,100	
	Total ..				2,100
	Total, M. Plantations ..				2,100

O. MISCELLANEOUS.

Estimate No. 269-G.

Fixing demarcation stones along Rajamadam Branch Canal.

220	Fixing D. stones	0 8 0	Each.	110	
	Total ..				110
	Carried over ..				110

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
RAJAMADAM BRANCH CANAL—cont.					
					Brought forward .. 110
O. MISCELLANEOUS—cont.					
Estimate No. 270-G.					
Fixing reduced distance stones along Rajamadam Branch Canal.					
No. 56	Fixing reduced distance stones, 2' 6" × 0' 8" × 0' 6" in earth	1 12 0	Each.	98	
	Contingencies			8	
	Petty supervision			4	
	Total ..				110
Estimate No. 271-G.					
Fixing Bench mark stones along Rajamadam Branch Canal.					
No. 15	Fixing bench mark stones, 2' 6" × 0' 8" × 0' 5", in concrete 2' 0" × 1' 6" × 1' 6" with top and face neatly dressed and with a seat cut for the levelling staff and letter B.M. cut on either side of the seat	2 10 0	Each.	39	
	Petty supervision			4	
	Contingencies			7	
	Total ..				50
	Total ..				270

Estimate No. 272-G.

Earthenware pipe sluices for direct irrigation under Rajamadam Branch Canal.

A 9" earthenware pipe sluice at R.D. 9900 of Rajamadam Branch Canal (right bank).					
2-3 units.	Table moulded stock brick in lime mortar	26 5 0	100 c. ft.	61	
1-4 "	Plastering with portland cement, ¾" thick	6 12 0	100 sq. ft.	9	
No. 1	Cuddapah slab, 2" thick and 1' 3" × 1' 3", including cutting out 7" diameter circular vent	1 0 0	Each.	1	
" 15	Earthenware pipes, 9" diameter and 2' long, including fixing, etc.	2 6 0	"	36	
	Stem shutter with flat iron bars, teak beam, holding down bolts, etc., complete			10	
	Earthwork excavating foundation			5	
	Total ..			122	
	Petty supervision at 2½ per cent			3	
	Contingencies at 5 per cent			5	
	Total ..				130
A 12" earthenware pipe sluice at R.D. 1/4370 feet of Rajamadam Branch Canal (right bank).					
2-3 units.	Table moulded stock brick in lime mortar	27 0 0	100 c. ft.	62	
1-4 "	Plastering with portland cement, ¾" thick 1:3	6 12 0	100 sq. ft.	9	
No. 1	Cuddapah slab, 2" thick and 1' 6" × 1' 6", including cutting out 10" diameter circular vent			1	
" 15	Earthenware pipes, 12" diameter and 2' long, including fixing, etc.	4 2 0	Each.	62	
	Stem shutter with flat iron bar, teak beam, holding down bolts, etc., complete			10	
	Earthwork excavating foundations			5	
	Total ..			149	
	Contingencies at 5 per cent			7	
	Petty supervision at 2½ per cent			4	
	Total ..				160
	Carried over ..				290
	Carried over ..				270

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	
	RAJAMADAM BRANCH CANAL—cont.				
	Brought forward ..				270
	O. MISCELLANEOUS—cont.				
	Estimate No. 272-G.—cont.				
	Brought forward ..				270
	Earthenware pipe sluices for direct irrigation under Rajamadam Branch Canal—cont.				
	A 15" earthenware pipe sluice at R.D. 2/9120 feet of Rajamadam Branch Canal (left bank).				
2-3 units.	Table moulded stock brick in lime mortar ..	284 0 0	100 c. ft.	65	
1-4 "	Plastering with portland cement, 3" thick, 1:3	6 12 0	100 sq. ft.	9	
No. 1	Cuddapah slab, 2" thick and 1' 9" X 1' 9", including cutting out 13" diameter circular vent ..				
	Lump sum.			1	
" 11	Earthenware pipes, 2' long and 15" diameter, including fixing, etc. ..	5 14 0	Each.	65	
	Stem shutter with flat iron bar, teak beam, holding down bolts, etc., complete ..				
	Lump sum.			10	
	Earthwork excavating foundation ..			5	
	Total ..			155	
	Contingencies at 5 per cent ..			9	
	Petty supervision at 2½ per cent ..			6	
	Total ..				170
	A 15" earthenware pipe sluice at R.D. 2/9120 feet of Rajamadam Branch Canal (right bank).				
2-3 units.	Table moulded stock brick in lime mortar ..	28 4 0	100 c. ft.	65	
1-4 "	Plastering with portland cement, 3" thick, 1:3	6 12 0	100 sq. ft.	9	
No. 1	Cuddapah slab, 2" thick and 2' X 2', including cutting out 16½" circular vent ..	1 0 0	Each.	1	
" 15	Earthenware pipes, 2' long and 18" diameter, including fitting, etc. ..	8 6 0	"	126	
	Stem shutter with flat iron bar, teak beam, holding down bolts, etc., complete ..				
	Lump sum.			10	
	Earthwork excavating foundations ..			5	
	Total ..			216	
	Petty supervision at 2½ per cent ..			5	
	Contingencies at 5 per cent ..			9	
	Total ..				230
	A 15" earthenware pipe sluice at R.D. 3/2370 feet of Rajamadam Branch Canal (left bank).				
2-3 units.	Table moulded stock brick in lime mortar ..	28 13 0	100 c. ft.	67	
1-4 "	Plastering with portland cement, 3" thick, 1:3	6 12 0	100 sq. ft.	9	
No. 1	Cuddapah slab, 2" thick X 1' 9" X 1' 9", including cutting out 12½" circular vent ..				
	Lump sum.			1	
" 11	Earthenware pipe, 2' long and 15" diameter, including fixing, etc. ..	5 14 0	Each.	65	
	Stem shutter with flat iron bar, teak beam, holding down bolts, etc., complete ..				
	Lump sum.			10	
	Earthwork excavating foundation ..			5	
	Total ..			157	
	Contingencies at 5 per cent ..			8	
	Petty supervision at 2½ per cent ..			5	
	Total ..				170
	A 12" earthenware pipe sluice at R.D. 3/4370 feet of Rajamadam Branch Canal (right bank).				
2-3 units.	Table moulded stock brick in lime mortar ..	28 15 0	100 c. ft.	67	
1-4 "	Plastering with portland cement, 3" thick, 1:3	6 12 0	100 sq. ft.	9	
No. 1	Cuddapah slab, 2" thick 1' 6" X 1' 6", including cutting out 1" diameter circular vent ..				
	Lump sum.			1	
	Carried over ..				860
	Carried over ..				270

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
	RAJAMADAM BRANCH CANAL—cont.				
	Brought forward ..				860
	O. MISCELLANEOUS—cont.				
	Brought forward ..				270
	Estimate No. 272-G.—cont.				
	Earthenware pipe sluices for direct irrigation under Rajamadam Branch Canal—cont.				
No. 15	A 12" earthenware pipe sluice at R.D. 3/4370 feet of Rajamadam Branch Canal (right bank)—cont.				
	Earthenware pipes, 2' long and diameter, including fixing, etc. ..	4 2 0	Each.	62	
	Stem shutter with flat iron bar, teak beam holding down bolts, etc., complete ..				
	Lump sum.			10	
	Earthwork excavating foundations ..			5	
	Total ..			161	
	Contingencies at 5 per cent ..			6	
	Petty supervision at 2½ per cent ..			3	
	Total ..				170
	Total, Pipe sluices ..				1,030
	Total, O. Miscellaneous ..				1,300
	P. MAINTENANCE.				
	Estimate No. 273-G.				
	Maintenance of Rajamadam Branch Canal during construction.				
	Maintenance during construction ..		Lump sum.	1,750	
	Total ..				1,750
	Total, P. Maintenance ..				1,750
	PUDUPATNAM BRANCH CANAL.				
	A. PRELIMINARY EXPENSES.				
	Estimate No. 274-G.				
	Preliminary expenses for Pudupatnam Branch Canal.				
1½ miles.	Cost of preliminary surveys ..		Lump sum.	800	
	Setting out canal alignment during execution ..	80 0 0	Mile.	120	
	Contingencies ..			80	
	Total ..				1,000
	Total, A. Preliminary Expenses ..				1,000
	B. LAND.				
	Estimate No. 275-G.				
	Compensation for land for Pudupatnam Branch Canal.				
21.32 acres.	Dry lands to be acquired permanently for canal occupation ..	50 0 0	Acres.	1,067	
	Add 15 per cent. for compulsory acquisition ..			159	
367 units.	Compensation for earth to be taken from lands adjoining the canal in banking portions ..	0 10 0	Unit.	229	
	Sundries ..			15	
	Total ..				1,470
	Total, B. Land ..				1,470

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

PUDUPATNAM BRANCH CANAL—cont.

D. REGULATORS.

Estimate No. 276-G (Plan No. G. 207).

Head sluice at head with 3' drop for Pudupatnam Branch Canal.

67-6 units.	Concrete broken bricks in surki mortar ..	26 10 0	100 c. ft.	1,808	
66-6 "	Table-moulded stock bricks in lime mortar ..	29 2 0	100 "	1,940	
6-9 "	Archwork, table moulded stock bricks in lime mortar ..	30 2 0	100 "	208	
31-40 "	Cement plastering, $\frac{3}{8}$ " thick, 2:1 ..	6 12 0	109 sq. ft.	319	
15-80 "	Do. $\frac{1}{2}$ " thick, 3:1 ..	1 12 0	C.ft.	263	
150 c. ft.	Cutstone work ..	27 4 0	"	1,006	
38-90 units.	Concrete block revetment and pitching ..	5 5 0	"	44	
8-20 "	Gravel backing for revetments ..	4 0 0	"	212	
53-0 c. ft.	Teakwood, wrought and put up ..				
No. 4.	Teakwood shutters, 6' 3" x 3' 9" x 0' 3" with straps, bolts, etc., screw shafts $2\frac{1}{2}$ " diameter screw boxes, frick in plate, bolts, handles, holding down bolts, irons, etc., complete ..	160 0 0	Each.	640	
	Cartage, railway fares, etc., for shutters ..			12	
	Earthwork, excavating foundation, filling in and forming banks ..			200	
	Centering for arches ..			70	
	Sheds for materials ..			80	
	Clay puddle ..		Lump sum.	8	
	Contingencies at 5 per cent ..			340	
	Petty supervision at $2\frac{1}{2}$ per cent ..			170	
	Total ..				7,320
	Total, D. Regulators ..				7,320

E. FALLS AND WEIRS.

Estimate No. 277-G (Plan No. G. 208).

6' drop at R. D. 660 of Pudupatnam Branch Canal.

35-6 units.	Concrete broken bricks in surki mortar ..	26 10 0	100 c. ft.	948	
60-2 "	Table moulded brickwork in lime mortar ..	29 2 0	100 "	1,763	
32-0 "	Plastering with portland cement, $\frac{3}{8}$ " thick, 1:2 ..	6 12 0	100 sq. ft.	216	
38-8 "	Concrete blocks for apron and revetment ..	27 4 0	100 c. ft.	1,067	
4-7 "	Gravel backing ..	5 5 0	100 "	25	
No. 87	Cuddapah slabs, 2" thick ..	20 0 0	100 sq. ft.	18	
	Clay puddle ..		Lump sum.	30	
	Earthwork excavating foundations and filling in ..			200	
	Shed for materials ..			45	
	Contingencies at 5 per cent ..			215	
	Petty supervision at $2\frac{1}{2}$ per cent ..			113	
	Total ..				4,620

Estimate No. 278-G.

6' drop at R.D. 1650 of Pudupatnam Branch Canal.

35-6 units.	Concrete broken bricks in surki mortar ..	26 10 0	100 c. ft.	948	
60-2 "	Table moulded bricks in lime mortar ..	29 2 0	100 "	1,763	
32-0 "	Plastering with portland cement, $\frac{3}{8}$ " thick, 1:3 ..	6 12 0	100 sq. ft.	216	
38-8 "	Concrete blocks for apron and revetment ..	27 4 0	100 c. ft.	1,067	
4-7 "	Gravel backing ..	5 5 0	100 "	25	
No. 87	Cuddapah slabs, 2" thick ..	20 2 0	100 sq. ft.	18	
	Clay puddle ..		Lump sum.	30	
	Earthwork excavating foundations and filling ..			200	
	Shed for material ..			45	
	Contingencies at 5 per cent ..			215	
	Petty supervision at $2\frac{1}{2}$ per cent ..			113	
	Total ..				4,620
	Total, E. Falls and Weirs ..				9,240

GRAND ANICUT SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

PUDUPATNAM BRANCH CANAL—cont.

K. BUILDINGS.

Estimate No. 279-G.

Inspection sheds and staff quarters for Pudupatnam Branch Canal.

No. 4	Inspection sheds (temporary) ..	500	Each.	2,400	
" 2	Blocks of lascar's huts (permanent) ..	1,500	"	3,000	
" 2	Store sheds (permanent) ..	600	"	1,200	
" 4	Quarters for subordinates at sites of important works (temporary) ..	400	"	1,600	
	Total ..				8,200
	Total, K. Buildings ..				8,200

L. EARTHWORK.

Estimate No. 280-G (Plan G. No. 206).

Excavating Pudupatnam Branch Canal.

1,607	Earthwork excavating in red loamy soil and laying banks in layers and sectioning with an initial lead of 20 yards and lift of two yards.	3 12 0	100 c. ft.	6,026	
	Contingencies at 5 per cent ..			302	
	Petty supervision at $2\frac{1}{2}$ per cent ..			152	
	Total ..				6,480
	Total, L. Earthwork ..				6,480

M. PLANTATIONS.

Estimate No. 281-G.

Providing avenues along roads on canal banks of Pudupatnam Branch Canal.

1½ miles.	Providing avenues along roads canal banks ..	300 0 0	Mile.	450	
	Total ..				450
	Total, M. Plantations ..				450

O. MISCELLANEOUS.

Estimate No. 282-G.

Fixing demarcation stones for Pudupatnam Branch Canal.

No. 44	Fixing demarcation stones for Pudupatnam Branch Canal at four for every furlong ..	0 8 0	Each.	22	
	Sundries ..			8	
	Total ..				30

Estimate No. 283-G.

Fixing reduced distance stones along Pudupatnam Branch Canal.

No. 11	Fixing reduced distance stones, 2' 6" x 0' 8" x 0' 5" in earth at every 500 feet of Pudupatnam Branch Canal ..	1 12 0	Each.	19	
	Contingencies ..			7	
	Petty supervision ..			4	
	Total ..				30
				Carried over	60

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

PUDUPATNAM BRANCH CANAL—*cont.*O. MISCELLANEOUS—*cont.* Brought forward ... 60

Estimate No. 284-G.

Fixing Bench mark stones along Pudupatnam Branch Canal.

No. 4	Fixing bench mark stones, 2' 6" × 0' 8" × 0' 5" in concrete at every 2,500 feet ..	2 10 0	Each.	11	
	Contingencies	..	..	6	
	Petty supervision	..	..	3	
	Total	..	..	..	20
	Total	..	..	..	80

Estimate No. 285-G.

Earthenware pipe sluices along Pudupatnam Branch Canal.

<i>9" pipe sluice on the left bank of the Pudupatnam Branch Canal at R.D. 330.</i>					
2-30 units.	Table moulded stock bricks in lime mortar ..	29 2 0	100 c. ft.	67	
1-40 "	Plastering, $\frac{3}{4}$ " thick with Portland cement, 3:1 ..	6 12 0	100 sq. ft.	9	
No. 1	Cuddapah slab, 2" thick and 1' 3" × 1' 3", including cutting out circular vent, $7\frac{1}{2}$ " diameter ..	1 0 0	Each.	1	
" 16	Earthenware pipes, 9" diameter and 2' long including fixing, etc. ..	2 6 0	"	34	
" 1	Stem shutter with flat iron bar, teak beam, holding down bolts, etc., complete ..	Lump sum.		10	
	Earthwork excavating foundations and filling in	..	..	10	
	Total	..	..	131	
	Contingencies at 5 per cent	..	..	6	
	Petty supervision at $2\frac{1}{2}$ per cent	..	..	3	
	Total	..	..	..	140
<i>12" pipe sluice on the right bank of the Pudupatnam Branch Canal at R.D. 330.</i>					
2-30 units.	Table moulded stock bricks in lime mortar ..	29 2 0	100 c. ft.	67	
1-40 "	Plastering, $\frac{3}{4}$ " thick with portland cement, 3:1 ..	6 12 0	Square.	9	
No. 1	Cuddapah slab, 2" thick and 1' 6" × 1' 6", including cutting out circular vent $8\frac{1}{2}$ " diameter ..	1 0 0	Each.	1	
	Earthenware pipes 2' long and 12" diameter including fixing, etc. ..	4 2 0	"	66	
	Stem shutter with flat iron bar, teak beam, holding down bolts, etc., complete ..	Lump sum.		10	
	Earthwork excavating foundation and filling in	..	..	5	
	Total	..	..	158	
	Contingencies at 5 per cent	..	..	8	
	Petty supervision at $2\frac{1}{2}$ per cent	..	..	4	
	Total	..	..	..	170
	Carried over	..	..	..	310
	Carried over	..	..	..	80

GRAND ANICUT CANAL SYSTEM—MAIN CANALS AND BRANCHES—*cont.*

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

PUDUPATNAM BRANCH CANAL—*cont.*O. MISCELLANEOUS—*cont.* Brought forward .. 80Estimate No. 285-G—*cont.* Brought forward .. 310Earthenware pipe sluice along Pudupatnam Branch Canal—*cont.*

<i>15" Pipe sluice at R.D. on the left bank of Pudupatnam Branch Canal.</i>					
2-30 units.	Table moulded stock bricks in lime mortar ..	30 1 0	100 c. ft.	69	
1-40 "	Plastering, $\frac{3}{4}$ " thick with portland cement, 3:1 ..	6 12 0	Square.	9	
No. 1	Cuddapah slab, 2" thick and 1' 9" × 1' 5", including cutting out circular vent $12\frac{1}{2}$ " diameter ..	1 0 9	Each.	1	
" 2	Earthenware pipes, 15" diameter and 2' long including fixing, etc. ..	5 14 0	"	71	
	Stem shutter with flat iron bar, teak beam, holding down bolts, etc., complete ..	Lump sum.		10	
	Earthwork excavating foundations and filling in	..	..	8	
	Total	..	..	168	
	Contingencies at 5 per cent	..	..	8	
	Petty supervision at $2\frac{1}{2}$ per cent	..	..	4	
	Total	..	..	..	180
	Total, Pipe sluices	..	..	..	490
	Total, O. Miscellaneous	..	..	..	570

P. MAINTENANCE.

Estimate No. 286-G.

Maintenance of Pudupatnam Branch during construction.

Maintenance during construction	Lump sum.	500	
Total	..	..	500
Total, P. Maintenance	..	..	500

Abstracts of Estimates.

VADAVAR SYSTEM.

(2) MAIN CANALS AND BRANCHES.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR AND VADAVAR EXTENSION CANAL.

A. PRELIMINARY EXPENSES.

Estimate No. 1-V.

The Vadavar and Vadavar Extension Canal—Preliminary Expenses.

7½ miles.	Cost of preliminary surveys	Lump sum.	..	20,000	
	Laying out canal alignment during execution.	60 0 0	Mile.	450	
	Contingencies	..	..	50	
	Total	..	..	..	20,500
	Total, A. Preliminary Expenses	..	..	..	20,500

B. LAND.

Estimate No. 2-V.

Compensation for land for the Vadavar and Vadavar Extension Canal.

0.65 acres.	Perambur village, wet	200 0 0	Acre	130	
1.42 "	Pilliaranatham village dry	80 0 0	"	114	
0.25 "	Do. wet	200 0 0	"	50	
0.03 "	Siralur village, wet	200 0 0	"	6	
1.77 "	Chakrasamandan village, dry	80 0 0	"	142	
0.36 "	Do. wet	200 0 0	"	72	
33 "	Maharaja's inam village, dry	80 0 0	"	2,640	
3.4 "	Baramuthirakottai do.	80 0 0	"	272	
0.8 "	Kambayanatham do.	300 0 0	"	180	
0.4 "	Do. village, wet	600 0 0	"	240	
2.75 "	Muvarkottai village, dry	300 0 0	"	825	
0.4 "	Do. wet	600 0 0	"	240	
26.17 "	Vadavar Vadapadi village, dry	300 0 0	"	7,851	
12.00 "	Vadavar Agraharam, dry	300 0 0	"	3,600	
44.16 "	Vadavar Tenpadi village, dry	300 0 0	"	13,248	
38.36 "	Periyur village, wet	300 0 0	"	11,505	
	Total	..	..	..	41,116
15,273,000 c. ft.	Add 15 per cent for compulsory acquisition	0 10 0	1,000 c. ft.	6,166	
	Temporary occupation of land for taking earth	..	..	9,549	
	Contingencies	..	..	170	
	Total	..	..	..	57,000

Estimate No. 3-V.

Compensation for land for Muthalaimuthuvvari diversion.

109,604 c. ft.	Extra earth required for banking and for which compensation for temporary occupation of land is to be awarded	0 10 0	1,000 c. ft.	68	
5.36 acres.	Compensation for dry lands required for permanent occupation in Palliyeri village.	225 0 0	Acre.	1,206	
	Add 15 per cent for compulsory acquisition	..	..	82	
17.58 "	Add 15 per cent for wet lands required for permanent occupation in Palliyeri village	450 0 0	Acre.	7,902	
	Add 15 per cent for compulsory acquisition	..	..	1,185	
	Total	..	..	..	10,543
	Carried over	..	..	..	57,000

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR AND VADAVAR EXTENSION CANAL—cont.

B. LAND—cont.

Brought forward .. 57,000

Estimate No. 3-V—cont.

Brought forward .. 10,543

Compensation for land for Muthalaimuthuvvari diversion—cont.

	<i>Right Flood Bank.</i>				
497,580 c. ft.	Extra earth required for banking and for which compensation for temporary occupation of land is to be awarded.	0 10 0	1,000 c. ft.	300	
3.00 acres.	Compensation for dry lands required for permanent occupation in Palliyeri village.	225 0 0	Acre.	675	
	Add 15 per cent for compulsory acquisition	..	..	101	
	Total	..	..	..	1,076
	<i>Left Flood Bank.</i>				
879,618 c. ft.	Earthwork required for banking and for which compensation for temporary occupation of land is to be awarded.	0 10 0	1,000 c. ft.	550	
2.04 acres.	Compensation for dry lands required for permanent occupation in Palliyeri village.	225 0 0	Acre.	459	
	Add 15 per cent for compulsory acquisition	..	..	68	
4.71 "	Compensation for dry lands required for permanent occupation in Ramanadhapuram village.	225 0 0	Acre.	1,060	
	Add 15 per cent for compulsory acquisition	..	..	159	
4.3 "	Compensation for wet lands required for permanent occupation in Palliyeri village.	450 0 0	Acre.	1,935	
	Add 15 per cent for compulsory acquisition	..	..	290	4,521
	Contingencies	..	..	..	60
	Total	..	..	..	16,200
	Amount to be debited to the project Muthalaimuthuvvari diversion	..	..	16,200	8,100
	Total, B land	..	..	..	65,100

D. REGULATORS.

Estimate No. 4-V (Plan Nos. V 21 and V 22).

Supplemental head sluice at the head of the Vadavar.

116.94	Concrete with broken brick in surki mortar	21 0 0	100 c. ft.	2,456	
121.44	Table moulded brick in surki mortar	24 8 0	100 "	9,975	
12.46	Archwork table moulded brick in surki mortar.	25 8 0	100 "	318	
	Centring for do. do.	..	..	120	
82.02	Plastering with portland cement ¾" thick—1 cement 2 sand.	6 12 0	Sqr.	554	
120 c. ft.	Cutstone dressed	2 8 0	C. ft.	300	
37.33 "	Teakwood wrought and put up	4 4 0	"	159	
No. 8	Teakwood shutters with planks 3" thick and screw shafts 2½" dr. including screw box brackets, holding down bolts, angle irons, etc., complete.	190 0 0	Each.	1,520	
66.63	Concrete block for revetment and pitching	21 12 0	100 c. ft.	1,449	
13.12	Gravel backing	5 0 0	"	65	
	Earthwork excavation filling in and forming banks.	..	..	170	
	Shed for materials	..	..	151	
	Baling	..	..	100	
	Total	..	..	..	10,338
	Contingencies	..	..	..	515
	Petty supervision	..	..	..	247
	Total	..	..	..	11,100
	Carried over	..	..	..	11,100

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR AND VADAVAR EXTENSION CANAL—cont.					
Brought forward ..				11,100	
D. REGULATORS—cont.					
Estimate No. 5-V (Plan No. V. 23).					
Regulator at R. D. 10/8300 of the Vadavar.					
61.89 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	1,300	
75.26 "	Platform moulded brick in chunam ..	21 8 0	"	1,618	
10.13 "	Archwork platform moulded brick in chunam ..	22 8 0	"	228	
	Centring for arches ..	Lump sum.		50	
72 c. ft.	Cutstone dressed ..	2 8 0	C. ft.	180	
59.58 "	Plastering with portland cement $\frac{3}{4}$ " thick 1 cement 3 sand.	6 12 0	Sqr.	402	
No. 6	Teakwood shutters 3" thick with screw shafts $2\frac{1}{2}$ " diameter including screw box, brackets, holding down bolts, angle iron, etc., complete, including railway charges fixing.	185 0 0	Each.	1,110	
31.75	Concrete block for revetment and pitching ..	21 12 0	100 c. ft.	691	
7.22	Backing with brick jelly ..	10 8 0	"	76	
35.88	Teakwood wrought and put up ..	4 4 0	C. ft.	153	
	Earthwork excavating for foundations and filling in forming banks.	Lump sum.		80	
	Shed for materials ..			29	
	Total ..			5,917	
	Contingencies ..			295	
	Petty supervision ..			148	
	Total ..			6,360	
Total, D. Regulators ..				17,460	

E. FALLS AND WEIRS.

Estimate No. 6-V (Plan No. V. 24).

Drop 3 feet at R. D. 7920 of the Vadavar.

58.50 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	1,229	
45.17 "	Platform moulded brick in chunam ..	21 3 0	"	971	
28.50 "	Plastering with portland cement $\frac{3}{4}$ " thick 1 cement 3 sand.	6 12 0	109 sq. ft.	192	
1.50 "	Cuddapah slabs 2" thick ..	30 0 0	"	45	
86.90 "	Concrete block for revetment and pitching ..	21 12 0	100 c. ft.	1,890	
14.23 "	Brick jelly backing ..	10 8 0	"	150	
	Earthwork excavating foundations, etc.	Lump sum.		85	
	Shed for materials ..			25	
	Baling ..			70	
	Total ..			4,657	
	Contingencies ..			230	
	Petty supervision ..			113	
	Total ..			5,000	

Estimate No. 7-V (Plan No. V. 25).

Drop 2 feet at R. D. 1/6500 of the Vadavar.

56.40 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	1,184	
38.42 "	Brick in chunam ..	21 8 0	"	826	
27.14 "	Plastering with portland cement, $\frac{3}{4}$ " thick 1 cement and 3 sand.	6 12 0	Sqr.	183	
1.26 "	Cuddapah slabs 2" thick ..	30 0 0	"	38	
84.08 "	Concrete block for revetment and apron ..	21 12 0	100 c. ft.	1,829	
12.77 "	Brick jelly packing 6" thick ..	10 8 0	"	134	
	Earthwork excavating and filling in forming banks.	Lump sum.		32	
	Shed for materials ..			20	
	Baling ..			30	
	Total ..			4,276	
	Contingencies ..			212	
	Petty supervision ..			112	
	Total ..			4,600	
Carried over ..				9,600	

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR AND VADAVAR EXTENSION CANAL—cont.					
Brought forward ..				9,600	
E. FALLS AND WEIRS—cont.					
Estimate No. 8-V (Plan No. V. 26).					
Drop 3 feet combined with foot bridge at R. D. 8/2170.					
5,139 c. ft.	Concrete, broken brick in surki mortar ..	21 0 0	100 c. ft.	1,080	
4,221 "	Platform-moulded brickwork in chunam ..	21 8 0	"	908	
2,614 sq. ft.	Cement-plastering, $\frac{3}{4}$ " thick, 1 cement and 3 sand.	6 12 0	100 sq. ft.	176	
9,664 c. ft.	Concrete blocks for revetment ..	21 12 0	100 c. ft.	2,080	
2,050 "	Brick jelly backing ..	10 8 0	"	215	
100 sq. ft.	Cuddapah slabs, 2" thick ..	30 0 0	100 sq. ft.	30	
39.8 cwt.	Rolled steel girders ..	8 0 0	Cwt.	318	
74.0 r. ft.	Cost of foot bridge ..	6 5 0	R. ft.	467	
	Earthwork ..	Lump sum.		91	
8 c. ft.	Cutstone work ..	2 8 0	C. ft.	20	
	Shed for materials ..			25	
	Total ..			5,410	
	Contingencies ..			270	
	Petty supervision ..			120	
	Total ..			5,800	

Estimate No. 9-V (Plan No. V. 27).

Drop 3 feet at R. D. 9/1080 of the Vadavar.

47.50 units.	Concrete, broken brick in surki mortar ..	21 0 0	100 c. ft.	898	
41.70 "	Platform-moulded brick in mortar ..	21 8 0	"	897	
24.00 "	Cement-plastering, $\frac{1}{2}$ " thick, 3 to 1 ..	6 12 0	100 sq. ft.	162	
100 sq. ft.	Cuddapah slabs, 2" thick ..	30 0 0	"	30	
106.25 "	Concrete blocks for revetment ..	21 12 0	100 c. ft.	2,311	
24.50 "	Gravel backing ..	10 8 0	"	257	
	Earthwork ..	Lump sum.		87	
	Shed for materials ..			25	
	Total ..			4,767	
	Contingencies ..			235	
	Supervision ..			118	
	Total ..			5,120	

Estimate No. 10-V (Plan No. V. 28).

Drop 4 feet at R. D. 11/4180 of the Vadavar.

31.08 units.	Concrete, broken brick in surki mortar ..	21 0 0	100 c. ft.	653	
42.13 "	Platform-moulded brick in chunam ..	21 8 0	"	906	
24.90 "	Plastering with portland cement $\frac{3}{4}$ " thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	168	
0.72 "	Cuddapah slabs, 2" thick ..	30 0 0	"	22	
39.14 "	Concrete blocks for revetment and pitching ..	21 12 0	100 c. ft.	851	
6.23 "	Brick jelly backing ..	10 8 0	"	65	
	Earthwork ..	Lump sum.		85	
	Shed for materials ..			24	
	Total ..			2,774	
	Contingencies ..			138	
	Petty supervision ..			68	
	Total ..			2,980	
Total, E. Falls and Weirs ..				23,500	

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR AND VADAVAR EXTENSION CANAL—cont.					
F. CROSS DRAINAGE WORKS.					
Estimate No. 11-V (Plan No. V. 30).					
Super-passage for the Muthalaimuthuvari diversion, R.D. 2/3100.					
814.4 units.	Concrete, broken brick in surki mortar ..	21 0 0	100 c. ft.	17,102	
656.50 "	Table-moulded brick in surki mortar ..	24 8 0	"	16,084	
157.70 "	Archwork, table moulded brick in surki mortar.	25 8 0	"	4,021	
	Centering for archwork ..		Lump sum.	1,577	
431.00 "	Plastering with portland cement $\frac{3}{4}$ " 1 cement and 3 sand ..	6 12 0	100 sq. ft.	2,909	
0.88 "	Cuddapah slab, 2" thick ..	30 0 0	"	26	
281.00 "	Concrete block revetment and apron ..	21 12 0	"	6,111	
25.00 "	Gravel backing to revetment ..	5 0 0	100 sq. ft.	125	
542.9 "	Clay puddle under apron ..	2 0 0	"	1,086	
	Earthwork, excavating and filling in ..		Lump sum.	1,250	
	Baling water ..		"	1,200	
	Removing old Maravanapatti surplus and forming new banks with necessary revetment ..		Lump sum.	400	
	Shed for materials ..		"	600	
	Total ..			591	
	Contingencies ..			2,606	
	Petty supervision ..			1,303	
	Total ..			56,400	
	Cost to be debited to the project ..	2		28,200	

Estimate No. 12-V (Plan No. V. 31).

Aqueduct at R.D. 12/9835 of the Vadavar across Kalapalli channel.

82.40 units.	Concrete, broken in surki mortar ..	21 0 0	100 c. ft.	1,730	
87.40 "	Platform-moulded brick in surki mortar ..	23 0 0	"	2,010	
27.50 "	Archwork, platform moulded brick in surki mortar ..	24 0 0	"	660	
	Centering for archwork ..		Lump sum.	264	
54.90 "	Plastering with portland cement $\frac{3}{4}$ " thick, 1 cement and 3 sand ..	6 12 0	100 c. ft.	371	
12.60 "	Brick on end 9" thick ..	13 8 0	"	173	
	Earthwork, excavating foundations and filling in ..		Lump sum.	100	
	Shed for materials ..		"	30	
	Contingencies ..			265	
	Petty supervision ..			137	
	Total ..			5,740	

Estimate No. 13-V (Plan No. V. 32).

Aqueduct at R. D. 13/3980 of the Vadavar Extension Canal across the surplus channel of Ponnangani Tank.

119.00 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	2,499	
111.00 "	Platform-moulded brick in surki mortar ..	23 0 0	"	2,553	
55.00 "	Archwork, platform-moulded brick in surki mortar ..	24 0 0	"	1,320	
	Centering for archwork ..		Lump sum.	520	
98.20 "	Plastering with portland cement $\frac{3}{4}$ " thick, 1 cement and 3 sand ..	6 12 0	100 sq. ft.	683	
26.20 "	Brick on end 9" thick ..	13 8 0	"	354	
	Earthwork excavating foundations and filling in, etc. ..		Lump sum.	112	
	Shed for materials ..		"	35	
	Total ..			8,056	
	Contingencies ..			404	
	Petty supervision ..			200	
	Total ..			8,660	
	* Total, F. Cross Drainage Works ..			43,600	

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR AND VADAVAR EXTENSION CANAL—cont.					
G. BRIDGES.					
Estimate No. 14-V.					
Girder bridge "C" class at R.D. 2/112 of the Vadavar.					
No. 1	Abutment and wings less revetments, etc., as per type estimate.	1,720 0 0	No. 1.	1,720	
76 r.ft.	Pier as per type estimate ..	220 0 0	"	220	
	Roadway including Westwood's through plate, cement concrete, road metalling, including standards, hand-rails, wheel guards, etc., complete.	30 15 0	R. ft.	2,351	
120.8 cwt.	Rolled steel beams ..	8 0 0	Cwt.	966	
No. 2	Stiffening frames as per type estimate ..	22 12 0	Each.	46	
	Total ..			5,303	5,300

Estimate No. 15-V.

Foot bridge at R.D. 6/3690 of the Vadavar.

No. 1	Abutments, etc., as per type estimate ..	84 0 0	Each.	84	
2	Piers as per type estimate ..	96 0 0	"	192	
107 $\frac{1}{2}$ r. ft.	Roadway including standards, hand-rails, cleats, corrugated iron sheets, etc., complete as per type estimate.	6 5 0	R. ft.	680	
79.69 cwt.	Rolled steel beam girders 15" $\times$ 5" $\times$ 42 lb. ..	8 0 0	Cwt.	638	
144 c. ft.	Add for extra height 1' 6" — Platform moulded brick in chunam ..	21 8 0	100 c. ft.	31	
71 sq. ft.	Plastering with portland cement $\frac{3}{4}$ " thick (one cement, three sand).	6 12 0	100 sq. ft.	5	
	Shed for materials ..		Lump sum.	15	
	Contingencies ..		"	3	
	Petty supervision ..		"	2	
	Total ..			1,650	

Estimate No. 16-V.

Girder bridge "C" class at R.D. 6/8145 of the Vadavar.

No. 1	Abutments, wings, etc., as per type estimate ..	1,770 0 0	One.	1,770	
74 r.ft.	Pier as per type estimate ..	210 0 0	Each.	210	
	Roadway including Westwood's through plate, cement concrete, road metalling, hand-rails, etc., complete as per type estimate.	30 15 0	R. ft.	2,289	
117.61 cwt.	Rolled steel beam girders 20" $\times$ 7 $\frac{1}{2}$ " $\times$ 89 lb. ..	8 0 0	Cwt.	941	
No. 4.	Stiffening frames as per type estimate ..	22 12 0	Each.	91	
972 c. ft.	Add for extra height 2' — Platform moulded brick in chunam ..	21 8 0	100 c. ft.	209	
148 sq. ft.	Plastering with portland cement $\frac{3}{4}$ " thick (one cement, three sand).	6 12 0	100 sq. ft.	10	
	Shed for materials ..		Lump sum.	60	
	Contingencies ..		"	12	
	Petty supervision ..		"	6	
	Total ..			5,598	
420 c. ft.	Deduct for revetments—				
	Revetment as per type estimate ..	21 0 0	100 c. ft.	88	
	Gravel backing as per type estimate ..	2 0 0	"	3	
	Contingencies ..		"	5	
	Petty supervision ..		"	2	
	Total deduction ..			98	
	Net Total ..			5,500	
	Carried over ..			12,450	

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR AND VADAVAR EXTENSION CANAL—cont.					
				Brought forward ..	12,45
G. BRIDGES—cont.					
Estimate No. 17-V.					
Girder bridge "B" class at R.D. 7/4250 of the Vadavar.					
No. 1.	Abutments and wings, etc., as per type estimate.	1,860 0 0	1	1,860	
	Pier, 9' high, as per type estimate	240 0 0	Each.	240	
74 r. ft.	Roadway including Westwood's trough plate, cement concrete, road metalling, including standards, hand-rails, etc., as per type estimate.	39 2 0	R. ft.	2,895	
183-68 cwt.	Rolled steel girders 20" X 7½" and 24" X 7½"	8 0 0	cwt.	1,469	
4 sets.	Stiffening frames B class	35 8 0	Set.	142	
Add for extra height 2' 6"—					
1,275 c. ft.	Platform moulded brick in chunam.	21 8 0	100 c. ft.	274	
210 sq. ft.	Plastering with portland cement, ¾" thick (one cement, three sand).	6 12 0	100 sq. ft.	14	
				Lump sum.	60
				Baling	20
				Contingencies at 5 per cent	16
				Petty supervision at 2½ per cent	8
Total ..					6,998
Deduct for revetment—					
420 c. ft.	Revetment (concrete block) as per type estimate	21 0 0		88	
140 "	Gravel backing do.	2 0 0		3	
				Contingencies at 5 per cent	5
				Petty supervision at 2½ per cent	2
Total deduction ..					98
Net Total ..					6,900

Estimate No. 18-V.

Girder bridge "C" class at R.D. 7/8375 of the Vadavar.

No. 1.	Abutments and wings, etc., as per type estimate.	1,770 0 0	Each.	1,770	
	Pier, 9' high, as per type estimate	210 0 0		210	
66 sq. ft.	Roadway including Westwood's trough plate, handrails, standards, metalling, etc., complete, as per type estimate.	30 15 0	R. ft.	2,042	
88-4 cwt.	Rolled steel girders, 18" X 7" X 75 lb.	8 0 0	Cwt.	707	
No. 2.	Stiffening frames as per type estimate	22 12 0	Each.	46	
Add for extra height 3'—					
1,476 c. ft.	Platform moulded brick in chunam	21 8 0	100 c. ft.	317	
122 sq. ft.	Plastering with portland cement, ¾" thick (one cement, three sand).	6 12 0	100	15	
				Lump sum.	50
				Contingencies	14
				Petty supervision	7
Total ..					5,178
Deduct for revetments—					
420 c. ft.	Concrete block revetment as per type estimate.	21 0 0	100 c. ft.	88	
140 "	Gravel backing as per type estimate	2 0 0	100 "	3	
				Contingencies	5
				Petty supervision	2
Total deduction ..					98
Net Total ..					5,080

Estimate No. 19-V.

Girder bridge "C" class at R.D. 9/0255 of the Vadavar.

No. 1.	Abutments and wings as per type estimate	1,770 0 0	Each.	1,770	
	Piers as per type estimate	210 0 0		210	
62 r. ft.	Roadway including Westwood's trough plate, handrails, etc., complete as per type estimate.	30 15 0	R. ft.	1,918	
83-04 cwt.	Rolled steel beam girders, 18" X 7" X 75 lb.	8 0 0	Cwt.	634	
No. 2.	Stiffening frames as per type estimate	22 12 0	Each.	46	
Add for extra height 3½"—					
1,734 c. ft.	Platform moulded brick in chunam	21 8 0	100 c. ft.	373	
459 sq. ft.	Plastering with portland cement, ¾" (one cement, three sand).	6 12 0	100 sq. ft.	17	
Carried over ..				4,988-	24,430

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR AND VADAVAR EXTENSION CANAL—cont.					
				Brought forward ..	24,430
G. BRIDGES—cont.					
Estimate No. 19-V—cont.					
				Brought forward ..	4,998
Girder bridge "C" class at R.D. 9/0255 of the Vadavar—cont.					
				Lump sum.	50
				Contingencies	21
				Petty supervision	10
Total ..					5,079
Deduct for revetment—					
4-20 c. ft.	Revetment as per type estimate	21 0 0	100 c. ft.	88	
140 "	Gravel backing do.	2 0 0	100 "	3	
				Contingencies	5
				Petty supervision	3
Total deduction ..					99
Net Total ..					4,980

Estimate No. 20-V.

Girder bridge "C" class at R.D. 9/7515 of the Vadavar.

No. 1.	Abutments and wings, etc., complete as per type estimate.	1,770 0 0	Each.	1,770	
	Pier, 9' high, as per type estimate	210 0 0		210	
56 r. ft.	Roadway including Westwood's trough plate, concrete, road metalling, standards, handrails, etc., as per type estimate.	30 15 0	R. ft.	1,733	
62 cwt.	Rolled steel beams girders, 16" X 6" X 62 lb.	8 0 0	Cwt.	496	
No. 2.	Stiffening frames between pier and abutment as per type estimate	22 12 0		46	
Add for extra height 4'—					
1,998 c. ft.	Platform moulded brick in chunam	21 8 0	100 c. ft.	430	
296 sq. ft.	Plastering with portland cement, ¾" thick (one cement, three sand).	6 12 0	100 sq. ft.	20	
				Lump sum.	40
				Contingencies	22
				Petty supervision	11
Total ..					4,778
Deduct for revetment—					
420 c. ft.	Revetment, concrete block	21 0 0	100 c. ft.	88	
140 "	Gravel backing to revetment	2 0 0	100 "	3	
				Contingencies	5
				Petty supervision	2
Total deduction ..					98
Net Total ..					4,680

Estimate No. 21-V.

Girder bridge "C" class at R.D. 11/8536 of the Vadavar.

No. 1.	Abutments and wing as per estimate No. 25 at R.D. 13/8030.	1,230 0 0	Each.	1,230	
	Pier "C" class type estimate	210 0 0		210	
54 r. ft.	Roadway including Westwood's trough plate, etc., complete as per "C" class type estimate.	30 15 0	R. ft.	1,671	
54-96 cwt.	Rolled steel beam girder, 14" X 6" X 57 lb.	8 0 0	Cwt.	440	
No. 2.	Stiffening frames at 1 per span	22 12 0	Each.	46	
				Lump sum.	35
Total ..					3,632
Deduct for extra height piers—					
1-98 units.	Platform moulded brick in chunam	21 8 0	100 c. ft.	43	
1-1 "	Plastering with portland cement, ¾" thick (one cement, three sand).	6 12 0	100 sq. ft.	7	
				Contingencies	1
				Petty supervision	1
Total deduction ..					52
Net Total ..					3,580
Carried over ..					37,670

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR AND VADAVAR EXTENSION CANAL—cont.					
Brought forward ..					37
G. BRIDGES—cont.					
Estimate No. 22-V.					
Girder bridge "B" class at R.D. 12/1836 of the Vadavar.					
No. 1.	Abutments and wings with revetment, etc., complete as per type estimate.	1,860 0 0	..	1,860	
54 r. ft.	Pier as per type estimate.	240 0 0	..	240	
	Roadway including Westwood's trough plate including handrails, standards, etc., as per "B" class type estimate.	39 2 0	..	2,113	
89-68 cwt.	Roller steel beam girders, 16" x 6" x 62 lb. as per type estimate.	8 0 0	Cwt.	717	
2 sets.	Stiffening frames as per type estimate	35 8 0	Set.	71	
	Shed for materials	Lump sum.		40	
	Total ..	..	..	5,041	
244	Deduct extra height 6"—				
42 sq. ft.	Platform moulded brick in chunam ..	21 8 0	100 c. ft.	52	
	Plastering with cement $\frac{3}{4}$ " thick (one cement, three sand).	6 12 0	100 sq. ft.	3	
420 c. ft.	Concrete block revetment as per type estimate.	21 0 0	100 c. ft.	88	
140 "	Gravel backing to revetment as per type estimate.	2 0 0	100 "	3	
	Contingencies	..	..	10	
	Petty supervision	..	..	5	
	Total deduction ..	..	..	161	
	Net Total ..	..	..	..	4,88
Estimate No. 23-V.					
Girder bridge "B" class at R.D. 12/8156 of the Vadavar.					
No. 1.	Abutments and wings, etc., complete as per separate estimate No. 24 at R.D. 13/8930.	1,230 0 0	No.	1,230	
40 r. ft.	Roadway including Westwood's trough plate, handrails, etc., complete as per "C" class type estimate.	30 15 0	R. ft.	1,238	
71-43 cwt.	Roller steel girders, 24" x 7 $\frac{1}{2}$ " x 40 lb.	8 0 0	Cwt.	571	
No. 2.	Stiffening frames to girders as per type estimate.	22 12 0	Each.	46	
	Add for revetment—				
2-4 units.	Concrete block revetments, 18" ..	21 0 0	100 c. ft.	50	
0-8 "	Brick jelly-backing to revetment ..	10 8 0	100 "	8	
	Shed for materials	Lump sum.		30	
	Contingencies	..	..	4	
	Petty supervision	..	..	3	
	Total ..	..	..	..	3,18
Estimate No. 24-V.					
Girder bridge "C" class at R.D. 13/2726 of the Vadavar.					
No. 1.	Abutment and wings with revetments, etc., as per type estimate.	1,770 0 0	Each.	1,770	
38 r. ft.	Roadway including Westwood's trough plate, cement concrete, road-metalling, handrails, etc., complete as per type estimate.	30 15 0	R. ft.	1,176	
60-39 cwt.	Roller steel beam girder, 20" x 7 $\frac{1}{2}$ " x 89 lb.	8 0 0	Cwt.	483	
No. 2.	Stiffening frames as per type estimate ..	22 12 0	"	46	
	Add for extra height, 2 $\frac{1}{2}$ "—				
645 c. ft.	Platform-moulded brick in chunam ..	21 8 0	100 c. ft.	139	
54 sq. ft.	Plastering with portland cement, $\frac{3}{4}$ " thick (one cement, three sand).	6 12 0	100 sq. ft.	4	
	Shed for materials	Lump sum.		40	
	Contingencies	..	..	6	
	Petty supervision	..	..	3	
	Carried over ..	..	..	3,667	45,73

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR AND VADAVAR EXTENSION CANAL—cont.					
Brought forward ..					45,730
G. BRIDGES—cont.					
Estimate No. 24-V—cont.					
Brought forward ..					3,667
Girder bridge "C" class at R.D. 13/2726 of the Vadavar—cont.					
420 c. ft.	Deduct for—				
140 "	Revetment concrete block as per type estimate.	21 0 0	100 c. ft.	88	
	Gravel backing to revetment as per type estimate.	2 0 0	100 "	3	
	Contingencies	..	..	4	
	Petty supervision	..	..	2	
	Total deduction ..	..	..	97	
	Net Total ..	..	..	..	3,570
Estimate No. 25-V.					
Girder bridge "C" class at R.D. 13/8930 of the Vadavar.					
1,600	For two abutments and wings, etc.—				
26-2	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	336	
14-0	Platform moulded brick in chunam ..	21 8 0	100 "	563	
	Plastering with portland cement, $\frac{3}{4}$ " (one cement, three sand).	6 12 0	100 sq. ft.	95	
5-75	Road-metalling	12 0 0	100 c. ft.	69	
2-09	Gravelling to road	2 0 0	100 "	4	
3 c. ft.	Cutstone work	2 8 0	0. ft.	8	
No. 1	Earthwork excavating foundation	Lump sum.		50	
" 8	Guard stones	3 0 0	Each.	24	
	Contingencies	..	..	53	
	Petty supervision	..	..	28	
39 r. ft.	Roadway including Westwood's trough plate, cement concrete, road-metalling, handrails, etc., as per "C" class type estimate.	30 15 0	R. ft.	1,207	
69-64 cwt.	Roller steel beam girders, 124" x 7 $\frac{1}{2}$ " x 100..	8 0 0	Cwt.	557	
No. 2	Stiffening frames as per type estimate ..	22 12 0	"	46	
	Shed for materials	..	..	20	
	Total ..	..	..	..	3,060
	Total, G. Bridges ..	..	..	..	52,360
H. ESCAPES.					
Estimate No. 26-V. (Plan No. V-33.)					
Surplus sluice No. 1 at R.D. 5280 of the Vadavar.					
62-94 units.	Concrete with broken brick in surki mortar ..	21 0 0	100 c. ft.	1,322	
70-12 "	Platform moulded brick in mortar	21 8 0	100 "	1,507	
63 c. ft.	Cutstone	2 8 0	C. ft.	158	
53-34 units.	Plastering with portland cement $\frac{3}{4}$ " thick (one cement, three sand).	6 12 0	Sqr.	360	
22-88 "	Concrete block for revetment and pitching including packing.	21 12 0	100 c. ft.	498	
4-45 "	Gravel backing under revetments	5 0 0	100 "	22	
26-26 "	Teakwood, wrought and put up	4 4 0	C. ft.	112	
No. 5.	Teakwood shuttles, 5' 6" x 5' 3" and 3" thick with screw shaft, 2 $\frac{1}{2}$ " diameter, holding down bolts, brackets, angle iron, including cartage and railway charges ($\frac{1}{2}$ the rate).	185 0 0	Each.	925	
12-94 units.	Archwork, platform moulded brick in mortar ..	22 8 0	100 c. ft.	291	
	Centering	..	..	120	
	Earthwork (excavation and filling in)	Lump sum.		120	
	Shed for materials	..	..	42	
	Baling	..	..	100	
	Total ..	..	..	5,577	
	Contingencies	..	..	283	
	Petty supervision	..	..	140	
	Grand Total ..	..	..	6,000	
	Amount to be debited to the project ..	..	..	6,000	3,000
	Carried over ..	..	..	..	3,000

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR AND VADAVAR EXTENSION CANAL—cont.					
H. ESCAPES—cont.				Brought forward ..	3,000
Estimate No. 27-V. (Plan No. V-34).					
Surplus sluice No. 2 at R.D. 2/3000 of the Vadavar.					
89.03 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	1,870	
82.00 "	Platform moulded brickwork in chunam ..	21 8 0	C. ft.	1,763	
12.2 "	Archwork, platform moulded brick in chunam ..	22 8 0	"	275	
	Centring for arches ..		Lump sum.	110	
67.40 "	Plastering with portland cement $\frac{3}{4}$ " thick, 3 to 1.	6 12 0	"	455	
99 c. ft.	Cutstone work ..	2 8 0	"	248	
31.50 "	Concrete block apron and revetment ..	21 12 0	100 c. ft.	750	
5.20 "	Gravel backing to revetment ..	5 0 0	100 "	31	
	Earthwork, excavating foundation and forming tanks, etc., complete.		Lump sum.	100	
	Shed for materials ..		"	39	
	Baling out water ..		"	40	
No. 8.	Teakwood screw-gearing shutters, 3" thick, with teak beams, holding down bolts, etc., complete	200 0 0	Each.	1,600	
	Contingencies ..		"	362	
	Petty supervision ..		"	187	
	Total ..		"		7,830
	Cost to be debited to the project ..		"	7,830	
				2	= 3,915

Part of Estimate No. 28-V (Plan No. V-36).

Improvements to the old Pulampallam surplus

18.00 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	378	
9.00 "	Platform moulded brickwork in lime mortar ..	21 8 0	100 "	193	
6.40 "	Plastering with portland cement, $\frac{3}{4}$ " thick (one cement, three sand).	6 12 0	100 sq. ft.	43	
	Connecting old and new work ..		Lump sum.	20	
	Earthwork, excavating foundation ..		"	15	
	Shed for materials ..		"	15	
	Contingencies ..		"	24	
	Petty supervision ..		"	12	
	Total ..		"		700

Estimate No. 28-V (Plan Nos. V-36 & V-37).

Improvements to the old Pulampallam surplus (sluice No. 3) at R.D. No. 4/1910 of the Vadavar.

59.91 units.	Table moulded brick in chunam ..	23 0 0	100 c. ft.	1,378	
7.52 "	Archwork table moulded brick in mortar ..	24 0 0	100 "	180	
	Centring for archwork ..		Lump sum.	72	
2.15 c. ft.	Cutstone work ..	2 8 0	C. ft.	538	
8.50 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	137	
27.50 "	Concrete blocks for apron ..	21 12 0	100 "	698	
8.50 "	Brick jelly backing ..	10 8 0	100 "	68	
65.41 "	Plastering with portland cement, $\frac{3}{4}$ " thick (one cement and three sand).	6 12 0	100 sq. ft.	442	
No. 4.	Screw-gearing shutters including beam stone, etc., complete.	280 0 0	Each.	1,120	
	Unforeseen works ..		"	120	
	Contingencies ..		"	220	
	Petty supervision ..		"	110	
	Shed for materials ..		Lump sum.	75	
	Total ..		"		5,058
179 c. ft.	Deduct cost of cutstone available in the existing work.	2 0 0	C. ft.	158	
	Net amount of estimate ..		"		4,900
	Improving the old Pulampallam surplus as per separate estimate above.		"		700
	Total ..		"		5,600
	Cost to be debited to the project = $\frac{5,600}{2}$..		"		= 2,800
	Carried over ..		"		9,715

-130-

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR AND VADAVAR EXTENSION CANAL—cont.					
H. ESCAPES—cont.				Brought forward ..	9,715
Estimate No. 29-V (Plan Nos. V-38 & V-39).					
Surplus (sluice No. 4) at R.D. No. 10/8300 of the Vadavar.					
99.30 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	2,085	
111.20 "	Platform moulded brick in lime mortar ..	21 8 0	100 "	2,391	
108 "	Cutstone work ..	2 8 0	C. ft.	270	
18.00 "	Archwork platform moulded brick in mortar ..	22 8 0	100 c. ft.	405	
	Centring for arches ..		Lump sum.	167	
87.00 "	Cement plastering, $\frac{3}{4}$ " thick (one cement, three sand).	6 12 0	100 sq. ft.	587	
53.6 "	Concrete blocks for revetment ..	21 12 0	100 c. ft.	1,166	
9.8 "	Brick jelly backing ..	10 8 0	100 "	103	
72 "	Teakwood wrought and put up ..	4 4 0	C. ft.	306	
No. 1	Providing screw-gearing shutters, complete	186 0 0	Each.	186	
" 7	Do. automatic shutters ..	125 0 0	"	875	
	Earthwork ..		Lump sum.	110	
	Baling water ..		"	170	
	Cutting groves, etc. ..		"	30	
	Shed for materials ..		"	150	
	Total ..		"		9,001
	Contingencies ..		"		456
	Petty supervision ..		"		243
	Total ..		"		9,700
	Cost to be debited to the project = $\frac{9,700}{2}$..		"		= 4,850
	Total, H. Escapes ..		"		14,565

K. BUILDINGS.

Estimate No. 30-V.

Quarters for two lascars at surplus (sluice No. 1) R.D. 5280.

No. 2	Sheds as per detail abstract estimate below ..	405 0 0	Each.	810	
" 1	Deduct for cost of one cross wall, roofing, and compound wall between 2 lascars' sheds as per detail abstract estimate below ..	72 0 0	"	72	
	Net Total ..		"	738 or say 740	
Shed for one lascar.					
320 c. ft.	Earthwork, excavating foundations ..	3 12 0	1,000 c. ft.	1	
178 sq. ft.	Earthwork, filling in basement 1 foot and forming floor including a coating of cowdung ..	0 8 0	100 sq. ft.	1	
106 c. ft.	Concrete with broken brick in ordinary mortar.	19 0 0	100 c. ft.	20	
352 "	Platform moulded brick in ordinary mortar ..	21 8 0	100 "	26	
469 "	Ground moulded country brick in clay ..	16 0 0	100 "	75	
16 "	Archwork with platform moulded brick in chunam ..	22 8 0	100 "	4	
22.6 "	Country wood wrought and put up ..	2 4 0	1 "	51	
No. 1	Post ..	1 7 0	Each.	1	
59 sq. ft.	Country wood battened doors and windows ..	0 12 0	Sq. ft.	44	
357 "	Roofing with flat and pan tiles including teak reapers and chunam borders ..	20 0 0	100 sq. ft.	71	
12.65 "	Painting with chunam including whitewashing two coats ..	1 11 3	100 "	22	
123 "	Tarring doors and windows ..	1 0 0	"	1	
383 "	Tarring wood work ..	1 2 0	100 sq. ft.	4	
0.13 c. ft.	Cutstone ..	2 8 0	1 c. ft.	1	
No. 1	Forming fire places ..		Lump sum.	4	
	Total ..		"		376
	Contingencies ..		"		19
	Petty supervision ..		"		10
	Total ..		"		405
	Carried over ..		"		740

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
VADAVAR AND VADAVAR EXTENSION CANAL—cont.					
				Brought forward ..	740.
K. BUILDINGS—cont.					
Estimate No. 30-V—cont.					
Quarters for two lascars at surplus (sluice No 1) R.D. 5280—cont.					
<i>Cost of one cross wall, roofing and compound wall between two lascars' sheds.</i>					
75 c. ft.	Earthwork, excavating foundation ..	3 12 0	1,000 c. ft.	0 4 6	
29 "	Concrete broken brick in mortar ..	19 0 0	100 "	5 8 2	
80 "	Platform moulded brick in chunam ..	21 8 0	100 "	17 3 2	
182 "	Ground moulded brick in clay ..	16 0 0	100 "	29 1 11	
419 sq. ft.	Pointing with chunam including white washing two coats ..	1 11 3	100 sq. ft.	7 2 2	
39 "	Roofing, etc. ..	20 0 0	100 "	7 12 10	
	Total ..			67 0 9	
	Contingencies and petty supervision ..			5 0 0	
	Total ..			72 0 0	or say 72

Estimate No. 31-V.

Quarters for two lascars at R.D. 2/3100 of the Vadavar.

As per estimate for the one at R.D. 5280 ..	..	..	740 0 0	
Total ..	..	..	..	740

Estimate No. 32-V.

Quarters for two lascars at R.D. 4/1910 of the Vadavar.

As per estimate for one at R.D. 5280 ..	..	..	740 0 0	
Total ..	..	..	..	740

Estimate No. 33-V.

Quarters for four lascars at R.D. 10/8300.

No. 4	Sheds as per detail estimate enclosed for the one at R.D. 5280.	405 0 0	Each.	1,620 0 0	
3	Deduct the cost of cross wall, roofing and compound wall between two sheds as per detail estimate for the one at R.D. 5280.	72 0 0	"	216 0 0	
	Total ..	..	..	1,404 0 0	or say 1,400

Estimate No. 34-V.

One store-shed at R.D. 10/8300 of the Vadavar.

1	Store-shed ..	Lump sum.	740 0 0	
	Total ..	..	..	740
		Carried over ..		4,360

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR AND VADAVAR EXTENSION CANAL—cont.					
				Brought forward ..	4,360
K. BUILDINGS—cont.					
Estimate No. 35-V.					
Sheds for lascars at tail end at R.D. 14/6520.					
As per estimate for the one at R.D. 5280 ..	..	..	..	740	
Total ..	..	..	..	..	740

Estimate No. 36-V.

Inspection bungalow with outhouses at Salyamangalam.

No. 1	Inspection bungalow as per separate detail estimate below.	2,970 0 0	Each.	2,970	
1	Kitchen as per separate estimate below	380 0 0	"	380	
1	Stables do.	280 0 0	"	280	
	Total ..	..	..	..	3,630
Inspection bungalow at Salyamangalam.					
1-757 units.	Earthwork, excavation for foundations ..	3 12 0	1,000 c. ft.	7	
1-354 "	Filling in basement ..	2 8 0	"	3	
8-50 "	Concrete broken brick in lime mortar ..	19 0 0	"	162	
11-20 "	Brick table moulded in lime mortar for foundation and basement.	21 8 0	100 c. ft.	241	
12-75 "	Brick table moulded in lime mortar for superstructure including scaffolding.	22 8 0	"	287	
0-49 "	Archwork in lime mortar ..	22 8 0	"	11	
4-00 "	Scaffolding for archwork ..	Lump sum.	"	4	
154-58 "	Outstone work ..	2 0 0	C. ft.	8	
	Teakwood, wrought and put up including cartage, etc.	4 4 0	"	657	
126-00 "	Woods, sunshades with necessary brackets, including painting, etc., complete.	1 0 0	Sq. ft.	126	
105-0 sq. ft.	Doors 3/4 panelled and 3/4 venetian with frames and iron fastenings, complete.	1 8 0	"	158	
78-00 "	Doors panelled with frames and iron fastenings, complete.	1 4 0	"	98	
129-0 "	Windows, venetian, including frames and iron fastenings, complete.	1 8 0	"	194	
9-38 squares.	Flooring, 6" concrete ..	10 8 0	100 sq. ft.	98	
9-38 "	Portland cement plastering for flooring, 3/4" thick.	6 12 0	"	63	
0-87 unit.	Paving with 9" Henkie's tiles laid on 6" concrete neatly pointed with cement.	25 0 0	"	22	
15-67 "	Roofing with pan tiles over flat tiles including reapers and chunam borders, complete.	20 0 0	Sq. ft.	315	
38-00 "	Plastering with lime mortar two coats and white-washing two coats.	3 0 0	100 sq. ft.	114	
12-25 "	Painting two coats, doors and windows ..	3 0 0	"	37	
17-03 "	Painting two coats, wood-work ..	3 0 0	"	51	
4-93 "	Bamboo matting ..	2 8 0	"	12	
3-75 "	Rattan chairs with blue cloths, ropes and pulleys, etc., complete.	20 0 0	"	75	
	Total ..	..	..	2,743	
	Contingencies ..	..	..	138	
	Petty supervision ..	..	..	72	
	Unforeseen items ..	..	..	17	
	Total ..	..	..	..	2,970
				Carried over ..	8,730

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR AND VADAVAR EXTENSION CANAL—cont.

K. BUILDINGS—cont.

Brought forward .. 8,730

Estimate No. 36-V—cont.

Inspection bungalow with outhouses at Salyamangalam—cont.

Kitchens attached to the Inspection bungalow at Salyamangalam.					
4-54 c. ft.	Earthwork excavating for foundations ..	3 12 0	1,000 c. ft.	2	
91 "	Filling in basement with earth ..	2 8 0	"	1	
3-59 "	Concrete broken brick in lime mortar ..	19 0 0	100 c. ft.	68	
169 "	Country brick in clay in foundation and basement.	16 0 0	"	27	
7-00	Sunburnt brick in clay ..	7 0 0	"	49	
17 c. ft.	Flat archwork brick in lime mortar ..	22 8 0	"	4	
1,049 sq. ft.	Plastering with one coat of chunam and two coats of whitewashing.	3 0 0	100 sq. ft.	31	
145	Flooring with 4" concrete and plastered with two coats of lime mortar.	7 0 0	"	10	
386	Roofing with plain pan tiles over reepers ..	10 0 0	"	39	
29-27	Country wood wrought and put up ..	2 12 0	C. ft.	80	
No. 3.	Wooden posts, 6' long ..	1 8 0	Each.	6	
21 sq. ft.	Doors braced batton including frames and iron fittings, complete.	0 12 0	Sq. ft.	16	
20 "	Windows, batton including frames and iron fittings, complete.	0 12 0	"	15	
1-38 squares.	Painting two coats ..	3 0 0	100 sq. ft.	4	
392 sq. ft.	Tarring two coats ..	0 12 0	"	3	
	Total ..			354	
	Contingencies ..			17	
	Petty supervision ..			9	
	Total ..				380
Stable attached to the Inspection bungalow at Salyamangalam.					
260 c. ft.	Earthwork excavating for foundations ..	3 12 0	1,000 c. ft.	1	
12-00	Mud work in foundation and superstructure ..	3 8 0	100 c. ft.	42	
47-19	Country wood wrought and put up ..	2 12 0	C. ft.	180	
78 r. ft.	Wooden posts ..	0 1 6	R. ft.	7	
788 sq. ft.	Roofing with thatch including bamboo reepers.	5 8 0	100 sq. ft.	43	
9 c. ft.	Cutson work ..	2 0 0	C. ft.	18	
8-51	Gravelling, 6" thick, well watered and rammed.	3 4 0	Sq. ft.	11	
No. 4	Bamboo hurdles, 3" diameter and 14' long ..	18 0 0	100	1	
602 sq. ft.	Tarring two coats ..	0 12 0	100 sq. ft.	5	
	Total ..			258	
	Contingencies ..			15	
	Petty supervision ..			9	
	Total ..				280

Estimate No. 37-V.

Inspection bungalow with outhouses at Vaduvur.

As per estimate for the one at Salyamangalam.	..	..	3,630	
Total ..	..	..	..	3,630

Estimate No. 38-V.

Inspection bungalow with outhouses at Ullikkotta.

As per estimate for the one at Salyamangalam.	..	..	3,630	3,630
Total, K. Buildings ..	..	..	..	15,990

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR AND VADAVAR EXTENSION CANAL—cont.

L. EARTHWORK.

Estimate No. 39-V.

Improvements to the Vadavar and excavating adavar extension canal.

11,111,000 c. ft.	Widening and forming bank including sectioning and tamping ..	4 5 0	1,000 c. ft.	47,916	
2,734,000 "	Excavating Vadavar Extension canal and forming banks including sectioning and tamping ..	3 12 0	1,000 "	10,253	
11,315,000 "	Excavating Vadavar Extension canal and forming banks including extra lead, 10 yards and lift 1 yard ..	4 5 0	1,000 "	48,796	
	Total ..			1,06,965	
	Contingencies ..			6,348	
	Petty supervision ..			2,687	
	Total ..				1,15,000

Estimate No. 40-V.

Excavating the diversion of Mudalaimuthuvuri and forming flood banks.

1,909,000 c. ft.	Excavating the diversion of Mudalaimuthuvuri.				
	Earthwork cutting in ordinary soil (extra lead 30 yards including sectioning and tamping).	4 10 0	1,000 c. ft.	8,829	
	Right Flood Bank.				
479,580 "	Earthwork excavating and forming bank including sectioning and tamping ..	3 12 0	1,000 "	1,798	
	Left Flood Bank.				
879,618 "	Earthwork excavating and forming bank including sectioning and tamping ..	3 12 0	1,000 "	3,298	
	Total ..			13,925	
	Contingencies ..			695	
	Petty supervision ..			340	
	Grand total ..			15,000	
	Amount to be debited to the project = $\frac{15,000}{2}$				7,500
	Total, L. Earthwork ..				1,22,500

M. PLANTATION.

Estimate No. 41-V.

Forming avenues on canal banks used as roads.

27½ miles.	Planting avenue trees on the bank used as road.	300 0 0.	Mile.	8,250	
	Contingencies ..			400	
	Petty supervision ..			250	
	Total ..				8,900
	Total, M. Plantations ..				8,900

O. MISCELLANEOUS.

Estimate No. 42-V.

Fixing demarcation stones along the Vadavar and Vadavar extension canal.

No. 680	Revenue survey stones including conveyance to site and fixing in earth ..	0 8 0	Each.	340	..
	Contingencies ..		Lump sum.	10	..
	Total ..				350
				Carried over ..	350

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR AND VADAVAR EXTENSION CANAL—cont.

Brought forward .. 350

O. MISCELLANEOUS—cont.

Estimate No. 43-V.

Fixing R.D. stones along the Vadavar and the Vadavar Extension canal.

No. 293	Cutstone 2' 6" × 8" × 5", including conveyance to site and fixing in earth ..	2 4 0	..	659	
	Contingencies at 5 per cent ..	..	..	33	
	Petty supervision ..	..	..	18	
	Total ..	..	..	..	710

Estimate No. 44-V.

Fixing Bench Mark stones along the Vadavar and the Vadavar Extension canal.

No. 55	Cutstone 2' 6" × 8" × 5", neatly dressed at top with a seat for levelling staff and imbedded in concrete, 2' 0" × 1' 6" × 1' 6" ..	3 2 0	Each.	172	
	Contingencies ..	..	..	10	
	Petty supervision ..	..	..	8	
	Total ..	..	..	..	190

Estimate No. 45-V.

Fixing Demarcation stones for the Mudalaimuthuvari diversion.

No. 100	Demarcation stones including fixing for the Mudalaimuthuvari diversion and flood banks ..	0 8 0	Each.	50	
	Total ..	..	..	..	50
	Cost to be debited to the project = $\frac{50}{2}$..	..	..	..	25

Estimate No. 46-V. (Plan No. V-40.)

Irrigation Syphon for Palleri channel across Mudalaimuthuvari diversion.

58-5 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	1,229	
46 "	Platform moulded brick work in surki mortar ..	23 0 0	"	1,058	
15-6 "	Archwork platform moulded brick in surki mortar ..	24 0 0	"	374	
	Centering for archwork ..	..	Lump sum.	150	
30-00 units.	Plastering with Portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	203	
	Earthwork excavating foundations and forming banks, etc. ..	..	Lump sum.	90	
	Baling ..	..	..	30	
	Shed for materials ..	..	Lump sum.	26	
	Contingencies ..	..	..	157	
	Petty supervision ..	..	..	83	
	Total ..	..	..	3,400	
	Cost to be debited to the project = $\frac{3,400}{2}$..	..	..	..	1,700

Estimate No. 47-V.

Irrigation Syphon for Punthottam channel under the Mudalaimuthuvari diversion at R.D. 2/3160 of the Vadavar.

No. 1	As per estimate for Irrigation syphon for the Palleri channel ..	3,400	No. 1	3,400	
	Extra for connecting with the existing head sluice ..	..	Lump sum.	600	
	Total ..	..	..	4,000	
	Cost to be debited to the project = $\frac{4,000}{2}$..	..	..	..	2,000
	Carried over ..	..	..	..	4,975

VADAVAR SYSTEM—MAIN CANALS AND BRANCHES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR AND VADAVAR EXTENSION CANAL—cont.

O. MISCELLANEOUS—cont.

Brought forward .. 4,975

Type Estimate.

Earthenware pipe sluice for F.S.L. of 4½ feet for the Vadavar Extension canal.

0-25 unit.	Platform-moulded, brick in chunam ..	21 8 0	100 c. ft.	20	
No. 18.	Earthenware pipes, 12" diameter, 2' long ..	4 2 0	Each.	74	
0-62 unit.	Plastering with surki mortar, 2 coats ..	3 4 0	100 sq. ft.	2	
No. 1.	Cuddapah slab vent, stone, 2" thick 1'—6" × 1'—6" with 9" circular vent. ..	..	Lump sum.	1	
	Earthwork, excavating foundation for 15' top-width of bank. ..	..	Do.	15	
	Contingencies ..	..	..	5	
	Petty supervision ..	..	..	3	
	Total ..	..	..	..	120
	Estimate for sluices with pipes 3" diameter ..	..	..	Rs. 50	
	Do. do. 6" ..	..	..	.. 60	
	Do. do. 9" ..	..	..	.. 80	
	Do. do. 12" ..	..	..	.. 120	
	Do. do. 15" ..	..	..	.. 160	

Estimate No. 48-V (Plan No. V-41).

Pipe sluices for the Vadavar Extension canal.

No. 1	Sluice No. I at R.D. 11/4180 pipes, 9" diameter, as per type estimate above. Left bank. ..	..	..	80	
" 1	Sluice No. II at R.D. 12/3750, pipe 6" diameter. Left bank. ..	..	..	60	
" 1	Sluice No. III at R.D. 12/5400, pipe 12" diameter. Right bank. ..	..	..	120	
" 1	Sluice No. IV at R.D. 12/6060, pipe 6" diameter. Left bank. ..	..	..	60	
" 1	Sluice No. V at R.D. 13/0020, pipe 9" diameter. Left bank. ..	..	..	80	
" 1	Sluice No. VI at R.D. 13/0020, pipe 9" diameter. Right bank. ..	..	..	80	
" 1	Sluice No. VII at R.D. 13/7940, pipe 9" diameter. Right bank. ..	..	..	80	
" 1	Sluice No. VIII at R.D. 13/7940, pipe 9" diameter. Left bank. ..	..	..	80	
" 1	Sluice No. IX at R.D. 14/1240, pipe 9" diameter. Left bank. ..	..	..	80	
" 1	Sluice No. X at R.D. 14/3220, pipe 15" diameter. Left bank. ..	..	..	160	
	Total ..	..	..	..	880
	Total, O. Miscellaneous ..	..	..	..	5,855

P. MAINTENANCE.

Estimate No. 49-V.

The Vadavar and Vadavar Extension Canal—Maintenance during construction.

20½ miles.	Maintenance of the Vadavar during construction. ..	300	Mile.	6,150	
7½ "	Maintenance of Vadavar Extension canal during construction. ..	200	"	1,500	
	Contingencies ..	..	..	350	
	Total ..	..	..	..	8,000
	Total, P. Maintenance ..	..	..	..	8,000

VADAVAR SYSTEM—DISTRIBUTARIES.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

1. WORKS.

3. DISTRIBUTARIES.

PUTHUR CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 50-V.

Preliminary expenses for Puthur channel.

3,005 acres.	Cost of Preliminary surveys ..	0 6 0	Acre.	1,127	
7-1 miles.	Laying out before execution ..	40 0 0	Mile.	283	
	Total ..				1,410
	Total, A. Preliminary Expenses ..				1,410

B. LAND.

Estimate No. 51-V.

Compensation for land for Puthur channel.

2-33 acres.	Salyamangalam village, dry ..	150 0 0	Acre.	350	
1-38 "	Do. wet lands ..	375 0 0	"	518	
3-16 "	Palliyur village, wet lands ..	450 0 0	"	1,422	
11-20 "	Kilakolpattu village, dry lands ..	150 0 0	"	1,680	
10-75 "	Vadapadi village, dry lands ..	150 0 0	"	1,613	
6-20 "	Puthur village, dry lands ..	150 0 0	"	930	
5-61 "	Puliakudi village, dry lands ..	150 0 0	"	842	
8-21 "	Kovilenni village, dry lands ..	150 0 0	"	1,232	
	Total ..			8,587	
	Add for compulsory acquisition ..			1,289	
	Compensation for earth ..			754	
	Total ..				10,630
	Total, B. Land ..				10,630

C. WORKS.

Estimate No. 52-V.

Head sluice and 3 feet drop combined Puthur channel.

13-00 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	273	
26-80 "	Platform moulded brick in chunam ..	21 8 0	100 "	576	
1-5 "	Do. archwork brick in chunam ..	22 8 0	100 "	34	
	Centering for arch ..			12	
11 c. ft.	Outstone work ..	2 8 0	C. ft.	28	
13-00 units.	Plastering with Portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	88	
8-80 "	Brick on end (9") laid dry ..	13 8 0	100 "	119	
3-50 "	Brick jelly backing 6" ..	10 8 0	100 c. ft.	37	
4-00 "	Teakwood wrought and put up ..	4 0 0	C. ft.	16	
	Teakwood shutter 5'-6" X 2'-9" including handles, bolts, fittings, angle iron for grooves, etc., complete. ..		Lump sum.	115	
	Fitting charges 1/12 the cost of shutter ..			10	
	Earthwork, excavating foundations forming approaches, etc., complete. ..			15	
	Shed for materials ..			20	
	Total ..			1,343	
	Contingencies ..			66	
	Petty supervision ..			41	
	Total ..				1,450
	Carried over ..				1,450

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

PUTHUR CHANNEL—cont.

Brought forward .. 1,450

C. WORKS—cont.

Estimate No. 53-V.

Sluice at 660 feet of Puthur channel.

4-40 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	92	
6-00 "	Platform moulded brick in mortar ..	21 8 0	100 "	129	
0-82 "	Archwork (platform moulded bricks in mortar) ..	22 8 0	100 "	18	
	Centering for the arch ..		Lump sum.	7	
5-12 "	Outstone work ..	2 8 0	C. ft.	13	
5-30 "	Plastering with Portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	35	
1-60 "	Brick on end, 9" thick, laid dry ..	13 8 0	100 "	22	
0-75 "	Brick jelly backing for revetment ..	10 8 0	100 c. ft.	8	
	Providing 1 steam shutter ..		Lump sum.	30	
	Earthwork excavating foundations ..			5	
	Shed for materials ..			10	
	Total ..			369	
	Contingencies ..			19	
	Petty supervision ..			12	
	Total ..				400

Estimate No. 54-V.

"B" class girder bridge of 16 feet span at 2,640 feet of Puthur channel.

14-00 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	294	
19-75 "	Platform moulded brick in mortar ..	21 8 0	100 "	425	
4-5 c. ft.	Outstone work ..	2 8 0	C. ft.	11	
3-90 units.	Brick on end, 9" ..	13 8 0	100 sq. ft.	53	
2-00 "	Brick jelly backing ..	10 8 0	100 c. ft.	21	
21-375 cwt.	Rolled steel beam ..	8 0 0	Cwt.	171	
1-5 units.	Road metalling complete ..	27 8 0	100 c. ft.	41	
10-5 "	Plastering with portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	71	
No. 8	Wheel guard stones ..	3 0 0	No.	24	
19 r. ft.	Westwood's trough plate, including road metalling including hand rails, etc. ..	40 11 0	R. ft.	773	
	Earthwork, excavating foundations, forming approaches, etc. ..		Lump sum.	25	
	Total ..			1,909	
	Shed for materials ..		Lump sum.	29	
	Contingencies ..			95	
	Petty supervision ..			57	
	Total ..			1,909	2,090

Estimate No. 55-V.

"B" class girder bridge of 16 feet span at 3,960 feet of Puthur channel.

13-10 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	275	
17-25 "	Platform moulded brick in mortar ..	21 8 0	100 "	371	
5 c. ft.	Outstone work ..	2 8 0	C. ft.	13	
3-95 units.	Brick on end laid dry ..	13 8 0	100 sq. ft.	53	
2-00 "	Brick jelly backing ..	10 8 0	100 c. ft.	21	
1-90 "	Road metalling ..	27 8 0	100 "	52	
21-375 cwt.	Rolled steel beam ..	8 0 0	Cwt.	171	
8-40 units.	Plastering with portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	57	
No. 8	Wheel guard stones ..	3 0 0	No.	24	
19 r. ft.	Westwood's trough plate, cement concrete including hand rails, etc. ..	40 11 0	R. ft.	773	
	Earthwork excavating foundations, etc. ..			30	
	Total ..			1,840	
	Shed for materials ..		Lump sum.	26	
	Contingencies ..			90	
	Petty supervision ..			54	
	Total ..				2,010
	Carried over ..				5,950

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rent.	Per	Amount	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

PUTHUR CHANNEL—cont.

Brought forward .. 5,950

C. WORKS—cont.

Estimate No. 56-V.

"C" class girder bridge of 15 feet span at 3 miles 1,720 feet of Puthur channel.

Same as "C" class girder bridge of 15' span at 2 miles 3,300 feet in Mannargudi channel.	Lump sum.	1,800 0 0	
Total ..	..	..	1,800

Estimate No. 57-V.

"B" class masonry bridge of 12 feet span at 5 miles 198 feet of Puthur channel.

As per type estimate	..	..	830 0 0
Add for forming approaches, etc.	..	..	30 0 0
Total ..	..	..	860

Culvert of 12 feet span with 14 feet roadway (Type estimate)

8 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	168 0 0
14-25 "	Platform moulded brickwork in chunam	21 8 0	"	306 0 0
3-6 "	Do. archwork do.	22 8 0	"	81 0 0
	Centering for archwork	Lump sum.		30 0 0
11-4 "	Plastering with cement, $\frac{3}{4}$ " (1 cement and 3 sand)	6 12 0	100 c. ft.	77 0 0
73 r. ft.	Cornice work including plastering with cement, $\frac{3}{4}$ "	0 4 0	R. ft.	18 0 0
2 units.	Brick in end, 9"	13 8 0	100 c. ft.	27 0 0
1 "	Brick jelly backing, 6"	10 8 0	"	11 0 0
8 No.	Guard stones, 9" diameter, 3' high	3 0 0	Each.	24 0 0
	Earthwork excavating foundations and filling in.	Lump sum.		12 0 0
	Shed for material	"		12 0 0
	Total ..	..	..	766 0 0
	Contingencies	..	..	40 0 0
	Petty supervision	..	..	24 0 0
	Total ..	..	..	830 0 0
	Culvert with 10' roadway with 6" concrete over the arch.	..	..	..
	Deduct cost of 4 r. ft. at Rs. 20-6-0 per r. ft. as per separate estimate = 82 (766-82).	..	..	..
	Contingencies	..	..	35 0 0
	Petty supervision	..	..	21 0 0
	Total ..	..	..	740 0 0

Culvert of 12 feet span (1 r. ft.).

26 c. ft.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	5 7 4
34 "	Platform moulded brickwork in chunam	21 8 0	"	7 5 0
21 "	Archwork platform moulded brickwork in chunam.	22 8 0	"	4 11 7
	Centering for the archwork	Lump sum.		1 11 0
18 sq. ft.	Plastering with portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand).	6 12 0	100 sq. ft.	1 3 5
	Total for 1 r. ft. ..	..	..	20 6 4
		..	..	or say 23 6 0

Carried over .. 8,610

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.

PUTHUR CHANNEL—cont.

C. WORKS—cont.

Estimate No. 58-V.

Railway bridge of two vents of 6-ft. span each combined with 2-ft. drop at 5 miles 3,894 feet of Puthur Channel.

For one 6' span bridge as given by the Railway authorities and embodied in Mr. Moss's Project.	..	..	2,250 0 0
For 1 pier 6 feet of roadway and drop wall	..	..	350 0 0
Temporary diversion of road	..	..	500 0 0
Total ..	..	..	3,100

Estimate No. 59-V.

"C" class masonry bridge of 12-ft. span at 6 miles 858 feet of Puthur Channel.

As per estimate for B class bridge of 12 feet span at 5 miles 198 feet of Puthur channel excluding contingencies and petty supervision.	..	..	766 0 0
Deduct cost of 4 r. ft. of tunnel	20 6 0	1 r. ft.	82 0 0
Net total ..	..	..	684 0 0
Add for forming approaches	..	..	30 0 0
Contingencies	..	..	35 0 0
Petty supervision	..	..	21 0 0
Total ..	..	..	770

Estimate No. 60-V.

2-ft. drop at 6 miles 1,518 ft. of Puthur Channel.

As per estimate for type plan No. 207	..	..	320 0 0
Add for 2 feet extra width of channel	11 6 0	1 foot.	23 0 0
Total ..	..	..	343 or say 345

2-ft. open fall to discharge 25 cusecs (Plan No. 207).

2-40 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	50 0 0
3-30 "	Platform-moulded brick in mortar	21 8 0	"	71 0 0
2-80 "	Brick on end for apron	13 8 0	100 sq. ft.	88 0 0
3-10 "	Concrete blocks for revetments	21 12 0	100 c. ft.	67 0 0
2-12 "	Brick jelly backing, 6"	10 8 0	"	22 0 0
3-09 "	Plastering with Portland cement, $\frac{3}{4}$ " thick	6 12 0	100 sq. ft.	20 0 0
0-20 "	Cuddapah slab lip	30 0 0	"	6 0 0
	Earthwork excavating foundations	Lump sum.		15 0 0
	Shed for materials	"		10 0 0
	Total ..	..	..	299 0 0
	Contingencies	..	..	14 0 0
	Petty supervision	..	..	7 0 0
	Total ..	..	..	320 0 0

Rate for 1 r. ft. of body wall and apron.

0-20 unit.	Concrete, broken brick in surki mortar	21 0 0	100 c. ft.	4 3 2
0-15 "	Brick in mortar (platform-moulded)	21 8 0	"	3 3 7
0-21 "	Brick on end apron, 9" thick	13 8 0	100 sq. ft.	2 13 4
0-17 "	Pastering with portland cement, $\frac{3}{4}$ " thick, 1:3.. ..	6 12 0	"	1 2 4
	Total ..	..	..	11 6 5
		..	..	or say 11 6 0

Estimate No. 61-V.

3-ft. drop at 6 miles 2,508 ft. of Puthur Channel.

As per estimate for type plan No. 217	..	..	420 0 0
Deduct for $\frac{1}{2}$ " width of channel	13 11 0	1 foot.	20 0 0
Total ..	..	..	400
		..	Carried over .. 13,225

VADAVAR SYSTEM—DISTRIBUTARIES—*cont.*

PUTHUR CHANNEL—*cont.*

C. WORKS--cont.

Estimate Type.

3-ft. open fall to discharge 25 cusecs (Plan No. 217).

3-30 units.	Concrete broken brick in surki mortar ..	21	0	0	100 c. ft.	69	0	0
4-90 "	Platform moulded brick in mortar ..	21	8	0	"	105	0	0
0-14 "	Coddaph slab 2" thick ..	30	0	0	100 sq. ft.	4	0	0
3-00 "	Brick on end apron 5" thick ..	13	8	0	"	41	0	0
4-00 "	Concrete blocks for revetment ..	21	12	0	100 c. ft.	87	0	0
2-50 "	Brick jelly backing 6" thick ..	10	8	0	"	28	0	0
2-74 "	Plastering with oment, 3" thick ..	6	12	0	100 sq. ft.	19	0	0
	Earthwork excavation, etc. ..				Lump sum.	25	0	0
	Shed for materials ..				"	10	0	0
	Total ..					387	0	0
	Contingencies ..					21	0	0
	Petty supervision ..					12	0	0
	Total ..							

420

Estimate for 1 foot width of channel in 3 feet open fall (Type plan No. 217).

Total ..	..	..	13 10 9 or say 13 11 0
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Estimate No. 62-V.

Pipe sluices in Puthur Channel.

Total ..	..	..	1,305 or say
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Total, C. Works ..	..	..	..	14,525
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VADAVAR SYSTEM—DISTRIBUTARIES—*cont.*

PUTHUR CHANNEL—cont.

Type Estimate No. I.

An earthenware pipe sluice with shutter for F.S.L. $2\frac{1}{2}$ and $2\frac{3}{4}$ feet.

0-70 unit.	Platform moulded brick in chunam ..	..	21	8	0	Unit.	15
No. 10	Earthenware pipes, 9" diameter 2' long ..	..	2	6	3	Each.	24
0-50	Plastering with Portland cement, 3" thick ..	..	6	12	0	"	3
No. 14	Caddapah slab vent stone 2" thick, 1' 3" X 1' 3" with 8" circular vent way.	..				Lump sum.	1
" I	Stom shutter with flat iron bar teak beam hold- ing down bolts, etc., complete.	..				"	10
	Earthwork excavating foundations, etc.	..				"	5
	Total ..	..	..	..	..	..	58
	Contingencies	..	..	..	..	..	5
	Petty supervision	..	..	..	..	..	2
	Total ..	..	..	..	..	..	65
	Ra.	Rs.					Rs.
3" diar. pipe—estimate..	.. .. .	45	12" diar. pipe—estimate	.. .. .	.. .. .	.. .. .	80
6" " " "	.. .. .	50	15" " " "	.. .. .	.. .. .	.. .. .	100
9" " " "	.. .. .	65	18" " " "	.. .. .	.. .. .	.. .. .	125

Type Estimate No. II.

An earthenware pipe sluice without shutter for F.S.L. $2\frac{1}{2}$ and $2\frac{3}{4}$ feet.

Total ..	..
----------	----

Type Estimate No. III.

An earthenware pipe sluice with shutter for F.S.L. of $2\frac{1}{2}'$ and $2\frac{3}{4}'$ clear over fall.

Total ..	..
----------	----

Sluice with pipe.										Cost with shutter.		Cost without shutter.	
										rs.		rs.	
6" diam.	..	..	..	..	..	..	..	..	..	85		75	
9" "	..	..	..	..	..	..	..	..	..	90		80	
12" "	..	..	..	..	..	..	..	..	..	110		100	
15" "	..	..	..	..	..	..	..	..	..	140		130	

VADAVAR SYSTEM—DISTRIBUTARIES—*cont.*

PUTHUR CHANNEL—*cont.*

An earthenware pipe sluice without shutter for F.S.L. 2' and $2\frac{1}{4}$ '.

3" diar. pipe—estimate	..	..	Rs 30	12" diar. pipe—estimate	..	..	Rs 60
6" " " "	..	..	40	15" " "	..	..	85
9" " " "	..	..	50	18" " "	..	..	105

An earthenware pipe sluice without shutter for F.S.L, 1.75' and below.

				RS.					RS.
3" diar. pipe—estimate	..	..	..	30	12" diar. pipe—estimate	..	..	..	60
6" " "	..	..	..	40	15" " "	..	..	..	80
9" " "	..	..	..	50	18" " "	..	..	..	95

Estimate No. 63-V.

2,734-000 units.	Earthwork excavating the channel of 20 yards and a lift of 2 yards.	with a lead	3 12 0	1,000 c. ft.	10,253
	Contingencies				500
	Petty supervision				247
	Total				11,000
	Total, L. Earthwork				11,000

Estimate No. 64-V.

No. 170	Revenue survey stones including conveyance to site and fixing in earth.	..	Each.	85	
	Contingencies	..	..	5	
	Total ..	..	..	..	90
				Carried over ..	96

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS. A. P.	RS.

PUTHUR No. 1 CHANNEL—cont.

C. WORKS—cont.

Estimate No. 71-V.

Brought forward .. 3,140

Pipe sluices in Puthur No. 1 Channel.

Sluice at R.B. at 858' (12" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	60 0 0	
Sluice at L. B. at 858' (6" pipe) as per type estimate V attached to the estimate of sluice, in Puthur channel	..	..	40 0 0	
Total	..	..	..	100

Estimate No. 72-V.

Cross wall with vent at 132 feet of Puthur No. 1 Channel.

As per type estimate below	..	..	20 0 0	
Add for 1 foot extra width of channel	1 9 0	..	2 0 0	
Total	..	..	22 0 0 or say 25	
Total, C. Works	..	..	..	3,265

Type estimate for a cross wall with vent.

0.41 unit. Concrete, brick jelly in surki mortar	21 0 0	100 c. ft.	9 0 0	
0.18 " Platform moulded brick in mortar	21 8 0	100 "	4 0 0	
4 sq. ft. Cuddapah slab, 2" thick	30 0 0	100 sq. ft.	1 0 0	
0.25 " Plastering with portland cement, 3/4" thick	6 12 0	100 "	2 0 0	
Earthwork excavating foundations	Lump sum.	..	1 0 0	
Total	..	..	17 0 0	
Contingencies	..	..	2 0 0	
Petty supervision	..	..	1 0 0	
Total	..	..	20 0 0	

Rate per running foot for cross wall with vent (Type estimate.)

4 c. ft. Concrete broken brick in surki mortar	21 0 0	100 c. ft.	0 13 5	
2 " Platform moulded brick in chunam	21 8 0	100 "	0 6 11	
4 sq. ft. Plastering with cement, 3/4" (1 cement 3 sand)	..	..	0 4 4	
Total	..	..	1 8 8 or say 1 9 0	

L: EARTHWORK.

Estimate No. 73-V.

Excavating Puthur No. 1 Channel.

28,000 units. Earthwork	3 12 0	1,000 c. ft.	120 0 0	
Contingencies	..	..	4 0 0	
Petty supervision	..	..	6 0 0	
Total	..	..	..	130
Total, L. Earthwork	..	..	..	130

O. MISCELLANEOUS.

Estimate No. 74-V.

Fixing demarcation stones for Puthur No. 1 Channel.

No. 6. Revenue survey stones including cartage to site and fixing in earth	0 8 0	Each.	3 0 0	
Contingencies	..	..	2 0 0	
Total	..	..	..	5
Carried over	..	..	..	5

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS.	RS.

PUTHUR No. 1 CHANNEL—cont.

O. MISCELLANEOUS—cont.

Estimate No. 75-V.

Brought forward .. 5

Fixing mile and furlong stones along Puthur No. 1 Channel.

No. 2 Furlong stones	2 0 0	Each.	4	
Total	..	..	4 or 5	
Total, O. Miscellaneous	..	..	..	10

P. MAINTENANCE.

Estimate No. 76-V.

Maintenance of Puthur No. 1 Channel.

25 mile. Maintenance during execution	25 0 0	Mile.	6	
Total	..	..	..	5
Total, P. Maintenance	..	..	..	5

PUTHUR No. 2 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 77-V.

Preliminary expenses for Puthur No. 2 Channel.

220 acres. Cost of preliminary surveys	0 6 0	Acre.	83	
25 mile. Laying out before execution	10 0 0	Mile.	3	
Contingencies	..	..	4	
Total	..	..	..	90
Total, A. Preliminary Expenses	..	..	..	90

B. LAND.

Estimate No. 78-V.

Compensation for lands for Puthur No. 2 Channel.

140 acres. Puthur village	150 0 0	Acre.	210	
Add for compulsory acquisition	..	..	30	
Compensation	..	..	30	
Total	..	..	..	270
Total, B. land	..	..	..	270

C. WORKS.

Estimate No. 79-V.

Pipe sluice in Puthur No. 2 Channel.

Sluice at head (12" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel.	..	..	100	
Total	..	..	..	100

Estimate No. 80-V.

3-ft. drop at 1,320 feet of Puthur No. 2 Channel.

As per type estimate below	11 10 0	1 foot.	320	
Deduct for 3 1/2' width of channel	..	..	41	
Total	..	..	279 or 280	
Carried over	..	..	..	380

VADAVAR SYSTEM--DISTRIBUTARIES--cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
PUTHUR No. 2 CHANNEL--cont.					
C. WORKS--cont.					
Type Estimate.				Brought forward ..	380
3-ft. open fall to discharge 10 cusecs.					
2.60 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	55 0 0	
3.55 "	Platform-moulded brick in surki mortar ..	21 3 0	100 "	76 0 0	
2.50 "	Brick on end ..	13 8 0	100 sq. ft.	34 0 0	
1.64 "	Plastering with Portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 "	11 0 0	
3.00 "	Concrete blocks including packing ..	21 12 0	100 c. ft.	66 0 0	
1.85 "	Brick jelly backing ..	10 8 0	100 "	19 0 0	
0.15 unit.	Cuddapah slab notoh lip ..	30 0 0	100 sq. ft.	5 0 0	
	Earthwork excavating foundations, etc. ..		Lump sum.	20 0 0	
	Shed for materials ..			10 0 0	
	Total ..			295 0 0	
	Contingencies ..			15 0 0	
	Petty supervision ..			10 0 0	
	Grand ..			320 0 0	

Rate for 1 r. ft. of body wall apron.

0.21 unit.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	4 6 7	
0.16 "	Brick in mortar (platform moulded) ..	21 8 0	100 "	3 7 0	
0.19 "	Brick on end, 9" thick ..	13 8 0	100 sq. ft.	2 9 0	
0.18 "	Plastering with Portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 "	1 3 5	
	Total ..			11 10 0	
	Total, C. Works ..				380

L. EARTHWORK.

Estimate No. 81-V.

Excavating Puthur No. 2 Channel.

58,000 units.	Earthwork ..	3 12 0	1,003 c. ft.	218 0 0	
	Contingencies ..			13 0 0	
	Petty supervision ..			9 0 0	
	Total ..				240
	Total, L. Earthwork ..				240

O. MISCELLANEOUS.

Estimate No. 82-V.

Fixing demarcation stones for Puthur No. 2 Channel.

No. 6	Revenue Survey stones including cartage to site and fixing. ..	0 8 0	Each.	3 0 0	
	Contingencies ..			2 0 0	
	Total ..				5

Estimate No. 83-V.

Fixing mile and furlong stones along Puthur No. 2 Channel.

No. 2	Furlong stones ..	2 2 0	Each.	4 0 0	
	Total ..				4 or 5
	Total, O. Miscellaneous ..				10

VADAVAR SYSTEM--DISTRIBUTARIES--cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
PUTHUR No. 2 CHANNEL--cont.					
Estimate No. 84-V.					
P. MAINTENANCE.					
Maintenance of Puthur No. 2 Channel.					
25 mile.	Maintenance during execution ..	25 0 0	Mile.		
	Total ..				say
	Total, P. Maintenance ..				5
PUTHUR No. 3-CHANNEL.					
A. PRELIMINARY EXPENSES.					
Estimate No. 85-V.					
Preliminary expenses for Puthur No. 3 Channel.					
1,332 acres.	Cost of preliminary surveys ..	0 6 0	Acre.	462	
3.25 miles.	Laying out before execution ..	10 0 0	Mile.	33	
	Contingencies ..			5	
	Total ..				500
	Total, A. Preliminary Expenses ..				500
B. LAND.					
Estimate No. 86-V.					
Compensation for land for Puthur No. 3 Channel.					
2.70 acres.	Kolleni village, dry ..	150 0 0	Acre	405	
6.30 "	Puliyakudi village, dry ..	150 0 0	"	94	
4.04 "	Do. wet ..	300 0 0	"	1,242	
2.10 "	Adanur village, dry ..	225 0 0	"	472	
6.43 "	Munnavaleottai village, dry ..	150 0 0	"	815	
4.68 "	Do. wet ..	300 0 0	"	1,404	
0.75 "	Kalacheri village ..	250 0 0	"	188	
	Total ..				5,442
	Add for compulsory acquisition ..			818	
	Compensation for earth ..			750	
	Total ..				7,010
	Total, B. Land ..				7,010
C. WORKS.					
Estimate No. 87-V.					
Head sluice and 2 $\frac{1}{2}$ ft. drop combined, Puthur No. 3 Channel.					
5.7 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	120	
7.5 "	Platform moulded brick in mortar ..	21 8 0	100 "	161	
0.6 "	Do. in archwork ..	22 8 0	100 "	14	
	Centering for the archwork ..		Lump sum.	5	
6 c. ft.	Cutstonework ..	2 8 0	c. ft.	15	
5.5 sq. ft.	Plastering with portland cement, $\frac{3}{4}$ inch thick (1:3) ..	6 12 0	100 sq. ft.	37	
3.2 "	Brick on end, 9 inches ..	13 8 0	100 c. ft.	43	
1.5 units.	Brick jelly backing, 6 inches ..	10 8 0	100 "	16	
3 c. ft.	Teakwood, wrought and put up ..	4 0 0	C. ft.	12	
	Teakwood shutter 3 feet X 1' 3" including handles, bolts, fittings and iron for grooves, etc., complete ..		Lump sum.	55	
	Fitting charges, 1/12 the cost of the shutter ..		Say	5	
	Earthwork, excavating foundations, forming approaches, etc., complete. ..		Lump sum.	15	
	Shed for materials ..			10	
	Total ..				508
	Contingencies ..				25
	Petty supervision ..				17
	Total ..				550
	Carried over ..				550

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
PUTHUR No. 3 CHANNEL—cont.					
C. WORKS—cont.					
Brought forward ..				550	
Estimate No. 88 V.					
1-ft. drop at 0 mile 2,772 feet of Puthur No. 3 Channel.					
2-00 units.	Concrete broken brick in surki mortar..	21 0 0	100 c. ft.	42	
2-3 "	Platform moulded brick work in ordinary mortar ..	21 8 0	100 "	49	
1-6 "	Plastering with cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	11	
2-0 "	Brick on end 9" ..	13 8 0	100 "	27	
2-1 "	Concrete blocks 12" ..	21 12 0	100 c. ft.	46	
1-5 "	Brick jelly backing 6" ..	10 8 0	100 "	16	
0-12 "	Cuddapah slab, 2" thick ..	30 0 0	100 sq. ft.	4	
	Earthwork excavating foundations, etc. ..	Lump sum.		10	
	Shed for materials ..			10	
	Total ..			215	
	Contingencies ..			10*	
	Petty supervision ..			5	
	Total ..				230

Estimate No. 89 V.

Aqueduct of 19 spans of 6 feet each at 0 mile 3,630 feet of Puthur No. 3 Channel.

Estimate for one pier and one arch.

1-42 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	30
1-47 "	Platform moulded brick in surki mortar ..	23 0 0	100 "	34
0-65 "	Platform moulded brick archwork in surki mortar ..	24 0 0	100 "	16
	Centering for the archwork ..	Lump sum.		4
0-30 "	Brick on end, 9" ..	13 8 0	100 sq. ft.	4
3-10 "	Plastering with Portland cement, $\frac{3}{4}$ " ..	6 12 0	100 "	22
	Earthwork excavating foundations ..	Lump sum.		3
	Total ..			113

Estimate for two abutments and one arch.

10-7 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	225
13-12 "	Platform moulded brick in surki mortar ..	23 0 0	100 "	302
0-65 "	Platform moulded brick archwork surki mortar ..	24 0 0	100 "	16
	Centering for the archwork ..	Lump sum.		5
14-20 "	Brick on end 9" ..	13 8 0	100 sq. ft.	192
7-00 "	Brick jelly backing 6" ..	10 8 0	100 c. ft.	74
8-08 "	Plastering with Portland cement, $\frac{3}{4}$ " ..	6 12 0	100 sq. ft.	54
	Earthwork excavating foundations ..	Lump sum.		10
	Total ..			878

Aqueduct of 19 spans of 6 feet each at 0 mile 3,630 feet of Puthur No. 3 Channel.

Value of two abutments and one arch as per separate estimate ..			878
Spans ..	113 0 0	Each.	2,034
Shed for materials ..			40
Contingencies ..			150
Petty supervision ..			78
Total ..			3,180
Carried over ..			3,960

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
PUTHUR No. 3 CHANNEL—cont.					
C. WORKS—cont.					
Brought forward ..				3,960	
Estimate No. 90-V.					
Undertunnel at 0 mile 4,158 feet of Puthur No. 3 Channel.					
12-00 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	252 0 0	
11-80 "	Platform moulded brick in surki mortar ..	23 0 0	100 "	271 0 0	
2-55 "	Platform moulded brick archwork in surki mortar ..	24 0 0	100 "	61 0 0	
	Centering archwork ..	8 0 0	100 "	20 0 0	
2-55 "	Plastering with Portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	43 0 0	
6-30 "	Earthwork excavating foundations ..	Lump sum.		20 0 0	
	Shed for materials ..			10 0 0	
	Total ..			677 0 0	
	Contingencies ..			34 0 0	
	Petty supervision ..			19 0 0	
	Total ..				750

Estimate No. 91-V.

Under-tunnel at 4,356 feet of Puthur No. 3 Channel.

Estimate for 1 r. ft. of tunnel.

0-20 unit.	Concrete broken in surki mortar ..	21 0 0	100 c. ft.	4 3 2
0-19 "	Brickwork in surki mortar (platform moulded) ..	23 0 0	"	4 5 11
0-05 "	Archwork do. ..	24 0 0	"	1 3 2
	Centering for do. ..	8 0 0	"	0 6 5
1-10 "	Plastering with Portland cement, $\frac{3}{4}$ " ..	6 12 0	100 sq. ft.	0 10 10
	Total per sq. ft., say ..			10 13 6
				or
				10 14 0

Cost of front and rear head walls.

Amount of estimate for this under-tunnel with 46' of tunnel, as per estimate for this work at 4,158 feet in Puthur No. 3 channel excluding contingencies, supervision, shed for materials and earthwork excavation ..	10 14 0	R. ft.	647 0 0
Cost of 46 r. ft. of tunnel as per above rate ..			500 0 0
Total ..			147 0 0

Under-tunnel 55 feet long at 4,356 feet of Puthur No. 3 Channel.

55 r. ft.	Tunnel ..	10 14 0	R. ft.	598 0 0
	Head walls ..			147 0 0
	Earthwork, excavating foundations, etc. ..			20 0 0
	Shed for materials ..			10 0 0
	Contingencies ..			40 0 0
	Petty supervision ..			25 0 0
	Total ..			850

Note.—The plan for undertunnel at 4,158 feet in this channel has been followed in preparing this estimate.

Estimate No. 92-V.

"C" class masonry bridge of 8-ft. span at 5,214 feet of Puthur No. 3 Channel.

As per estimate below ..			650 0 0
Add for forming approaches, etc. ..			80 0 0
Total ..			730
Carried over ..			6,270

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
PUTHUR No. 3 CHANNEL—cont.					
C. WORKS—cont.					
Brought forward .. 6,270					
Estimate No. 92-V—cont.					
Culvert of 8-ft. span with 14-ft. roadway.					
17.7 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	162 0 0	
2.7 "	Platform moulded brick in chunam ..	21 8 0	100 "	273 0 0	
2.00 "	Do. archwork in chunam ..	22 8 0	100 "	45 0 0	
	Centering for the archwork ..		Lump sum.	15 0 0	
10.6 "	Plastering with Portland cement, $\frac{3}{4}$ " (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	72 0 0	
	Cornice work including plastering, $\frac{3}{4}$ " ..	0 4 0	R. ft.	18 0 0	
65 r. ft.	Brick on end dry packing ..	13 8 0	100 sq. ft.	27 0 0	
2 units.	Brick jelly backing, 6" ..	10 8 0	100 c. ft.	11 0 0	
1 unit.	Guard stones, 9" diameter and 3' high ..	8 0 0	Each.	24 0 0	
3 No.	Earthwork excavating foundations and filling in ..		Lump sum.	10 0 0	
	Shed for materials ..		"	10 0 0	
	Total ..			665 0 0	
	Contingencies ..			34 0 0	
	Petty supervision ..			20 0 0	
	Total ..				720
Cost of culvert with 10' roadway and 6" concrete over the arches—					
	Deduct the cost of 4 r. ft. at Rs. 15-11-0 per r. ft. (vide separate estimate) ..	4x15-11-0, say 63,666-63=603		0 0	
	Contingencies ..			17 0 0	
	Petty supervision ..			30 0 0	
	Total ..			650 0 0	
One running foot of above culvert of 8' span.					
23 c. ft.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	4 13 3	
29 "	Platform moulded brick in chunam ..	21 8 0	100 "	6 3 9	
12 "	Do. archwork ..	22 8 0	100 "	2 11 2	
	Centering for the archwork ..		Lump sum.	0 15 4	
14 sq. ft.	Plastering with Portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	0 15 1	
	Total ..			15 10 7	
			or say	15 11 0	

Estimate No. 93-V.

Under-tunnel 51 feet long at 1 mile of Puthur No. 3 Channel.

51 r. ft.	Tunnel ..	10 14 0	R. ft.	555 0 0	
	Head walls ..			147 0 0	
	Earthwork excavating foundations ..			25 0 0	
	Shed for materials ..			10 0 0	
	Contingencies ..			38 0 0	
	Petty supervision ..			25 0 0	
	Total ..				800
	Carried over ..				7,070

Note.—The plan for the undertunnel at 0 mile 4,158 feet in this channel has been followed in preparing this estimate.

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
PUTHUR No. 3 CHANNEL—cont.					
Brought forward .. 7,070					
O. WORKS—cont.					
Estimate No. 94-V.					
Regulator at 1 mile 1,980 feet of Puthur No. 3 Channel.					
1.55 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	33 0 0	
0.75 "	Platform moulded brick in mortar ..	21 8 0	100 "	16 0 0	
2.75 "	Brick on end, 9" ..	13 8 0	100 sq. ft.	37 0 0	
1.00 "	Brick jelly, backing, 6" ..	10 8 0	100 c. ft.	11 0 0	
0.8 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	5 0 0	
	Earthwork excavating foundations, etc. ..		Lump sum.	5 0 0	
	Shed for materials ..		"	10 0 0	
	Total ..			117 0 0	
	Contingencies ..			8 0 0	
	Petty supervision ..			5 0 0	
	Total ..				130

Estimate No. 95-V.

4-ft. drop at 1 mile, 4,620 feet of Puthur No. 3 Channel.

Same as the estimate for type plan No. 60 ..			320 0 0	
Total ..				320

4-ft. syphon well drop to discharge 5 cusecs (Plan No. 60).

1.18 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	25 0 0	
2.28 "	Broken brick in surki mortar ..	23 0 0	100 "	52 0 0	
2.53 "	Plastering with Portland cement, $\frac{3}{4}$ " ..	6 12 0	100 sq. ft.	17 0 0	
.51 "	Cuddapah slab flooring ..	30 0 0	100 "	15 0 0	
3.35 "	Brick on end for revetment and floor, 9" thick ..	13 8 0	100 "	45 0 0	
1.40 "	Brick jelly backing ..	10 8 0	100 c. ft.	15 0 0	
34 r. ft.	Pipe (stoneware), 12" diameter ..	2 1 0	R. ft.	70 0 0	
3 units.	Cutstone work ..	2 8 0	C. ft.	8 0 0	
	Cement grouting ..		Lump sum.	5 0 0	
	Clay puddle work ..		"	10 0 0	
	Earthwork excavating foundations and forming banks ..		"	25 0 0	
	Shed for materials ..		"	10 0 0	
	Total ..			297 0 0	
	Contingencies ..			15 0 0	
	Petty supervision ..			8 0 0	
	Total ..			320 0 0	

Estimate No. 96-V.

4-ft. drop at 2 miles 891 feet of Puthur No. 3 Channel.

As per estimate for the 4' drop at 1 mile 4,620 feet of this channel.			320 0 0	
Total ..				320
				Carried over .. 7,840

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
PUTHUR No. 3 CHANNEL—cont.					
C. WORKS—cont.				Brought forward ..	7,840
Estimate No. 97-V.					
Under-tunnel 43 feet long at 2 miles 4,686 feet of Puthur No. 3 Channel.					
42 r. ft.	Tunnel	*10 14 0	R. ft.	468	
	Head walls			147	
	Earthwork excavating foundations			20	
	Shed for materials			10	
	Contingencies			35	
	Petty supervision			20	
	Total				700

* Rate as per estimate No. 91-V.

Note.—The plan for the under-tunnel at 4,158 feet in this channel has been followed in preparing this estimate.

Estimate No. 98-V.

Aqueduct of 13 spans of 6 feet each at 2 miles 4,950 feet of Puthur No. 3 Channel.

Estimate for one pier and one arch of aqueduct.

1 20 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	25	
1 50 "	Platform moulded brick in do. ..	23 0 0	100 "	35	
0 50 "	Do. archwork in do. ..	24 0 0	100 "	12	
	Centring for the arch		Lump sum.	4	
0 25 "	Brick on end, 9"	13 8 0	100 sq. ft.	4	
2 90 "	Plastering with portland cement, 3" ..	6 12 0	100 "	20	
	Earthwork excavating foundations		Lump sum.	1	
	Total				10

Estimate for two abutments and one arch.

9 34 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	196	
15 25 "	Platform moulded brick in do. ..	23 0 0	100 "	351	
0 50 "	Do. archwork in do. ..	24 0 0	100 "	12	
	Centring charges		Lump sum.	4	
14 20 "	Brick on end, 9"	13 8 0	100 sq. ft.	192	
7 00 "	Brick jelly backing, 6"	10 8 0	100 "	74	
8 60 "	Plastering with portland cement, 3" ..	6 12 0	100 "	58	
	Earthwork excavating foundations		Lump sum.	6	
	Total				893

Aqueduct of 13 spans of 6 feet each at 2 miles 4,950 feet of Puthur No. 3 Channel.

12 No.	Value of two abutments and one arch ..	101 0 0	Each.	893	
	Spans			1,212	
	Shed for materials			30	
	Contingencies			109	
	Petty supervision			56	
	Total				2,300
				Carried over ..	10,840

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
PUTHUR No. 3 CHANNEL—cont.					
C. WORKS—cont.				Brought forward ..	10,840
Estimate No. 99-V.					
Pipe sluices in Puthur No. 3 Channel.					
	Sluice R.B. at 2,310' (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel			40	
	Sluice L.B. at 2,310' (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel			40	
	Sluice R.B. at 1 mile 1,980' (15" pipe) as per type estimate V I below			90	
	Sluice L.B. at 1 mile 1,980' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel			50	
	Sluice R.B. at 1 mile 2,970' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel			50	
	Sluice L.B. at 1 mile 2,970' (12" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel			60	
	Sluice R.B. at 1 mile 4,620' (12" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel			60	
	Sluice L.B. at 1 mile 4,620' (12" pipe) as per type estimate VI below			90	
	Sluice L.B. at 3 miles 1,320' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel			50	
	Total				530

Type Estimate No. VI.

An earthenware pipe sluice with shutter for F.S.L. 1½ feet and below.

0 68 unit.	Platform moulded brick in chunam ..	21 8 0	Unit.	15	
1 No.	Cuddapah slab for vent stone, 2' thick, 1'8" X 1'6" which 11½" circular vent ..		Lump sum.	1	
8 "	Earthenware pipes, 2' long, 12" diameter ..	4 2 0	Each.	33	
0 42 unit.	Plastering with Portland cement, ½" thick ..	6 12 0		3	
1 No.	Steam shutter with iron flat bar, teak beam holding down bolts, etc., complete ..		Lump sum.	10	
	Earthwork excavating foundations, etc. ..			5	
	Total				67
	Contingencies				5
	Petty supervision				3
	Total				75
	3" diameter pipe—estimate Rs. 40 ..		12" diameter p — estimate Rs. 75 ..		
	6" " " " " 50 ..		15" " " " " 90 ..		
	9" " " " " 60 ..		18" " " " " 105 ..		

Estimate No. 100-V.

Cross wall with vent at 3 miles, 1,320 feet of Puthur No. 3 Channel.

As per estimate for the cross wall with vent at 1,320 feet of Puthur No. 1 channel ..			20	
Add for 1 foot extra width of channel ..	1 9 0		2	
Total			22	25
Total, C. Works				11,395

L. EARTHWORK.

Estimate No. 100-V.

Excavating Puthur No. 3 Channel.

2,005-000 units.	Earthwork	3 12 0	1,000 c. ft.	7,519	
	Contingencies			376	
	Petty supervision			225	
	Total				8,120
	Total, L. Earthwork				8,120

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
PUTHUR No. 3 CHANNEL—cont.					
O. MISCELLANEOUS.					
Estimate No. 102-V.					
Fixing demarcation stones for Puthur No. 3 Channel.					
78 No.	Revenue survey stones including cartage to site and fixing	0 8 0	Each.	39	
	Contingencies	..	..	1	
	Total	..	..	..	40

Estimate No. 103-V.

Fixing mile and furlong stones along Puthur No. 3 Channel.

3 No.	Mile stones	3 2 0	Each.	9	
23 No.	Furlong stones	2 2 0	..	49	
	Total	..	..	58 or	60
	Total, O. Miscellaneous	..	..	..	100

P. MAINTENANCE.

Estimate No. 104-V.

Maintenance of Puthur No. 3 Channel.

3.25 miles.	Maintenance during execution	25 0 0	Mile	81	
	Total	..	..	81 say	80
	Total, P. Maintenance	..	..	..	80

PUTHUR No. 4 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 105-V.

Preliminary expenses for Puthur No. 4 Channel.

245 acres.	Cost of preliminary surveys	0 6 0	Acre.	92	
3 units.	Laying out before execution	10 0 0	Mile.	3	
	Contingencies	..	..	5	
	Total	..	..	..	100
	Total, A. Preliminary Expenses	..	..	..	100

B. LAND.

Estimate No. 106-V.

Compensation for land for Puthur No. 4 Channel.

1.84 acres.	Koilvenni village, dry	150 0 0	..	201	
	Total	..	..	201	
	Add for compulsory acquisition	..	..	29	
	Total	..	..	..	230
	Total, B. Land	..	..	..	230

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
PUTHUR No. 4 CHANNEL—cont.					
C. WORKS.					
Estimate No. 107-V.					
Pipe sluice in Puthur No. 4 Channel.					
	Pipe sluice at head (15" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel	..	..	90	
	Add for 6' extra width tunnel	..	..	12	
	Total	..	..	102 or say	100

Estimate No. 108-V.

Railway Bridge of one vent 6-ft. span at 1,584 feet of Puthur No. 4 Channel.

	As per estimate given by railway authorities and embodied in Mr. Moss's project	..	..	2,250	
	Diversion of road	..	..	500	
	Total	..	..	..	2,750
	Total, C. Works	..	..	..	2,850

L. EARTHWORK.

Estimate No. 109-V.

Excavating Puthur No. 4 Channel.

19,000 units.	Earthwork	3 12 0	1,000 c.ft.	71	
	Contingencies	..	..	6	
	Petty supervision	..	..	3	
	Total	..	..	..	80
	Total, L. Earthwork	..	..	..	80

O. MISCELLANEOUS.

Estimate No. 110-V.

Fixing demarcation stones for Puthur No. 4 Channel.

No. 7	Revenue survey stones including cartage to site and fixing in earth	0 8 0	Each.	4	
	Contingencies	..	..	1	
	Total	..	..	..	5

Estimate No. 111-V.

Fixing mile and furlong stones along Puthur No. 4 Channel.

No. 2	Furlong stones	2 2 0	Each.	4	
	Total	..	..	4 or say	5
	Total, O. Miscellaneous	..	..	..	10

P. MAINTENANCE.

Estimate No. 112-V.

Maintenance of Puthur No. 4 Channel.

3 mile.	Maintenance during execution	25 0 0	Mile.	8	
	Total	..	..	8 or say	10
	Total, P. Maintenance	..	..	..	10

VADAVAR SYSTEM--DISTRIBUTARIES--cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.

PUTHUR No. 5 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 113-V.

Preliminary expenses for Puthur No. 5 Channel.

839 acres.	Cost of preliminary surveys	0 6 0	Acre.	333	
1.75 miles.	Laying out before execution	10 0 0	Mile.	18	
	Contingencies	..		9	
	Total	..		..	360
	Total, A. Preliminary Expenses	..		..	360

B. LAND.

Estimate No. 114-V.

Compensation for land for the Puthur No. 5 Channel.

4.26 acres.	Koivenni village	150 0 0	Acre.	639 0 0	
6.65 "	Adanur village	225 0 0		1,474 0 0	
	Total	..		2,113 0 0	
	Add for compulsory acquisition	..		317 0 0	
	Compensation for earth	..		100 0 0	
	Total	..		..	2,530
	Total, B. Land	..		..	2,530

C. WORKS.

Estimate No. 115-V.

2-ft. drop at 1,188 feet of Puthur No. 5 Channel.

Same as the estimate for type plan No. 223	..	..	260 0 0	
Total	..	..	..	260

2-ft. open fall to discharge 10 cusecs (Plan No. 223).

2.09 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	44 0 0	
2.72 "	Brick in mortar	21 8 0	100 "	58 0 0	
1.50 "	Plastering with Portland cement, 6" thick	6 12 0	100 sq. ft.	10 0 0	
1.70 "	Brick on end	13 8 0	100 "	23 0 0	
0.15 "	Cuddapah slab lip for notch	30 0 0	100 "	5 0 0	
2.40 "	Concrete blocks including packing	21 12 0	100 c. ft.	52 0 0	
1.58 "	Brick jellybacking	10 8 0	100 "	17 0 0	
	Earthwork excavating foundations and filling in	Lump.	sum.	15 0 0	
	Shed for materials	..	..	10 0 0	
	Total	..	..	239 0 0	
	Contingencies	..	..	12 0 0	
	Petty supervision	..	..	9 0 0	
	Total	..	..	260 0 0	

Rate for 1 r. ft. of body wall and apron.

0.18 unit.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	3 12 6	
0.13 "	Platform moulded brick in mortar	21 8 0	100 "	2 12 9	
0.18 "	Brick on end, 6" thick	13 8 0	100 sq. ft.	2 6 11	
0.15 "	Plastering with Portland cement, 3" thick	6 12 0	100 "	1 0 2	
	Total	..	..	10 0 4	10
				or say	
	Carried over				260

VADAVAR SYSTEM--DISTRIBUTARIES--cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.

PUTHUR No. 5 CHANNEL--cont.

C. WORKS--cont.

Estimate No. 116-V.

Regulator at 1 mile, 495 feet of Puthur No. 5 Channel.

As per estimate for the regulator at the head of Chattichatram No. 2 channel	..	..	100 0 0	
Add for 1 foot length of body wall and 1 foot width of front apron	..	..	say 3 0 0	
Total	..	..	103	105
			or say	

Estimate No. 117-V.

Aqueduct of 21 spans of 6 feet each at 1 mile, 2,640 feet for Puthur No. 5 Channel.

Estimate for two abutments and one arch.					
9.34 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	196	
14.5 "	Platform moulded brick in do.	23 0 0	100 "	333	
0.50 "	Archwork, platform moulded brick in surki mortar	24 0 0	100 "	12	
	Centring charges	Lump sum.		4	
14.20 "	Brick on end	13 8 0	100 sq. ft.	192	
7.00 "	Brick jelly backing	10 8 0	100 c. ft.	74	
7.80 "	Plastering with portland cement	6 12 0	100 sq. ft.	53	
	Earthwork excavating foundations, etc.	Lump sum.		7	
	Total	..	..	871	
Estimates for one pier and one arch.					
1.22 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	26	
1.20 "	Platform moulded brick in do.	23 0 0	100 "	80	
1.50 "	Do. archwork in do.	24 0 0	100 "	12	
	Centring for the arch	Lump sum.		4	
0.25 "	Brick on end, 3"	13 8 0	100 sq. ft.	4	
2.60 "	Plastering with Portland cement, 3"	6 12 0	100 "	18	
	Earthwork excavating foundations	Lump sum.		1	
	Total	..	..	95	
Value of 2 abutments and one arch as per estimate C					
	.. .. .	..	..	871	
No. 20	Spans	95	Each.	1,900	
	Shed for materials	..	..	40	
	Contingencies	..	..	131	
	Petty supervision	..	..	68	
	Total	..	..	3,010	

Note.—The plan of the aqueduct at 2 mile, 4,950 feet in Puthur No. 3 channel has been followed in preparing this estimate.

Estimate No. 118-V.

3-ft. deep at 2 mile 2,838 feet of Puthur No. 5 Channel.

As per estimate for the 3' drop at 1,320' of Puthur No. 2 channel	..	..	320	
Deduct for 5 1/2' width of channel	11 10 0	1 ft.	41	
Total	..	..	279	280
			or say	

Estimate No. 119-V.

Pipe sluices in Puthur No. 5 Channel.

Sluice R. B. at 990' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	50	
Sluice L. B. at 3,300' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	50	
Sluice R. B. at 1 mile 495' (12" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	60	
Sluice L. B. at 1 mile 495' (15" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel	..	..	90	
Sluice R. B. at 1 mile 2,838' (9" pipe) as per type estimate VII below	..	..	70	
Sluice L. B. at 1 mile 2,838' (9" pipe) as per type estimate VII below	..	..	70	
Total	..	..	390	
Total, C. Works	..	..	..	4,045

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS.	RS.
PUTHUR No. 5. CHANNEL—cont.					
Type Estimate No. VII.					
Type estimate for clear overfall sluice with F.S.L. 1'75' and below without shutter.					
	Cost of sluice with shutter as per type estimate excluding contingencies and petty supervision.	..	..	71	
	Deduct cost of shutter	..	..	..	
	Do. cost of vent stone	..	..	..	
	Do. cost of beam	..	..	..	
	Total, deductions ..	..	..	9	
	Total, less deductions ..	..	..	62	
	Add cost of vent stone 1' 6" X 1' 9" X 6" = 1 1/2.	..	..	3	
	Add cost of masonry above vent stone ..	..	..	1	
	Total ..	..	..	66	
	Contingencies	..	..	3	
	Petty supervision	..	..	1	
	Total ..	..	..	..	70
	Cost with 6" pipe	..	..	..	
	Do. 12" do.	..	..	..	
	Do. 15" do.	..	..	..	

L. EARTHWORK.

Estimate No. 120-V.

Excavating Puthur No. 5 Channel.

317 000 units	Earthwork	3 12 0	1,000 c. ft.	1,189	
	Contingencies	..	..	64	
	Petty supervision	..	..	37	
	Total ..	..	..	..	1,290
	Total, L. Earthwork ..	..	..	..	1,290

O. MISCELLANEOUS.

Estimate No. 121-V.

Fixing demarcation stones for Puthur No. 5 Channel.

No. 42	Revenue survey stones including cartage to site and fixing in earth	0 8 0	Each	21	
	Contingencies	..	..	4	
	Total ..	..	..	..	25

Estimate No. 122-V.

Fixing mile and furlong stones along Puthur No. 5 Channel.

No. 1	Mile stone	3 2 0	Each	3	
No. 10	Furlong stones	2 2 0	..	27	
	Total ..	..	..	..	30
	Total, O. Miscellaneous ..	..	..	..	55

P. MAINTENANCE.

Estimate No. 123-V.

Maintenance of Puthur No. 5 Channel.

1.75 miles.	Maintenance during execution	25 0 0	Mile.	44	
	Total, say ..	..	..	44 or say	45
	Total, P. Maintenance ..	..	..	..	45

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS.	RS.

CHETTICHATRAM CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 124-V.

Preliminary expenses for Chettichatram channel.

1,224 acres.	Cost of preliminary surveys	0 6 0	Acre.	459	
4.5 miles.	Laying out before execution	10 0 0	Mile.	45	
	Contingencies	..	..	6	
	Total ..	..	..	..	510
	Total, A. Preliminary Expenses ..	..	..	..	510

B. LAND.

Estimate No. 125-V.

Compensation for land for Chettichatram Channel.

10 38	Kambayenatham	150	Acre.	1,567	
14 33	Arindavapuram	156	..	2,150	
4 72	Puliyakudi	150	..	708	
	Compensation for earth	..	..	50	
	Add for compulsory acquisition	..	..	555	
	Total ..	..	..	..	5,020
	Total, B. Land ..	..	..	..	5,020

C. WORKS.

Estimate No. 126-V.

Constructing head sluice in Chettichatram Channel.

10.3 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	216	
18.0	Platform moulded brickwork in mortar ..	21 8 0	100 "	287	
1 15	Semi-circular arch work platform moulded in mortar	22 8 0	100 "	26	
	Centering charges for arch work	..	Lump sum.	9	
8.5 sq. ft.	Plastering with Portland cement, 1/2" thick ..	6 12 0	100 sq. ft.	57	
6.6	Brick on end 9" for apron and revetment ..	13 8 0	100 "	89	
2 75 units.	Brick jelly backing 6"	10 8 0	100 "	30	
4 c. ft.	Teakwood wrought and put up	4 0 0	C. ft.	16	
7 "	Cut stone work neatly dressed	2 8 0	..	18	
	Teakwood screw-gearing shutter 3' 9" X 2' 0" including all the fittings, anchor bolts, handles, etc., complete	..	Lump sum.	90	
	Fitting charges 1/12 the cost of the shutter ..	..	say	8	
	Earthwork, excavating foundations and forming approaches	..	..	30	
	Total ..	..	..	..	976
	Shed for materials	..	..	15	
	Contingencies	..	..	48	
	Petty supervision	..	..	31	
	Total ..	..	..	..	1,070
	Carried over ..	..	..	..	1,070

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

CHETTICHATRAM CHANNEL—cont.

Brought forward .. 1,070

C. WORKS—cont.

Estimate No. 127-V.

"B" class bridge of 12 feet span at 0 mile 1,320 ft. of Chettichatram Channel.

As per estimate for the bridge at 5 miles 193 feet of Puthur channel ..	..	..	830	
Forming approaches to the roadway, etc. ..	..	Lump sum.	20	
Total ..	..	..	..	850

Estimate No. 128-V.

Outlet at 0 mile 4,290 feet of Chettichatram Channel.

Estimate for wings including stepped portion.

0.9 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	19
0.45 "	Platform moulded brick in chunam ..	21 8 0	100 "	10
0.3 "	Plastering with cement (1:3) ..	6 12 2	100 sq. ft.	2
2.6 "	Brick on end, 9" ..	13 8 0	100 "	35
0.7 "	Brick jelly, backing 6" ..	10 8 0	100 c. ft.	7
	Earthwork, excavating foundations and filling in ..	..	..	1
	Lump sum.	..	..	74
	Total ..	..	..	..
	Contingencies ..	..	..	4
	Petty supervision ..	..	..	2
	Total ..	..	..	80
	Body wall.			
7.00 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	147
2.6 "	Platform moulded brick work in chunam ..	21 8 0	100 "	55
1.4 "	Plastering with cement $\frac{1}{2}$ " (1 cement and 3 sand) ..	6 12 0	100 sq. ft.	9
9.00 "	Brick on end, 9" ..	13 8 0	100 "	122
	Earthwork, excavating foundation and filling in ..	..	..	5
	Shed for materials ..	..	..	10
	Lump sum.	..	..	349
	Total ..	..	..	..
	Contingencies ..	..	..	19
	Petty supervision ..	..	..	12
	Total ..	..	..	380
	Rate per running foot of body-wall, 339/90. Say.	3 12 3	..	..
	Total ..	..	..	460

N.B.—The type plan has been followed in preparing this estimate.

Estimate No. 129-V.

"B" class bridge of 10 feet span at 2 miles 396 feet of Chettichatram Channel.

As per type estimate below ..	..	..	750	
Forming approaches to the road-way ..	..	Lump sum.	10	
Total ..	..	..	..	760
	..	..	..	3,140

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.

CHETTICHATRAM CHANNEL—cont.

Brought forward .. 3,140

C. WORKS—cont.

Estimate No. 129-V—cont.

"B" class bridge of 10 feet span at 2 miles 396 feet of Chettichatram Channel—cont.

	Culvert of 15 ft. span with 14 ft. roadway (Type estimate).			
7.75 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	163 0 0
13.00 "	Platform moulded brick in chunam ..	21 8 0	100 "	280 0 0
2.35 "	Do. archwork in chunam ..	22 8 0	100 "	53 0 0
	Centering for the archwork ..	..	Lump sum.	20 0 0
11.3 "	Plastering with cement, $\frac{1}{2}$ " thick one cement and three sand ..	6 12 0	100 sq. ft.	76 0 0
69 r. ft.	Cornice work including cement plastering, $\frac{1}{2}$ " ..	0 4 0	R. ft.	17 0 0
2.00 units.	Brick on end, 9" ..	13 8 0	100 sq. ft.	27 0 0
1.00 "	Brick jelly backing, 6" ..	10 8 0	100 c. ft.	11 0 0
No. 8 "	Guard stone, 6" Dir. 3' high ..	3 0 0	Each.	24 0 0
	Earthwork excavating foundations and filling in ..	..	..	10 0 0
	Shed for materials ..	..	..	10 0 0
	Lump sum.	..	..	691 0 0
	Total ..	..	..	..
	Contingencies ..	..	..	36 0 0
	Petty supervision ..	..	..	23 0 0
	Total ..	..	..	750 0 0
	Cost of culvert with 10' roadway with 6" concrete over the arch ..	..	..	..
	Deduct the cost of 4 R. ft. at Rs. 16-14-0 per foot ..	..	..	..
	Vide separate estimate, 4 X 16-14-0 ..	..	Say 691-67	624 0 0
	Contingencies ..	..	..	27 0 0
	Petty supervision ..	..	..	19 0 0
	Total for 10 ft. roadway ..	..	..	680 0 0
	1 Running foot of culvert of 10-ft. span.			
23 c. ft.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	4 13 3
31 "	Platform moulded brickwork in chunam ..	21 8 0	100 "	6 10 8
14 "	Do. archwork do. ..	22 8 0	100 "	3 2 6
	Centering for the archwork ..	..	Lump sum.	1 2 0
16 sq. ft.	Plastering with Portland cement, $\frac{1}{2}$ " thick (1 cement: 3 sand) ..	6 12 0	100 sq. ft.	1 1 3
	Total ..	..	..	16 13 8
	or say	..	..	16 14 0

Estimate No. 130-V.

Outlet at 2 miles 1,914 feet of Chettichatram Channel.

124 ft.	Body wall (as per estimate for outlet at 0 mile 4,290 feet in the same channel) ..	3 12 3	R. ft.	467 0 0
	Wings do. do. ..	..	..	80 0 0
	Total ..	..	..	547 0 0
	Shed for materials ..	..	Lump sum.	10 0 0
	Contingencies ..	..	..	25 0 0
	Petty supervision ..	..	..	18 0 0
	Total ..	..	..	600
	Carried over ..	..	..	3,740

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

CHETTICHATRAM CHANNEL—cont.

Brought forward .. 3,7

C. WORKS—cont.

Estimate No. 131-V.

Constructing 2½ feet drop at 3 miles 2,970 feet of Chettichatram Channel

2-3 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	48	
3-2 "	Brickwork (platform moulded) in mortar ..	21 8 0	100 "	67	
1-9 "	Brick on end, 9" ..	13 8 0	100 sq. ft.	26	
2-5 "	Revetment with concrete blocks, 1' ..	21 12 0	100 c. ft.	54	
1-7 "	Brick jelly, 6" ..	10 8 0	100 "	18	
2-0 "	Cement plastering, ¾" (1:3) ..	6 12 0	100 sq. ft.	14	
15 sq. ft.	Cuddapah slab, 2" thick ..	30 0 0	100 "	5	
	Earthwork, excavating foundations, etc. ..		Lump sum.	7	
	Total ..			239	
	Shed for materials ..			10	
	Contingencies ..			12	
	Petty supervision ..			9	
	Total ..				270

Estimate No. 132-V.

Constructing 1 foot drop at 4 miles 330 feet of Chettichatram Channel.

1-8 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	38	
1-8 "	Platform moulded brick in mortar ..	21 8 0	100 "	33	
1-5 sq. ft.	Brick on end 9" for apron and revetment ..	13 8 0	100 sq. ft.	20	
1-85 units.	Revetment concrete blocks, 12" thick ..	21 12 0	100 c. ft.	40	
1-3 "	Brick jelly backing, 6" ..	10 8 0	100 "	14	
1-3 "	Cement plastering, ¾" (1 cement 3 sand) ..	6 12 0	100 sq. ft.	9	
12 sq. ft.	Cuddapah slab, 2" thick ..	30 0 0	100 "	4	
	Earthwork, excavating foundations ..		Lump sum.	7	
	Total ..			170	
	Shed for materials ..			10	
	Contingencies ..			12	
	Petty supervision ..			8	
	Total ..				200

Estimate No. 133-V.

Pipe sluices in Chettichatram Channel.

	Sluice right bank at 1—3,630' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..			50	
	Sluice right bank at 2—1,320' (12" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..			60	
	Sluice right bank at 3—330' (15" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel ..			90	
	Sluice left bank at 3—660' (12" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel ..			75	
	Sluice right bank at 3—2270' (15" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel ..			90	
	Sluice left bank at 3—2,970' (12" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel ..			75	
	Sluice right bank at 4—990' (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..			40	
	Total ..				480
	Total, C. Works ..				4,690

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

CHETTICHATRAM CHANNEL—cont.

L. EARTHWORK.

Estimate No. 134-V.

Excavating Chettichatram Channel.

501,000 units	Excavating the channel with a lead of 20 yards ..	3 12 0	100 c. ft.	3,379	
	Contingencies ..			168	
	Petty supervision ..			103	
	Total ..				3,650
	Total, L. Earthwork ..				3,650

O. MISCELLANEOUS.

Estimate No. 135-V.

Fixed demarcation stones on Chettichatram Channel.

No. 108	Revenue survey stones including cartage to site and fixing in earth ..	0 8 0	Each.	54	
	Contingencies ..			1	
	Total ..				55

Estimate No. 136-V.

Fixing mile and furlong stones along Chettichatram Channel.

No. 4	Mile stones ..	3 2 0	Each.	13	
" 32	Furlong stones ..	2 2 0	"	68	
	Total ..			81 or say	80
	Total, O. Miscellaneous ..				135

P. MAINTENANCE.

Estimate No. 137-V.

Maintenance of Chettichatram Channel.

4-5 miles.	Maintenance during construction ..	25 0 0	Mile.	113 0 0	
	Total say ..			113 or say	115
	Total, P. Maintenance ..				115

CHETTICHATRAM No. 1 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 138-V.

Preliminary expenses for Chettichatram No. 1 Channel.

220 acres.	Cost of preliminary surveys ..	0 6 0	Acres.	83	
475 miles.	Laying out before execution ..	10 0 0	Mile.	5	
	Contingencies ..			2	
	Total ..				90
	Total, A. Preliminary Expenses ..				90

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

CHETTICHATRAM No. 1 CHANNEL—cont.

B. LAND.

Estimate No. 139-V.

Compensation for land for Chettichatram No. 1 Channel.

23-2	Puliyakudi	150 0 0	Acre.	348	
	Compensation for earth .. .. .	.. .. .	..	10	
	Add for compulsory acquisition .. .. .	.. .. .	..	52	
	Total .. .. .	.. .. .	..	..	41
	Total, B. Land .. .. .	.. .. .	..	..	41

C. WORKS.

Estimate No. 140-V.

Constructing 5-ft. Syphon well drop at 0 mile, 1,320 feet of Chettichatram No. 1 Channel.

1-2 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	25	
2-25 "	Brickwork (platform moulded) in surki mortar	23 0 0	100 "	52	
0-6 "	Cuddapah slab 2" thick	30 0 0	100 sq. ft.	18	
2-4 "	Outstone work neatly dressed	2 8 0	C. ft.	6	
2-8 sq. ft.	Brick on end 9" for apron and revetment	13 8 0	100 sq. ft.	38	
1-2 units.	Brick jelly 6" under revetment	10 8 0	100 c. ft.	13	
2-75 sq. ft.	Plastering with portland cement 3/4" thick (1 cement 3 sand)	6 12 0	100 sq. ft.	19	
No. 18	Stoneware pipe 9" diameter including cartage and fixing	3 8 0	Pipe	63	
	Earthwork, excavating foundations, forming bund and drain .. .. .	.. .. .	Lump sum.	15	
	Total .. .. .	.. .. .	..	249	
	Shed for materials .. .. .	.. .. .	..	10	
	Contingencies .. .. .	.. .. .	..	13	
	Petty supervision .. .. .	.. .. .	..	8	
	Total .. .. .	.. .. .	..	..	28

Estimate No. 141-V.

Pipe sluices in Chettichatram No. 1 Channel.

	Sluice at head (12" pipes) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel .. .. .	.. .. .	..	80	
	Sluice at L.B. at 0 0 feet (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel .. .. .	.. .. .	..	50	
	Sluice at R.B. at 0—990 (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel .. .. .	.. .. .	..	50	
	Sluice at L.B. at 0—990 feet (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel .. .. .	.. .. .	..	50	
	Total .. .. .	.. .. .	..	..	28
	Total, C. Works .. .. .	.. .. .	..	..	514

L. EARTHWORK.

Estimate No. 142-V.

Excavating Chettichatram No. 1 Channel.

49-000	Excavating the channel with a lead of 20 yards and a lift of 2 yards	3 12 0	1,000 c. ft.	184	
	Contingencies .. .. .	.. .. .	..	11	
	Petty supervision .. .. .	.. .. .	..	5	
	Total .. .. .	.. .. .	..	..	200
	Total, L. Earthwork .. .. .	.. .. .	..	..	200

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

CHETTICHATRAM No. 1 CHANNEL—cont.

O. MISCELLANEOUS.

Estimate No. 143-V.

Fixing demarcation stones on Chettichatram No. 1 Channel.

No. 10	Revenue survey stones including cartage to site and fixing in earth.	0 8 0	Each.	5	
	Total .. .. .	.. .. .	..	..	5

Estimate No. 144-V.

Fixing mile and furlong stones Chettichatram No. 1 Channel.

No. 3	Furlong stones	2 2 0	Each.	6	
	Total .. .. .	.. .. .	..	6 or say	5
	Total, O. Miscellaneous .. .. .	.. .. .	..	..	10

P. MAINTENANCE.

Estimate No. 145-V.

Maintenance of Chettichatram No. 1 Channel.

475 mile.	Maintenance during execution	25 0 0	Mile.	12	
	Total .. .. .	.. .. .	..	12 or say	15
	Total, P. Maintenance .. .. .	.. .. .	..	..	15

CHETTICHATRAM No. 2 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 146-V.

Preliminary expenses for Chettichatram No. 2 Channel.

366 acres.	Cost of preliminary surveys	0 6 0	Acre.	137	
25 mile.	Laying out before execution	10 0 0	Mile	3	
	Total .. .. .	.. .. .	..	..	140
	Total, A. Preliminary Expenses .. .. .	.. .. .	..	..	140

B. LAND.

Estimate No. 147-V.

Compensation for land for Chettichatram No. 2 Channel.

1-31	Puliyakudi	150 0 0	Acre.	196	
	Compensation for earth .. .. .	.. .. .	..	20	
	Add for compulsory acquisition .. .. .	.. .. .	..	34	
	Total .. .. .	.. .. .	..	..	250
	Total, B. Land .. .. .	.. .. .	..	..	250

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
CHETTICHATRAM No. 2 CHANNEL—cont.					
C. WORKS.					
Estimate No. 148-V.					
Regulator at head of Chettichatram No. 2 Channel.					
1 unit.	Concrete broken brick in surki mortar ..	21 0 0	100 c.ft.	21	
0.55 unit.	Platform moulded brick work in mortar ..	21 8 0	"	12	
2.1 sq. ft.	9" brick on end for apron and revetment ..	13 8 0	100 sq. ft.	28	
0.9 c.ft.	Brick jelly backing ..	10 8 0	100 c.ft.	9	
0.6 "	Plastering with portland cement 3" thick (1 cement and 3 sand) ..	6 12 0	"	4	
	Earthwork, excavating foundations ..		Lump sum.	6	
	Total ..			79	
	Shed for materials ..		Lump sum.	10	
	Contingencies ..			7	
	Petty supervision ..			4	
	Grand total ..				100

Estimate No. 149-V.

Pipe sluice in Chettichatram No. 2 Channel.

Sluice L.B. at 990 feet (12" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel.	..	..	75	
Total ..	..	..	..	75

Estimate No. 150-V.

Cross wall with vent at 0 mile 1,320 feet of Chettichatram No. 2 Channel.

As per estimate for the cross wall with vent at 1,320 feet for Puthur No. 1 channel.	..	..	20	
Total ..	..	..	..	20
Total, C. Works ..	..	..	..	195

L. EARTHWORK.

Estimate No. 151-V.

Excavating Chettichatram No. 2 Channel.

39-000	Excavating the channel with a lead of 20 yards and a lift of 2 yards.	3 12 0	1,000 c.ft.	146	
	Contingencies ..	..	..	9	
	Petty supervision ..	..	..	5	
	Total ..	..	..	..	160
	Total, L. Earthwork ..	..	..	..	160

O. MISCELLANEOUS.

Estimate No. 152-V.

Demarcation stones on Chettichatram No. 2 Channel.

No. 6	Revenue survey stones including cartage to site and fixing in earth.	0 3 0	Each.	3	
	Contingencies ..	..	..	2	
	Total ..	..	..	..	5

Estimate No. 153-V.

Fixing mile and furlong stones along Chettichatram No. 2 Channel.

No. 2	Furlong stones ..	2 2 0	Each.	4	
	Total ..	..	..	4 or say	5
	Total, O. Miscellaneous ..	..	..	..	10

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
CHETTICHATRAM No. 2 CHANNEL—cont.					
P. MAINTENANCE.					
Estimate No. 154-V.					
Maintenance of Chettichatram No. 2 Channel.					
25 mile.	Maintenance during execution ..	25 0 0	Each.	6	
	Total ..	..	..	6 or say	5
	Total, P. Maintenance ..	..	..	..	5

ILUPPADI CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 155-V.

Preliminary expenses for Iluppadi Channel.

3,030 acres.	Cost of preliminary surveys ..	0 6 0	Acre.	1,138	
5.31 miles.	Laying out before execution ..	40 0 0	Mile.	212	
	Contingencies ..	..	..	22	
	Total ..	..	..	..	1,370
	Total, A. Preliminary Expenses ..	..	..	..	1,370

B. LAND.

Estimate No. 156-V.

Compensation for land for Iluppadi Channel.

11.23 acres.	Muvarkottai ..	300 0 0	Acre.	3,369	
12.43 "	Vaduvur Vadapathi ..	300 0 0	"	3,729	
7.68 "	Munnavalkottai No. 16 village ..	150 0 0	"	1,137	
3.16 "	Do. Inam ..	300 0 0	"	948	
1.05 "	Kilapattu (hamlet of Rayapuram) ..	300 0 0	"	315	
	Compensation for earth ..	..	..	700	
	Add for compulsory acquisition ..	..	..	1,422	
	Total ..	..	..	..	11,620
	Total, B. Land ..	..	..	..	11,620

C. WORKS.

Estimate No. 157-V.

Head sluice and bridge at 33 feet of Iluppadi Channel.

10.7 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	225	
23.90 "	Platform moulded brick work in mortar ..	21 8 0	100 "	513	
9 c. ft.	Cut-stone work ..	2 8 0	C. ft.	23	
7.00 units.	Brick on end 9" ..	13 8 0	100 sq. ft.	95	
2.85 "	Brick jelly backing ..	10 8 0	100 c. ft.	30	
1.65 "	Arch-work brick in mortar ..	22 8 0	100 "	37	
	Centering charges ..		Lump sum.	13	
11.70 "	Plastering with Portland cement 3" thick ..	6 12 0	100 sq. ft.	79	
3.49 "	Teak wood work ..	4 0 0	C. ft.	14	
No. 1 "	Teak-wood shutter ..		Lump sum.	120	
4 "	Wheel guard stones 9" diameter and 3' high ..	3 0 0	Each.	12	
	Conveyance and fixing charge 1/12 of shutter cost ..	..	..	10	
	Earthwork excavating, foundations forming banks, etc. ..		Lump sum.	7	
	Sheds for materials ..	..	..	15	
	Total ..	..	..	1,193	
	Contingencies ..	..	..	60	
	Petty supervision ..	..	..	37	
	Total ..	..	..	..	1,290
	Carried over ..	..	..	..	1,290

Estimate No. 159-V.

As per estimate for the 3' drop at 6 miles 2,508				
ft. of Puthar channel	13	11	0	420
Deduct for 1½ ft. width of channel			1 foot	20
Total ..	..	..	..	400

Estimate No. 160-V.

As per estimate for the bridge at 6,214 ft. of				
Puthur No. 3 channel	..	..	720	
Add for forming approaches	..	..	50	
Total ..	..	..	..	770

Estimate No. 161-V.

As per estimate for the 3' drop at 6 miles 2,508				
ft. of Puthur channel	13	11	0	120
Deduct for 1½ ft. width of channel			1 foot.	20
Total ..	..	..	..	400

Estimate No. 162-V.

1.95 units.	Concrete broken brick in surki mortar	.. ..	21 0 0	100 c. ft.	41
1.50 "	Platform moulded brick in mortar	.. ..	21 8 0	100 "	32
2.60 "	Brick on end, 9" .. ..	.. ..	13 8 0	100 sq. ft.	36
1.00 unit.	Brick jelly backing .. ..	.. ..	10 8 0	100 c. ft.	11
0.90 "	Plastering with portland cement, $\frac{3}{4}$ " thick (1 cement : 3 sand) .. ..	.. ..	6 12 0	100 sq. ft.	6
	Earthwork, excavation, etc. .. ..	.. ..	Lump sum.		5
	Sbed for materials .. ..	.. ..	.. ..		10
	Total .. ..	.. ..	.. ..		140
	Contingencies .. ..	.. ..	.. ..		6
	Petty supervision .. ..	.. ..	.. ..		4
	Total .. ..	.. ..	.. ..		150
				Carried over ..	4,220

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
ILUPPADI CHANNEL—cont.					
C. WORKS—cont.					
<i>Estimate No. 163—V.</i>					
3-ft. drop at 4 miles 990 feet of Iluppadi Channel.					
Same as per estimate for the 3' drop at 1,320 feet of Puthur No. 2 channel.	..	..	320		
Total	..	..	..	320	
<i>Estimate No. 164—V.</i>					
2-ft. drop at 4 miles 2,310 feet of Iluppadi Channel.					
As per estimate for the 2' drop at 1,188 feet of Puthur No. 5 channel	..	..	260		
Total ..	..	..	..	260	
<i>Estimate No. 165—V.</i>					
2-ft. drop at 4 miles 4,950 feet of Iluppadi Channel.					
As per estimate for the 2' drop at 1,188 feet of Puthur No. 5 channel.	..	..	260		
Deduct for 1½' width of channel	10 0 0	1 ft.	15		
Total ..	..	..	..	245	

Estimate No. 166-V.

Sluice, L.B. at 1 mile 3,366 feet (15" pipe) as per type estimate VIII below.	..	..	85
Sluice, R.B. at 2 miles 660 feet (12" pipe) as per type estimate VIII below.	..	..	70
Sluice, L.B. at 2 miles 660' (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel.	..	..	60
Sluice, R.B. at 2 miles 3,564 feet (9" pipe) as per type estimate III attached to the estimate of sluices in Puthur channel.	..	..	70
Sluice, L.B. at 2 miles 3,564 feet (6" pipe) as per type estimate III attached to the estimate of sluices in Puthur channel.	..	..	60
Sluice, R.B. at 3 miles 1,716 feet (12" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel.	..	..	60
Sluice, L.B. at 3 miles 1,716 feet (12" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel.	..	..	60
Sluice, R.B. at 3 miles 4,950 feet (15" pipe) as per estimate VI attached to the estimate of sluices in Puthur No. 3 channel.	..	..	85
Sluice, L.B. at 3 miles 4,950 feet (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel.	..	..	40
Sluice, R.B. at 4 miles 2,145 feet (12" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel.	..	..	70
Sluice, L.B. at 4 miles 2,145 feet (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel.	..	..	50
Sluice, R.B. at 4 miles 4,950 feet (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel.	..	..	50
Sluice, L.B. at 4 miles 4,950 feet (12" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel.	..	..	70
Total ..	..	..	..
Total, C. Works ..	..	..	..

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
1	2	3	4	5	6
		RS. A. P.		RS.	RS.
ILUPPADI CHANNEL—cont.					
<i>Type Estimate No. VIII.</i>					
An earthenware pipe sluice with shutter for F.S.L. (2 and 2½ ft.)					
0.71 units.	Platform-moulded brick in chunam ..	21 8 0	Unit.	15	
No. 1	Cuddapah slab vent stone, 2" thick, 1'6"×1'6" with 10½" circular vent.		Lump sum.	1	
No. 8	Earthenware pipes 12" diameter 2' long ..	4 2 0	Pipe.	33	
0.4	Plastering with Portland cement, ¾" thick ..	6 12 0	100 sq. ft.	3	
No. 1	Stem shutter with iron flat bar, teak beam and holding down bolts, etc., complete.		Lump sum.	10	
	Earthwork, excavating foundations, etc. ..			5	
	Total ..			67	
	Contingencies ..			2	
	Petty supervision ..			1	
	Total ..				70
	3" pipe—estimate Rs. ..	40	12" pipe—estimate Rs. ..	70	
	6" Do. ..	50	15" Do. ..	90	
	9" Do. ..	55	18" Do. ..	110	

L. EARTHWORK.*Estimate No. 167-V.***Excavating Iluppadi Channel.**

1,567 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards.	3 12 0	1,000 c. ft.	5,839	
	Contingencies ..			294	
	Petty supervision ..			177	
	Total ..				6,310
	Total, L. Earthwork ..				6,310

O. MISCELLANEOUS.*Estimate No. 168-V.***Fixing demarcation stones on Iluppadi Channel.**

No. 127	Revenue survey stones including cartage to site and fixing in earth.	0 8 0	Each.	64	
	Contingencies ..			1	
	Total ..				65

*Estimate No. 169-V.***Fixing mile and furlong stones along Iluppadi Channel.**

No. 5	Mile stones ..	3 2 0	Each.	16	
37	Furlong stones ..	2 2 0	"	79	
	Total ..				95
	Total, O. Miscellaneous ..				160

P. MAINTENANCE.*Estimate No. 170-V.***Maintenance of Iluppadi Channel.**

5.31	Maintenance during execution ..	100 0 0	Mile.	531	
	Total ..			531	530
	Total, P. Maintenance ..				530

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
MUVANALLUR CHANNEL.					
A. PRELIMINARY EXPENSES.					
<i>Estimate No. 171-V.</i>					
Preliminary Expenses for Muvanallur Channel.					
999 acres.	Cost of preliminary surveys ..	0 6 0	Acre.	375	
3.1 miles.	Laying out before execution ..	40 0 0	Mile.	124	
	Contingencies ..			1	
	Total ..				500
	Total, A. Preliminary Expenses ..				500
B. LAND.					
<i>Estimate No. 172-V.</i>					
Compensation for land for Muvanallur Channel.					
17.51 acres.	Vaduvur Vadapadi ..	300 0 0	Acre.	5,253	
5.31 "	Edagankottai Melaiyur ..	225 0 0	"	1,195	
	Compensation for earth ..			200	
	Add for compulsory acquisition ..			972	
	Total ..				7,620
	Total, B. Land ..				7,620
C. WORKS.					
<i>Estimate No. 173-V.</i>					
Constructing a head sluice in the Muvanallur Channel.					
8.25 units.	Concrete, broken brick in surki mortar ..	21 0 0	100 c.ft.	173	
8.10 "	Platform-moulded brick in mortar ..	21 8 0	100 "	174	
0.8 "	Archwork, platform-moulded brick in mortar ..	22 8 0	100 "	18	
	Centering charges for archwork ..			6	
7 squares.	Plastering with Portland cement, ¾" thick (1:3).	6 12 0	100 sq. ft.	47	
5.5 c. ft.	Cut-stone work neatly dressed ..	2 8 0	C. ft.	14	
3.22 "	Teakwood wrought and put up ..	4 0 0	"	13	
4.4 squares.	Brick on end, 9" for apron and revetment ..	13 8 0	100 sq. ft.	59	
1.8 units.	Brick jelly backing ..	10 8 0	100 c.ft.	19	
	Providing teak-wood shutter 5' 0" × 2' 6", including gearing rod holding down bolts, screw, box, etc., complete ..		Lump sum.	95	
	Fitting charges, ¼ of the cost of the shutter ..			8	
	Earthwork, excavating foundations, forming approaches, etc., complete ..			20	
	Total ..				676
	Contingencies ..			35	
	Petty supervision ..			19	
	Total ..				730
<i>Estimate No. 174-V.</i>					
1-ft. drop and bridge at 0 mile 4,818 feet of Muvanallur Channel.					
9.50 units.	Concrete, broken brick in surki mortar ..	21 0 0	100 c.ft.	200	
10.80 "	Platform-moulded brick work in mortar ..	21 8 0	100 "	232	
2.40 "	Platform segmental arch-work in mortar ..	22 8 0	100 "	54	
	Centering charges for arch-work ..		Lump sum.	19	
0.9 unit.	Arched drop wall with brick in surki mortar ..	21 0 0	100 c.ft.	22	
0.60 square.	Plastering with Portland cement, ¾" thick (3 sand and 1 cement) ..	6 12 0	100 sq. ft.	4	
11.00 "	Plastering with Portland cement, ¾" thick (1 cement and 3 sand) ..	6 12 0	100 "	74	
5.70 "	Brick on end, 9" thick, for apron and revetment.	13 8 0	100 "	77	
1.60 units.	Brick jelly backing, 6" ..	10 8 0	"	17	
9 sq. ft.	Cuddapah slab, 2" for notch ..	30 0 0	100 sq. ft.	3	
	Earthwork, excavating foundations and forming approaches to road-way ..		Lump sum.	15	
	Total ..				717
	Shed for materials ..			11	
	Contingencies ..			39	
	Petty supervision ..			23	
	Total ..				790
	Carried over ..				1,520

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS. A. P.
MUVANALLUR CHANNEL—cont.					
				Brought forward ..	1,520 0 0

C. WORKS—cont.

Estimate No. 175-V.

4-ft. drop and bridge at 1 mile 1,551 feet of Muvanallur Channel.

As per type estimate below ..	5 3 0	1 foot.	640 0 0	
Add for five feet extra length of tunnel ..			28 0 0	
Total ..			668 0 0	or 670 0 0
45-ft. Siphon well drop to discharge 25 cusecs Plan No. 57).				
5-25 units. Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	110 0 0	
5-00 " Brick in surki mortar ..	23 0 0	100 "	115 0 0	
2-50 " Archwork brick in surki mortar ..	24 0 0	100 "	60 0 0	
Centering charges ..			20 0 0	
16 c. ft. Cutstone work ..	2 8 0	C. ft.	40 0 0	
61 " Cuddapah slab 2" thick ..	30 0 0	100 sq. ft.	18 0 0	
6-75 " Brick on end revetment and apron ..	13 8 0	100 "	91 0 0	
2-40 " Brick jelly backing ..	10 8 0	100 "	25 0 0	
7-50 " Plastering with portland cement 3/4" thick ..	6 12 0	100 "	51 0 0	
Clay puddle work ..		Lump sum.	15 0 0	
Earthwork excavating foundations, etc.			33 0 0	
Shed for materials ..			10 0 0	
Total ..			588 0 0	
Contingencies ..			32 0 0	
Petty supervision ..			20 0 0	
Total ..			640 0 0	
Rate for 1 r. ft. tunnel.				
0-09 unit. Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	1 14 3	
0-03 " Platform moulded brick in surki mortar ..	23 0 0	100 "	0 11 0	
0-08 " Archwork brick in surki mortar ..	24 0 0	100 "	1 7 0	
Centering for arch work ..		Lump sum.	0 7 8	
0-10 " Plastering with Portland cement 3/4" thick ..	6 12 0	100 sq. ft.	0 10 10	
Total ..			5 2 9	5 3 0

Estimate No. 176-V.

4-ft. drop at 2 miles 1,168 feet of Muvanallur Channel.

As per type estimate attached to the 4' drop at 1 mile 1,551 feet in Muvanallur channel ..	640 0 0	
Total ..	640 0 0	

Estimate No. 177-V.

Constructing 1-ft. drop at 2 miles 3,828 feet of the Muvanallur Channel.

2-3 units. Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	48 0 0	
2-2 " Platform moulded brick in mortar ..	21 8 0	100 "	47 0 0	
2-4 " 9" brick on end dry backing for apron and revetment ..	13 8 0	100 sq. ft.	32 0 0	
2-6 " Concrete blocks for revetment ..	21 12 0	100 c. ft.	57 0 0	
1-9 " Brick jelly backing ..	10 8 0	100 "	20 0 0	
2-5 squares. Plastering with portland cement 3/4" (1 cement, 3 sand) ..	6 12 0	100 sq. ft.	17 0 0	
0-12 " Cuddapah slab 2" thick ..	30 0 0	100 "	4 0 0	
Earthwork, excavating foundations, forming bund, etc. ..		Lump sum.	12 0 0	
Total ..			237 0 0	
Shed for materials ..			10 0 0	
Contingencies ..			13 0 0	
Petty supervision ..			10 0 0	
Total ..			270 0 0	
Carried over ..				3,100 0 0

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
MUVANALLUR CHANNEL—cont.					

C. WORKS—cont.

Brought forward .. 3,100

Estimate No. 178-V.

Pipe sluices in Muvanallur Channel.

Sluice L.B. at 1 mile 198' (12" pipe) as per type estimate VIII attached to the estimate of sluices in Puppadi channel ..	70	
Sluice L.B. at 1 mile 3,828' (12" pipe) as per type estimate VIII attached to the estimate of sluices in Puppadi channel ..	70	
Sluice R.B. at 1 mile 3,828' (12" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel ..	65	
Sluice L.B. at 2 miles 1,188' (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel ..	50	
Sluice R.B. at 2 miles 1,188' (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel ..	50	
Sluice L.B. at 2 miles 3,828' (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel ..	50	
Sluice R.B. at 2 miles 3,828' (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel ..	50	
Sluice L.B. at 3 miles 528' (6" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel ..	40	
Total ..	445	
Total, C. Works ..	3,545	

L. EARTHWORK.

Estimate No. 179-V.

Excavating Muvanallur Channel.

817-000 units. Excavating the channel with a lead of 20 yards and lift of 2 yards ..	3 12 0	1,000 c. ft.	3,064	
Contingencies ..			155	
Petty supervision ..			80	
Total ..			3,300	
Total, L. Earthwork ..			3,300	

O. MISCELLANEOUS.

Estimate No. 180-V.

Fixing demarcation stones on Muvanallur Channel.

No. 24 Revenue survey stones including cartage to site and fixing in earth ..	0 8 0	Each.	62	
Contingencies ..			3	
Total ..			65	

Estimate No. 181-V.

Fixing mile and furlong stones along Muvanallur Channel.

No. 3 Mile stones ..	3 2 0	Each.	9	
" 21 Furlong stones ..	2 2 0	"	45	
Total ..			54 or say	55
Total, O. Miscellaneous ..			120	

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
MUVANALLUR CHANNEL—cont.					
P. MAINTENANCE.					
Estimate No. 182-V.					
Maintenance of Muvanallur Channel.					
3.1 miles.	Maintenance during execution	100 0 0	Mile.	310 0 0	
	Total	..	..	..	310
	Total, P. Maintenance	..	..	..	310

MUVANALLUR No. 1 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 183-V.

Preliminary Expenses for Muvanallur No. 1 Channel.

423 acres.	Cost of preliminary surveys	0 6 0	Acre.	159 0 0	
81 mile.	Laying out before execution	10 0 0	Mile.	8 0 0	
	Contingencies	..	..	3 0 0	
	Total	..	..	..	170
	Total, A. Preliminary Expenses	..	..	..	170

B. LAND.

Estimate No. 184-V.

Compensation for land for Muvanallur No. 1 Channel.

4.43 acres.	Edangankottai Melaiyur	225 0 0	Acre.	997 0 0	
	Compensation for earth	..	..	50 0 0	
	Add 15 per cent for compulsory acquisition	..	..	..	
	Total	..	..	..	1,200
	Total, B. Land	..	..	..	1,200

C. WORKS.

Estimate No. 185-V.

Constructing head sluice in Muvanallur No. 1 Channel.

2.30 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	48 0 0	
2.6 "	Platform moulded brick work in mortar	21 8 0	100 "	56 0 0	
0.8 unit.	Segmental archwork platform moulded brick in mortar	22 8 0	100 "	18 0 0	
	Centering archwork	..	Lump sum.	6 0 0	
5 c. ft.	Cutstone work neatly dressed	2 8 0	C. ft.	13 0 0	
2.75 squares.	Plastering with Portland cement, $\frac{3}{4}$ " thick (1:3)	6 12 0	100 sq. ft.	19 0 0	
1.3 "	Brick on end 9" thick for apron and revetment	13 8 0	100 "	18 0 0	
0.6 unit.	Brick jelly backing	10 8 0	100 c. ft.	6 0 0	
	Teakwood shutter 2' X 1' 6", with iron fittings, spear rod, etc., complete	..	Lump sum.	30 0 0	
	Fitting charges 1/12 the cost of the shutter	..	Say	2 0 0	
	Earthwork, excavating foundations, forming approaches, etc.	..	..	10 0 0	
	Total	..	..	226 0 0	
	Shed for materials	..	..	10 0 0	
	Contingencies	..	..	14 0 0	
	Petty supervision	..	..	10 0 0	
	Total	..	..	260 0 0	260
	Carried over	..	..	..	260

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
MUVANALLUR No. 1 CHANNEL—cont.					
	Brought forward				260

C. WORKS—cont.

Estimate No. 186-V.

3-ft. drop at 990 ft. in Muvanallur No. 1 Channel.

As per type estimate attached to the 3' drop at 1,320' of Puthur No. 2 channel	..	..	320	
Deduct for 2 feet width of channel	11 10 0	1 ft.	23	
Total	..	..	297 or say	300

Estimate No. 187-V.

2-ft. drop at 2,178 feet in Muvanallur No. 1 Channel.

As per type estimate attached to the 2 feet drop at 0 mile 1,188 feet of Puthur No. 5 channel.	..	..	260	
Deduct for $2\frac{1}{2}$ feet width of channel	10 0 0	1 ft.	25	
Total	..	..	235 or say	240

Estimate No. 188-V.

Constructing an undertunnel at 0 mile 3,630 feet in Muvanallur No. 1 Channel.

12.60 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	265	
8.25 "	Brick-work in surki mortar	23 0 0	100 "	190	
1.75 "	Archwork platform moulded brick in surki mortar	24 0 0	100 "	42	
8.10 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	55	
	Earthwork, excavating foundations	..	Lump sum.	16	
	Total	..	..	568	
	Shed for materials	..	..	10	
	Contingencies	..	..	27	
	Petty supervision	..	..	15	
	Total	..	..	620	620

Estimate No. 189-V.

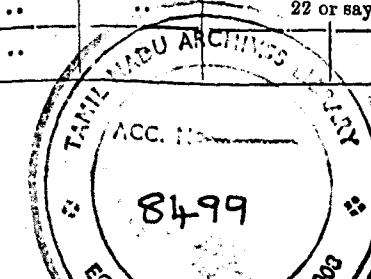
Pipe sluices in Muvanallur No. 1 Channel.

Sluice left bank at 1,980 feet (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	40	
Sluice right bank at 1,980 feet (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	40	
Sluice left bank at 4,290 feet (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	50	
Total	..	..	130	

Estimate No. 190-V.

Cross wall with vent at 4,290 feet in Muvanallur No. 1 Channel.

As per type estimate attached to the estimate for the cross wall with vent at 1,320 feet in Puthur No. 1 channel	..	..	20	
Add for 1 foot extra width of channel	..	..	2	
Total	..	..	22 or say	25
Total, C. Works	..	..	..	1,575



VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MUVANALLUR No. 1 CHANNEL—cont.

L. EARTHWORK.

Estimate No. 191-V.

Evacuating Muvanallur No. 1 Channel.

147,000 units	Excavating the channel with a lead of 20 yards and a lift of 2 yards	3 12 0	1,000	551	
	Contingencies	..	..	30	
	Petty supervision	..	..	19	
	Total	..	..	..	600
	Total, L. Earthwork	..	..	..	600

O. MISCELLANEOUS.

Estimate No. 192-V.

Fixing demarcation stones on Muvanallur No. 1 Channel.

No. 23	Revenue survey stones including cartage to site and fixing in earth	0 8 0	Each.	16	
	Contingencies	..	..	4	
	Total	..	..	..	20

Estimate No. 193-V.

Fixing mile and furlong stones along Muvanallur No. 1 Channel.

No. 6	Furlong stones	2 2 0	Each.	13	
	Total	..	..	Say	15
	Total, O. Miscellaneous	..	..	..	35

P. MAINTENANCE.

Estimate No. 194-V.

Maintenance of Muvanallur No. 1 Channel.

-8 mile.	Maintenance during execution	25 0 0	Mile.	20	
	Total	..	..	..	20
	Total, P. Maintenance	..	..	..	20

MUVANALLUR No. 2 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 195-V.

Preliminary Expenses for Muvanallur No. 2 Channel.

1,258 acres.	Cost of preliminary surveys	0 6 0	Acre.	472	
2.06 miles.	Laying out before execution	10 0 0	Mile.	21	
	Contingencies	..	..	7	
	Total	..	..	..	500
	Total, A. Preliminary Expenses	..	..	..	500

B. LAND.

Estimate No. 196-V.

Compensation for land for Muvanallur No. 2 Channel.

9.44 acres.	Edangankottai Melayur	225 0 0	Acre.	2,124	
3.97 "	Do. Kilayur	225 0 0	"	893	
	Compensation for earth	..	..	200	
	Add 15 per cent for compulsory acquisition	..	..	453	
	Total	..	..	..	3,670
	Total, B. Land	..	..	..	3,670

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.

MUVANALLUR No. 2 CHANNEL—cont.

C. WORKS.

Estimate No. 197-V.

Regulator at the head of Muvanallur No. 2 Channel.

1.55 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	33 0 0	
0.8 "	Platform moulded brick in mortar	21 8 0	100 "	17 0 0	
3.75 squares.	Brick on end, 9" for apron and revetment	13 8 0	100 sq. ft.	51 0 0	
1 unit.	Brick jelly backing	10 8 0	100 c. ft.	11 0 0	
0.9 square.	Plastering with Portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	6 0 0	
	Earthwork, excavating foundations, etc.	..	Lump sum.	5 0 0	
	Shed for materials	..	..	10 0 0	
	Total	..	..	133 0 0	
	Contingencies	..	..	8 0 0	
	Petty supervision	..	..	4 0 0	
	Total	..	..	..	145

Estimate No. 198-V.

2-ft. drop at 1 mile 1,914 feet in Muvanallur No. 2 Channel.

As per type estimate attached to the estimate for the 2' drop at 0 mile 1,188 feet of Pathur No. 6 channel	..	..	260 0 0	
Total	..	..	..	260

Estimate No. 199-V.

4-ft. drop at 1 mile 2,705 feet in Muvanallur No. 2 Channel.

As per type estimate below	..	..	500 0 0	
Total	..	..	..	500

4-ft. syphon well drop to discharge 10 cusecs (Plan No. 76.)

4.28 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	89 0 0	
4.00 "	Platform moulded brick in surki mortar	23 0 0	100 "	92 0 0	
2.20 "	Archwork brick in surki mortar	24 0 0	100 "	53 0 0	
	Centering charges	..	Lump sum.	18 0 0	
5.00 "	Brick on end	13 8 0	100 sq. ft.	68 0 0	
2.50 "	Brick jelly backing	10 8 0	100 c. ft.	26 0 0	
8 c. ft.	Cutstone work	2 8 0	C. ft.	20 0 0	
40 sq. ft.	Cuddapah slab, 2" thick	30 0 0	100 sq. ft.	12 0 0	
5.50 units.	Plastering with Portland cement $\frac{3}{4}$ " thick	6 12 0	100 "	37 0 0	
	Clay puddle work	..	Lump sum.	10 0 0	
	Earthwork, excavating foundations	..	..	25 0 0	
	Shed for materials	..	..	10 0 0	
	Total	..	..	460 0 0	
	Contingencies	..	..	25 0 0	
	Petty supervision	..	..	15 0 0	
	Total	..	..	500 0 0	

Rate for 1 R. ft.

0.08 unit.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	1 10 10	
0.03 "	Platform moulded brick in surki mortar	23 0 0	100 "	0 11 1	
0.05 "	Archwork platform moulded brick in surki mortar	24 0 0	100 "	1 3 2	
	Centering for archwork	..	Lump sum.	0 6 3	
0.08 "	Plastering with Portland cement $\frac{3}{4}$ " thick (1 cement and 3 sand)	6 13 0	100 sq. ft.	0 8 8	
	Total	..	..	4 8 0	

Carried over .. 905

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MUVANALLUR No. 2 CHANNEL—cont.

C. WORKS—cont.

Estimate No. 200-V.

2-ft. drop at 1 mile 1,894 feet in Muvanallur No. 2 Channel.

As per type estimate attached to the estimate for the 2' drop at 0 mile 1,188 feet of Puthur No. 5 channel	10 0 0	1 ft.	260 25	
Deduct for 2½ width of channel.. .. .				
Total			235 or say	240

Estimate No. 201-V.

Pipe sluices in Muvanallur No. 2 Channel.

Sluice left bank at 2,409' (6" pipe) as per type estimate VII attached to the estimate of sluices in Puthur No. 5 channel			60	
Sluice right bank at 2,409' (9" pipe) as per type estimate VII attached to the estimate of sluices in Puthur No. 5 channel			70	
Sluice left bank at 1 mile 759' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel			50	
Sluice right bank at 1 mile 759' (15" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel			90	
Sluice left bank at 1 mile 1,914' (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel			40	
Sluice left bank at 1 mile 3,894' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel			50	
Sluice right bank at 1 mile 3,894' (12" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel			75	
Sluice left bank at 2 miles 330' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel			50	
Sluice right bank at 2 miles 330' (12" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel			75	
Total				560

Estimate No. 202-V.

Cross wall with vent at 2 miles 330 feet in Muvanallur No. 2 Channel.

As per type estimate attached to the estimate for the cross wall with vent at 0 mile 1,320 feet of Puthur No. 1 Channel			20 2	
Add for 1 foot extra width of channel.. .. .				
Total			22 or say	25
Total, C. Works				1,730

L. EARTHWORK.

Estimate No. 203-V.

Excavating Muvanallur No. 2 Channel.

540-000	Excavating the channel with a lead of 20 yards and a lift of 2 yards	3 12 0	1,000 c. ft.	2,925 105 50	
	Contingencies				
	Petty supervision				
	Total				2,180
	Total, L. Earthwork				2,180

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MUVANALLUR No. 2 CHANNEL—cont.

O. MISCELLANEOUS.

Estimate No. 204-V.

Fixing demarcation stones on Muvanallur No. 2 Channel.

No. 82	Revenue survey stones including cartage to site and fixing in earth	0 8 0	Each.	41	
	Contingencies			4	
	Total				45

Estimate No. 205-V.

Fixing mile and furlong stones along Muvanallur No. 2 Channel.

No. 2	Mile stones	3 2 0	Each.	6	
No. 14	Furlong stones	2 2 0		30	
	Total			36 or say	35
	Total, O. Miscellaneous				80

P. MAINTENANCE.

Estimate No. 206-V.

Maintenance of Muvanallur No. 2 Channel.

2.06 miles.	Maintenance during execution	25 0 0	Mile.	52	
	Total			Say	50
	Total, P. Maintenance				50

MANNARGUDI CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 207-V.

Preliminary Expenses for Mannargudi Channel.

3,673 acres.	Cost of preliminary surveys	0 6 0	Acre.	1,277	
8.66 miles.	Laying out before execution	40 0 0	Mile.	346 22	
	Contingencies				
	Total			1,745	
	Total, A. Preliminary Expenses				1,745

B. LAND.

Estimate No. 208-V.

Compensation for land for Mannargudi Channel.

30 78 acres.	Vadavar tenpathi village	200 0 0	Acre.	9,234	
12.06 "	Serumangalam	300 0 0		3,618	
13.23 "	Muvanallur (inam)	150 0 0		1,955	
4.19 "	Mannargudi village	250 0 0		1,048	
5.99 "	Neduvikottai	150 0 0		899	
4.63 "	Gopralayam	150 0 0		695	
	Compensation for earth			1,000	
	Add 15 per cent for compulsory acquisition			2,621	
	Total			21,100	
	Total, B. Land				21,100

VADAVAR SYSTEM--DISTRIBUTARIES--cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
MANNARGUDI CHANNEL--cont.					
C. WORKS.					
Estimate No. 209-V.					
Head sluice for the Mannargudi Channel.					
25.6 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	538	
20.3 "	Platform moulded brick in mortar ..	21 8 0	100 "	437	
4.10 "	Segmental archwork in mortar ..	22 8 0	100 "	92	
	Centering charges ..			32	
26 c. ft.	Cutstone work ..	2 8 0	C. ft.	65	
12.75 c. ft.	Teakwood wrought and put up ..	4 0 0	"	51	
No. 3	Teakwood shutters, 5' 6" X 2' 9" including iron work, screw-gearing arrangements, etc., complete ..	105 0 0	Each.	315	
" 3	Fitting charges and carriage for shutters to workshop one-twelfth the cost of shutter ..	8 12 0		26	
13.70	Plastering with Portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	92	
8.25	Brick on end ..	13 8 0	100 "	111	
1.80	Brick jelly backing, 6" thick ..	10 8 0	100 c. ft.	19	
	Earthwork, excavating foundations, etc. ..		Lump sum.	30	
	Sheds for materials ..			30	
	Total ..			1,838	
	Contingencies ..			90	
	Petty supervision ..			52	
	Total ..				1,980

Estimate No. 210-V.

1-ft. drop at 2 miles 1,980 feet in the Mannargudi Channel.

3.50 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	74	
3.50 "	Platform moulded brick in mortar ..	21 8 0	100 "	75	
9.00 "	Concrete block work ..	21 12 0	100 "	196	
2.60 "	Brick on end ..	13 8 0	100 sq. ft.	35	
2.90 "	Brick jelly backing ..	10 8 0	100 c. ft.	30	
35 sq. ft.	Cuddapah slabs ..	30 0 0	100 sq. ft.	11	
3.00 units.	Plastering with Portland cement $\frac{3}{4}$ " thick cement 3 sand) ..	6 12 0	100 "	20	
	Earthwork, excavating foundations, etc. ..		Lump sum.	10	
	Sheds for materials ..			12	
	Total ..			463	
	Contingencies ..			23	
	Petty supervision ..			14	
	Grand total ..				500

Estimate No. 211-V.

"C" class girder bridge of 15' 0" span at 2 miles 3,300 feet in Mannargudi Channel.

12.30 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	258	
14.5 "	Platform moulded brick in mortar ..	21 8 0	100 "	312	
3 c. ft.	Cutstone work ..	2 8 0	C. ft.	8	
13.13 cwt.	Rolled steel beams ..	8 0 0	Cwt.	105	
18 r. ft.	Iron work including road metalling ..	32 0 0	R. ft.	576	
1.50	Road metalling ..	27 8 0	100 c. ft.	41	
9.20	Plastering with Portland Cement, $\frac{3}{4}$ " thick (3 to 1) ..	6 12 0	100 sq. ft.	62	
No. 8	Wheel guard stones ..	3 0 0	Each	24	
4.00 units	Brick on end ..	13 8 0	100 sq. ft.	54	
2.00 "	Brick jelly backing ..	10 8 0	100 c. ft.	21	
	Earthwork, excavating foundations and forming approaches ..		Lump sum.	180	
	Shed for materials ..			25	
	Total ..			1,666	
	Contingencies ..			84	
	Petty supervision ..			50	
	Total ..				1,800
	Carried over ..				4,280

VADAVAR SYSTEM--DISTRIBUTARIES--cont.

Quantity.	Description of work.	Rate.	Per.	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
MANNARGUDI CHANNEL--cont.					
C. WORKS--cont.					
Estimate No. 212-V.					
"B" Class masonry bridge of 12' span at 4 miles 170 feet in Mannargudi Channel.					
	As per type estimate attached to the estimate for the bridge at 5 miles 198 feet of Puthar channel ..			830	
	Add for forming approaches ..			80	
	Total ..				860
Estimate No. 213-V.					
Outlet 83' 0" long at 5 miles 3,300 feet in Mannargudi Channel.					
83 r. ft.	Cost of wings including body-wall and rear apron excluding contingencies and petty supervision as per type estimate below ..			80	
	Cost of body-wall with 10' width of apron excluding contingencies and petty supervision as per type estimate below ..	4 6 0	R. ft.	362	
	Shed for materials ..			10	
	Contingencies ..			25	
	Petty supervision ..			13	
	Total ..				490
Type estimate for an outlet estimate for wings including stepped portion of body-wall.					
1 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	21	
0.65 "	Platform moulded brickwork in chunam ..	21 8 0	100 "	14	
0.3 "	Plastering with cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	2	
2.5 "	Brick on end, 9" ..	13 8 0	100 "	34	
0.7 "	Brick jelly backing, 6" ..	10 8 0	100 "	7	
	Earthwork excavating foundations ..		Lump sum.	2	
	Total for two wings ..			80	
	Contingencies and petty supervision ..			10	
	Total ..				90
Body-wall for a length of 83' 0".					
7.1 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	149	
3.9 "	Platform moulded brick work in chunam ..	21 8 0	100 "	84	
1.25 "	Plastering with cement, $\frac{3}{4}$ " thick (1:3) ..	6 12 0	100 sq. ft.	8	
8.3 "	Brick on end, 9" ..	13 8 0	100 "	111	
	Earthwork excavating foundations and filling in, etc. ..		Lump sum.	10	
	Total ..			362	
	Contingencies ..			21	
	Petty supervision ..			17	
	Total for 83 r. ft. with 10' apron ..				400
	Total ..				490
	Total for 1 r. ft. = $\frac{362}{83}$ = Rs. 4-6-0				
Estimate No. 214-V.					
Regulator at 6 miles 990 feet in Mannargudi Channel.					
2.50 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	53	
2.20 "	Platform moulded brick in mortar ..	21 8 0	100 "	47	
6.20 "	Brick on end, 9" thick ..	13 8 0	100 sq. ft.	84	
2.00 "	Brick jelly backing ..	20 8 0	100 c. ft.	21	
1.70 "	Plastering with Portland cement, $\frac{3}{4}$ " thick ..	6 11 0	100 sq. ft.	11	
	Earthwork, excavating foundations, etc. ..		Lump sum.	6	
	Sheds for materials ..			10	
	Total ..			232	
	Contingencies ..			12	
	Petty supervision ..			6	
	Total ..				250
	Carried over ..				5,880

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MANNARGUDI CHANNEL—cont.

C. WORKS—cont.

Brought forward .. 5,880

Estimate No. 215-V.

"B" Class masonry bridge of 10 feet span at 7 miles 495 feet in Mannargudi Channel.

As per type estimate attached to the estimate for the bridge at 2 miles 396 feet of Chetti-chattram channel	..	..	750	
Add for forming approaches, etc.	..	..	20	
Total	..	..	..	770

Estimate No. 216-V.

4-ft. drop at 7 miles 1,452 feet in Mannargudi Channel.

As per type estimate attached to the estimate for the 4' drop at 1 mile 1,551 feet in Muvannallur channel	..	..	640	
Deduct 1½' width of apron in front and rear 2 × 1½ × 6½ × 19½ sq. ft. of brick on end at Rs. 13-8-0 per 100 sq. ft.	..	..	3	
Total	..	..	637 or say 640	

Estimate No. 217-V.

2-ft. drop at 7 miles 2,970 feet in Mannargudi Channel.

As per type estimate attached to the estimate for the 2' drop at 6 miles 1,518 feet of Puthur channel	..	..	320	
Deduct for 1½' width of channel	11 6 0	1 ft.	17	
Total	..	..	303 or say 305	

Estimate No. 218-V.

Sluice at 7 miles 4,340 feet of the Mannargudi Channel for the Municipal Channel.

5-10 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	107
8-20 "	Platform moulded brick work in mortar	21 8 0	100 "	176
0-50 "	Arch work platforms moulded brick in mortar. Centering for arch work	22 8 0	100 "	11
5 c. ft.	Cutstone work	2 8 0	C. ft.	13
2-52 units.	Teakwood wrought and put up	4 0 0	"	10
4-00 "	Brick on end, 9"	13 8 0	100 sq. ft.	54
1-60 "	Brick jelly backing	10 8 0	100 c. ft.	17
5-10 "	Plastering with Portland cement, ¾" thick (1 cement, 3 sand)	6 12 0	100 sq. ft.	34
No. 1	Screw-gearing shutter, 2' 6" × 2' 3" including iron work, etc.			
	Conveyance and fitting charges 1/12 the cost of shutter			
	Earthwork, excavation, etc., complete			
	Sheds for materials			
	Total			510
	Contingencies			25
	Petty supervision			15
	Total			550

Estimate No. 219-V.

"B" Class masonry bridge of 8 feet span at 8 miles 1,320 feet in Mannargudi Channel.

As per type estimate attached to the estimate for the bridge at 5,214 feet of Puthur No. 3 channel	..	..	720	
Add for forming approaches, etc.	..	..	70	
Total	..	..	..	790
			Carried over ..	8,935

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS.		RS.	RS.

MANNARGUDI CHANNEL—cont.

C. WORKS—cont.

Brought forward .. 8,935

Estimate No. 220 V.

Pipe sluices in Mannargudi Channel.

Sluice right bank at 1,320' (12" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel	..	..	70
Sluice right bank at 3,630' (6" pipe) as per type estimate IX below	..	..	75
Sluice left bank at 1 mile 3,300' (9" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel	..	..	50
Sluice right bank at 1 mile 3,300' (12" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel	..	..	80
Sluice left bank at 1 mile 3,300' (9" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel	..	..	50
Sluice right bank at 2 miles (12" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel	..	..	80
Sluice left bank at 2 miles (9" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel	..	..	50
Sluice right bank at 3 miles 990' (15" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel	..	..	100
Sluice left bank at 3 miles 1,650' (9" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel	..	..	50
Sluice left bank at 3 miles 1,650' (6" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel	..	..	45
Sluice left bank at 3 miles 3,300' (6" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel	..	..	45
Do. do.	..	..	45
Sluice right bank at 4 miles (15" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel	..	..	100
Sluice left bank at 4 miles 1,650' (12" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel	..	..	70
Sluice right bank at 4 miles 3,630' (9" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel	..	..	50
Sluice left bank at 4 miles 3,630' (6" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel	..	..	45
Sluice right bank at 4 miles 3,960' (12" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel	..	..	70
Sluice left bank at 4 miles 3,960' (15" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel	..	..	100
Sluice right bank at 5 miles 3,828' (12" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel	..	..	80
Sluice left bank at 6 miles 990' (15" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel	..	..	100
Sluice left bank at 6 miles 990' (12" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel	..	..	80
Sluice right bank at 6 miles 990' (12" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel	..	..	70
Sluice left bank at 6 miles 3,135' (18" pipe) as per type estimate VIII attached to the estimate of sluices in Illuppadi channel	..	..	110
Sluice right bank at 7 miles 660' (12" pipe) as per type estimate IV attached to the estimate of sluices in Illuppadi channel	44	..	65
Sluice left bank at 7 miles 660' (9" pipe) as per type estimate IV attached to the estimate of sluices in Illuppadi channel	..	..	50
Carried over			1,730

8,935

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
MANNARGUDI CHANNEL—cont.					
C. WORKS—cont.					
Estimate No. 226-V—cont.					
Pipe sluices in Mannargudi Channel—cont.					
Brought forward .. 1,730					
	Sluice right bank at 7 miles 4,620' (8" pipe) as per type estimate IV attached to the estimate of sluices in Illupadi channel ..	..	..	50	
	Sluice left bank at 7 miles 4,620' (12" pipe) as per type estimate IV attached to the estimate of sluices in Illupadi channel ..	..	..	65	
	Sluice right bank at 8 miles (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel ..	..	..	50	
	Sluice left bank at 8 miles 3,500' (12" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel ..	..	..	65	
	Total ..	..	..		1,900
	Total, C. Works ..	..	..		10,895

Type Estimate IX.

Earthenware pipe sluice without shutter for F.S.L. $2\frac{1}{2}'$ and $2\frac{3}{4}'$ with clear overfall.

1.65 units.	Platform moulded brick in chunam ..	21 8 0	170 c. ft.	35	
No. 1	Cuddapah slab for the vent stone, 2" thick ..	..	..	1	
	1' 6" X 1' 3" with circular vent, 8" dr. ..	Lump sum.		8	
1.15	Plastering with Portland cement, $\frac{3}{4}"$..	6 12 0	100 sq. ft.	24	
No. 10	Earthenware pipes, 2' long, 9" dr. ..	2 6 3	Pipe	5	
	Earthwork, excavating foundations ..	Lump sum.		4	
	Contingencies ..	..	..	3	
	Petty supervision ..	..	..		80
	Total ..	..	..		
	Sluice with pipe.		Cost without shutter.		
	6" dr. ..	..	..	75	
	9" dr. ..	..	..	80	
	12" dr. ..	..	..	100	
	15" dr. ..	..	..	130	

L. EARTHWORK.

Estimate No. 221-V.

Excavating Mannargudi Channel.

8,866 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards ..	3 12 0	100 c. ft.	12,623	
	Contingencies ..	..	..	630	
	Petty supervision ..	..	..	377	
	Total ..	..	..		13,630
	Total, L. Earthwork ..	..	..		13,630

O. MISCELLANEOUS.

Estimate No. 222-V.

Fixing demarcation stones on Mannargudi Channel.

No. 277	Revenue survey stones including cartage to site and fixing in earth ..	0 8 0	Each.	139	
	Contingencies ..	..	..	11	
	Total ..	..	..		150

Estimate No. 223-V.

Fixing mile and furlong stones along Mannargudi Channel.

No. 8	Mile stones ..	3 2 0	Each.	25	
No. 61	Furlong stones ..	2 2 0	..	130	
	Total ..	..	..		155
	Total, O. Miscellaneous ..	..	..		305

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
MANNARGUDI CHANNEL—cont.					
P. MAINTENANCE.					
Estimate No. 224-V.					
Maintenance of Mannargudi Channel.					
8.66 miles.	Maintenance during execution ..	100	Mile.	866	
	Total ..	..	..		865
	Total, P. Maintenance ..	..	..		865

MANNARGUDI No. 1 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 225-V.

Preliminary expenses for Mannargudi No. 1 Channel.

200 acres.	Cost of preliminary surveys ..	0 6 0	Acre.	75	
38 mile.	Laying out before execution ..	10 0 0	Mile.	4	
	Contingencies ..	..	..	1	
	Total ..	..	..		80
	Total, A. Preliminary Expenses ..	..	..		80

B. LAND.

Estimate No. 226-V.

Compensation for land for Mannargudi No. 1 Channel.

0.78 acres.	Vaduvur Tenpathi village ..	300	Acre.	231	
	Compensation for earth ..	..	..	15	
	Add 15 per cent for compulsory acquisition ..	..	..	36	
	Total ..	..	..		285
	Total, B. Land ..	..	..		285

C. WORKS.

Estimate No. 227-V.

2-ft. drop and bridge at 0 mile 792 feet in Mannargudi No. 1 Channel.

5.50 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	116	
10.30 "	Brickwork in mortar ..	21 8 0	100 "	222	
1.00 "	Archwork brick in mortar ..	22 8 0	100 "	23	
0.50 "	Horizontal archwork in surki mortar ..	24 0 0	100 "	12	
1.40 "	Brick on end, 9" ..	13 8 0	100 sq. ft.	19	
0.60 "	Brick jelly backing ..	10 8 0	100 c. ft.	6	
0.02 "	Cuddapah slab ..	30 0 0	100 sq. ft.	1	
9.90 "	Plastering with Portland cement, $\frac{3}{4}"$ thick ..	6 12 0	100 "	67	
No. 8	Wheel guard stones, 8" diameter and 3' high ..	3 0 0	Each.	24	
	Earthwork, excavation forming approaches, etc. ..	Lump sum.		71	
	Shed for materials ..	..	..	10	
	Total ..	..	..		571
	Contingencies ..	..	..		28
	Petty supervision ..	..	..		11
	Total ..	..	..		610

Estimate No. 228-V.

Pipe sluice in Mannargudi No. 1 Channel.

	Sluice at head (9" pipe) as per type estimate III attached to the estimate of sluices in Puthur channel ..	..	..	90	
	Sluice right bank at head (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	..	..	40	
	Sluice left bank at head (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	..	..	40	
	Total ..	..	..		170
	Total, C. Works ..	..	..		780

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MANNARGUDI No. 1 CHANNEL—cont.

L. EARTHWORK.

Estimate No. 229-V.

Excavating Mannargudi No. 1 Channel.

24 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards.	3 12 0	1,000 c. ft.	90	
	Contingencies	..	..	5	
	Petty supervision	..	..	5	
	Total	..	..	..	100
	Total, L. Earthwork	..	..	..	100

O. MISCELLANEOUS.

Estimate No. 230-V.

Fixing demarcation stones on Mannargudi No. 1 Channel.

No. 12	Revenue survey stones including cartage to site and fixing in earth.	0 8 0	Each.	6	
	Contingencies	..	..	4	
	Total	..	..	..	10

Estimate No. 231-V.

Fixing mile and furlong stones along Mannargudi No. 1 Channel.

No. 3	Furlong stones	2 2 0	Each.	6	
	Total	..	..	..	Say 5
	Total, O. Miscellaneous	..	..	..	15

P. MAINTENANCE.

Estimate No. 232-V.

Maintenance of Mannargudi No. 1 Channel.

38 mile.	Maintenance during execution	25 0 0	Mile.	10	
	Total	..	..	..	10
	Total, P. Maintenance	..	..	..	10

MANNARGUDI No. 2 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 233-V.

Preliminary expenses for Mannargudi No. 2 Channel.

248 acres.	Cost of preliminary surveys	0 6 0	Acre.	92	
56 mile.	Laying out before execution	10 0 0	Mile.	6	
	Contingencies	..	..	2	
	Total	..	..	..	100
	Total, A. Preliminary Expenses	..	..	..	100

B. LAND.

Estimate No. 234-V.

Compensation for land for Mannargudi No. 2 Channel.

21 acre.	Vaduvur Tenpathi village	300 0 0	Acre.	63	
	Edyankottai Meliyur	225 0 0	..	113	
	Add 15 per cent for compulsory acquisition	..	..	24	
	Total	..	..	..	200
	Total, B. Land	..	..	..	200

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MANNARGUDI No. 2 CHANNEL—cont.

C. WORKS.

Estimate No. 235-V.

Pipe sluices in Mannargudi No. 2 Channel.

	Head (pipe) sluice at 200' (12" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel	..	..	80	
	Add for 8' extra length of tunnel	4 2 0	1 pipe	17	
	Total	..	..	97 or say	100
	Total, C. Works	..	..	..	100

L. EARTHWORK.

Estimate No. 236-V.

Excavating Mannargudi No. 2 Channel.

16 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards	3 12 0	1,000 c. ft.	60	
	Contingencies	..	..	3	
	Petty supervision	..	..	2	
	Total	..	..	..	65
	Total, L. Earthwork	..	..	..	65

O. MISCELLANEOUS.

Estimate No. 237-V.

Fixing demarcation stones on the Mannargudi No. 2 Channel.

No. 18	Revenue survey stones including cartage to site and fixing in earth	0 8 0	Each.	9	
	Contingencies	..	..	1	
	Total	..	..	..	10

Estimate No. 238-V.

Fixing mile and furlong stones along Mannargudi No. 2 Channel.

No. 4.	Furlong stones	2 2 0	Each.	9	
	Total	..	..	..	Say 10
	Total, O. Miscellaneous	..	..	..	20

P. MAINTENANCE.

Estimate No. 239-V.

Maintenance of Mannargudi No. 2 Channel.

56 mile.	Maintenance of Mannargudi channel during execution	25 0 0	Mile.	14	
	Contingencies	..	..	1	
	Total	..	..	..	15
	Total, P. Maintenance	..	..	..	15

MANNARGUDI No. 3 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 240-V.

Preliminary expenses for Mannargudi No. 3 Channel.

120 acres.	Cost of preliminary surveys	0 6 0	Acre.	45	
38 mile.	Laying out before execution	10 0 0	Mile.	4	
	Contingencies	..	..	1	
	Total	..	..	..	50
	Total, A. Preliminary Expenses	..	..	..	50

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MANNARGUDI No. 3 CHANNEL—cont.

B. LAND.

Estimate No. 241-V.

Compensation for land for Mannargudi No. 3 Channel.

0.69 acres.	Vaduvur Tenpathi	300 0 0	Acre.	207	
0.17 "	Edayankottai Melaiyur	225 0 0	"	38	
	Compensation for earth	..	..	20	
	Add 15 per cent for compulsory acquisition	..	..	35	
	Total	..	..	..	30
	Total, B. Land	..	..	..	30

C. WORKS.

Estimate No. 242-V.

6-ft. Syphon well drop at 790 feet in Mannargudi No. 3 Channel.

1.20 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	25	
2.40 "	Brick work in surki mortar	23 0 0	"	55	
0.55 "	Caddapah slab, 2" thick	30 0 0	100 sq. ft.	17	
2.38 "	Cutstone work	2 8 0	C. ft.	6	
3.00 "	Brick on end, 9"	13 8 0	100 sq. ft.	41	
1.25 "	Brick jelly backing	10 8 0	100 c. ft.	13	
2.30 "	Plastering with Portland cement, $\frac{3}{4}$ " thick (1 cement : 3 sand)	6 12 0	100 sq. ft.	16	
43 R.F. or 22 pipes.	Stoneware pipe, 9" diameter, including cartage and fixing	2 6 0	Pipe 2' long.	52	
	Earthwork, excavation and forming banks, etc.	Lump sum.	..	7	
	Sheds for materials	..	..	8	
	Total	..	..	240	
	Contingencies	..	..	13	
	Petty supervision	..	..	7	
	Total	..	..	..	26

Estimate No. 243-V.

Pipe sluice in Mannargudi No. 3 Channel.

	Sluice at head (12" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel	..	..	80	
	Do. at head (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	40	
	Total	..	..	..	12
	Total, C. Works	..	..	..	38

L. EARTHWORK.

Estimate No. 244-V.

Excavating Mannargudi No. 3 Channel.

37 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards	3 12 0	1,000 c. ft.	139	
	Contingencies	..	..	7	
	Petty supervision	..	..	4	
	Total	..	..	..	15
	Total, L. Earthwork	..	..	..	15

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MANNARGUDI No. 3 CHANNEL—cont.

O. MISCELLANEOUS.

Estimate No. 245-V.

Fixing demarcation stones on Mannargudi No. 3 Channel.

No. 12	Revenue survey stones including cartage to site and fixing.	0 8 0	Each.	6	
	Contingencies	..	..	4	
	Total	..	..	..	10

Estimate No. 246-V.

Fixing mile and furlong stones along Mannargudi No. 3 Channel.

No. 3	Furlong stones	2 2 0	Each.	6	
	Total	..	..	..	Say 5
	Total, O. Miscellaneous	..	..	..	15

P. MAINTENANCE.

Estimate No. 247-V.

Maintenance of Mannargudi No. 3 Channel.

38 mile.	Maintenance during execution	25 0 0	Mile.	10	
	Total	..	..	..	10
	Total, P. Maintenance	..	..	..	10

MANNARGUDI No. 4 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 248-V.

Preliminary expenses for Mannargudi No. 4 Channel.

228 acres.	Cost of preliminary survey	0 6 0	Acre.	86	
31 mile.	Laying out before execution	10 0 0	Mile.	3	
	Contingencies	..	..	1	
	Total	..	..	..	90
	Total, A. Preliminary Expenses	..	..	..	90

B. LAND.

Estimate No. 249-V.

Compensation for land for Mannargudi No. 4 Channel.

0.38 acres.	Serumangalam village	300 0 0	Acre.	114	
1.23 acres.	Vaduvur-Tenpadi village	300 0 0	"	369	
	Add 15 per cent for compulsory acquisition	..	..	77	
	Total	..	..	..	560
	Total, B. Land	..	..	..	560

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MANNARGUDI No. 4 CHANNEL—cont.

C. WORKS.

Estimate No. 250-V.

Pipe sluice in Mannargudi No. 4 Channel.

Pipe sluice at 330 feet (12" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel.	..	..	80	
Add for 8 feet extra length of tunnel..	4 2 0	One pipe.	17	
Total ..	..	..	97	
Or say ..	..	..	..	100
Total, C. Works ..	..	..	..	100

L. EARTHWORK.

Estimate No. 251-V.

Excavating Mannargudi No. 4 Channel.

31 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards.	3 12 0	1,000 c. ft.	116	
	Contingencies	..	..	6	
	Petty supervision	..	..	3	
	Total ..	..	..	..	125
	Total, L. Earthwork ..	..	..	..	125

O. MISCELLANEOUS.

Estimate No. 252-V.

Fixing demarcation stones on Mannargudi No. 4 Channel.

No. 10	Revenue survey stones including cartage to site and fixing in earth.	0 8 0	Each.	5	
	Contingencies	..	..	..	
	Total ..	..	..	..	5

Estimate No. 253-V.

Fixing mile and furlong stones along Mannargudi No. 4 Channel.

No. 2	Furlong stones	2 2 0	Each.	4	
	Total ..	..	..	..	Say 5
	Total, O. Miscellaneous ..	..	..	..	10

P. MAINTENANCE.

Estimate No. 254-V.

Maintenance of Mannargudi No. 4 Channel.

31 mile.	Maintenance during execution	25 0 0	Mile.	8	
	Total, say ..	..	..	..	10
	Total, P. Maintenance ..	..	..	..	10

MANNARGUDI No. 5 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 255-V.

Preliminary expenses for Mannargudi No. 5 Channel.

288 acres.	Cost of preliminary surveys	0 6 0	Acre.	108	
69 mile.	Laying out before execution	10 0 0	Mile.	7	
	Contingencies	..	..	5	
	Total ..	..	..	..	120
	Total, A. Preliminary Expenses ..	..	..	..	120

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MANNARGUDI No. 5 CHANNEL—cont.

B. LAND.

Estimate No. 256-V.

Compensation for land for Mannargudi No. 5 Channel.

1.26 acres.	Serumangalam village	300 0 0	Acre.	378	
2.43 "	Edayankottai Kilayur	225 0 0	"	547	
	Compensation for earth	..	..	10	
	Add 15 per cent for compulsory acquisition ..	..	..	140	
	Total ..	..	..	..	1,075
	Total, B. Land ..	..	..	..	1,075

C. WORKS.

Estimate No. 257-V.

4-ft. drop at 2,640 in Mannargudi No. 5 Channel.

	As per type estimate attached to the estimate for the 4' drop at 1 mile 4,623 feet of Puthur No. 3 channel.	..	..	320	
	Add for 17 pipes 9" diameter	2 6 0	One pipe.	40	
	Total ..	..	..	360	
	Deduct for 17 pipes 12" diameter provided in the estimate.	4 2 0	One pipe.	70	
	Net Total ..	..	..	..	290

Estimate No. 258-V.

Pipe sluices in Mannargudi No. 5 Channel.

	Head (pipe) sluice at 330' (12" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel.	..	..	80	
	Add for 8' extra length of tunnel	4 2 0	One pipe.	17	
	Total ..	..	..	97	
	Or say ..	..	..	..	100
	Sluice R.B. at 2,640' (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel.	..	..	40	
	Do. L.B. at 2,640' (12" pipe) as per type estimate V attached to the estimate of sluices in Puthur No. 3 channel.	..	..	75	
	Total ..	..	..	115	
	Total ..	..	..	..	215
	Total, C. Works ..	..	..	..	505

L. EARTHWORK.

Estimate No. 259-V.

Excavating Mannargudi No. 5 Channel.

69 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards.	3 12 0	1,000 c. ft.	221	
	Contingencies	..	..	11	
	Petty supervision	..	..	8	
	Total ..	..	..	..	240
	Total, L. Earthwork ..	..	..	..	240

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MANNARGUDI No. 5 CHANNEL—cont.

O. MISCELLANEOUS.

Estimate No. 260-V.

Fixing demarcation stones in Mannargudi No. 5 Channel.

No. 22	Revenue survey stones including cartage to site and fixing in earth.	0 8 0	Each.	11	
	Contingencies	..	..	4	
	Total	..	..	..	15

Estimate No. 261-V.

Fixing mile and furlong stones along Mannargudi No. 5 Channel.

No. 5	Furlong stones	2 2 0	Each.	11	
	Total	..	..	Say	10
	Total, O. Miscellaneous	..	..	..	25

P. MAINTENANCE.

Estimate No. 262-V.

Maintenance of Mannargudi No. 5 Channel.

69 mile.	Maintenance during execution	25 0 0	Mile.	17	
	Total	..	..	.. say	20
	Total, P. Maintenance	..	..	..	20

A. PRELIMINARY EXPENSES.

Estimate No. 263-V.

Preliminary expenses for Mannargudi No. 5 Channel.

417 acres.	Cost of preliminary surveys	0 6 0	Acre.	156	
1-008 miles.	Laying out before execution	10 0 0	Mile.	10	
	Contingencies	..	..	4	
	Total	..	..	..	170
	Total, A. Preliminary Expenses	..	..	..	170

B. LAND.

Estimate No. 264-V.

Compensation for land for Mannargudi No. 6 Channel.

1-46 acres.	Gopralayam village	150 0 0	Acre.	219 0 0	
4-02 "	Assahan village	150 0 0	"	603 0 0	
	Compensation for earth	..	..	100 0 0	
	Add 15 per cent for compulsory acquisition	..	..	128 0 0	
	Total	..	..	..	1,050
	Total, B. Land	..	..	..	1,050

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.

MANNARGUDI No. 6 CHANNEL—cont.

C. WORKS.

Estimate No. 265-V.

"B" Class masonry bridge of 4 feet span at 1,420 feet in Mannargudi No. 6 Channel.

	As per type estimate below	..	..	620 0 0	
	Add for forming approaches, etc.	..	..	30 0 0	
	Total	..	..	..	650
	<i>Culvert of 4 ft. span with 14 roadway, Type setraate.</i>				
7-8 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	153 0 0	
10-4 "	Platform moulded brickwork in chunam	21 8 0	100 "	224 0 0	
1-55 "	Do. archwork in chunam	22 8 0	100 "	35 0 0	
	Centering for the archwork	..	..	12 0 0	
8-6 "	Plastering with Portland cement $\frac{3}{4}$ (one cement and three sand)	6 12 0	100 sq. ft.	58 0 0	
55 r. ft.	Cornice work including plastering with Portland cement $\frac{3}{4}$ thick	0 4 0	R. ft.	14 0 0	
1-7 units.	Brick on end 9"	13 8 0	100 sq. ft.	23 0 0	
0-9 "	Brick jelly backing, 6"	10 8 0	100 c. ft.	9 0 0	
	Earthwork excavating foundations and filling in	..	..	10 0 0	
	Lump sum.	..	..	10 0 0	
No. 8.	Shed for materials	..	..	10 0 0	
	Gu rd stones 9" diameter 3" high	3 0 0	Each.	24 0 0	
	Total	..	..	572 0 0	
	Contingencies	..	..	30 0 0	
	Petty supervision	..	..	18 0 0	
	Total	..	..	620 0 0	
	<i>Culvert with 10' roadway with 6" concrete over the arch.</i>				
	Deduct for cost of 4 r. ft. at Rs. 13 (vide separate detailed estimate, Rs. 572-52)	..	..	520 0 0	
	Contingencies	..	..	25 0 0	
	Petty supervision	..	..	15 0 0	
	Total for 10-ft. roadway	..	..	560 0 0	
	<i>Culvert of 4' span (1 r. ft.)</i>				
22 c. ft.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	4 9 11	
23 "	Platform moulded brick in chunam	21 8 0	100 "	4 15 1	
9 "	Do. archwork	22 8 0	100 "	2 0 0	
	Centering for the archwork	..	..	0 11 6	
10 sq. ft.	Plastering with portland cement $\frac{3}{4}$ (one cement and three sand)	6 12 0	100 sq. ft.	0 10 10	
	Total per r. ft.	..	..	12 15 4	
	or say	..	..	13 0 0	

Estimate No. 266-V.

3-ft. drop and bridge at 3,430 feet in Mannargudi No. 6 Channel.

6-6 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	137	
10-73 "	Platform moulded brickwork in mortar	21 8 0	100 "	230	
0-08 "	Horizontal archwork brick in surki mortar	24 0 0	100 "	19	
1-2 "	Semi-circular archwork brick in mortar	22 8 0	100 "	27	
	Centering charges	..	..	10	
1-6 "	Brick on end 9"	13 8 0	100 sq. ft.	22	
7-75 "	Brick jelly backing, 6"	10 8 0	100 c. ft.	8	
8 "	Plastering with Portland cement $\frac{3}{4}$ thick (one cement and three sand)	6 12 0	100 sq. ft.	47	
4 sq. ft.	Cuddapah slab, 2" thick	30 0 0	100 "	1	
No. 4.	Guard stones, 3 ft. long 9" diameter	3 0 0	Each.	24	
	Earthwork, excavating foundations, forming approaches, etc.	..	..	Lump sum	20
	Shed for materials	..	..	..	10
	Contingencies	..	..	..	30
	Petty supervision	..	..	..	15
	Total	..	..	..	600
	Carried over	..	..	..	1,250

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.

MANNARGUDI No. 6 CHANNEL—cont.

Brought forward .. 1,25

C. WORKS—cont.

Estimate No. 267-V.

2-ft. drop and bridge at 1 mile 40 feet in Mannargudi No. 6 Channel.

Same as for the 2" drop and bridge at 1,716 ft. in Palaiyur No. 2 channel	..	..	505	
Total	..	..	..	505

Estimate No. 268-V.

Pipe sluices in Mannargudi No. 6 Channel.

Head (pipe) sluice at head (18" pipe) as per type estimate VIII attached to the estimate of sluices in Juppadi channel	..	..	110	
Head (pipe) sluice right bank at 2,640' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	50	
Head (pipe) sluice left bank at 2,640' (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	40	
Head (pipe) sluice right bank at 3,960' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	50	
Head (pipe) sluice left bank at 3,960' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	50	
Total	..	..	..	300
Total, C. Works	..	..	..	2,055

L. EARTHWORK.

Estimate No. 269-V.

Excavating Mannargudi No. 6 Channel.

224 units. Excavating the channel with a lead of 20 yards and a lift of 2 yards	3 12 0	1,000 c. ft.	840	
Contingencies	..	..	42	
Petty supervision	..	..	28	
Total	..	..	..	910
Total, L. Earthwork	..	..	..	910

O. MISCELLANEOUS.

Estimate No. 279-V.

Fixing demarcation stones on Mannargudi No. 6 Channel.

No. 32 Revenue survey stones including cartage to site and fixing in earth	0 8 0	Each.	16	
Contingencies	..	..	4	
Total	..	..	..	20

Estimate No. 271-V.

Fixing mile and furlong stones along Mannargudi No. 6 Channel.

No. 1 Mile stone	3 2 0	Each.	15	
No. 2 Furlong stones	2 2 0	..	..	
Total	..	..	18 or	20
Total, O. Miscellaneous	..	..	..	40

VADAVAR SYSTEM—DISTRIBUTARIES—cont

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MANNARGUDI No. 6 CHANNEL—cont.

P. MAINTENANCE.

Estimate No. 272-V.

Maintenance of Mannargudi No. 6 Channel.

1,008 Maintenance during execution	25 0 0	Mile.	25	..
Total, P. Maintenance	..	..	..	25

MANNARGUDI No. 7 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 273-V.

Preliminary Expenses for Mannargudi No. 7 Channel.

979 acres. Cost of preliminary surveys	0 6 0	Acre.	367	..
1.41 miles. Laying out before execution	10 0 0	Mile.	14	..
Contingencies	..	..	4	..
Total	..	..	..	385
Total, A. Preliminary Expenses	..	..	..	385

B. LAND.

Estimate No. 274-V.

Compensation for land for Mannargudi No. 7 Channel.

396 acres. Gopalayam village	150 0 0	Acre.	594	
4.11 Aseham village	150 0 0	..	617	
Compensation for earth	..	..	100	
Add 15 per cent for compulsory acquisition	..	..	189	
Total	..	..	..	1,500
Total, B. Land	..	..	..	1,500

C. WORKS.

Estimate No. 275-V.

4-ft. drop and bridge at 1,320 feet in Mannargudi No. 7 Channel.

As per type estimate attached to the estimate for the 4' drop at 1 mile 2,706 feet of Muva-nallur No. 2 channel. Add for 5' extra length of tunnel	4 8 0	1 foot.	500	23
Total	..	..	523	or say 525

Estimate No. 276-V.

"B" Class masonry bridge of 4-ft. span at 1 mile 2,110 feet in Mannargudi No. 7 Channel.

As per type estimate attached to the estimate for the bridge at 1,420 feet of Mannargudi, No. 6 channel. Add for forming approaches, etc.	..	..	620	20
Total	..	..	..	640
Carried over	..	..	..	1,165

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MANNARGUDI No. 7 CHANNEL—cont.

C. WORKS—cont.

Estimate No. 277-V.

Brought forward 1,165

Pipe sluices in Mannargudi No. 7 Channel.

Sluice, L.B. at head (6" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel.	..	..	40	
Do. R.B. at head (15" pipe) as per type estimate VIII attached to the estimate of sluices in Ilupadi channel.	..	..	90	
Do. R.B. at 3,100' (12" pipe) as per type estimate V attached to the estimate of sluices in the Puthur channel.	..	..	60	
Do. L.B. at 3,100' (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel.	..	..	40	
Do. R.B. at 4,750' (12" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel.	..	..	60	
Do. L.B. at 4,750' (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel.	..	..	50	
Total ..	..	..	..	340
Total, C. Works ..	..	..	..	1,505

L. EARTHWORK.

Estimate No. 278-V.

Excavating Mannargudi No. 7 Channel.

243 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards	3 12 0	1,000 c. ft.	911	
	Contingent charges	..	..	45	
	Petty supervision	..	..	24	
	Total ..	..	..	..	980
	Total, L. Earthwork ..	..	..	..	980

O. MISCELLANEOUS.

Estimate No. 279-V.

Fixing demarcation stones on Mannargudi No. 7 Channel.

No. 45	Revenue survey stones including cartage to site and fixing in earth	0 8 0	Each.	23	
	Contingencies	..	..	2	
	Total ..	..	..	..	25

Estimate No. 280-V.

Fixing mile and furlong stones along Mannargudi No. 7 Channel.

No. 1	Mile stone	3 2 0	Each.	3	
10	Furlong stones	2 2 0	..	21	
	Total ..	..	..	24 or	25
	Total, O. Miscellaneous ..	..	..	..	50

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MANNARGUDI No. 7 CHANNEL—cont.

P. MAINTENANCE.

Estimate No. 281-V.

Maintenance of Mannargudi No. 7 Channel.

1.41 miles.	Maintenance during execution	25 0 0	Mile.	35	
	Total ..	..	..	..	35
	Total, P. Maintenance ..	..	..	..	35

VADAVAR No. 1 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 282-V.

Preliminary Expenses for Vadavar No. 1 Channel.

3,310 acres.	Cost of preliminary surveys	0 6 0	Acre	1,241	
7.31 miles.	Laying out before execution	40 0 0	Mile.	292	
	Contingencies	..	..	17	
	Total ..	..	..	..	1,550
	Total, A. Preliminary Expenses ..	..	..	..	1,550

B. LAND.

Estimate No. 283-V.

Compensation for land for Vadavar No. 1 Channel.

5.07 acres.	Paraiyur village	300 0 0	Acre.	1,521	
11.54 "	Sirumangalam village	300 0 0	"	3,462	
6.44 "	Muvanalur inam	150 0 0	"	816	
17.38 "	Neduvakotta village	150 0 0	"	2,607	
15.90 "	Panganadu village	150 0 0	"	2,385	
0.21 acre.	Aasham village	150 0 0	"	32	
	Total ..	..	..	10,823	
	Compensation for earth	..	..	1,000	
	Add 15 per cent for compulsory acquisition ..	..	..	1,627	
	Total ..	..	..	..	13,450
	Total, B. Land ..	..	..	..	13,450

C. WORKS.

Estimate No. 284-V.

Head sluice for the Vadavar No. 1 Channel.

9.50 units.	Concrete broken brick in surki mortar	21 0 0	100 c.ft.	200	
10.60 "	Platform moulded brick in mortar	21 8 0	100 "	225	
1.45 "	Archwork platform-moulded brick in mortar ..	22 8 0	100 "	33	
	Centring charges	..	..	12	
4.50 "	Brick on end 9"	13 8 0	100 sq. ft.	61	
1.85 "	Brick jelly-backing	10 8 0	100 c.ft.	20	
8 c.ft.	Cutstone work	2 8 0	C.ft.	20	
7.90 "	Plastering with portland cement, 3" thick ..	6 12 0	100 sq. ft.	53	
4 c.ft.	Teakwood wrought and put up	4 0 0	C.ft.	16	
No. 1	Teakwood shutter; 6' 10" X 2' 6" with screw-gearing shutter arrangements.	..	Lump sum.	110	
	Conveyance and fitting charges	..	..	10	
	Shed for materials	..	..	12	
	Earthwork excavation, etc.	..	..	8	
	Total ..	..	..	763	
	Contingencies	..	..	35	
	Petty supervision	..	..	22	
	Total ..	..	..	..	820
	Carried over ..	..	..	..	820

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
VADAVAR No. 1 CHANNEL—cont.					
C. WORKS—cont.					
Estimate No. 285-V.					
Outlet, 71' 0" at 0 mile 1,452 feet in Vadavar No. 1 Channel.					
71 r. ft.	Cost of body wall and 10' apron as per type estimate attached to the estimate for the outlet at 5 miles 3,300 feet of Mannargudi channel ..	4 6 0	R. ft.	311 0 0	
	Cost of stepped portion of body wall at ends and brick on end wings excluding contingencies and petty supervision ..	..	..	80 0 0	
	Total ..	..	..	391 0 0	
	Shed for materials ..	..	..	10 0 0	
	Contingencies ..	..	..	19 0 0	
	Petty supervision ..	..	..	10 0 0	
	Total ..	..	..	..	430
Estimate No. 286-V.					
Outlet, 52' 0" at 1 mile 1,782 feet in Vadavar No. 1 Channel.					
52 r. ft.	Cost of body wall and 10' of brick on end apron as per type estimate attached to the estimate for the outlet at 5 miles 3,300 feet of Mannargudi channel ..	4 6 0	R. ft.	228 0 0	
	Cost of stepped portion of body wall at ends and brick on end wings excluding contingencies and petty supervision ..	..	..	80 0 0	
	Total ..	..	..	308 0 0	
	Shed for materials ..	..	..	10 0 0	
	Contingencies ..	..	..	14 0 0	
	Petty supervision ..	..	..	8 0 0	
	Total ..	..	..	..	340
Estimate No. 287-V.					
4-ft. drop at 1 mile 3,366 feet in Vadavar No. 1 Channel.					
	As per type estimate below ..	..	..	910 0 0	
	Deduct for 2' width of apron in front and rear = $2 \times 7\frac{1}{2} \times 2 = 30$ sq. ft. of brick on end at Rs. 13-8-0 per 100 sq. ft. ..	..	..	4 0 0	
	Total ..	..	..	906 0 0 or	910
4 ft. syphon well drop to discharge 50 cusecs, type No. 84.					
6-80 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c.ft.	143 0 0	
9-30 "	Platform-moulded brickwork in surki mortar ..	23 0 0	100 "	214 0 0	
2-90 "	Archwork (brick in surki mortar) ..	24 0 0	100 "	70 0 0	
	Centring for arches ..	..	..	24 0 0	
3-10 "	Brick jelly-backing ..	10 8 0	100 c.ft.	33 0 0	
19 c.ft.	Cutstone work ..	2 8 0	C.ft.	48 0 0	
11-3 "	Cuddapah slabs flooring, 2" thick ..	30 0 0	100 sq. ft.	33 0 0	
9-2 "	Plastering with portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 "	77 0 0	
	Brick on end, 9" thick, for apron and revetment ..	13 8 0	100 "	124 0 0	
	Earthwork excavating foundations and forming banks ..	..	..	Lump sum.	50 0 0
	Clay puddle work ..	..	..	..	10 0 0
	Shed for materials ..	..	..	..	12 0 0
	Total ..	..	..	838 0 0	
	Contingencies ..	..	..	46 0 0	
	Petty supervision ..	..	..	26 0 0	
	Total ..	..	..	910 0 0	
Type plan No. 84.					
0-09 unit.	Concrete broken brick in surki mortar ..	21 0 0	100 c.ft.	1 14 3	
0-06 "	Platform-moulded brick in surki mortar ..	23 0 0	100 "	1 6 1	
0-07 "	Archwork do. do. ..	24 0 0	100 "	1 10 11	
	Centring for the arch ..	..	..	Lump sum.	0 8 11
0-13 "	Plastering with Portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	0 14 0	
	Total ..	..	..	6 6 2	
	Carried over ..	..	..	or 6 6 0	2,500

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS. A. P.
VADAVAR No. 1 CHANNEL—cont.					
C. WORKS—cont.					
Estimate No. 288-V.					
2-ft. drop at 2 miles 2,970 feet in Vadavar No. 1 Channel.					
	As per type estimate below ..	..	..	620 0 0	
	Deduct for 3' width of channel ..	15 5 0	1 ft.	46 0 0	
	Total ..	..	..	574 0 0 or	570 0 0
2-ft. open full to discharge 50 cusecs (Plan No. 171).					
3-60 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c.ft.	97 0 0	
5-00 "	Brickwork in mortar ..	21 8 0	100 "	108 0 0	
3-30 "	Plastering with Portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	22 0 0	
2-50 "	Brick on end 9" ..	13 8 0	100 "	34 0 0	
11-10 "	Concrete blocks for revetment and apron ..	21 12 0	100 c.ft.	241 0 0	
3-40 "	Brick jelly-backing ..	10 8 0	100 "	36 0 0	
23 sq. ft.	Cuddapah slab, $\frac{3}{4}$ " thick ..	30 0 0	100 sq. ft.	7 0 0	
	Clay puddle work ..	..	..	Lump sum.	5 0 0
	Earth-work excavation ..	..	..	..	15 0 0
	Shed for materials ..	..	..	..	10 0 0
	Total ..	..	..	575 0 0	
	Contingencies ..	..	..	28 0 0	
	Petty supervision ..	..	..	17 0 0	
	Total ..	..	..	620 0 0	
Estimate for 1' width of channel in 2' open fall of type plan No. 171.					
0-23 unit.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	4 13 3	
0-17 "	Platform-moulded brick in mortar ..	21 8 0	100 "	3 10 6	
0-08 "	Brick on end 9" ..	13 5 0	100 sq. ft.	1 1 3	
0-20 "	Concrete blocks, 12" thick ..	21 12 0	100 c. ft.	4 5 7	
0-21 "	Plastering with Portland cement $\frac{3}{4}$ " (1 cement 3 sand). ..	6 12 0	100 sq. ft.	1 6 8	
	Total ..	..	..	16 5 3	
	or say	..	..	15 5 0	
Estimate No. 289-V.					
2-ft. drop at 3 miles 66 feet in Vadavar No. 1 Channel.					
	As per type estimate attached to the estimate for the 2' drop at 6 miles 1,518 feet of Puthur channel.	..	..	320 0 0	
	Add for half a foot width channel ..	11 6 0	1 ft.	6 0 0	
	Total ..	..	..	326 or say 330	
Estimate No. 290-V.					
"B" class masonry bridge of 8-ft. span at 4 miles 2,607 feet in Vadavar No. 1 Channel.					
	As per type estimate attached to the estimate for the bridge at 0 mile 5,214 feet of Puthur No. 3 channel.	..	..	720 0 0	
	Add for forming approaches, etc. ..	..	..	220 0 0	
	Total ..	..	..	940 0 0	
	Carried over ..	..	..	4,340 0 0	

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR No. 1 CHANNEL—cont.					
C. WORKS—cont. Brought forward .. 4,84					
Estimate No. 291-V.					
Regulator and bridge at 5 miles 1,815 feet in Vadavar No. 1 Channel.					
7.5 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c.ft.	158	
11.2 "	Platform-moulded brick in mortar ..	21 8 0	100 "	241	
1.7 "	Segmental archwork brick in mortar ..	22 8 0	100 "	38	
	Centring charges for archwork ..		Lump sum.	14	
8.00 "	Plastering with Portland cement, 2" thick ..	6 12 0	100 sq. ft.	54	
1.9 "	Brick on end, 9" ..	13 8 0	100 "	26	
0.75 "	Brick jelly-backing, 6" ..	10 8 0	100 c.ft.	8	
No. 8.	Guard stones, 3' long 9" diameter ..	3 0 0	Each.	24	
	Earth-work, excavating foundations and forming banks, approaches, etc. ..		Lump sum.	25	
	Shed for materials ..		"	10	
	Total ..			598	
	Contingencies ..			33	
	Petty supervision ..			19	
	Total ..				65

Estimate No. 292-V.

4-ft. drop at 6 miles 957 in Vadavar No. 1 Channel.

As per type estimate attached to the estimate for the 4' drop at 1 mile 2,706 feet of Muvanallur No. 2 channel.	..	..	500	
Deduct for 1½' width of apron in front and rear = 2 × 1½ × 5½ or 15.6 sq. ft. of brick on end at Rs. 13-8-0 per 100 sq. ft.	..	..	2	
Total ..	..	..	498 or say	50

Estimate No. 293-V.

4-ft. drop and bridge at 6 miles 3,729 in Vadavar No. 1 Channel.

As per type estimate attached to the estimate for the 4' drop at 1 mile 4,620 feet of Puthur No. 3 channel.	..	..	320	
Deduct the cost of 17 pipes, 12" in diameter ..	4 2 0	Each.	70	
Net cost of the drop ..	..	..	250	
Add for 20 pipes, 6" in diameter, ..	1 5 0	Each.	26	
Total ..	..	..	276 or say	2

Estimate No. 294-V.

Pipe sluices in Vadavar No. 1 Channel.

Sluice left bank at 3,564 feet (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel.	..	..	50	
Sluice left bank at 4,422 feet (12" pipe) as per type estimate VIII attached to the estimate of sluices in Iluppadi channel.	..	..	70	
Sluice left bank at 1 mile 2,310 feet (12" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel.	..	..	65	
Sluice at 1 mile 3,366 feet (12" pipe) as per type estimate VIII attached to the estimate of sluices in Iluppadi channel.	..	..	70	
Sluice left bank at 2 miles 2,574 feet (12" pipe) as per type estimate VIII attached to the estimate of sluices in Iluppadi channel.	..	..	70	
Carried over ..			485	5.7

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR No. 1 CHANNEL—cont.					
C. WORKS—cont.					
Estimate No. 294-V—cont.					
Pipe sluices in Vadavar No. 1 Channel—cont.					
	Sluice right bank at 2 miles 2,970 feet (12" pipe) as per type estimate VIII attached to the estimate of sluices in Iluppadi channel.	..	..	70	
	Sluice left bank at 3 miles 66 feet (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel.	..	..	50	
	Sluice left bank at 3 miles 3,465 feet (6" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel.	..	..	40	
	Sluice right bank at 3 miles 3,465 feet (6" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel.	..	..	50	
	Sluice left bank at 3 miles 5,247 feet (12" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel.	..	..	65	
	Sluice right bank at 3 miles 5,247 feet (12" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel.	..	..	65	
	Sluice left bank at 4 miles 165 feet (15" pipe) as per type estimate VIII attached to the estimate of sluices in Iluppadi channel.	..	..	85	
	Sluice right bank at 4 miles 165 feet (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel.	..	..	50	
	Sluice right bank at 4 miles 5,115 feet (15" pipe) as per type estimate VIII attached to the estimate of sluices in Iluppadi channel.	..	..	85	
	Sluice left bank at 5 miles 1,815 feet (15" pipe) as per type estimate VIII attached to the estimate of sluices in Iluppadi channel.	..	..	85	
	Sluice left bank at 5 miles 5,247 feet (15" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel.	..	..	90	
	Sluice right bank at 5 miles 5,247 feet (15" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel.	..	..	105	
	Sluice right bank at 6 miles 3,729 feet (15" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel.	..	..	90	
	Sluice left bank at 6 miles 3,729 feet (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel.	..	..	50	
	Total ..	..	..	..	1,300
	Total, C. Works ..	..	..	..	7,070

L EARTHWORK.

Estimate No 295-V.

Excavating Vadavar No. 1 Channel.

Excavating the channel with a lead of 20 yards and a lift of 2 yards.	3 12 0	100 c. ft.	11,020	
Contingencies ..	..	..	550	
Petty supervision ..	..	..	330	
Total, L. Earthwork ..	..	..	11,900	

O. MISCELLANEOUS.

Estimate No. 296-V.

Fixing demarcation stones on Vadavar No. 1 Channel.

176 Berenne Survey stones including cartage to site and fixing in earth.	0 8 0	Each.	88	
Contingencies ..	..	..	2	
Total ..	..	..	90	
Carried over ..			90	

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 1 CHANNEL—cont.

O. MISCELLANEOUS—cont.

Brought forward .. 9

Estimate No. 297-V.

Fixing mile and furlong stones along Vadavar No. 1 Channel.

No. 7	Mile stones ..	3 2 0	Each.	22	
" 51	Furlong stones ..	2 2 0	"	108	
	Total ..				130
	Total, O. Miscellaneous ..				220

P. MAINTENANCE.

Estimate No. 298-V.

Maintenance of Vadavar No. 1 Channel.

7.31 miles.	Maintenance during execution ..	100 0 0	Mile.	731	
	Contingencies ..			9	
	Total, P. Maintenance ..				

VADAVAR EXTENSION CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 299-V.

Preliminary Expenses for Vadavar Extension Channel.

5,550 acres.	Cost of preliminary surveys ..	0 6 0	Acre.	2,081	
12.81 miles.	Laying out before execution ..	40 0 0	Mile.	512	
	Contingencies ..			22	
	Total ..				2,615
	Total, A. Preliminary Expenses ..				2,615

B. LAND.

Estimate No. 300-V.

Compensation for land for Vadavar Extension Channel.

18.71	Periyur village ..	300 0 0	Acre.	5,613	
14.98	Nemelli ..	150 0 0	"	2,247	
8.15	Serumangalam village ..	300 0 0	"	2,445	
8.62	Mahadevapatnam ..	200 0 0	"	1,724	
7.59	Pallakudi village ..	250 0 0	"	1,898	
21.35	Ullikottai ..	225 0 0	"	4,806	
25.29	Kandadampattu village ..	225 0 0	"	5,090	
17.91	Avikottai village ..	250 0 0	"	4,478	
10.76	Olayakunnam village ..	250 0 0	"	2,690	
4.90	Attivetti village ..	300 0 0	"	1,470	
	Compensation for earth ..			2,000	
	Add 15 per cent for compulsory acquisition ..			4,959	
	Total ..				40,020
	Total, B. Land ..				40,020

C. WORKS.

Estimate No. 301-V.

Head sluice to Vadavar Extension Channel.

29.8 units	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	626	
28.3 "	Platform moulded brick in mortar ..	21 8 0	100 "	608	
3.5 "	Archwork brick in mortar ..	22 8 0	100 "	79	
	Centering for arches ..		Lump sum.	30	
23 squares.	Plastering with Portland cement $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	155	
47 c. ft.	Cutstone work ..	2 8 0	C. ft.	118	
29.1 "	Concrete block work ..	21 12 0	100 c. ft.	633	
8.3 "	Brick jelly backing ..	10 8 0	"	87	
13.6 "	Teakwood wrought and put up ..	4 0 0	C. ft.	54	
No. 4	Teakwood shutter $4\frac{1}{2}$ by 3' by 2' with screw gear-	95 0 0	Each.	380	
	ing arrangement, etc., complete ..			32	
" 3	Railway charges and conveyance to workshop for				
	the shutters $\frac{1}{2}$ cost ..		Lump sum.	30	
	Earthwork, excavating foundations, etc. ..			40	
	Shed for materials ..			2,872	
	Total ..				144
	Contingencies ..				84
	Petty supervision ..				
	Total ..				3,100
	Carried over ..				3,100

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR EXTENSION CHANNEL—cont.

Brought forward .. 3,100

C. WORKS—cont.

Estimate No. 302-V.

"C" Class girder bridge of 36' span at 0 mile 4,554 feet, Vadavar Extension Channel.

	As per estimate for "C class" girder bridge—				
	36' span at 1 mile 2,508' ..				3,240
	Total ..				3,240

Estimate No. 303-V.

Girder Bridge 36' span 10' Roadway at 1 mile 2,508 feet, Vadavar Extension Channel.

12.90 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	271	
20.20 "	Platform moulded brick work in mortar ..	21 8 0	100 "	434	
3 c. ft.	Cutstone work ..	2 8 0	C. ft.	8	
69.64 cwt.	Roller steel beam ..	8 0 0	Cwt.	557	
39 r. ft.	Iron work including road metalling wheel guards, etc. ..	32 0 0	R. ft.	1,248	No data.
1.9 units.	Road metalling, complete ..	27 8 0	100 c. ft.	52	
No. 2	Stiffeners ..	22 12 0	No.	46	
9.00	Plastering with Portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	62	
No. 8	Guard stones ..	3 0 0	No.	24	
1.00	Brick on end, 9" ..	13 8 0	100 sq. ft.	68	
2.50	Brick jelly backing, 6" ..	10 8 0	100 c. ft.	28	
	Shed for materials ..			45	
	Earthwork excavation, forming approaches, etc. ..		Lump sum.	180	
	Total ..				3,021
	Contingencies ..				149
	Petty supervision ..				70
	Total ..				3,240

Estimate No. 304-V.

An outlet 79'-02 at 2 miles 4,158 feet, Vadavar Extension Channel.

8.42 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	177	
6.65 "	Platform moulded brick in mortar ..	21 8 0	100 "	143	
2.58 "	Brick on end ..	13 8 0	100 sq. ft.	35	
0.90 "	Brick jelly backing ..	10 8 0	100 c. ft.	10	
2.50 "	Plastering with portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	17	
	Earthwork, excavating foundations, etc. ..		Lump sum.	10	
	Shed for materials ..			10	
	Total ..				402
	Contingencies ..				24
	Petty supervision ..				14
	Grand Total ..				440

Estimate No. 305-V.

Girder bridge at 3 miles 1,518 feet, Vadavar Extension Channel.

12.50 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	263	
18.50 "	Platform moulded brick in ordinary mortar ..	21 8 0	100 "	393	
9.10 "	Plastering with portland cement, $\frac{3}{4}$ " ..	6 12 0	100 sq. ft.	61	
3 c. ft.	Cutstone work ..	2 8 0	C. ft.	8	
55.63 cwt.	Roller steel beams ..	8 0 0	Cwt.	445	
1.40 "	Metalling ..	27 8 0	100 c. ft.	39	No data.
5.00 "	Brick on end, 9" thick ..	13 8 0	100 sq. ft.	68	
2.50 "	Brick jelly backing ..	10 8 0	100 c. ft.	28	
35 r. ft.	Westwood's trough plate, including wheel guards, road metalling ..	32 0 0	R. ft.	1,120	
No. 8	Wheel guard stones ..	3 0 0	Each.	24	
" 2	Stiffeners ..	22 12 0	"	46	
	Shed for materials ..			38	
	Total ..				2,536
	Contingencies ..				134
	Petty supervision ..				70
	Total ..				2,740
	Carried over ..				12,760

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR EXTENSION CHANNEL—cont.					
C. WORKS—cont.				Brought forward ..	12,760
Estimate No. 306-V.					
3-ft. drop at 3 miles, 2,310 feet of Vadavar Extension Channel.					
11.6 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	244	
14.6 "	Platform moulded brick in mortar ..	21 8 0	100 "	314	
10.2 "	Plastering with portland cement $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	69	
16.5 "	Concrete block work ..	21 12 0	100 c. ft.	359	
5.25 "	Brick on end 9" ..	13 8 0	100 sq. ft.	71	
4.3 "	Brick jelly backing 6" ..	10 8 0	100 c. ft.	45	
0.44 "	Cuddapah slab 2" thick ..	30 0 0	100 sq. ft.	13	
	Earthwork excavating foundations ..		Lump sum.	25	
	Shed for materials ..			20	
	Total ..			1,160	
	Contingencies ..			60	
	Petty supervision ..			30	
	Grand Total ..				1,250

Estimate No. 307-V.

Girder bridge of 26' span of 14' roadway in Vadavar Extension Channel at 4 miles 1,518 feet.

13.00 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	273	
17.00 "	Platform moulded brick in ordinary mortar ..	21 8 0	100 "	366	
7.5 "	Plastering with portland cement $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	51	
5 c. ft.	Cutstone work ..	2 8 0	C. ft.	13	
4.5 units.	Brick on end 9" ..	13 8 0	100 sq. ft.	61	
2.25 "	Brick jelly backing 6" ..	10 8 0	100 c. ft.	24	
51.53 cwt.	Rolled steel beams ..	8 0 0	Cwt.	412	
2.3 "	Road metalling ..	27 8 0	100 c. ft.	63	
No. 8 "	Guard stones 9" Dr. $\times$ 3' high ..	3 0 0	Each.	24	
29 r. ft.	Roadway with Westwood's trough plates including wheel guards, hand rails, metalling, etc., complete.	40 11 0	R. ft.	1,180	No data.
	Earthwork excavating foundations, forming approaches, etc.		Lump sum.	130	
	Shed for materials ..			40	
	Total ..			2,637	
	Contingencies ..			133	
	Petty supervision ..			70	
	Grand Total ..				2,840

Estimate No. 308-V.

2-ft. drop and bridge combined at 4 miles 4,224 feet of Vadavar Extension Channel.

17.75 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	373	
18.7 "	Platform moulded brick in mortar ..	21 8 0	100 "	402	
3 c. ft.	Cutstone work ..	2 8 0	C. ft.	8	
4 units.	Brick on end 9" thick ..	13 8 0	100 sq. ft.	54	
9 "	Concrete block work ..	21 12 0	100 c. ft.	196	
2.6 "	Brick jelly backing 6" ..	10 8 0	100 "	27	
12.80 "	Plastering with portland cement $\frac{3}{4}$ " ..	6 12 0	100 sq. ft.	84	
44 square.	Cuddapah slab 2" thick ..	30 0 0	100 "	13	
29½ r. ft.	Roadway including Westwood's trough plates, cement concrete, road metalling, wheel guards, standards, hand rails, etc., complete.	32 0 0	R. ft.	944	
1.75 units.	Metalling road between wings, complete ..	27 8 0	100 c. ft.	48	
21.40 "	Rolled steel girders 16" $\times$ 6" + 62 lbs ..	8 0 0	Cwt.	171	
No. 8 "	Wheel guard stones 3' long 9" Dr. ..	3 0 0	Each.	24	
	Earthwork excavating foundation, forming approaches, etc.		Lump sum.	100	
	Shed for materials ..			40	
	Total ..			2,484	
	Contingencies ..			124	
	Petty supervision ..			62	
	Total ..				2,670
	Carried over ..				19,520

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR EXTENSION CHANNEL—cont.					
C. WORKS—cont.				Brought forward ..	19,520
Estimate No. 309-V.					
2-ft. drop at 5 miles 3,960 feet of Vadavar Extension Channel.					
8.7 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	183	
9.5 "	Platform moulded brick in mortar ..	21 8 0	100 "	204	
12.5 "	Concrete blocks ..	21 12 0	100 "	272	
4 "	Brick on end, 9 inches ..	13 8 0	100 "	54	
3.3 "	Brick jelly backing, 6" ..	10 8 0	100 "	34	
6.7 square.	Plastering with portland cement $\frac{3}{4}$ " ..	6 12 0	100 sq. ft.	45	
0.4 square.	Cuddapah slab, 2" thick ..	30 0 0	100 "	12	
L.S.	Earthwork excavating foundations, etc.		Lump sum.	15	
	Shed for materials ..			10	
	Total ..			829	
	Contingencies ..			44	
	Petty supervision ..			27	
	Total ..				900

Estimate No. 310-V.

Constructing an outlet 59' 0" at 7 miles 198 feet of Vadavar Extension Channel.

59 r. ft.	Cost of body wall with 10 ft. of brick on end apron as per type estimate attached to the estimate for the outlet at 5-3800 in Mannargudi channel ..	4 6 0	R. ft.	258	
	Cost of stepped portion of body wall at ends and brick on end wings excluding contingencies and petty supervision ..			80	
	Total ..			338	
	Shed for materials ..			10	
	Contingencies ..			19	
	Petty supervision ..			13	
	Total ..				380

Estimate No. 311-V.

Constructing an outlet 46' 0" at 7 miles 3,254 feet of Vadavar Extension Channel.

46 r. ft.	Cost of body wall with 10' width of brick on end apron, as per type estimate attached to the estimate for the outlet at 5 m. 3,300 ft. in Mannargudi channel ..	4 6 0	R. ft.	201	
	Cost of stepped portion of body wall at ends and brick on end wings excluding contingencies and petty supervision ..			80	
	Total ..			281	
	Shed for materials ..			10	
	Contingencies ..			19	
	Petty supervision ..			10	
	Total ..				320

Estimate No. 312-V.

4-ft. drop and bridge to discharge 1,015 cusecs at 8 miles 858 feet of Vadavar Extension Channel.

14.20 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	298	
20.70 "	Platform moulded brick in mortar ..	21 8 0	100 "	445	
13.40 "	Concrete block for revetment and apron ..	21 12 0	100 "	291	
3.20 "	Brick on end 9" ..	13 8 0	100 sq. ft.	43	
3.60 "	Brick jelly backing ..	10 8 0	100 c. ft.	38	
0.33 "	Cuddapah slab, 2" thick ..	30 0 0	100 sq. ft.	10	
11.00 "	Plastering with portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 "	74	
	Earthwork, excavation, etc. ..		Lump sum.	30	
	Shed for materials ..			20	
	Total ..			1,249	
	Contingencies ..			61	
	Petty supervision ..			30	
	Total ..				1,340
	Carried over ..				22,460

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR EXTENSION CHANNEL—cont.					
C. WORKS—cont.					
Estimate No. 313-V.					
Drop and bridge combined in the Vadavar Extension Channel at 8 miles 4,423 feet.					
10-60 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft. ..	223	
20-1 "	Platform moulded brick in mortar	21 8 0	100 " ..	432	
1-40 "	Horizontal archwork	22 8 0	100 " ..	32	
2-75 "	Archwork brick in mortar	22 8 0	100 " ..	62	
	Centring for archwork		Lump sum.	22	
3-75 squares.	Brick on end 9 inches	12 8 0	100 sq. ft. ..	51	
7-00 units.	Concrete blocks	21 12 0	C ft. ..	152	
15-4 squares.	Plastering with portland cement $\frac{3}{4}$ inch thick (1:3).	6 12 0	100 sq. ft. ..	104	
3-65 units.	Brick jelly backing	10 8 0	100 c. ft. ..	38	
0-30 squares.	Cuddapah slab 2 inches thick	30 0 0	100 sq. ft. ..	9	
	Earthwork, excavating and forming banks, etc. ..		Lump sum.	35	
	Wheel guard stones 3 feet high and 9 inches diameter	3 0 0	Each. ..	24	
	Shed for materials			20	
	Total			1,204	
	Contingencies			60	
	Petty supervision			36	
	Total			1,300	

Estimate No. 314-V.

2-ft. drop at 9 miles 1,650 feet of Vadavar Extension Channel.

As per type estimate attached to the estimate for the 2 ft. drop at 2 miles 2,970 feet of Vadavar No. 1 channel	..	..	620	
Deduct for 1 foot width of channel	..	..	15	
Total	..	..	605 or 610	

Estimate No. 315-V.

4-ft. drop and bridge at 9 miles 2,640 feet of Vadavar Extension Channel.

As per type estimate attached to the estimate for the 4 ft. drop at 1 mile 3,366 feet of Vadavar No. 1 channel	..	..	910	
Add for 5 ft. extra in tunnel	6 6 0	R. ft.	32	
Total	..	..	942	
Deduct for 1 foot width of apron both in front and rear $2 \times 7\frac{1}{2} \times 1 = 15$ sq. ft. of brick on end at Rs. 13-8-0 per 100 sq. ft.	..	..	2	
Net Total	..	..	940	

Estimate No. 316-V.

2-ft. drop at 10th mile of Vadavar Extension Channel.

As per type estimate attached to the estimate for the 2 ft. drop at 2 miles 2,970 feet of Vadavar No. 1 channel	..	..	620	
Deduct for 2 ft. width of channel	15 5 0	R. ft.	30	
Net Total	..	..	590	

Estimate No. 317-V.

3-ft. drop at 10 miles 2,970 feet of Vadavar Extension Channel.

As per type estimate attached to the estimate for the 3 ft. drop at 6 miles 2,508 feet of Puthur channel	..	..	420	
Add for $1\frac{1}{2}$ feet width of channel	13 11 0	1 ft.	20	
Total	..	..	440	
Carried over ..				26,760

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR EXTENSION CHANNEL—cont.					
C. WORKS—cont.					
Estimate No. 318-V.					
3-ft. drop at 10 miles 4,950 feet of Vadavar Extension Channel.					
The same as for the type estimate attached to the estimate for the 3 ft. drop at 6 miles 2,508 feet of Puthur channel					
	Total	..	..	420	420
Estimate No. 319-V.					
"C" class masonry bridge of 10-ft. span at 11 miles 1,650 feet of Vadavar Extension Channel.					
As per type estimate attached to the estimate for the bridge at 2 miles 396 feet of Chettichatram channel					
	Add for forming approaches, etc.	..	..	680	
	Total	..	..	30	710
Estimate No. 320-V.					
Regulator at 12 miles 2,310 feet of Vadavar Extension Channel.					
1-60 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft. ..	34	
1-00 "	Platform moulded brick in mortar	21 8 0	100 " ..	22	
3-50 "	Brick on end	13 8 0	100 sq. ft. ..	47	
1-25 "	Brick jelly backing	10 8 0	100 c. ft. ..	13	
0-09 "	Plastering with Portland cement $\frac{3}{4}$ "	6 12 0	100 sq. ft. ..	6	
	Earthwork excavating foundations and filling in. ..		Lump sum.	5	
	Shed for materials			10	
	Contingencies			8	
	Petty supervision			5	
	Total	..	..	150	
Estimate No. 321-V.					
Pipe sluices in Vadavar Extension Channel.					
Sluice R.B. at 0 mile 726 ft. (12" pipe) as per type estimate X below	..	..	120		
Sluice R.B. at 0 mile 2,310 ft. (6" pipe) as per type estimate XI below	..	..	50		
Sluice R.B. at 0 mile 2,310 ft. (18" pipe) as per type estimate X below	..	..	180		
Sluice R.B. at 0 mile 4,818 ft. (9" pipe) as per type estimate XI below	..	..	65		
Sluice L.B. at 0 mile 4,818 ft. (9" pipe) as per type estimate XI below	..	..	65		
Sluice R.B. at 1 mile 1,584 ft. (9" pipe) as per type estimate X below	..	..	90		
Sluice L.B. at 1 mile 1,584 ft. (6" pipe) as per type estimate XI below	..	..	50		
Sluice L.B. at 1 mile 5,148 ft. (12" pipe) as per type estimate X below	..	..	120		
Sluice R.B. at 2 miles 2,376 ft. (9" pipe) as per type estimate XI below	..	..	65		
Sluice L.B. at 2 miles 2,376 ft. (12" pipe) as per type estimate X below	..	..	120		
Sluice R.B. at 3 miles 726 ft. (9" pipe) as per type estimate XI below	..	..	65		
Sluice R.B. 3 miles 2,310 ft. (9" pipe) as per type estimate XI below	..	..	65		
Sluice L.B. at 3 miles 3,960 ft. (6" pipe) as per type estimate XII below	..	..	45		
Sluice R.B. at 4 miles 660 ft. (9" pipe) as per type estimate XII below	..	..	55		
Sluice L.B. at 4 miles 660 ft. (12" pipe) as per type estimate XII below	..	..	80		
Sluice R.B. at 4 miles 1,650 ft. (9" pipe) as per type estimate XII below	..	..	55		
Sluice L.B. at 4 miles 1,650 ft. (9" pipe) as per type estimate XII below	..	..	55		
Sluice L.B. at 4 miles 3,960 ft. (12" pipe) as per type estimate XIII below	..	..	115		
Sluice R.B. at 5 miles 1,452 ft. (9" pipe) as per type estimate XII below	..	..	55		
Carried over ..				1,615	
Carried over ..				27,020	

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR EXTENSION CHANNEL—cont.

Brought forward .. 27,620

Brought forward .. 1,515

C. WORKS—cont.

Estimate No. 321—V—cont.

Pipe sluices in Vadavar Extension Channel—cont.

Sluice L.B. at 5 miles 3,762 ft. (12" pipe) as per type estimate XII below	..	..	80
Sluice R.B. at 5 miles 3,762 ft. (18" pipe) as per type estimate XIII below	..	..	176
Sluice R.B. at 5 miles 3,762 ft. (9" pipe) as per type estimate XII below	..	..	55
Sluice R.B. at 6 miles 2,640 ft. (12" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel	..	..	80
Sluice L.B. at 6 miles 2,640 ft. (12" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel	..	..	80
Sluice L.B. at 8 miles 528 ft. (12" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel	..	..	70
Sluice R.B. at 8 miles 528 ft. (9" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel	..	..	50
Sluice R.B. at 8 miles 4,158 ft. (9" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel	..	..	50
Sluice L.B. at 9 miles 1,650 ft. (9" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel	..	..	50
Sluice L.B. at 9-3,630' (6" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	40
Sluice R.B. at 10 miles (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	50
Sluice L.B. at 10 miles (6" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	40
Sluice L.B. at 10-2,970' (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	50
Sluice R.B. at 10-2,970' (6" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	40
Sluice R.B. at 11-330' (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	50
Sluice L.B. 11-330' (6" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	40
Sluice R.B. at 11-2,970' (15" pipe) as per type estimate VIII attached to the estimate of sluices in Illupadi channel	..	..	85
Sluice L.B. at 11-2,970' (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	50
Sluice L.B. 11-3,960' (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	50
Sluice L.B. at 12-1,056' (6" pipe) as per type estimate III attached to the estimate of sluices in Puthur channel	..	..	60
Sluice R.B. at 12-2,310' (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	50
Sluice R.B. at 12 miles 2,310' (15" pipe) as per type estimate VIII attached to the estimate of sluices in Illupadi channel	..	..	85
Sluice R.B. at 12 miles 2,310' (12" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	65
Sluice L.B. at 12 miles 2,310' (12" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	65
Total	..	..	3,025
Total, C. Works	..	..	30,645

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR EXTENSION CHANNEL—cont.

Type Estimate X.

An earthenware pipe sluice with shutter for F.S.L. of $3\frac{1}{2}$ and $3\frac{3}{4}$ feet.

1.05 units.	Platform moulded brick in chunam	21 8 0	Unit.	23
No. 15	Earthenware pipes 13" dia. 2' long	5 13 9	Each.	88
0.64 units.	Plastering with Portland cement $\frac{3}{4}$ "	6 12 0	Unit.	4
No. 1	Cuddapah slab for vent stone 2" thick 1' 9" X 1' 9" with 12" circular vent. Lump sum.			1
" 1	Stem shutter with iron flat bar, teak-beam and holding down bolts, etc., complete.			10
	Earthwork excavating foundations for 12 ft. bank width.			10
	Total			136
	Contingencies			6
	Petty supervision			3
	Total			145
	3" dia. pipe—estimate Rs. 60			
	6" " " " " 75			
	9" " " " " 90			
	12" dia. pipe—estimate Rs. 120			
	15" " " " " 145			
	18" " " " " 180			

Type Estimate XI.

An earthenware pipe sluice for F.S.L. of $3\frac{1}{2}$ and $3\frac{3}{4}$ ft. without shutter.

0.77 unit.	Platform moulded brick in chunam	21 8 0	100 c. ft.	17
No. 13	Earthenware pipes 2' long 6" dia.	1 4 7	Each.	17
0.54 unit.	Plastering with Portland cement $\frac{3}{4}$ "	6 12 0	Unit.	4
No. 1	Cuddapah slab vent stone 2" thick 1' 0" X 1' 0" with $6\frac{1}{2}$ " circular vent. Lump sum.			1
	Earthwork excavating foundations			5
	Total			44
	Contingencies			4
	Petty supervision			2
	Total			50
	3" dia. pipe—estimate Rs. 35			
	6" " " " " 50			
	9" " " " " 65			
	12" dia. pipe—estimate Rs. 85			
	15" " " " " 110			
	18" " " " " 140			

Type Estimate XII.

Constructing an earthenware pipe sluice for F.S.L. of 3 and $3\frac{1}{4}$ ft. without shutter.

0.71 unit.	Platform moulded brick in chunam	21 8 0	..	15
No. 12	Earthenware pipes 2' long 9" dia.	2 6 3	Each.	24
0.51 unit.	Plastering with Portland cement $\frac{3}{4}$ "	6 12 0	..	3
No. 1	Cuddapah slab vent stone 2" thick 1' 3" X 1' 3" with $6\frac{1}{2}$ " circular vent. Lump sum.			1
	Earthwork excavating foundations, etc.			5
	Total			48
	Contingencies			4
	Petty supervision			3
	Total			55
	3" dia. pipe—estimate Rs. 35			
	6" " " " " 45			
	9" " " " " 55			
	12" dia. pipe—estimate Rs. 80			
	15" " " " " 105			
	18" " " " " 130			

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR EXTENSION CHANNEL—cont.

Type Estimate XIII.

An earthenware pipe sluice with shutter for F.S.L. 3 and $3\frac{1}{2}$ ft.

0.89 unit.	Platform moulded brick in channam	21 8 0	Units.	19	
No. 15	Earthenware pipes 2' long 12" dia.	4 2 0	Pipe.	62	
0.57 unit.	Plastering with Portland cement $\frac{3}{4}$ " thick ..	6 12 0	Unit.	4	
No. 1	Cuddapah slab vent stone 2' thick 1' 6" X 1' 6" with 11" circular vent out.		Lump sum.	1	
	Stem shutter with flat iron bars, teak beam and holding down bolts, etc., complete.		"	10	
	Earthwork, excavating foundations, etc., for 12' bank width complete.		"	10	
	Total			106	
	Contingencies			6	
	Petty supervision			3	
	Total			115	
	3" diar. pipe—estimate Rs. 60		12" diar. pipe estimate Rs. 115		
	6" " " " 70		15" " " " 140		
	9" " " " 85		18" " " " 175		

L. EARTHWORK.

Estimate No. 322-V.

Excavating Vadavar Extension Channel.

8,529 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards.	3 12 0	1000 c. ft.	31,984	
	Contingencies			1,600	
	Petty supervision			956	
	Total			34,540	
	Total, L. Earthwork			34,540	

O. MISCELLANEOUS.

Estimate No. 323-V.

Fixing demarcation stones on Vadavar Extension Channel.

No. 308	Revenue survey stones including cartage to site and fixing in earth.	0 8 0	Each.	154	
	Contingencies			6	
	Total			160	

Estimate No. 324-V.

Fixing mile and furlong stones along Vadavar Extension Channel.

No. 12	Mile stones	3 2 0	Each.	38	
.. 90	Furlong stones	2 2 0	"	191	
	Total			229 or 230	
	Total, O. Miscellaneous			390	

P. MAINTENANCE.

Estimate No. 325-V.

Maintenance of Vadavar Extension Channel.

12.61 miles.	Maintenance during execution	100 0 0	Mile.	1,261	
	Total, Say			1,280	
	Total, P. Maintenance			1,280	

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 2 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 326-V.

Preliminary Expenses for Vadavar No. 2 Channel.

319 acres.	Cost of preliminary surveys	0 6 0	Acre.	120	
80 mile.	Laying out before execution	10 0 0	Mile.	8	
	Contingencies			2	
	Total			130	
	Total, A. Preliminary Expenses			130	

B. LAND.

Estimate No. 327-V.

Compensation for land for Vadavar No. 2 Channel.

4.84 acres.	Peraiyur village	300 0 0	Acre.	1,452	
	Add 15 per cent for compulsory acquisition ..			218	
	Total			1,670	
	Total, B. Land			1,670	

C. WORKS.

Estimate No. 328-V.

Pipes in Vadavar No. 2 Channel.

Head (pipe)	Sluice at head (12" pipe) as per type estimate X attached to the estimate of sluices in Vadavar extension channel			120	
	Sluice right bank at 3,330' (15" pipe) as per type estimate VI attached to the estimate of sluices in Puthur channel			80	
	Total			200	

Estimate No. 329-V.

Cross wall with vent at 4,224 feet in Vadavar No. 2 Channel.

	As per type estimate attached to the estimate for the cross wall with vent at 0—1,320' of Puthur No. 1 channel			20	
	Total			20	
	Total, C. Works			220	

L. EARTHWORK.

Estimate No. 330-V.

Excavating Vadavar No. 2 Channel.

118,560 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards	3 12 0	1,000 c. ft.	437	
	Contingencies			21	
	Petty supervision			12	
	Total			470	
	Total, L. Earthwork			470	

O. MISCELLANEOUS.

Estimate No. 331-V.

Fixing demarcation stones on Vadavar No. 2 Channel.

No. 20.	Revenue survey stones including cartage to site and fixing in earth	0 8 0	Each.	10	
	Contingencies				
	Total			10	
	Carried over			10	

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 2 CHANNEL—cont.

O. MISCELLANEOUS—cont.

Brought forward .. 10

Estimate No. 332-V.

Fixing mile and furlong stones in Vadavar No. 2 Channel.

No. 6	Furlong stones	2 2 0	Each.	13	
	Sundries			2	
	Total				15
	Total, O. Miscellaneous				25

P. MAINTENANCE.

Estimate No. 333-V.

Maintenance of Vadavar No. 2 Channel.

80 miles.	Maintenance during execution	25 0 0	Mile.	20	
	Total				20
	Total, P. Maintenance				90

VADAVAR No. 3 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 334-V.

Preliminary expenses for Vadavar No. 3 Channel.

1,414 acres.	Cost of preliminary surveys	0 6 0	Acre.	530	
2,025 miles.	Laying out before execution	10 0 0	Mile.	20	
	Contingencies			10	
	Total				560
	Total, A. Preliminary Expenses				560

B. LAND.

Estimate No. 335-V.

Compensation for land for Vadavar No. 3 Channel.

0.64 acres.	Serumangalam village	300 0 0	Acre.	180	
5.85 "	Nemeli village	150 0 0	"	878	
3.37 "	Mahadevapatnam	200 0 0	"	1,674	
	Compensation for earth			400	
	Total			3,132	
	Add 15 per cent for compulsory acquisition			408	
	Total				3,540
	Total B. Land				3,500

C. WORKS.

Estimate No. 336-V.

Head sluice for Vadavar No. 3 Channel.

5.9 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	124	
8.8 "	Platform moulded brick in mortar	21 0 5	100 "	178	
0.8 "	Semi-circular archwork in mortar	22 1 0	108 "	18	
	Centering for archwork		Lump sum.	6	
3.90 "	Brick on end, 9" thick	13 8 0	100 sq. ft.	53	
1.70 "	Brick jelly packing, 6" thick	10 8 0	100 c. ft.	18	
5.25 c. ft.	Caststone work neatly dressed	2 8 0	c. ft.	13	
3 "	Teakwood wrought and put up	4 0 0	"	12	
5.4 squares.	Plastering with Portland cement, 1"	6 12 1	100 sq. ft.	36	
No. 1	Teakwood shutter, 2' 3" x 1' 9" including gearing rods, spanner holding down bolts, etc., complete		Lump sum.	70	
	Fitting charges, 1/2 cost of shutter			6	
	Earthwork excavating foundations, etc.			10	
	Shed for materials			10	
	Total				554
	Contingencies				28
	Petty supervision				18
	Total				600
	Carried over				600

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 3 CHANNEL—cont.

Brought forward .. 600

C. WORKS—cont.

Estimate No. 337-V.

Regulator and bridge combined at 1 mile 4,422 feet, Vadavar No. 3 Channel.

6 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	128	
7.7 "	Platform moulded brick in mortar	21 8 0	100 "	165	
1.2 "	Archwork platform moulded brick in mortar	22 8 0	100 "	27	
	Centering charges for arches		Lump sum.	10	
5.7 "	Plastering with Portland cement, 1/2"	6 12 0	100 s. ft.	39	
1.4 "	Brick on end, 9"	13 8 0	100 "	19	
0.6 "	Brick jelly packing, 6"	10 8 0	100 c. ft.	6	
No. 8.	Guard stones, 3' long 9" diameter	3 0 0	Each.	24	
	Earthwork excavating foundations, etc.		Lump sum.	11	
	Shed for materials			10	
	Total				438
	Contingencies				21
	Petty supervision				11
	Total				470

Estimate No. 338-V.

Pipe sluices in Vadavar No. 3 Channel

Sluice left bank at head (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel			50	
Sluice right bank at 2,772 feet (12" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel			75	
Sluice left bank at 2,772 feet (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel			40	
Sluice right bank at 1 mile 1,782 feet (18" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel			105	
Sluice left bank at 1 mile 1,782 feet (12" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel			75	
Sluice right bank at 1 mile 4,422 feet (6" pipe) as per type estimate VII attached to the estimate of sluices in Puthur No. 5 channel			60	
Sluice left bank at 1 mile 4,422 feet (9" pipe) as per type estimate VII attached to the estimate of sluices in Puthur No. 5 channel			70	
Sluice left bank at 2 miles 792 feet (12" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel			60	
Total				535

Estimate No. 339-V.

Cross wall with vent at 2 miles 792 feet in Vadavar No. 3 Channel.

As per type estimate attached to the estimate for the cross wall with vent at 0 mile 1,320 feet in Puthur No. 1 channel	1 9 0	1 foot	20	
Add for 2 feet of extra width of channel			3	
Total			23	25
Total, C. Works				1,630

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
VADAVAR No. 3 CHANNEL—cont.					
L. EARTHWORK.					
Estimate No. 340-V.					
Excavating Vadavar No. 3 Channel.					
738-390 units	Excavating the channel with a lead of 20 yards and a lift of 2 yards	3 12 0	1,000 c. ft.	2,769	
	Contingencies	5 per cent.	..	138	
	Petty supervision	3 ..	..	83	
	Total	..	..	..	2,990
	Total, L. Earthwork	..	..	..	2,990

O. MISCELLANEOUS.

Estimate No. 341-V.

Fixing demarcation stones on Vadavar No. 3 Channel.

No. 48	Revenue survey stones including cartage to site and fixing in earth	0 8 0	Each.	24	
	Contingencies	..	..	1	
	Total	..	..	2	25

Estimate No. 342-V.

Fixing mile and furlong stones along Vadavar No. 3 Channel.

No. 2	Mile stones	3 2 0	Each.	6	
No. 14	Furlong stones	2 2 0	..	30	
	Total	..	..	36 or	40
	Total, O. Miscellaneous	..	..	..	65

P. MAINTENANCE.

Estimate No. 343-V.

Maintenance of Vadavar No. 3 Channel.

2-025 miles	Maintenance during execution	25 0 0	Mile.	51	
	Total, say	..	..	..	50
	Total, P. Maintenance	..	..	..	50

VADAVAR No. 4 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 344-V.

Preliminary Expenses for Vadavar No. 4 Channel.

995 acres	Cost of preliminary surveys	0 6 0	Acre.	373	
1-56 miles.	Laying out before execution	10 0 0	Mile.	16	
	Contingencies	..	..	11	
	Total	..	..	..	400
	Total, A. Preliminary Expenses	..	..	..	400

B. LAND.

Estimate No. 345-V.

Compensation for land for Vadavar No. 4 Channel.

3-72 acres	Ullikkotta village	225 0 0	Acre.	837	
5-82 "	Kandudampattu village	225 0 0	..	1,310	
	Compensation for earth	..	..	80	
	Total	..	..	2,227	
	Add 15 per cent. for compulsory acquisition	..	..	323	
	Grand Total	..	..	..	2,550
	Total, B. Land	..	..	..	2,550

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
VADAVAR No. 4 CHANNEL—cont.					
C. WORKS.					
Estimate No. 346-V.					
Head sluice for Vadavar No. 4 Channel.					
5-10 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	107	
5-30 "	Platform moulded brick in mortar	21 8 0	100 "	114	
0-50 "	Archwork platform moulded brick in mortar	22 8 0	100 "	11	
	Centering charges for archwork	Lump sum.	..	4	
4 "	Cut-stone work	2 8 0	c. ft.	10	
3-30 "	Brick on end 9" thick	13 8 0	100 sq. ft.	45	
1-40 "	Brick jelly backing	10 8 0	100 c. ft.	15	
5-10 "	Plastering with portland cement, 3" thick	6 12 0	100 sq. ft.	34	
2-5 "	Teak-wood wrought and put up	4 0 0	c. ft.	10	
	Teak-wood screw gearing shutter	Lump sum.	..	57	
	Fitting and conveyance charges of shutter	..	..	5	
	Shed for materials	..	..	10	
	Earthwork, excavation, etc.	..	..	16	
	Total	..	..	437	
	Contingencies	..	..	21	
	Petty supervision	..	..	12	
	Grand Total	..	..	..	470

Estimate No. 347-V.

"C." Class bridge of 6" span at 2,442 feet of Vadavar No. 4 Channel.

..	As per type estimate below	..	..	580	..
..	Add for forming approaches, etc.	..	..	20	..
	Total	..	..	..	600

Culvert of 6 feet span with 14 feet roadway.

7-2 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	151 0 0	
11-00 "	Platform moulded brick in chunam	21 8 0	100 "	237 0 0	
1-75 "	Do. archwork do.	22 8 0	100 "	39 0 0	
	Centering for the archwork	Lump sum.	..	14 0 0	
9-00 units.	Plastering with portland cement 3" thick (1 cement : 3 sand)	6 12 0	100 sq. ft.	61 0 0	
57 r. ft.	Cornice work including plastering with cement 3" (1 cement : 3 sand)	0 4 0	R. ft.	14 3 0	
1-7 units.	Brick on end 9"	13 8 0	100 sq. ft.	23 0 0	
0-9 "	Brick jelly backing 6"	10 8 0	100 c. ft.	9 0 0	
No. 8	Guard stones 9" diam. 3' high	3 0 0	Each.	24 0 0	
	Earthwork excavating foundations and felling in	Lump sum.	..	10 0 0	
	Shed for materials	..	..	10 0 0	
	Total	..	..	592 0 0	
	Contingencies at 5 per cent.	..	..	30 0 0	
	Petty supervision at 3 per cent.	..	..	18 0 0	
	Total	..	..	640 0 0	
	Cost of culvert with 10' roadway and 6" concrete over the arch	..	..	..	
	Deduct the cost 4 r. ft. at Rs. 14-12-0 per r. ft. —vide separate estimate—4×Rs. 14-12-0 = 56-592-59	..	..	533 0 0	
	Contingencies	..	..	23 0 0	
	Petty supervision	..	..	18 0 0	
	Total for 10' roadway	..	..	580 0 0	

One running foot of culvert of 6 feet span.

23 c. ft.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	4 13 4	
28 "	Platform moulded brick in chunam	21 8 0	100 "	6 0 4	
10 "	Do. archwork do.	22 8 0	100 "	2 4 0	
	Centering for the archwork	Lump sum.	..	0 12 10	
12 sq. ft.	Plastering with portland cement 3" thick (1 cement : 3 sand)	6 12 0	100 "	0 13 0	
	Total for 1 r. ft.	..	..	14 11 6	
	Or say	..	..	14 12 0	
	Carried over	..	..	1,070 0 0	

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 4 CHANNEL—cont.

Brought forward .. 1,070

C. WORKS—cont.

Estimate No. 348-V.

4-ft. drop and bridge at 3,960 feet of Vadavar No. 4 Channel.

As per type estimate attached to the estimate for the 4' drop at 1 mile 2,706' of Mavanallur No. 2 channel ..	..	..	..	500	..
Add for 1 foot extra length of tunnel ..	4 8 0	1 foot.	..	5	..
Total ..	..	..	..	505 or say	510

Estimate No. 349-V.

2-ft. drop at 5,016 feet in Vadavar No. 4 Channel.

As per type estimate attached to the estimate for the 2' drop at 1,186' of Puthur No. 5 channel. Deduct for 1'-5' width of channel 10 miles 1 foot. ..	..	..	..	260	..
Net Total ..	..	..	..	245	250
Total ..	..	..	..	..	250

Estimate No. 350-V.

4-ft. drop at 1 mile 462 feet in Vadavar No. 4 Channel.

As per type estimate attached to the estimate for the 4' drop at 1 mile 4,620' of Puthur No. 3 channel ..	..	..	..	320	..
Total ..	..	..	..	..	320

Estimate No. 351-V.

2-ft. drop and bridge at 1 mile 1,221 feet in Vadavar No. 4 Channel.

Same as estimate for 2' drop and bridge at 5 miles 3,927' in Palayur channel ..	..	..	..	810	..
Total ..	..	..	..	..	810

Estimate No. 352-V.

4-ft. drop at 1 mile 2,310 feet in Vadavar No. 4 Channel.

As per type estimate attached to the estimate for the 4' drop at 1 mile 4,620' of Puthur No. 3 channel ..	..	..	..	320	..
Total ..	..	..	..	..	320

Estimate No. 353-V.

Pipe sluices in Vadavar No. 4 Channel.

Sluice left bank at 1,320' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	..	..	..	50	..
Sluice right bank at 2,070' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	..	..	..	50	..
Sluice left bank at 3,960' (15" pipe) as per type estimate V1 attached to the estimate of sluices in Puthur No. 3 channel ..	..	..	..	90	..
Sluice left bank at 3,960' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	..	..	..	50	..
Sluice left bank at 1 mile 462' (15" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	..	..	..	50	..
Sluice right bank at 1 mile 462' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	..	..	..	50	..
Total ..	..	..	..	..	840
Total, C. Works ..	..	..	..	..	3,820

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 4 CHANNEL—cont.

L. EARTHWORK.

Estimate No. 354-V.

Excavating Vadavar No. 4 Channel.

304,000 units.	Excavating the channel with a lead of 20 and lift of 2 yards ..	3 12 0	1,000 c. ft.	1,140	..
	Contingencies ..	..	..	57	..
	Petty supervision ..	..	..	33	..
	Total ..	..	..	..	1,230
	Total, L. Earthwork ..	..	..	..	1,230
	Grand Total ..	..	..	..	1,230

O. MISCELLANEOUS.

Estimate No. 355-V.

Fixing demarcation stones on Vadavar No. 4 Channel.

No. 38	Revenue survey stones including cartage to site and fixing in earth ..	0 8 0	Each.	19	..
	Contingencies ..	..	..	1	..
	Total ..	..	..	..	20

Estimate No. 456-V.

Fixing mile and furlong stones on Vadavar No. 4 Channel.

No. 1	Mile stone ..	3 2 0	Each.	3	..
11	Furlong stones ..	2 2 0	..	23	..
	Total ..	..	..	..	26 or 25
	Total, O. Miscellaneous ..	..	..	..	45

P. MAINTENANCE.

Estimate No. 357-V.

Maintenance of Vadavar No. 4 Channel.

1.66 miles.	Maintenance during extension ..	25 0 0	Mile.	39	..
	Total, say ..	..	..	..	40
	Total, P. Maintenance ..	..	..	..	40

VADAVAR No. 5 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 358-V.

Preliminary expenses for Vadavar No. 5 Channel

523 acres.	Cost of preliminary surveys ..	0 6 0	Acres.	196	..
625 mile.	Laying out before execution ..	10 0 0	Mile.	6	..
	Contingencies ..	..	..	8	..
	Total ..	..	..	..	210
	Total, A. Preliminary Expenses ..	..	..	..	210

B. LAND

Estimate No. 359-V.

Compensation for land for Vadavar No. 5 Channel.

3.18 acres.	Kandudampattu village ..	225 0 0	acre.	718	..
	Compensation for earth ..	..	..	20	..
	Add 15 per cent for compulsory acquisition ..	..	..	104	..
	Total ..	..	..	..	840
	Total, B. Land ..	..	..	..	840

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 5 CHANNEL—cont.

C. WORKS.

Estimate No. 360-V.

Head sluice for Vadavar No. 5 Channel.

The same as the estimate of the head sluice for P. Laiyur No. 2 channel	..	..	240	
Add for 9" extra height of platform and head walls	..	..	7	
Total	..	..	247 or say 250	

Estimate No. 361-V.

4-ft. drop and bridge at 1,518 feet in Vadavar No. 5 Channel.

As per type estimate attached to the estimate for the 4' drop at 1 mile 2,708' of Muvallur No. 2 channel	..	..	500	
Add for 1 foot extra length of tunnel	..	..	5	
Total	..	..	505	
Deduct for 1-5' width of apron in front and 2-1/2' width of apron in rear 1-5' x 5-5' x 2-5' x 5-5' = 8 1/2' + 13 1/2' = 22 square feet of brick on end at Rs. 13-8-0 per 100 square feet	..	..	3	
Net Total	..	..	502 or 500	

Estimate No. 362-V.

3-ft. drop at 2,316 feet in Vadavar No. 5 Channel.

As per type estimate attached to the estimate for the 3' drop at 1,320' of Puthur No. 2 channel	..	..	320	
Deduct for 2 1/2' width of channel	..	..	29	
Net Total	..	..	291 or 290	

Estimate No. 363-V.

Pipe sluices in Vadavar No. 5 Channel.

Sluice right bank at 1,980' (12" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	60	
Sluice left bank at 1,980' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	50	
Sluice right bank at 3,300' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	50	
Sluice left bank at 3,300' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	50	
Total	..	..	210	210

Estimate No. 364-V.

Cross wall with vent at 3,300 feet in Vadavar No. 5 Channel.

As per type estimate attached to the estimate for the cross wall with vent at 1,320' of Puthur No. 1 channel	..	..	20	
Add for 1 foot extra width of channel	..	..	2	
Total	..	..	22 or 25	
Total, C. Works	..	..	..	1,275

VADAVAR—SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 5 CHANNEL—cont.

L. EARTHWORK.

Estimate No. 365-V.

Excavating Vadavar No. 5 Channel.

31,000 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards.	3 12 0	1,000 c. ft.	304.	
	Contingencies	..	..	16	
	Petty supervision	..	..	10	
	Total	..	..	330	
	Total, L. Earthwork	..	..	..	330

O. MISCELLANEOUS.

Estimate No. 366-V.

Fixing demarcation stones on Vadavar No. 5 Channel.

No. 16	Revenue survey stones including cartage to site and fixing in earth.	0 8 0	Each.	8	
	Contingencies	..	..	2	
	Total	..	..	10	

Estimate No. 367-V.

Fixing mile and furlong stones along Vadavar No. 5 Channel.

No. 5	Furlong stones	2 2 0	Each.	11	
	Total, say	..	..	10	
	Total, O. Miscellaneous	..	..	20	

P. MAINTENANCE

Estimate No. 368-V.

Maintenance of Vadavar No. 5 Channel.

625 mile.	Maintenance during extension	25 0 0	Mile.	16	
	Total, say	..	..	15	
	Total, P. Maintenance	..	..	15	

VADAVAR No. 6 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 369-V.

Preliminary Expenses for Vadavar No. 6 Channel.

385 acres.	Cost of Preliminary surveys	0 6 0	Acre.	144	
27 mile.	Laying out before execution	10 0 0	Mile.	3	
	Contingencies	..	..	3	
	Total	..	..	150	
	Total, A. Preliminary Expenses	..	..	150	

B. LAND.

Estimate No. 370-V.

Compensation for land for Vadavar No. 6 Channel.

124 acres.	Kandudampattu village	225 0 0	Acre.	279	
	Add 15 per cent for compulsory acquisition	..	..	41	
	Total	..	..	320	
	Total, B. Land	..	..	320	

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 6 CHANNEL—cont.

C. WORKS.

Estimate No. 371-V.

Pipe sluices in Vadavar No. 6 Channel.

Head (pipe) sluice at head (15" pipe) as per type estimate 1 attached to the estimate of sluices in Puthur channel.	..	..	100	
Add for 1 pipe for extra length of tunnel ..	5 14 0	1 pipe.	6	
Total ..	..	..	106	
Sluice right bank at 1,452' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel.	..	..	50	
Total ..	..	..	156 or say 160	

Estimate No. 372-V.

Cross wall with vent at 1,452 feet in Vadavar No. 6 Channel.

As per type estimate attached to the estimate for the cross wall with vent at 1,320' of Puthur No. 1 channel.	..	..	20	
Add for 1 foot extra width of channel ..	1 9 0	1 foot.	2	
Total ..	..	..	22 or say 25.	
Total, C. Works ..	..	..	..	185

L. EARTHWORK.

Estimate No. 373-V.

Excavating Vadavar No. 6 Channel.

17,000 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards.	3 12 0	1,000 c. ft.	64	
	Contingencies ..	..	..	4	
	Petty supervision ..	..	..	2	
	Total ..	..	..	70	
	Total, L. Earthwork ..	..	..	..	70

O. MISCELLANEOUS.

Estimate No. 374-V.

Fixing demarcation stones on Vadavar No. 6 Channel.

No. 6	Revenue survey stones including cartage to site and fixing in earth.	0 8 0	Each.	3	
	Contingencies ..	..	..	2	
	Total ..	..	..	5	

Estimate No. 375-V.

Fixing mile and furlong stones along Vadavar No. 6 Channel.

No. 2	Furlong stones ..	2 2 0	Each.	4	
	Total, say ..	..	..	..	
	Total, O. Miscellaneous ..	..	..	..	1

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 6 CHANNEL—cont.

P. MAINTENANCE.

Estimate No. 376-V.

Maintenance of Vadavar No. 6 Channel.

27 mile.	Maintenance during execution ..	25 0 0	Mile.	7	
	Total ..	..	..	..	5
	Total, P. Maintenance ..	..	..	..	5

VADAVAR No. 7 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 377-V.

Preliminary Expenses for Vadavar No. 7 Channel.

527 acres.	Cost of preliminary surveys ..	0 6 0	Acre.	198	
5 mile.	Laying out before execution ..	10 0 0	Mile.	5	
	Contingencies ..	..	..	2	
	Total ..	..	..	205	
	Total, A. Preliminary Expenses ..	..	..	..	205

B. LAND.

Estimate No. 378-V.

Compensation for land for Vadavar No. 7 Channel.

247 acres.	Avikkottai village ..	250 0 0	Acre.	618	
	Compensation for earth ..	..	..	20	
	Add 15 per cent for compulsory acquisition ..	..	..	92	
	Total ..	..	..	730	
	Total, B. Land ..	..	..	..	730

C. WORKS.

Estimate No. 379-V.

Head sluice for Vadavar No. 7 Channel.

	The same as the estimate of the head sluice for Palaiyur No. 2 channel ..	..	..	240	
	Add extra height of 0.75' of platform and head walls ..	..	..	7	
	Total ..	..	..	247	250

Estimate No. 380-V.

2-ft. drop at 1,320 feet in Vadavar No. 7 Channel.

	As per type estimate attached to the estimate for the 2' drop at 1,188' of Puthur No. 5 channel.	..	..	280	
	Discount—for 1½ width of channel ..	10 0 0	1 foot.	15	
	Net total ..	..	..	..	245

Estimate No. 381-V.

Pipe sluices in Vadavar No. 7 Channel.

	Sluice right bank at head (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	..	..	50	
	Sluice right bank at 2,640' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	..	..	50	
	Sluices left bank at 2,640' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	..	..	50	
	Total ..	..	..	..	150
	Carried over ..	..	..	..	645

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 7 CHANNEL—cont.

Brought forward .. 64

C. WORKS—cont.

Estimate No. 382-V.

Cross wall with vent at 2,640 feet of Vadavar No. 7 Channel.

As per type estimate attached to the estimate for the cross wall with vent at 1,320' of Puthur No. 1 channel	..	..	20	
Add for 2' extra width of channel	1 9 0	1 foot.	3	
Total	..	..	23 0	25
Total, C. Works	..	..	..	670

L. EARTHWORK.

Estimate No. 383-V.

Excavating Vadavar No. 7 Channel.

50-000 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards	3 12 0	1,000 c. ft.	188	
	Contingencies	..	..	8	
	Petty supervision	..	..	4	
	Total	..	..	..	200
	Total, L. Earthwork	..	..	..	200

O. MISCELLANEOUS.

Estimate No. 384-V.

Fixing demarcation stones on Vadavar No. 7 Channel.

12 Nos.	Revenue survey stones including cartage to site and fixing in earth	0 8 0	Each.	6	
	Contingencies	..	..	4	
	Total	..	..	..	10

Estimate No. 385-V.

Fixing mile and furlong stones along Vadavar No. 7 Channel.

4 Nos.	Furlong stones	2 2 0	Each.	15	
	Total	..	..	..	15
	Total, O. Miscellaneous	..	..	..	25

P. MAINTENANCE.

Estimate No. 386-V.

Maintenance of Vadavar No. 7 Channel.

5 mile.	Maintenance during execution	25 0 0	Mile.	13	
	Total, say	..	..	..	15
	Total, P. Maintenance	..	..	..	15

VADAVAR No. 8 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 387-V.

Preliminary Expenses for Vadavar No. 8 Channel.

522 acres.	Cost of preliminary surveys	0 6 0	Acre.	196	
375 mile.	Laying out before execution	10 0 0	Mile.	4	
	Total	..	..	..	200
	Total A, Preliminary Expenses	..	..	..	200

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 8 CHANNEL—cont.

B. LAND.

Estimate No. 388-V.

Compensation for land for Vadavar No. 8 Channel.

2-11 acres.	Avikkottai (Kilakkurichi shrotriem)	250	Acre.	528	
	Compensation for earth	..	..	10	
	Add 15 per cent. for compulsory acquisition	..	..	82	
	Total	..	..	..	620
	Total, B. Land	..	..	..	620

C. WORKS.

Estimate No. 389-V.

Head sluice for Vadavar No. 8 Channel.

	The same as the estimate for head sluice for Palaiyur No. 2 channel	..	..	240	
	Add for extra height of $\frac{1}{2}$ foot in head walls and platform wall	..	..	7	
	Total	..	..	247	250

Estimate No. 390-V.

4-ft. Drop at 330' in Vadavar No. 8 Channel.

	The same as per type estimate attached to the estimate for the 4' drop at 1 m. 4,620' of Puthur No. 3 channel	..	..	320	
	Total	..	..	..	320

Estimate No. 391-V.

A 6-ft. syphon well drop at 0 mile 1,320 feet of Vadavar No. 8 Channel.

1-20 units.	Concrete, broken brick in surki mortar	21 0 0	100 c. ft.	25	
2-30 "	Platform moulded brick in surki mortar	23 0 0	100 "	53	
2 c. ft.	Cutstone work	2 8 0	C. ft.	5	
2-90 units.	Brick on end, 9"	13 8 0	100 sq. ft.	39	
1-20 "	Brick jelly backing	10 8 0	100 c. ft.	13	
2-30 "	Plastering with portland cement, $\frac{1}{2}$ " thick	6 12 0	100 sq. ft.	16	
0-60 "	Cuddapah slab	30 0 0	100 "	18	
No. 19 "	Stoneware pipes 12" diameter each 2' long	4 2 0	Pipe.	78	
	Earthwork, excavating foundations, etc.	..	..	20	
	Shed for materials	..	..	10	
	Total	..	..	277	
	Contingencies	..	..	13	
	Petty supervision	..	..	10	
	Total	..	..	..	300

Estimate No. 392-V.

Pipe sluices in Vadavar No. 8 Channel.

	Sluice right bank at head (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	50	
	Sluice left bank at head (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	50	
	Sluice right bank at 1,980' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	50	
	Sluice left bank at 1,980' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	50	
	Total	..	..	..	200
	Carried over	..	..	..	1,070

VADAVAR SYSTEM--DISTRIBUTARIES--cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 8 CHANNEL--cont.

Brought forward .. 1,0

C. WORKS--cont.

Estimate No. 393-V.

Cross wall with vent at 1,980 feet in Vadavar No. 8 Channel.

As per type estimate attached to the estimate for the cross wall with vent at 1,320' of Puthur No. 1 channel ..					
Add for 1 foot extra width of channel ..					
	1 9 0	1 foot.		20	
				2	
Total ..				22	or 1
Total, C. Works ..					1,0

L. EARTHWORK.

Estimate No. 394-V.

Excavating Vadavar No. 8 Channel.

57,000 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards ..	3 12 0	1,000 c. ft.	214	
	Contingencies ..			10	
	Petty supervision ..			6	
Total ..					23
Total, L. Earthwork ..					23

O. MISCELLANEOUS.

Estimate No. 395-V.

Fixing demarcation stones on Vadavar No. 8 Channel.

No. 10	Revenue survey stones including cartage to site and fixing in earth ..	0 8 0	Each.	5	
Total ..					

Estimate No. 396-V.

Fixing mile and furlong stones along Vadavar No. 8 Channel.

No. 3	Furlong stones ..	2 2 0	Each.	6	
Total say ..					
Total, O. Miscellaneous ..					

P. MAINTENANCE.

Estimate No. 397-V.

Maintenance of Vadavar No. 8 Channel.

375 mile.	Maintenance during execution ..	25 0 0	Mile.	9	
Total say ..					10
Total, P. Maintenance ..					10

VADAVAR No. 9 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 398-V.

Preliminary expenses for Vadavar No. 9 Channel.

187 acres.	Cost of preliminary surveys ..	0 6 0	Acre.	70	
31 mile.	Laying out before execution ..	10 0 0	Mile.	3	
	Contingencies ..			7	
Total ..					80
Total, A. Preliminary Expenses ..					80

VADAVAR SYSTEM--DISTRIBUTARIES--cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 9 CHANNEL--cont.

B. LAND.

Estimate No. 399-V.

Compensation for land for Vadavar No. 9 Channel.

150 acres.	Avikkottai village (Kilakkurichi shrotriem) ..	250 0 0	Acre.	375	
	Compensation for earth ..			10	
	Add 15 per cent for compulsory acquisition ..			55	
Total ..					440
Total, B. Land ..					440

C. WORKS.

Estimate No. 400-V.

Pipe sluice in Vadavar No. 9 Channel.

	Head (pipe) sluice at head (12" pipe) as per type estimate VIII attached to the estimate of sluices in Illappadi channel ..			70	
Total ..					70

Estimate No. 401-V.

4-ft. drop at 990 feet in Vadavar No. 9 Channel.

Mile.	As per type estimate attached to the estimate for the 4' drop at 4,620 feet of Puthur No. 3 channel ..	2 6 0	Each.	320	
	Add for 9" diameter pipes 17 in number ..			40	
Total ..					360
	Deduct the cost of 17 twelve inches diameter pipes allowed for in the type estimate ..	4 2 0	Each.	70	
Total ..					290
Total, C. Works ..					360

L. EARTHWORK.

Estimate No. 402-V.

Excavating Vadavar No. 9 Channel.

33,000 units.	Excavating the channel with a lead of 20 yards and a lift of two yards ..	3 12 0	1,000 c. ft.	124	
	Contingencies at 5 per cent ..			9	
	Petty supervision at 3 per cent ..			7	
Total ..					140
Total, L. Earthwork ..					140

O. MISCELLANEOUS.

Estimate No. 403-V.

Fixing demarcation stones on Vadavar No. 9 Channel.

No. 8	Revenue survey stones including cartage to site and fixing in earth ..	0 8 0	Each.	4	
	Contingencies ..			1	
Total say ..					5

Estimate No. 404-V.

Fixing mile and furlong stones along Vadavar No. 9 Channel.

No. 2	Furlong stones ..	2 2 0	Each.	4	
Total say ..					5
Total, O. Miscellaneous ..					10

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS.	RS.
VADAVAR No. 9 CHANNEL—cont.					
P. MAINTENANCE.					
Estimate No. 405-V.					
Maintenance of Vadavar No. 9 Channel.					
31 mile.	Maintenance during execution ..	25 0 0	Mile.		
	Total say ..	..	..	..	10
	Total, P. Maintenance ..	..	..	..	10

VADAVAR No. 10 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 406-V.

Preliminary Expenses for Vadavar No. 10 Channel.

846 acres.	Cost of preliminary surveys ..	0 6 0	Acre.	317	
75 mile.	Laying out before execution ..	10 0 0	Mile.	8	
	Contingencies ..	..	..	5	
	Total ..	..	..	..	330
	Total, A. Preliminary Expenses ..	..	..	..	330

B. LAND.

Estimate No. 407-V.

Compensation for land for Vadavar No. 10 Channel.

3.51 acres.	Avikotta (Kilakkurichi shrotriem) ..	250 0 0	Acre.	878	
0.92 "	Olayakunnam village ..	250 0 0	"	230	
	Total ..	..	..	..	1,108
	Compensation for earth ..	..	..	30	
	Add 15 per cent for compulsory acquisition ..	..	..	162	
	Total ..	..	..	..	1,300
	Total, B. Land ..	..	..	..	1,300

C. WORKS.

Estimate No. 408-V.

Head sluice for Vadavar No. 10 Channel.

6.20 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	130	
8.5 "	Platform moulded brick in mortar ..	21 8 0	100 "	183	
0.6 "	Arch work do. ..	22 8 0	100 "	14	
	Centering charges ..	..	Lump sum.	5	
3.5 squares.	Brick on end 9" ..	13 8 0	100 sq. ft.	47	
1.25 "	Brick jelly backing 6" ..	10 8 0	100 c. ft.	13	
2.5 c. ft.	Cutstone work ..	2 8 0	C. ft.	6	
2.25 "	Teakwood wrought and put up ..	4 0 0	"	9	
5.8 squares.	Plastering with portland cement 3" thick ..	6 12 0	100 sq. ft.	39	
No. 1	Teakwood shutter 1' 9" X 1' 9" with screw shaft, straps, bolts, handles, etc., complete ..	..	Lump sum.	55	
	Conveyance and fitting charges ..	..	..	5	
	Shed for materials ..	..	..	10	
	Earthwork, excavating foundations, forming approaches, etc. ..	..	..	25	
	Total ..	..	..	..	541
	Contingencies at 5 per cent ..	..	..	26	
	Petty supervision ..	..	..	13	
	Total ..	..	..	..	580

Estimate No. 409-V.

4-ft. drop at 900 feet in Vadavar No. 10 Channel.

	As per type estimate attached to the estimate for the 4 ft. drop at 1 mile 2,706 feet of Muvallur No. 2 channel ..	..	..	500	
	Total ..	..	..	..	500
	Carried over ..	..	..	..	1,080

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS.	RS.

VADAVAR No. 10 CHANNEL—cont.

C. WORKS—cont.

Estimate No. 410-V.

Brought forward .. 1,080

Constructing a 6-ft. syphon well drop at 2,310 feet in Vadavar No. 10 Channel.

4.50 units.	Concrete, brick jelly in surki mortar ..	21 0 0	100 c. ft.	95	
4.60 "	Platform moulded brick in surki mortar ..	23 0 0	100 "	106	
2.4 "	Semi-circular archwork, brick in surki mortar ..	24 0 0	100 "	58	
	Centering charges for archwork ..	..	Lump sum.	19	
6.3 "	Plastering with portland cement 3" thick ..	6 12 0	100 sq. ft.	43	
0.40 "	Caddapah slab 2" thick ..	30 0 0	100 "	12	
4.20 "	Brick on end 9" ..	13 8 0	100 "	57	
1.70 "	Brick jelly backing 6" thick ..	10 8 0	100 "	18	
10 c. ft.	Cutstone work ..	2 8 0	C. ft.	25	
	Earthwork, excavating foundations, forming bund drain, etc. ..	..	Lump sum.	20	
	Shed for materials ..	..	..	10	
	Total ..	..	..	..	463
	Contingencies ..	..	..	23	
	Petty supervision ..	..	..	14	
	Total ..	..	..	..	500

Estimate No. 411-V.

4-ft. drop at 2,970 feet in Vadavar No. 10 Channel.

	As per type estimate attached to the estimate for the 4-ft. drop at 1 mile 2,706 feet of Muvallur No. 2 channel ..	..	..	500	
	Deduct for 1½' width of apron in front and rear $2 \times 1\frac{1}{2} \times 5\frac{1}{2} = 16\frac{1}{2}$ sq. ft. of brick on end at 13-8-0 per 100 sq. ft. ..	..	..	2	
	Total ..	..	..	498 or	500

Estimate No. 412-V.

4-ft. drop at 3,630 feet in Vadavar No. 10 Channel.

	As per type estimate attached to the estimate for the 4' drop at 1 mile 2,706 feet of Muvallur No. 2 channel ..	..	..	500	
	Deduct for 1½' width of apron in front and rear ..	..	..	2	
	Total ..	..	..	498 or	500

Estimate No. 413-V.

Pipe sluices in Vadavar No. 10 Channel.

	Sluice R.B. at 990 feet (6" pipe) as per type estimate V attached to the estimate of sluice in Puthur channel ..	..	..	40	
	Sluice L.B. at 990 feet (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	..	..	40	
	Sluice R.B. at 2,310 feet (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	..	..	40	
	Sluice L.B. at 2,310 feet (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	..	..	50	
	Sluice R.B. at 3,300 feet (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	..	..	40	
	Sluice L.B. at 3,300 feet (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	..	..	50	
	Total ..	..	..	..	260
	Total, C. Works ..	..	..	..	2,840

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 10 CHANNEL—cont.

L. EARTHWORK.

Estimate No. 414-V.

Excavating Vadavar No. 10 Channel.

121,000 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards	3 12 0	1,000 c. ft.	454	
	Contingencies at 5 per cent.	..	..	22	
	Petty supervision at 3 per cent.	..	..	14	
	Total	..	..	..	490
	Total, L. Earthwork	..	..	..	490

O. MISCELLANEOUS.

Estimate No. 415-V.

Fixing demarcation stones on Vadavar No. 10 Channel.

No. 18	Revenue survey stones including cartage to site and fixing in earth	0 8 0	Each.	9	
	Contingencies	..	..	1	
	Total	..	..	..	10

Estimate No. 416-V.

Fixing mile and furlong stones along Vadavar No. 10 Channel.

No. 6	Furlong stones	2 2 0	Each.	13	
	Total say	..	..	..	15
	Total, O. Miscellaneous	..	..	..	25

P. MAINTENANCE.

Estimate No. 417-V.

Maintenance of Vadavar No. 10 Channel.

75 miles.	Maintenance during execution	25 0 0	Mile.	19	
	Total, P. Maintenance (say)	..	..	..	20

VADAVAR No. 11 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 418-V.

Preliminary Expenses for Vadavar No. 11 Channel.

278 acres.	Cost of preliminary surveys	0 6 0	Acre.	104	
375 acre.	Laying out before execution	10 0 0	Mile.	4	
	Contingencies	..	..	2	
	Total	..	..	..	110
	Total, A. Preliminary Expenses	..	..	..	110

B. LAND.

Estimate No. 419-V.

Compensation for land for Vadavar No. 11 Channel.

1.81 acres.	Attivetti village	300 0 0	Acre.	543	
	Compensation for earth	..	..	17	
	Add 15 per cent for compulsory acquisition	..	..	80	
	Total	..	..	..	640
	Total, B. Land	..	..	..	640

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 11 CHANNEL—cont.

C. WORKS.

Estimate No. 420-V.

Pipe sluices in Vadavar No. 11 Channel.

	Sluice at head (15" pipe) as per type estimate VII attached to the estimate of sluices in Puttur No. 5 channel	..	..	110	
	Sluice L.B. at head (12" pipe) as per type estimate V attached to the estimate of sluices in Puttur channel	..	..	60	
	Total	..	..	..	170

Estimate No. 421-V.

Cross wall with vent at 1,980 feet of Vadavar No. 11 Channel.

	As per type estimate attached to the estimate for the cross wall with vent at 1,320 feet of Puttur No. 1 channel.	..	..	20	
	Total	..	..	..	20
	Total, C. Works	..	..	..	190

L. EARTHWORK.

Estimate No. 422-V.

Excavating Vadavar No. 11 Channel.

33,545 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards	3 12 0	1,000 c. ft.	126	
	Contingencies	..	..	9	
	Petty supervision	..	..	5	
	Total	..	..	..	140
	Total, L. Earthwork	..	..	..	140

O. MISCELLANEOUS.

Estimate No. 423-V.

Fixing demarcation stones on Vadavar No. 11 Channel.

No. 10	Revenue survey stones including cartage to site and fixing in earth	0 8 0	Each.	5	
	Total	..	..	..	

Estimate No. 424-V.

Fixing mile and furlong stones along Vadavar No. 11 Channel.

No. 3	Furlong stones	2 2 0	Each.	6	
	Total say	..	..	..	5
	Total, O. Miscellaneous	..	..	..	10

P. MAINTENANCE.

Estimate No. 425-V.

Maintenance of Vadavar No. 11 Channel.

375 mile.	Maintenance during execution	25 0 0	Mile.	9	
	Total (say)	..	..	..	10
	Total, P. Maintenance	..	..	..	10

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 12 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 426-V.

Preliminary Expenses for Vadavar No. 12 Channel.

522 acres.	Cost of preliminary surveys	0 6 0	Acre.	196	
1-376 miles.	Laying out before execution	10 0 0	Mile.	14	
	Total				210
	Total, A. Preliminary Expenses				210

B. LAND.

Estimate No. 427-V.

Compensation for land for Vadavar No. 12 Channel.

0-55 acres.	Attivetti village	300 0 0	Acre.	150	
1-03 "	Kanniyakurichi village (wet)	250 0 0	"	258	
3-81 "	Do. (dry)	250 0 0	"	252	
3-09 "	Elavanur village	75 0 0	"	232	
	Total			1,592	
	Compensation for earth			150	
	Add 15 per cent for compulsory acquisition			238	
	Total				1,980
	Total, B. Land				1,980

C. WORKS.

Estimate No. 428-V.

3-ft. drop at 396 feet in Vadavar No. 12 Channel.

As per type estimate attached to the estimate for the 3-ft. drop at 1,320 feet of Puthur No. 2 channel			320	
Deduct for 2½' width of channel	10 11 0	1 ft.	29	
Total			291	or 290

Estimate No. 429-V.

3-ft. drop at 2,542 feet in Vadavar No. 12 Channel.

As per type estimate attached to the estimate for the 3-ft. drop at 1,320 feet of Puthur No. 2 channel			320	
Deduct for 2½' width of channel	11 10 0		29	
Total			291	or 290

Estimate No. 430-V.

3-ft. drop at 1 mile, 1,980 feet in Vadavar No. 12 Channel.

As per type estimate attached to the estimate for the 3 ft. drop at 1,320 feet of Puthur No. 2 channel.			320	
Deduct for 3½' width of channel	11 10 0	1 ft.	41	
Total			279	or 280
				Carried over .. 860

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

VADAVAR No. 12 CHANNEL—cont.

O. WORKS—cont.

Brought forward .. 860

Estimate No. 431-V.

Pipe sluices in Vadavar No. 12 Channel.

Sluice L.B. at head (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	40	
Sluice R.B. at 396 feet (3" pipe) as per type estimate VII attached to the estimate of sluices in Puthur No. 5 channel	..	..	70	
Sluice L.B. at 396 feet (6" pipe) as per type estimate VII attached to the estimate of sluices in Puthur No. 5 channel	..	..	60	
Sluice R.B. at 2,542 feet (6" pipe) as per type estimate VII attached to the estimate of sluices in Puthur No. 5 channel	..	..	60	
Sluice L.B. at 2,542 feet (6" pipe) as per type estimate VII attached to the estimate of sluices in Puthur No. 5 channel	..	..	60	
Sluice R.B. at 1 mile 330 feet (6" pipe) as per type estimate VII attached to the estimate of sluices in Puthur No. 5 channel	..	..	60	
Sluice L.B. at 1 mile 330 feet (6" pipe) as per type estimate VII attached to the estimate of sluices in Puthur No. 5 channel	..	..	60	
Total	..	..		410
Total, O. Works	..	..		1,270

L. EARTHWORK.

Estimate No. 432-V.

Excavating Vadavar No. 12 Channel.

438 units.	Excavating the channel with a lead of 20 yards and a lift of 2 yards	3 12 0	1,000 c. ft.	1,643	
	Contingencies	..	..	85	
	Petty supervision	..	..	52	
	Total	..	..		1,780
	Total, L. Earthwork	..	..		1,780

O. MISCELLANEOUS.

Estimate No. 433-V.

Fixing demarcation stones on Vadavar No. 12 Channel.

34	Revenue survey stones including cartage to site and fixing in earth	0 8 0	Each.	17	
	Contingencies	..	..	3	
	Total	..	..		20

Estimate No. 434-V.

Fixing mile and furlong stones along Vadavar No. 12 Channel.

No. 1	Mile stone	3 2 0	Each.	3	
" 10	Furlong stones	2 2 0	"	21	
	Total	..	..	24	or 25
	Total, O. Miscellaneous	..	..		45

P. MAINTENANCE.

Estimate No. 435-V.

Maintenance of Vadavar No. 12 Channel.

1-875	Maintenance during execution	25 0 0	Mile.	34	
	Total, say	..	..		35
	Total, P. Maintenance	..	..		35

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

PALAIYUR CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 436-V.

Preliminary Expenses for Palaiyur Channel.

3,562 acres.	Cost of preliminary surveys	0 6 0	Acre.	1,336	
6.7 miles.	Laying out before execution	40 0 0	Mile.	268	
	Contingencies	..	..	26	
	Total	..	..	..	1,630
	Total, A. Preliminary Expenses	..	..	..	1,630

B. LAND.

Estimate No. 437-V.

Compensation for lands for Palaiyur Channel.

14.44 acres.	Pallakkudi village	250 0 0	Acre.	3,810	
11.62 "	Ullikkotta do.	225 0 0	"	2,592	
30.76 "	Panganadu do.	150 0 0	"	4,614	
4.25 "	Vallur do.	225 0 0	"	956	
	Total	..	..	..	11,772
	Compensation for earth	..	..	1,000	
	Add 15 per cent for compulsory acquisition	..	..	1,718	
	Total	..	..	..	14,490
	Total, B. Land	..	..	..	14,490

C. WORKS.

Estimate No. 438-V.

Constructing a head sluice for Palaiyur Channel.

10.70 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	225	
13.70 "	Platform moulded brick in chunam ..	21 8 0	100 "	295	
1.80 "	Archwork platform moulded brick in chunam ..	22 8 0	100 "	41	
	Centering for archwork	Lump sum.		15	
10 c. ft.	Cutstone work	2 8 8	C. ft.	25	
9.30 "	Plastering with Portland cement $\frac{1}{4}$ " thick ..	6 12 0	100 sq. ft.	63	
6.60 "	Brick on end 9" thick	13 8 0	100 "	89	
2.40 "	Brick jelly backing	10 8 0	100 c. ft.	25	
5 "	Teakwood wrought and put up	4 0 0	C. ft.	20	
	Earthwork excavation, forming banks, approaches, etc.	Lump sum.		25	
No. 1	Screw-gearing shutter 6' 3" X 2' 9" X 3" with angle iron, holding down bolts, etc., complete.	..	..	120	
	Fitting charge 1/12 cost of shutter	..	..	10	
" 4	Wheel guard stones 9" diameter X 3' high ..	3 0 0	Each	12	
	Shed for materials	..	..	20	
	Total	..	..	..	985
	Contingencies	..	..	50	
	Petty supervision	..	..	25	
	Total	..	..	..	1,060
	Carried over	..	..	..	1,060

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

PALAIYUR CHANNEL—cont.

C. WORKS—cont.

Estimate No. 439-V.

Brought forward .. 1,000

Constructing a 4-ft. drop at 0 mile 3,300 feet in Palaiyur Channel.

12.05 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	253	
17.10 "	Platform moulded brick in mortar	21 8 0	100 "	363	
3.30 "	Horizontal archwork, platform moulded brick in surki mortar	24 0 0	100 "	79	
10.75 "	Plastering with portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	73	
16 sq. ft.	Cuddapah slab, 2" thick	30 0 0	100 "	5	
13.90 units.	Concrete block revetment	21 12 0	100 c. ft.	302	
3.50 "	Brick on end do.	13 8 0	100 sq. ft.	47	
4.00 "	Brick jelly backing to revetment	10 8 0	100 c. ft.	42	
	Earthwork excavating foundations	Lump sum.		30	
	Shed for materials	..	..	18	
	Total	..	..	..	1,217
	Contingencies	..	..	65	
	Petty supervision	..	..	38	
	Total	..	..	..	1,320

Estimate No. 440-V.

Girder bridge "B" Class of 18-ft. span with 14-ft. roadway in Palaiyur Channel.

12.70 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	267	
14.80 "	Platform moulded brickwork in chunam ..	21 8 0	C. ft.	318	
5 c. ft.	Cutstone work	2 8 0	"	13	
8.30 c. ft.	Plastering with portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	56	
1.50 "	Road metalling with gravel	27 8 0	100 c. ft.	41	
No. 8.	Wheel guard stones, 9" diameter 3' high ..	3 0 0	No.	24	
23.7 c. ft.	Rolled steel beam	8 0 0	Cwt.	190	
21 $\frac{1}{2}$ r. ft.	West Wood's trough plate including cement concrete, standards and hand rails ..	40 11 0	R. ft.	875	
4.0 "	Brick on end, 2-inch	13 8 0	100 sq. ft.	54	
2.00 "	Brick jelly backing	10 8 0	100 c. ft.	21	
	Shed for materials	..	..	20	
	Contingencies	..	..	94	
	Petty supervision	..	..	47	
	Total	..	..	..	2,020

Estimate No. 441-V.

6-ft. syphon well drop at 1 mile 2,970 feet in Palaiyur Channel.

7.4 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	155	
11.1 "	Platform moulded brick in surki mortar ..	23 0 0	100 "	255	
3.15 "	Semi-circular archwork in surki mortar ..	24 0 0	100 "	76	
	Centering for archwork	Lump sum.		25	
26 c. ft.	Cutstone work neatly dressed	2 8 0 4	C. ft.	65	
86 "	Cuddapah slab, 2" thick	30 0 0	100 sq. ft.	26	
11.50 "	Plastering with portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 "	73	
9.60 "	Brick on end, 9-inch	13 8 0	100 "	130	
2.90 "	Brick jelly backing, 6-inches	10 8 0	100 c. ft.	30	
	Earthwork excavation forming banks, cart-tracks, drain, etc., complete	Lump sum.		35	
	Shed for materials	..	..	30	
	Total	..	..	..	905
	Contingencies	..	..	47	
	Petty supervision	..	..	28	
	Total	..	..	..	980
	Carried over	..	..	..	5,300

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

PALAIYUR CHANNEL—cont.

C. WORKS—cont.

Brought forward .. 5,380

Estimate No. 442-V.

Constructing 4-ft. syphon well drop at 1 mile 3,765 feet in Palaiyur Channel.

7-10 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	149	
10-0 "	Platform moulded brick in surki mortar ..	23 0 0	100 "	230	
3-00 "	Semi-circular archwork, platform moulded brick in surki mortar ..	24 0 0	100 "	72	
	Centering for archwork ..		Lump sum.	25	
22 units.	Cutstone work neatly dressed ..	2 8 0	C. ft.	55	
6-8 sq. ft.	Cuddapah slab, 2" thick ..	30 0 0	100 sq. ft.	24	
1-3 "	Plastering with portland cement, 3/4" thick ..	6 12 0	100 "	76	
9-6 "	Brick on end, 9-inch ..	13 8 0	100 "	130	
2-9 "	Brick jelly backing, 6-inch ..	10 8 0	100 c. ft.	30	
	Earthwork excavating foundations, forming bund, cart-track, drain, etc., complete ..		Lump sum.	35	
	Shed for material ..			23	
	Total ..			849	
	Contingencies ..			45	
	Petty supervision ..			26	
	Total ..				920

Estimate No. 443-V.

Girder bridge "B" Class of 15-ft. span with 14-ft. roadway in Palaiyur Channel, at 2 miles 330 feet.

12-70 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	267	
14-80 "	Platform moulded brick in chunam ..	21 8 0	100 "	318	
5 c. ft.	Cutstone work ..	2 8 0	C. ft.	13	
8-30 "	Plastering with portland cement, 3/4" thick ..	6 12 0	100 sq. ft.	56	
1-50 "	Road metalling with gravel ..	27 8 0	100 c. ft.	41	
No. 8.	Wheel guard stones ..	3 0 0	No.	24	
23-7 c. ft.	Rolled steel beam ..	8 0 0	Cwt.	190	
18 1/2 r. ft.	West Wood's trough plate including cement concrete, standards and hand rails ..	40 11 0	R. ft.	753	
4-00 "	Brick on end 9-inch ..	13 8 0	100 sq. ft.	54	
2-00 "	Brick jelly backing ..	10 8 0	100 c. ft.	21	
	Shed for materials ..			20	
	Total ..			1,757	
	Contingencies ..			90	
	Petty supervision ..			53	
	Total ..				1,900

Estimate No. 444-V.

Outlet of 64 feet long at 2 miles 2,475 feet in Palaiyur Channel.

64 r. ft.	Body wall with apron, etc., as per type estimate attached to the outlet at 5 miles 3,300 feet of Mannargudi channel ..	4 6 0	R. ft.	280	
	Cost of wings and stepped portion of body wall as per type estimate excluding contingencies and petty supervision ..			80	
	Total ..			360	
	Sheds for materials ..			10	
	Contingencies ..			18	
	Petty supervision ..			12	
	Total ..				400
	Carried over ..				8,600

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

PALAIYUR CHANNEL—cont.

C. WORKS—cont.

Brought forward .. 8,600

Estimate No. 445-V.

Outlet of 45-ft. long at 3 miles 660 feet in Palaiyur Channel.

45 r. ft.	Body wall with apron, etc., as per type estimate attached to the estimate for the outlet at 5 miles 3,300 feet of Mannargudi channel ..	4 6 0	R. ft.	197	
	Cost of wings and stepped portion of body wall as per type estimate ..			90	
	Total ..			277	
	Contingencies ..			14	
	Petty supervision ..			9	
	Total ..				300

Estimate No. 446-V.

2-ft. drop at 4 miles 297 feet in Palaiyur Channel.

	As per type estimate attached to the estimate for the 2-ft. drop at 2 miles 2,970 feet of Vadavar No. 1 channel ..			620	
	Deduct for 1 1/2 ft. width of channel ..	15 5 0	1 ft.	23	
	Total ..			597 or	600

Estimate No. 447-V.

2-ft. drop at 4 miles 1,617 feet in Palaiyur Channel.

	As per type estimate attached to the estimate for the 2-ft. drop at 2 miles 2,970 feet of Vadavar No. 1 channel ..			620	
	Deduct for 2-ft. width of channel ..	15 5 0	1 ft.	20	
	Total ..				590

Estimate No. 448-V.

2-ft. at 4 miles 3,597 feet in Palaiyur Channel.

	The same as for the 2-ft. drop at 4 miles 1,617-ft. in this channel ..			590	
	Total ..				590

Estimate No. 449-V.

Bridge and drop 2-ft. combined at 5 miles 3,927 feet in Palaiyur Channel.

8-70 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c. ft.	183	
11-80 "	Platform moulded brickwork in chunam ..	21 8 0	100 "	254	
1-56 "	Archwork platform moulded brick in chunam ..	22 8 0	100 "	35	
	Centering for archwork ..		Lump sum.	15	
1-06 "	Horizontal archwork ..	22 8 0	Lump sum.	24	
1-40 "	Concrete block work ..	21 12 0	100 c. ft.	30	
4-60 "	Brick on end ..	13 8 0	100 sq. ft.	62	
2-00 "	Brick jelly backing ..	10 8 0	100 c. ft.	21	
15 "	Cuddapah slab 2" thick ..	30 0 0	100 sq. ft.	5	
10-20 "	Plastering with portland cement, 3/4" thick (1 cement and 3 sand) ..	6 12 0	100 "	69	
No. 8.	Wheel guard stones, 9" diameter and 3' high ..	3 0 0		24	
	Earthwork excavation, forming banks, etc. ..		Lump sum.	10	
	Shed for materials ..			20	
	Total ..			752	
	Contingencies ..			38	
	Petty supervision ..			20	
	Total ..				810
	Carried over ..				11,490

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
PALAIYUR CHANNEL—cont.					
C. WORKS—cont. Brought forward .. 11,44					
Estimate No. 450-V.					
Constructing an undertunnel of 12-ft. span at 6 miles 827 feet in the Palaiyur Channel.					
45-10 units.	Concrete brick jelly in surki mortar ..	21 0 0	100 c. ft.	958 0 0	
45-80 "	Platform moulded brick in surki mortar ..	23 0 0	100 "	1,076 0 0	
21-00 "	Archwork platform moulded brick in surki mortar ..	24 0 0	100 "	504 0 0	
	Centering for archwork ..		Lump sum.	150 0 0	
12-25 units.	Brick on end work ..	13 8 0	100 sq. ft.	165 0 0	
1-70 "	Brick jelly backing ..	10 8 0	100 c. ft.	18 0 0	
29-00 "	Plastering with portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	196 0 0	
	Earthwork excavating foundations ..		Lump sum.	80 0 0	
	Shed for materials ..		"	19 0 0	
	Total ..			3,156 0 0	
	Contingencies ..			159 0 0	
	Petty supervision ..			95 0 0	
	Total ..				

Estimate No. 451-V.

"B" Class masonry bridge of 8-ft. span 6 miles 1,353 feet in Palaiyur Channel.

As per type estimate attached to the estimate for the bridge at 5,214-ft. of Puthur No. 3 channel ..			720 0 0
Add for forming approaches, etc. ..			90 0 0
Total ..			810 0 0

Estimate No. 452-V.

An undertunnel of 12-ft. span at 6 miles 1,452 feet in Palaiyur Channel.

Estimate for one running foot of tunnel.					
0-50 units.	Concrete brick jelly in surki mortar ..	21 0 0	100 c. ft.	10 8 0	
0-47 "	Platform moulded brick in surki mortar ..	23 0 0	100 "	10 13 0	
0-26 "	Archwork brick in surki mortar ..	24 0 0	100 "	6 4 0	
	Centering for archwork ..			2 0 0	
0-31 "	Plastering with portland cement, $\frac{3}{4}$ " thick ..	6 12 0	100 sq. ft.	2 1 6	
0-10 "	Brick on end flooring ..	13 8 0	100 "	1 6 0	
	Sandries ..			0 2 0	
	Total ..			33 2 6	
Undertunnel of 12-ft. span and 92 ft. long at 6 miles 1,452 feet in Palaiyur Channel.					
33 r. ft.	Tunnel ..	33 2 6	R. ft.	3,050 0 0	
	Cost of an undertunnel of 12-ft. span and 80-ft. long in Palaiyur channel at 6 miles 827 feet excluding contingencies and petty supervision ..	3,157 0 0			
	Cost of 80 feet of tunnel alone at Rs. 33-2-6 ..	2,652 8 0			
	Net cost of front and rear head walls, etc. ..	504 8 0			
	Cost of front and rear head walls, etc., as above ..			505 0 0	
	Total ..			3,555 0 0	
	Contingencies ..			179 0 0	
	Petty supervision ..			108 0 0	
	Total ..				3,84
	Carried over ..				19,56

* Rate as per separate estimate.

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
				RS.	RS.
PALAIYUR CHANNEL—cont.					
C. WORKS—cont. Brought forward .. 19,650					
Estimate No. 453-V.					
Pipe sluices in Palaiyur Channel.					
	Sluice right bank at head (9" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel.			50	
	Sluice left bank 3,300' (12" pipe) as per type estimate III attached to the estimate of sluices in Puthur channel.			110	
	Sluice left bank at 3,300' (9" pipe) as per type estimate IX attached to the estimate of sluices in Mannargudi channel.			75	
	Sluice right bank at 1 mile 390' (9" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel.			65	
	Sluice left bank at one mile 990' (12" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel.			80	
	Sluice right bank at 1 mile 1,320' (6" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel.			45	
	Sluice at 1 mile 1,980' (15" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel.			100	
	Sluice at 1 mile 2,607' (9" pipe) as per type estimate III attached to the estimate of sluices in Puthur channel.			90	
	Sluice right bank at 2 miles 1,815' (9" pipe) as per type estimate IX attached to the estimate of sluices in Mannargudi channel.			80	
	Sluice left bank at 2 miles 4,125' (15" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel.			190	
	Sluice left bank at 3 miles 2,541' (12" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel.			80	
	Sluice right bank at 3 miles 4,257' (18" pipe) as per type estimate I attached to the estimate of sluices in Puthur channel.			125	
	Sluice right bank at 3 miles 5,247' (6" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel.			45	
	Sluice right bank at 3 miles 5,247' (6" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel.			45	
	Sluice left bank at 3 miles 5,247' (9" pipe) as per type estimate II attached to the estimate of sluices in Puthur channel.			50	
	Sluice left bank at 4 miles 3,267' (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel.			50	
	Sluice right bank at 5 miles 1,287' (12" pipe) as per type estimate VIII attached to the estimate of sluices in Iluppadi channel.			70	
	Sluice left bank at 5 miles 2,607' (15" pipe) as per type estimate VIII attached to the estimate of sluices in Iluppadi channel.			85	
	Sluice right bank at 5 miles 3,267' (9" pipe) as per type estimate III attached to the estimate of sluices in Puthur channel.			90	
	Sluice left bank at 6 miles 3,597' (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel.			50	
	Total ..				1,485
	Total, C. Works ..				21,035

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS.	RS.
PALAIYUR CHANNEL—cont.					
L. EARTHWORK.					
Estimate No. 454-V.					
Excavating the Palaiyur Channel.					
4,187,000 c. ft.	Earthwork for excavating the channel including 20 yards lead and two yards lift.	3 12 0	1,000 c. ft.	15,701	
	Contingencies	..	..	787	
	Petty supervision	..	..	472	
	Total ..	..	..	..	16,960
	Total, L. Earthwork ..	..	..	..	16,960

O. MISCELLANEOUS.

Estimate No. 455-V.

Fixing demarcation stones on the Palaiyur Channel.					
No. 161	Revenue survey stones including cartage to site and fixing in earth.	0 8 0	Each.	81	
	Total, say ..	..	..	..	80

Estimate No. 456-V.

Fixing mile and furlong stones along Palaiyur Channel.					
No. 6	Mile stones	3 2 0	Each.	19	
„ 47	Furlong stones	2 2 0	..	100	
	Total ..	..	..	119 or	120
	Total, O. Miscellaneous ..	..	..	..	200

P. MAINTENANCE.

Estimate No. 457-V.

Maintenance of Palaiyur Channel.					
6.7 miles.	Maintenance during execution	100 0 0	Mile.	670	
	Total ..	..	..	..	670
	Total, P. Maintenance ..	..	..	..	970

PALAIYUR No. 1 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 458-V.

Preliminary expenses for Palaiyur No. 1 Channel.					
401 acres.	Cost of preliminary surveys	0 6 0	Acre.	150	
„ 81 mile.	Laying out before execution	10 0 0	Mile.	8	
	Contingencies	..	..	2	
	Total ..	..	..	..	160
	Total, A. Preliminary expenses ..	..	..	..	160

B. LAND.

Estimate No. 459-V.

Compensation for land for Palaiyur No. 1 Channel.

2.82 acres.	Panganadu	150 0 0	Acre.	423	
	Total ..	..	..	..	423
	Compensation for earth	..	..	30	
	Add 15 per cent for compulsory acquisition	..	..	67	
	Total ..	..	..	..	520
	Total, B. Land ..	..	..	..	520

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity. (1)	Description of work. (2)	Rate. (3)	Per (4)	Amount. (5)	Total. (6)
		RS. A. P.		RS.	RS.

PALAIYUR No. 1 CHANNEL—cont.

C. WORKS.

Estimate No. 460-V.

Head sluice and bridge combined for the Palaiyur No. 1 Channel.

4.70 units.	Concrete brick jelly in surkimortar	21 0 0	100 c. ft.	97	
4.25 „	Platform moulded brickwork in chunam	21 8 0	100 „	91	
1.00 „	Archwork platform moulded brick in chunam.	22 8 0	100 „	24	
	Centering for archwork	..	Lump sum.	5	
4.5 c. ft.	Cutstone work	2 8 0	C. ft.	11	
2.20 units.	Brick on end 9"	13 8 0	100 sq. ft.	30	
1.00 „	Brick jelly backing for revetment	10 8 0	100 c. ft.	11	
4.00 „	Plastering with portland cement, 2" thick, 1 cement and 3 sand	6 12 0	100 sq. ft.	27	
No. 1	Teakwood stem shutter complete, including iron fittings, angle irons, carriage, etc.	..	Lump sum.	30	
No. 4	Wheel guard stones	3 0 0	Each.	12	
	Earthwork, excavation, forming banks, and approaches, etc., complete	..	Lump sum.	14	
	Shed for materials	..	..	10	
	Total ..	..	..	361	
	Contingencies	..	..	18	
	Supervision	..	..	11	
	Total ..	..	..	..	390

Estimate No. 461-V.

Pipe sluices in Palaiyur No. 1 Channel.

Sluice right bank at 2,310' (12" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel	..	..	75	
Sluice left bank at 2,310' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel.	..	..	50	
Total ..	..	..	..	125

Estimate No. 462-V.

4-ft. drop at 2,640 feet in Palaiyur No. 1 Channel.

As per type estimate attached to the estimate for the 4-ft. drop at 1 mile 4,620' of Puthur No. 3 channel.	..	..	320	
Add for 17 nine-inch diameter pipes	2 6 0	Each.	40	
Total ..	..	..	360	
Deduct the cost of 17 twelve-inch diameter pipes provided for in the estimate.	4 2 0	Each.	70	
Net total ..	..	..	..	290
Total, C. Works ..	..	..	..	805

L. EARTHWORK.

Estimate No. 463-V.

Excavating Palaiyur No. 1 Channel.

83,000 units.	Earthwork excavating the channel with a lead of 20 yards and a lift of 2 yards	3 12 0	1,000 c. ft.	311	
	Contingencies	..	..	18	
	Petty supervision	..	..	11	
	Total ..	..	..	..	340
	Total, L. Earthwork ..	..	..	..	340

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

PALAIYUR No. 1 CHANNEL—cont.

O. MISCELLANEOUS.

Estimate No. 464-V.

Fixing demarcation stones on the Palaiyur No. 1 Channel.

No. 50	Revenue survey stones including conveyance to site and fixing in earth	0 8 0	Each.	10	
	Total	..	..	..	10

Estimate No. 465-V.

Fixing mile and furlong stones along Palaiyur No. 1 Channel.

No. 6	Furlong stones	2 2 0	Each.	13	
	Total, say	..	..	..	15
	Total, O Miscellaneous	..	..	..	25

P. MAINTENANCE.

Estimate No. 466-V.

Maintenance of Palaiyur No. 1 Channel.

81 mile.	Maintenance during execution	25 0 0	Mile.	20	
	Total	..	..	..	20
	Total, P. Maintenance	..	..	..	20

PALAIYUR No. 2 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 467-V.

Preliminary Expenses for Palaiyur No. 2 Channel.

427 acres.	Cost of preliminary surveys	0 6 0	Acre.	160	
9 mile.	Laying out before execution	10 0 0	Mile.	7	
	Contingencies	..	..	3	
	Total	..	..	..	170
	Total, A. Preliminary Expenses	..	..	..	170

B. LAND.

Estimate No. 468-V.

Compensation for land for Palaiyur No. 2 Channel.

3.61 acres.	Vallur (Inam)	300 0 0	Acre.	1,083	
	Total	..	..	..	1,083
	Compensation for earth	..	..	20	
	Add 15 per cent for compulsory acquisition	..	..	162	
	Total	..	..	..	1,265
	Total, B Land	..	..	..	1,265

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

PALAIYUR No. 2 CHANNEL—cont.

C. WORKS.

Estimate No. 469-V.

Head sluice to Palaiyur No. 2 Channel.

2.00 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	42	
3.00 "	Platform moulded brick work in chunam	21 8 0	100 "	65	
5 c. ft.	Cutstone work	2 8 0	C. ft.	13	
0.50 "	Archwork platform moulded brick in chunam	22 8 0	"	11	
	Centering for archwork		Lump sum.	3	
1.60 c. ft.	Brick on end 9"	13 8 0	100 sq. ft.	23	
70 "	Brick jelly backing	10 8 0	100 c. ft.	8	
2.50 "	Plastering with Portland cement, 3" thick	6 12 0	100 sq. ft.	17	
No. 1	Teakwood shutter, 1' 7" X 1' 6" including iron fittings, etc., complete		Lump sum.	22	
	Earthwork excavation, etc.	..	..	5	
	Shed for materials	..	..	10	
	Total	..	..	218	
	Contingencies	..	..	14	
	Petty supervision	..	..	8	
	Total	..	..	..	240

Estimate No. 470-V.

Constructing 2-ft. drop and bridge combined at 1,716 feet in Palaiyur No. 2 Channel.

6.4 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	134	
8 "	Platform moulded brick in chunam	21 8 0	100 "	172	
1.75 "	Archwork platform moulded brick in chunam	22 8 0	100 "	39	
	Centering for archwork		Lump sum.	10	
5.8 sq. ft.	Plastering with cement, 3" thick	6 12 0	100 sq. ft.	39	
1.7 "	Brick on end, 9 inches	13 8 0	100 "	23	
0.7 units.	Brick jelly backing, 6 inches	10 8 0	100 c. ft.	7	
0.6 sq. ft.	Cuddapah slab, 2 inches thick	30 0 0	100 sq. ft.	2	
No. 8	Wheel guard stones, 3 feet high 9 inches diameter	3 0 0	Each.	24	
	Earthwork, excavating foundations, etc.		Lump sum.	10	
	Shed for materials	..	..	10	
	Total	..	..	470	
	Contingencies	..	..	23	
	Petty supervision	..	..	12	
	Total	..	..	..	505

Estimate No. 471-V.

Pipe sluices in Palaiyur No. 2 Channel.

Sluice right bank at 1,980 feet (6 inches pipe) as per type estimate VII attached to the estimate of sluices in Puthur No. 5 channel.	..	..	60	
Sluice left bank at 1,980 feet (9 inches pipe) as per type estimate VII attached to the estimate of sluices in Puthur No. 5 channel	..	..	70	
Total	..	..	..	130

Estimate No. 472-V.

Cross wall with vent at 3,630 feet in Palaiyur No. 2 Channel.

As per type estimate attached to the estimate for the cross wall with vent at 1,320 feet of Puthur No. 1 channel	..	..	20	
Total	..	..	20	
Total, C. works	..	..	..	895

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

PALAIYUR No. 2 CHANNEL—cont.

L. EARTHWORK.

Estimate No. 473-V.

Excavating Palaiyur No. 2 Channel.

112,000 units.	Earthwork, excavating the channel with a lead of 20 yards and a lift of 2 yards	3 12 0	1,000 c. ft.	420	
	Contingencies	..	..	26	
	Petty supervision	..	..	14	
	Total	..	..	..	460
	Total, L. Earthwork	..	..	..	460

O. MISCELLANEOUS.

Estimate No. 474-V.

Fixing demarcation stones on the Palaiyur No. 2 Channel.

No. 17	Revenue survey stones including conveyance site and fixing in earth	0 8 0	Each.	9	
	Contingencies	..	..	1	
	Total	..	..	..	10

Estimate No. 475-V.

Fixing mile and furlong stones along Palaiyur No. 2 Channel.

No. 5	Furlong stones	2 2 0	Each.	11	
	Total, say	..	..	..	10
	Total, O. Miscellaneous	..	..	..	20

P. MAINTENANCE.

Estimate No. 476-V.

Maintenance of Palaiyur No. 2 Channel.

69 mile.	Maintenance during execution	25 0 0	Mile	17	
	Total, say	..	..	..	15
	Total, P. Maintenance	..	..	..	15

PALAIYUR No. 3 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 477-V.

Preliminary Expenses for Palaiyur No. 3 Channel.

1,511 acres.	Cost of preliminary surveys	0 6 0	Acre.	507	
3,063 mile.	Laying out before execution	10 0 0	Mile	31	
	Contingencies	..	..	12	
	Total	..	..	..	610
	Total, A. Preliminary Expenses	..	..	..	610

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

PALAIYUR No. 3 CHANNEL—cont.

B. LAND.

Estimate No. 478-V.

Compensation for land for Palaiyur No. 3 Channel.

7-70 acres.	Vallur (Inam)	300 0 0	Acre.	2,310	
12-30 "	Vallur (Government)	225 0 0	"	2,768	
1-48 "	Thenparay village	225 0 0	"	333	
0-18 "	Palaiyur village	150 0 0	"	27	
	Total	..	..	5,438	
	Compensation for earth	..	..	600	
	Add 15 per cent for compulsory acquisition	..	..	812	
	Total	..	..	..	6,750
	Total, B. Land	..	..	..	6,750

C. WORKS.

Estimate No. 479-V.

Constructing a regulator and bridge combined at 0 mile 660 feet in Palaiyur No. 3 Channel.

7-00 units.	Concrete, broken brick in sarki mortar	21 0 0	100 c. ft.	147	
10 0 "	Platform moulded brick in chunam	21 8 0	100 "	215	
1-6 "	Archwork	22 8 0	100 "	36	
	Centering for archwork	..	..	14	
60 r. ft.	Cornice work excluding plastering with cement	0 4 0	R. ft.	15	
8 squares.	Plastering with cement, 2"	6 12 0	100 sq. ft.	54	
2-3 "	Brick on end, 8"	13 8 0	100 "	31	
0-9 units.	Brick jelly backing, 6"	10 8 0	100 "	9	
No. 8	Guard stones, 3' high, 9" diameter	3 0 0	Each.	24	
	Earthwork, excavating foundations, forming roadway and approaches	..	..	15	
	Shed for materials	..	..	15	
	Total	..	..	575	
	Contingencies	..	..	38	
	Petty supervision	..	..	17	
	Total	..	..	..	630

Estimate No. 480-V.

Undertunnel of 12 feet span and 129 feet long at 0 mile 1,782 feet in Palaiyur No. 3 Channel.

129 r. ft.	Tunnel	33 2 6	R. ft.	4,277	
	Cost of front and rear headwalls as per estimate of the undertunnel at 6 miles, 1,452 feet in Palaiyur channel	..	..	505	
	Total	..	..	4,782	
	Contingencies	..	..	237	
	Petty supervision	..	..	141	
	Total	..	..	..	5,150
	Carried over	..	..	..	5,790

370

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS. A. P.	RS.
	PALAIYUR No. 3 CHANNEL—cont.				
	C. WORKS—cont.				
	Estimate No. 481-V.				
	Undertunnel of 6-ft. span at 0 mile 2,310 feet in Palaiyur No. 3 Channel.				
40-20 units	Concrete, brick jelly in surki mortar ..	21 0 0	100 c. ft.	844 0 0	
36-60 "	Platform moulded brick in surki mortar ..	23 0 0	100 "	842 0 0	
15-00 "	Archwork do. do. ..	24 0 0	100 "	360 0 0	
	Centering for archwork ..			80 0 0	
4-80 "	Brick on end ..	13 8 0	100 sq. ft.	58 0 0	
1-70 "	Brick jelly backing ..	10 8 0	100 c. ft.	18 0 0	
19-10 "	Plastering with Portland cement, 3/4" thick ..	6 12 0	100 sq. ft.	129 0 0	
	Earthwork, excavation, etc. ..		Lump sum.	35 0 0	
	Shed for materials ..			35 0 0	
	Total ..			2,401 0 0	
	Contingencies ..			125 0 0	
	Petty supervision ..			64 0 0	
	Total ..				2,590

Estimate No. 482-V.

2-ft. drop at 1 mile 1,980 feet in Palaiyur No. 3 Channel.

As per type estimate attached to the estimate for the 2-ft. drop at 0 mile 1,188 ft. of Puthur No. 5 channel ..	260 0 0	
Total ..		260

Estimate No. 483-V.

Undertunnel of 6-ft. span at 2 miles 594 feet in Palaiyur No. 3 Channel.

Estimate for constructing one R. ft. of tunnel.

46 units.	Concrete, broken brick in surki mortar ..	21 0 0	100 c. ft.	9 11 0	
0-34 "	Brick in surki mortar ..	23 0 0	100 "	7 13 0	
0-20 "	Archwork, brick in surki mortar ..	24 0 0	100 "	4 13 0	
	Centering ..		Lump sum.	1 0 0	
0-20 "	Plastering with Portland cement, 3/4" thick ..	6 12 0	100 sq. ft.	1 5 7	
	Earthwork ..			0 7 0	
	Shed for materials ..			0 7 0	
	Total ..			25 8 7	
				or 25 9 0	

RS. A. P.
The cost of 1 running foot is .. 25 9 0
Do. 80 running feet .. 2,045 0 0
The amount of the estimate is .. 2,401 0 0
The cost of front and rear head walls, etc. = 2,401 = 2,045 = 356.

An undertunnel of 6-ft. span and 47 1/2 ft. long at 2 miles 594 feet in Palaiyur No. 3 Channel.

47 1/2 r. ft.	Tunnel ..	25 9 0	R. ft.	1,214 0 0	
	Cost of front and rear head walls, etc. ..			356 0 0	
	Total ..			1,570 0 0	
	Contingencies ..			75 0 0	
	Petty supervision ..			45 0 0	
	Total ..				1,690

Estimate No. 484-V.

Undertunnel 6-ft. span and 34 ft. long at 2 miles 2,574 feet in Palaiyur No. 3 Channel.

34 r. ft.	Tunnel ..	25 9 0	R. ft.	869 0 0	
	Cost of front and rear headwalls as per estimate of the undertunnel at 2 miles 594 ft. in this channel ..			356 0 0	
	Total ..			1,225 0 0	
	Contingencies ..			62 0 0	
	Petty supervision ..			33 0 0	
	Total ..				1,320
	Carried over ..				11,650

* Rate as per separate estimate.

371

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
				Brought forward ..	11,650

PALAIYUR No. 3 CHANNEL—cont.

C. WORKS—cont.

Estimate No. 485-V.

Regulator at 2 miles 4,620 feet in Palaiyur No. 3 Channel.

The same as for the regulator at the head of Chettichatram No. 2 channel ..	100	
Total ..		100

Estimate No. 486-V.

Pipe sluices in Palaiyur No. 3 Channel.

Sluice L.B. at head (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel ..	50	
Sluice L.B. at head (12" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel ..	65	
Sluice R.B. at 3,960 feet (12" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel ..	75	
Sluice L.B. at 3,960 feet (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	40	
Sluice R.B. at 1 mile 1,320 feet (9" pipe) as per type estimate VII attached to the estimate of sluices in Puthur No. 5 channel ..	70	
Sluice L.B. at 1 mile 1,320 feet (12" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	60	
Sluice R.B. at 1 mile 3,630 feet (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	50	
Sluice L.B. at 1 mile 3,630 feet (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	40	
Sluice R.B. at 2 miles, 1,650 feet (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	50	
Sluice L.B. at 2 miles, 3,260 feet (12" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel ..	75	
Sluice R.B. at 2 miles, 3,260 feet (6" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	40	
Sluice L.B. at 2 miles, 4,620 feet (12" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel ..	50	
Total ..		675
Total, C. Works ..		12,425

L. EARTHWORK.

Estimate No. 487-V.

Excavating Palaiyur No. 3 Channel.

1,804-000 units.	Earthwork, excavating the channel with a lead of 20 yards and a lift of 2 yards ..	3 12 0	1,000 c. ft.	4,890	
	Contingencies ..			246	
	Petty supervision ..			144	
	Total ..				5,280
	Total, L. Earthwork ..				5,280

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

PALAIYUR No. 3 CHANNEL—cont.

O. MISCELLANEOUS.

Estimate No. 488-V.

Fixing demarcation stones on Palaiyur No. 3 Channel.

No. 74.	Revenue survey stones including conveyance to site and fixing in earth	0 8 0	Each.	37	..
	Contingencies	..	..	3	..
	Total	..	..	..	40

Estimate No. 489-V.

Fixing mile and furlong stones Palaiyur No. 3 Channel.

No. 3.	Mile stones	3 2 0	Each.	9	..
„ 21.	Furlong stones	2 2 0	..	46	..
	Total	..	..	54 or	55
	Total, O. Miscellaneous.	..	..	..	95

P. MAINTENANCE.

Estimate No. 490-V.

Maintenance of Palaiyur No. 3 Channel.

3.063 miles.	Maintenance during execution	25 0 0	Mile.	77	..
	Total, say	..	..	..	75
	Total, P. Maintenance	..	..	..	75

MAHARAJAPURAM CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 491-V.

Preliminary expenses for Maharajapuram Channel.

787 acres.	Cost of preliminary surveys	0 6 0	Acres.	295	..
2.125 miles.	Laying out before execution	40 0 0	Mile.	85	..
	Contingencies	..	..	10	..
	Total	..	..	..	390
	Total, A. Preliminary Expenses	..	..	..	390

B. LAND.

Estimate No. 492-V.

Compensation for land for Maharajapuram Channel.

4.52 acres.	Kilakurichi village	250 0 0	Acres.	1,130	..
4.42 „	Avikottai	250 0 0	..	1,105	..
7.62 „	Melanattam	150 0 0	..	1,154	..
	Total	..	..	3,389	..
	Compensation for earth	..	..	200	..
	Add 1½ per cent for compulsory acquisition	..	..	511	..
	Total	..	..	..	4,100
	Total, B. Land	..	..	..	4,100

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MAHARAJAPURAM CHANNEL—cont.

C. WORKS.

Estimate No. 493-V.

Head sluice for Maharajapuram Channel.

6.6 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	139	..
7.7 „	Platform moulded brick in mortar	21 8 0	100 „	165	..
0.9 „	Archwork, platform moulded brick in mortar	22 8 0	100 „	20	..
	Centering for archwork	Lump sum.	..	10	..
10 c. ft.	Cutstone work, neatly dressed	2 8 0	C. ft.	25	..
5 „	Teakwood wrought and put up	4 0 0	..	20	..
7.7 units.	Plastering with Portland cement, ¾" thick (1:3)	6 12 0	100 sq. ft.	52	..
4.5 „	Brick on end, 9"	13 8 0	100 „	61	..
1.8 „	Brick jelly backing, 6" thick	10 8 0	100 „	19	..
No. 1.	Teakwood shutter, 5'-9" X 2'-6" including screw gearing rod, spanner, fittings, straps, etc., complete.	Lump sum.	..	90	..
	Fitting charges ½ the cost of shutter	..	..	8	..
	Earth work excavating foundations, forming approaches, etc.	..	..	15	..
	Shed for materials	..	..	15	..
	Total	..	..	640	..
	Contingencies	..	..	33	..
	Petty supervision	..	..	17	..
	Total	..	..	..	690

Estimate No. 494-V.

"B" Class masonry bridge of 12-feet span at 3,432-feet.

As per type estimate attached to the estimate for the bridge at 5 miles 198 ft. of Puthur channel	..	..	830	..
Forming approaches, etc.	..	..	10	..
Total	..	..	..	840

Estimate No. 495-V.

1-ft. drop at 0 mile 4,752 feet in Maharajapuram Channel.

2.50 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	48	..
2.20 „	Platform moulded bricks in mortar	21 8 0	100 „	47	..
1.90 „	Brick on end for front apron and revetment	13 8 0	100 sq. ft.	25	..
6.75 „	Concrete blocks for rear apron and revetment.	21 12 0	100 c. ft.	146	..
2.40 „	Brick jelly backing	10 8 0	100 „	25	..
2.50 „	Plastering with Portland cement, ¾" thick (1:3)	6 12 0	100 sq. ft.	17	..
0.12 „	Cuddapah slab, 2" thick	30 0 0	100 „	4	..
	Earthwork excavating foundations, etc.	..	..	12	..
	Shed for materials	..	..	10	..
	Contingencies	..	..	16	..
	Petty supervision	..	..	9	..
	Total	..	..	..	360

Estimate No. 496-V.

3-ft. drop at 2 miles in Maharajapuram Channel.

As per type estimate attached to the estimate for the 3-ft. drop at 6 miles 2,508 ft. of Puthur channel	..	..	420	..
Deduct for 1½ width of channel	18 11 0	1 ft.	20	..
Total	..	..	..	400
		Carried over ..	..	2,290

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MAHARAJAPURAM CHANNEL—cont.

C. WORKS—cont.

Brought forward .. 2,290

Estimate No. 497-V.

Pipe sluices in Maharajapuram Channel.

Sluice, right bank, at head (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	50	
Sluice, left bank, at head (6" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	40	
Sluice, right bank, at 1,980 ft. (6" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	40	
Sluice, left bank, at 1,980 ft. (6" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	50	
Sluice, right bank, at 3,432 ft. (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	50	
Sluice, left bank, at 3,432 ft. (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	50	
Sluice, right bank, at 1 m. 3,762 ft. (12" pipe) as per type estimate VIII attached to the estimate of sluices in Iluppadi channel	..	..	70	
Sluice, left bank, at 1 m. 3,762 ft. (9" pipe) as per type estimate IV attached to the estimate of sluices in Puthur channel	..	..	50	
Total	..	..	..	400
Total, C. Works	..	..	..	2,690

L. EARTHWORK.

Estimate No. 498-V.

Excavating Maharajapuram Channel.

327,000 units.	Excavating the channel with a lead of 20 yards and lift of 2 yards	3 12 0	1,000 c. ft.	3,101	
	Contingencies	..	..	153	
	Petty supervision	..	..	93	
	Total	..	..	..	3,350
	Total, L. Earthwork	..	..	..	3,350

O. MISCELLANEOUS.

Estimate No. 499-V.

Fixing demarcation stones on the Maharajapuram Channel.

No. 68	Revenue survey stones including conveyance to site and fixing in earth	0 8 0	Each.	34	
	Contingencies	..	..	1	
	Total	..	..	..	35

Estimate No. 500-V.

Fixing mile and furlong stones along Maharajapuram Channel.

No. 2	Mile stones	3 2 0	Each.	6	
.. 15	Furlong stones	2 2 0	..	32	
	Total	..	..	38 or	40
	Total, O. Miscellaneous	..	..	..	75

P. MAINTENANCE.

Estimate No. 501-V.

Maintenance of Maharajapuram Channel.

2-125 miles.	Maintenance during execution	100 0 0	Mile.	213	
	Total, say	..	..	215	
	Total, P. Maintenance	..	..	..	215

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MAHARAJAPURAM No. 1 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 502-V.

Preliminary Expenses for Maharajapuram No. 1 Channel.

7 acres.	Cost of preliminary surveys	0 6 0	Acre.	183	
0.3 mile.	Laying out before execution	10 0 0	Mile.	3	
	Contingencies	..	..	4	
	Total	..	..	..	190
	Total, A. Preliminary Expenses	..	..	..	190

B. LAND.

Estimate No. 503-V.

Compensation for land for Maharajapuram No. 1 Channel.

1.53 acres.	Avikkottai village	250 0 0	Acre.	383	
	Compensation for earth	..	..	5	
	Add 15 per cent for compulsory acquisition	..	..	62	
	Total	..	..	..	450
	Total, B. Land	..	..	..	450

C. WORKS.

Estimate No. 504-V.

Head sluice for Maharajapuram No. 1 Channel.

The same as for the head sluice for Palaiyur No. 2 channel	..	..	240	
Total	..	..	..	240

Estimate No. 505-V.

3-ft. drop at 660 ft. in Maharajapuram No. 1 Channel.

As type estimate attached to the estimate for the 3 ft. drop at 1,320 ft. of Puthur No. 2 channel.	..	..	320	
Minus for 2 feet width of channel	11 10 0	1 ft.	23	
Total	..	..	297 or	300

Estimate No. 506-V.

Pipe sluices in Maharajapuram No. 1 Channel.

Sluice, right bank, at head (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	50	
Sluice, right bank, at 1,320 ft. (8" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	50	
Total	..	..	..	100

Estimate No. 507-V.

Cross wall with vent at 1,650 feet in Maharajapuram No. 1 Channel.

As per type estimate attached to the estimate for the cross wall with vent at 0 m. 1,320 ft. of Puthur No. 1 channel	..	..	20	
Add for one extra width of channel	1 9 0	1 ft.	2	
Total	..	..	22 or	25
Total, C. Works	..	..	..	665

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
MAHARAJAPURAM No. 1 CHANNEL—cont.					
L. EARTHWORK.					
Estimate No. 508-V.					
Excavating Maharajapuram No. 1 Channel.					
31,000 units.	Excavating the channel with a lead of 20 yards and lift of 2 yards	3 12 0	1,000 c. ft.	116	
	Contingencies	..	..	9	
	Petty supervision	..	..	5	
	Total	..	..	..	130
	Total, L. Earthwork	..	..	..	130
O. MISCELLANEOUS.					
Estimate No. 509-V.					
Fixing demarcation stones on Maharajapuram No. 1 Channel.					
No. 36.	Revenue survey stones including conveyance to site and fixing in earth	0 8 0	Each.	18	
	Contingencies	..	..	2	
	Total	..	..	..	20
Estimate No. 510-V.					
Fixing mile and furlong stones along Maharajapuram No. 1 Channel.					
No. 1.	Mile stone	3 2 0	Each.	3	
.. 3.	Furlong stones	2 2 0	..	17	
	Total	..	..	..	20
	Total, O. Miscellaneous	..	..	..	40
P. MAINTENANCE.					
Estimate No. 511-V.					
Maintenance of Maharajapuram No. 1 Channel.					
1-125 miles.	Maintenance during execution	25 0 0	Mile.	28	
	Total, say	..	..	..	30
	Total, P. Maintenance	..	..	..	30
MAHARAJAPURAM No. 2 CHANNEL.					
A. PRELIMINARY EXPENSES.					
Estimate No. 512-V.					
Preliminary expenses for Maharajapuram No. 2 Channel.					
214 acres.	Cost of preliminary surveys	0 6 0	Acre.	80	
.. 38 mile.	Laying out before execution	10 0 0	Mile.	4	
	Contingencies	..	..	6	
	Total	..	..	..	90
	Total, A. Preliminary Expenses	..	..	..	90
B. LAND.					
Estimate No. 513-V.					
Compensation for lands for Maharajapuram No. 2 Channel.					
1-23 acres.	Melanatham	150 0 0	Acre.	290	
	Add 15 per cent for compulsory acquisition	..	..	60	
	Total	..	..	..	350
	Total, B. Land	..	..	..	350

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.
MAHARAJAPURAM No. 2 CHANNEL—cont.					
C. WORKS.					
Estimate No. 514-V.					
"C" Class bridge of 4-ft. span at 792 feet in Maharajapuram No. 2 Channel.					
	As per type estimate attached to the estimate for the bridge at 0 mile 1,420 feet of Mannargudi No. 6 channel	..	..	560	
	Forming approaches, etc.	..	..	20	
	Total	..	..	..	580
Estimate No. 515-V.					
4-ft. syphon well drop at 990 feet in Maharajapuram No. 2 Channel.					
1-18	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	25	
2-28	Platform moulded brick in surki mortar	23 0 0	100 ..	52	
2-53	Plastering with portland cement, $\frac{3}{4}$ " thick	6 12 0	100 sq. ft.	17	
-51	Cuddapah slab flooring	30 0 0	100 ..	15	
3-35	Brick on end	13 8 0	100 ..	45	
1-40	Brick jelly backing	10 8 0	100 c. ft.	15	
17	Stoneware pipes 9" diameter and 2' long	2 6 0	Each	40	
3	Cutstone work	2 8 0	C. ft.	8	
	Cement grouting	..	..	5	
	Clay puddle-work	..	..	10	
	Earthwork excavating foundations and filling in, and forming banks	..	..	25	
	Shed for materials	..	..	10	
	Total	..	..	..	160
	Contingencies	..	..	15	
	Petty supervision	..	..	8	
	Total	..	..	..	290
Estimate No. 516-V.					
6-ft. syphon well drop at 1,650 feet in Maharajapuram No. 2 Channel.					
1-20	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	25	
2-30	Platform moulded brick in surki mortar	23 0 0	100 ..	53	
2	Cutstone work	2 8 0	C. ft.	5	
2-70	Brick on end	13 8 0	100 sq. ft.	38	
1-20	Brick jelly backing	10 8 0	100 c. ft.	13	
2-30	Plastering with portland cement, $\frac{3}{4}$ " thick (1 cement and 3 sand)	6 12 0	100 sq. ft.	16	
0-60	Cuddapah slab	30 0 0	100 ..	18	
19	Stoneware pipe, 9" diameter each, 2' long	2 6 0	Each	45	
	Earthwork excavating foundations, etc.	..	..	20	
	Shed for materials	..	..	10	
	Contingencies	..	..	12	
	Petty supervision	..	..	7	
	Total	..	..	..	260
Estimate No. 517-V.					
Pipe sluices in Maharajapuram No. 2 Channel.					
	Head (pipe) sluice at head (12" pipe) as per type estimate XIV below	..	..	95	
	Sluice right bank at 990' (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel	..	..	50	
	Total	..	..	..	145
	Total, C. Works	..	..	..	1,275

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MAHARAJAPURAM No. 2 CHANNEL—cont.

Type Estimate XIV.

Type estimate for clear over fall sluice with F.S.L. 1.75' and below with shutter.

1-55 units.	Platform moulded brick in mortar	22 8 0	100 c. ft.	35	
No. 8	Earthenware pipe, 9" diameter each, 2' long	2 6 0	Each.	19	
0-60 units.	Teakwood wrought and put up	4 0 0	G. ft.	2	
3 sq. ft.	Cuddapah slab	30 0 0	100 sq. ft.	1	
3 c. ft.	Cutstone work	2 8 0	C. ft.	1	
Ns. 1	Teakwood shutter with iron handle, etc.	6 0 0	Each.	6	
1-20 units.	Plastering with Portland cement, 2" thick	6 12 0	100 sq. ft.	8	
	Total			72	
	Contingencies			5	
	Petty supervision			3	
	Total				80

Cost with 6" pipe	70
Do. 12" "	95
Do. 15" "	110

L. EARTHWORK.

Estimate No. 518-V.

Excavating Maharajapuram No. 2 Channel.

53-000 units.	Excavating the channel with a load of 20 yards and lift of 2 yards.	3 12 0	100 c. ft.	199	
	Contingencies			13	
	Petty supervision			8	
	Total				220
	Total, L. Earthwork				220

O. MISCELLANEOUS.

Estimate No. 519-V.

Fixing demarcation stone on the Maharajapuram No. 2 Channel.

No. 12	Revenue survey stones including conveyance to site and fixing in earth.	0 8 0	Each.	6	
	Contingencies			4	
	Total				10

Estimate No. 520-V.

Fixing mile and furlong stones along Maharajapuram No. 2 Channel.

No. 3	Furlong stones	2 2 0	Each.	6	
	Total, say				5
	Total, O. Miscellaneous				15

P. MAINTENANCE.

Estimate No. 521-V.

Maintenance of Maharajapuram No. 2 Channel.

38 miles.	Maintenance during execution	25 0 0	Mile.	10	
	Total, say				10
	Total, P. Maintenance				10

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MAHARAJAPURAM No. 3 CHANNEL.

A. PRELIMINARY EXPENSES.

Estimate No. 522-V.

Preliminary expenses for Maharajapuram No. 3 Channel.

1,503 acres.	Cost of preliminary surveys	0 6 0	Acre.	564	
2 miles.	Laying out before execution	10 0 0	Mile.	20	
	Contingencies			6	
	Total				590
	Total, A. Preliminary expenses				590

B. LAND.

Estimate No. 523-V.

Compensation for land for Maharajapuram No. 3 Channel.

4-09 acres.	Melanatham	150 0 0	Acre.	614	
5-84 "	Tirumakkottai (Government)	150 0 0	"	849	
3-42 "	Do. (Inam)	141 0 0	"	482	
	Total			1,945	
	Compensation for earth			100	
	Add 15 per cent for compulsory acquisition			295	
	Total				2,340
	Total, B. Land				2,340

C. WORKS.

Estimate No. 524-V.

2-ft. drop at 792 feet in Maharajapuram No. 3 Channel.

As per type estimate attached to the estimate for the 2' drop at 6 miles 1,518 feet of Puthur channel.				320	
Deduct for 1 1/2' width of channel	11 6 0	1 ft.		17	
Total				303 or	310

Estimate No. 525-V.

4-ft. syphon well drop at 2,310 feet in Maharajapuram No. 3 Channel.

4-50 units.	Concrete broken brick in surki mortar	21 0 0	100 c. ft.	95	
4-20 "	Platform moulded brick in surki mortar	23 0 0	100 "	96	
2-10 "	Archwork (brick in surki mortar)	24 0 0	100 "	50	
	Centering charges			17	
6-6 "	Plastering with Portland cement, 2" thick (1 cement and 3 sand).	6 12 0	100 sq. ft.	45	
5-70 "	Brick on end apron and revetment	13 8 0	100 "	77	
2-10 "	Brick jelly backing	10 8 0	100 c. ft.	22	
64 "	Cuddapah slab flooring, 2" thick	30 0 0	100 sq. ft.	19	
15 "	Cutstone work	2 8 0	C. ft.	38	
	Earthwork			35	
	Clay puddle work			15	
	Shed for materials			10	
	Total			519	
	Contingencies			25	
	Petty supervision			16	
	Total				560

Estimate No. 526-V.

3-ft. drop at 3,960 feet in Maharajapuram No. 3 Channel.

As per type estimate attached to the estimate for the 3' drop at 6 mile 1,320 feet of Puthur No. 2 channel.				320	
Total					320
				Carried over	1,190

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description of work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MAHARAJAPURAM No. 3 CHANNEL—cont.

C. WORKS—cont.

Brought forward .. 1,1 0

Estimate No. 527-V.

Regulator at 1 mile 3,300 feet in Maharajapuram No. 3 Channel.

1-15 units.	Concrete broken brick in surki mortar ..	21 0 0	100 c.ft.	24	
70 "	Platform moulded brick in mortar ..	21 8 0	"	15	
2-20 "	Brick on end ..	13 8 0	100 sq.ft.	30	
90 "	Brick jelly backing ..	10 8 0	100 c.ft.	9	
70 "	Plastering with Portland cement ..	6 12 0	100 sq.ft.	5	
	Earthwork, excavating foundations and filling in.			5	
	Shed for materials ..			10	
	Contingencies ..			8	
	Petty supervision ..			4	
	Total ..				110

Estimate No. 528-V.

Pipe sluices in Maharajapuram No. 3 Channel.

	Sluice right bank at head (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel.			50	
	Sluice left bank at head (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel.			50	
	Sluice right bank at 2310 feet (12" pipe) as per type estimate XIV attached to the estimate of sluices in Maharajapuram No. 2 channel.			95	
	Sluice right bank at 3630 feet (9" pipe) as per type estimate VII attached to the estimate of sluices in Puthur No. 5 channel.			70	
	Sluice left bank at 3630 feet (6" pipe) as per type estimate VII attached to the estimate of sluices in Puthur No. 5 channel.			60	
	Sluice left bank at 1 mile (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel.			50	
	Sluice right bank at 1 mile 3,300 feet (9" pipe) as per type estimate V attached to the estimate of sluices in Puthur channel.			50	
	Sluice right bank at 1 mile 3,300 feet (18" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel.			105	
	Sluice right bank at 1 mile 3,300 feet (6" pipe) as per type estimate V attached to the estimate.			40	
	Sluice left bank at 1 mile 3,300 feet (12" pipe) as per type estimate VI attached to the estimate of sluices in Puthur No. 3 channel.			75	
	Total ..				645
	Total, C. Works ..				1,945

L. EARTHWORK.

Estimate No. 529 V.

Excavating Maharajapuram No. 3 Channel.

517 units	Earthwork, including 20 yards lead and 2 yards lift.	3 12 0	1,000 c.ft.	1,939	
	Contingencies ..			94	
	Petty supervision ..			67	
	Total ..				2,096
	Total, L. Earthwork ..				2,090

VADAVAR SYSTEM—DISTRIBUTARIES—cont.

Quantity.	Description or work.	Rate.	Per	Amount.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A. P.		RS.	RS.

MAHARAJAPURAM No. 3 CHANNEL—cont.

O. MISCELLANEOUS.

Estimate No. 530-V.

Fixing demarcation stones on the Maharajapuram No. 3 Channel.

No. 64.	Revenue survey stones, including conveyance to site and fixing in earth ..	0 8 0	..	32 0 0	
	Contingencies ..		..	3 0 0	
	Total ..		..		35 0 0

Estimate No. 531-V.

Fixing mile and furlong stones along Maharajapuram No. 3 Channel.

No. 2	Mile stones ..	3 2 0	Each.	6	
14	Furlong stones ..	2 2 0	"	30	
	Total ..		..	36 or	35
	Total, O. Miscellaneous ..		..		70

P. MAINTENANCE.

Estimate No. 532-V.

Maintenance of Maharajapuram No. 3 Channel.

2 miles.	Maintenance during execution ..	25 0 0	Mile.	50	
	Total, say ..		..		50
	Total, P. Maintenance ..		..		50

194-

PART III

CLASSIFIED ABSTRACTS OF ESTIMATES

PART III.
CONDENSED ABSTRACT OF COST.

Serial number. (1)	Departmental head. (2)	Head works. (3)	Canal system. (4)	Total. (5)
	<i>A. Direct charges.</i>	rs.	rs.	rs.
1	Works	1,71,24,000	1,13,95,972	2,85,19,972
2	Establishment, Public Works Department	36,56,678	20,70,005	57,26,683
3	Establishment, other departments	3,48,000	1,47,800	4,95,800
4	Tools and plant, ordinary	2,45,535	1,35,000	3,80,535
5	Tools and plant, special	20,60,000	1,00,000	21,60,000
6	Suspense	50,000	30,000	80,000
7	Receipts on capital account	— 3,52,368	— 49,692	— 4,02,060
	A. Total, Direct charges ..	2,51,31,845	1,38,28,855	3,89,60,700
	<i>B. Indirect charges.</i>			
	Abatement of land revenue	2,22,500	4,45,650	6,68,150
	Leave and pension allowances	5,60,655	3,10,465	8,71,120
	B. Total, Indirect charges ..	7,83,155	7,56,115	15,39,270
	Grand total ..	2,59,15,000	1,45,85,000	4,05,00,000

STATEMENT of cost of Cauvery Reservoir Project under Departmental head "Works".
Head Works.

Sub-heads. (1)	Main dam. (2)	Main surplus sluices. (3)	Total. (4)
<i>1. Head Works.</i>	rs.	rs.	rs.
A. Preliminary expenses	1,50,000	..	1,50,000
B. Land	6,05,000	..	6,05,000
C. Works	1,42,04,020	8,01,680	1,50,05,700
K. Buildings	6,31,800	..	6,31,800
O. Miscellaneous	5,66,500	..	5,66,500
P. Maintenance	1,65,000	..	1,65,000
Total, Head Works ..	1,63,22,320	8,01,680	1,71,24,000

Canal system.

Sub-heads. (1)	Grand Anicut Canal system. (2)	Vadavar system (3)	Total. (4)
<i>2. Main Canal and Branches.</i>	rs.	rs.	rs.
A. Preliminary expenses	97,800	20,500	1,18,300
B. Land	5,49,300	78,100	6,27,400
D. Regulators	3,17,900	20,900	3,38,800
E. Falls and weirs	1,06,800	28,200	1,35,000
F. Cross drainage works	21,76,600	51,100	22,27,700
G. Bridges	8,23,800	62,800	8,86,600
H. Escapes	38,300	17,500	55,800
K. Buildings	2,13,900	19,200	2,33,100
L. Earthwork	21,15,000	1,47,000	22,62,000
M. Plantations	41,200	10,700	51,900
O. Miscellaneous	1,15,200	7,000	1,22,200
P. Maintenance	60,000	9,600	69,600
Total, Main Canal and Branches ..	66,59,400	4,72,600	71,32,000
<i>Distributaries.</i>			
A. Preliminary expenses	1,17,432	19,240	1,36,672
B. Land	13,02,800	2,10,180	15,12,980
C. Works	11,84,600	1,96,440	13,81,040
L. Earthwork	9,94,600	1,64,160	11,58,760
O. Miscellaneous	21,900	3,450	25,350
P. Maintenance	41,700	7,470	49,170
Total, Distributaries ..	36,63,032	6,00,940	42,63,972
Total, Canal system ..	1,03,22,432	10,73,540	1,13,95,972
Total, "Works" ..	..	..	2,85,19,972

Classified Abstracts of Estimates.

HEAD WORKS.

Abstract cost by sub-heads.

Name of work.	A. Preliminary expenses.	B. Land.	C. Works.	K. Buildings.	O. Miscellane- ous.	P. Maintenance.	Total.
Main dam	Rs. 1,50,000	Rs. 5,50,000	Rs. 1,29,12,750	Rs. 5,74,400	Rs. 5,15,000	Rs. 1,50,000	Rs. 1,48,52,150
Main surplus sluices ..	..	..	7,28,800	..	..	..	7,20,800
Total ..	1,50,000	5,50,000	1,36,41,550	5,74,400	5,15,000	1,50,000	1,55,80,950
Add unforeseen 10 per cent on works	..	55,000	13,64,150	57,400	51,500	15,000	15,43,950
Grand total ..	1,50,000	6,05,000	1,50,05,700	6,31,800	5,66,500	1,65,000	1,71,24,000

Classified Abstracts of Head Works.

Sub-head.	Name of work.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distri- butory.	Total of each main head.	Remarks. (In this column the numerators represent esti- mate number and the denominators Plan number.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	I. WORKS.					
	(i) HEAD WORKS.					
	1. Main dam, including water- spread ..	Rs.	Rs.		Rs.	
A. Prelimi- nary expenses.	Preliminary expenses	1,50,000	1,50,000	..	..	..
B. Land ..	Compensation for waterspread area, etc. (from Revenue officer's report).	5,50,000	5,50,000	..	..	Estimate No. 1 H.
C. Works..	Main dam	1,24,51,000	..	..	..	Plan No. 1 H. 2 H
	Sluice shutters and gear, including curtains and crane	4,61,750	1,29,12,750	..	..	2 H to 13 H. 9 H
K. Build- ings.	Workshops, store sheds, quarters for establishment, mechanics, etc.	5,74,400	5,74,400	..	..	10 H
O. Miscella- neous.	Communications, roads, railway tracks, etc., and sanitary works, water-supply, etc.	5,15,000	5,15,000	..	..	} 11 H
P. Mainte- nance.	Maintenance during construction. Total, Main dam, including water- spread.	1,50,000	1,50,000	..	..	
	2. Main surplus sluices.					
C. Works..	Main surplus sluices	3,58,300	..	..	..	12 H
	Shutters, including gear and steel work of roadway	3,70,500	..	..	..	14 H to 18 H 13 H
	Total ..	..	7,28,800	..	..	17 H and 18 H
	Total (i), Head Works ..	..	..	..	1,55,80,950	

Classified Abstracts of Estimates.

GRAND ANICUT CANAL SYSTEM.

MAIN CANALS AND BRANCHES.

Abstract of Cost by sub-heads.

Particulars.	A. Preliminary expenses.	B. Land.	D. Regulators.	E. Falls and weirs.	F. Cross Drainage works.	G. Bridges.	H. Escapes.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Grand Anicut canal	Rs. 78,600	Rs. 3,68,420	Rs. 2,05,320	Rs. ..	Rs. 18,07,280	Rs. 6,89,998	Rs. 26,250
Kalianodai branch	8,500	49,350	27,460	52,040	..	50,860	..
Vadakadn	5,300	24,700	11,840	13,050	..	22,600	2,700
Rajamadam	3,400	14,300	13,320	14,710	6,550	12,940	2,900
Pudupatnam	1,000	1,470	7,320	9,240	..	..	..
Total ..	96,800	4,58,240	2,64,960	89,040	18,13,830	6,86,398	31,940
Add 20 per cent for unforeseen contin- gencies.	..	91,660	52,940	17,760	3,62,770	1,37,302	6,360
Grand total ..	96,800	5,49,900	3,17,900	1,06,800	21,76,600	8,23,700	38,300

Particulars.	K. Buildings.	L. Earthwork.	M. Planta- tions.	O. Miscellane- ous.	P. Mainte- nance.	Total.
(9)	(10)	(11)	(12)	(13)	(14)	
Grand Anicut canal	Rs. 1,11,050	Rs. 15,41,182	Rs. 25,650	Rs. 87,180	Rs. 40,000	Rs. 48,90,930
Kalianodai branch	20,800	1,18,900	5,400	4,640	5,000	3,42,950
Vadakadu	7,400	38,300	3,200	2,200	2,750	1,34,130
Rajamadam	30,780	31,140	2,100	1,800	1,750	1,34,800
Pudupatnam	8,200	6,480	450	570	500	35,250
Total ..	1,78,230	17,36,002	36,800	95,890	50,000	55,38,130
Add 20 per cent for unforeseen contin- gencies.	35,670	3,46,998	7,200	19,210	10,000	10,87,870
Grand total ..	2,13,900	20,83,000	44,000	1,15,100	60,000	66,26,000

CAUVERY RESERVOIR PROJECT.

Classified Abstract of Grand Anicut System—Main Canals and Branches.

Sub-head.	Name of work.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	GRAND ANICUT CANAL SYSTEM.	RS.	RS.	RS.	RS.	
	I. WORKS.					
	2. MAIN CANALS AND BRANCHES.					
	<i>Grand Anicut Canal.</i>					
A. Preliminary expenses.	Preliminary expenses, Grand Anicut canal.	78,600				1-G
	Total ..		78,600			
B. Land ..	Land compensation, Grand Anicut canal.	3,68,420				2-G
	Total ..		3,68,420			
D. Regulators ..	Regulator at head ..	1,24,500				3-G
	Do. with bridge at 14/16 40.	1,100				G-43
	Do. at 15/19 40 ..	15,830				4-G
	Do. at 19/25 80 ..	14,630				G-45
	Do. at 26/34 28 ..	12,400				5-G
	Do. with bridge at 33/66 00.	6,750				G-46
	Do. do. at 36/26 00.	5,610				6-G
	Do. do. at 41/35 00.	4,500				G-47
	Total ..		2,05,320			7-G
F. Cross Drainage works.	Diverting old Vennar into Cauvery.	39,700				8-G
	Syphon aqueduct at 2/39 60 ..	55,700				G-44-50-209
	Do. at 4/07 84 ..	1,22,600				12-G
	Do. at 4/75 62 ..	52,000				G-52
	Do. at 5/50 70 ..	70,400				13-G
	Do. at 5/97 50 ..	55,500				G-53
	Do. at 8/62 47 ..	51,500				14-G
	Do. at 10/00 49 ..	88,000				G-54
	Do. at 11/24 30 ..	39,500				15-G
	Do. at 12/09 70 ..	31,000				G-55
	Do. at 12/55 69 ..	38,700				16-G
	Superpassage at 13/17 19 ..	18,800				G-56
	Inlet sluice at 13/68 50 ..	1,430				17-G
	Carried over ..	6,64,830	6,52,340			G-57

Classified Abstract of the Grand Anicut Canal System—Main Canals and Branches—cont.

Sub-head.	Name of work.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2. MAIN CANALS AND BRANCHES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	6,64,830	6,52,340			
	<i>Grand Anicut Canal—cont.</i>					
F. Cross Drainage works—cont.	Surplus sluice at 13/68 50 ..	2,740				24-G
	Inlet sluice at 14/00 00 ..	2,040				G-62
	Surplus sluice at 14/00 90 ..	3,700				25-G
	Syphon aqueduct at 14/20 96 ..	17,800				G-63
	Do. at 14/39 30 ..	24,400				26-G
	Do. at 14/52 00 ..	27,000				G-64
	Do. at 15/52 50 ..	19,200				27-G
	Canal syphon at 15/7 50 ..	90,000				G-65
	Syphon aqueduct at 16/05 40 ..	16,950				28-G
	Do. at 17/32 00 ..	24,100				G-66
	Do. at 18/09 80 ..	32,640				29-G
	Do. at 19/24 50 ..	22,200				G-67
	Do. at 19/31 65 ..	17,700				30-G
	Do. at 19/51 50 ..	26,900				G-68
	Do. at 20/76 00 ..	15,700				31-G
	Do. at 21/87 50 ..	51,400				G-69
	Do. at 23/33 60 ..	87,000				32-G
	Do. at 23/60 00 ..	19,800				G-70
	Do. at 24/61 30 ..	14,500				33-G
	Do. at 25/35 60 ..	24,800				G-71
	Do. at 25/55 30 ..	14,200				34-G
	Do. at 26/81 28 ..	50,900				G-72
	Do. at 28/21 35 ..	18,700				35-G
	Do. at 28/55 00 ..	15,600				G-73
	Do. at 30/21 35 ..	11,500				36-G
	Do. at 30/26 85 ..	61,500				G-74
	Do. at 30/78 35 ..	1,16,500				37-G
	Do. at 32/64 00 ..	47,300				G-75
	Do. at 33/83 34 ..	18,000				38-G
	Do. at 34/24 00 ..	17,850				G-76
	Do. at 34/82 50 ..	9,150				39-G
	Carried over ..	15,89,600	6,52,340			G-77

Classified Abstract of the Grand Anicut Canal System—Main Canals and Branches—cont.

Sub-head.	Name of work.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2. MAIN CANALS AND BRANCHES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	15,89,600	6,62,340			
	Grand Anicut Canal—cont.					
F. Cross Drainage works—cont.	Syphon aqueduct at 35/37 50 ..	22,000				55—G G—76 56—G G—77 57—G G—78 58—G G—78 59—G G—79 60—G G—77 61—G G—80 62—G G—77 63—G G—79 64—G G—81 65—G G—81 66—G G—82 67—G G—80 68—G G—79
	Do. at 36/15 70 ..	7,030				
	Do. at 36/31 00 ..	8,100				
	Do. at 37/08 00 ..	11,700				
	Do. at 37/83 00 ..	43,800				
	Do. at 38/78 00 ..	10,300				
	Do. at 39/83 00 ..	7,700				
	Do. at 40/60 00 ..	12,950				
	Do. at 41/60 00 ..	25,000				
	Do. at 42/14 00 ..	5,900				
	Do. at 42/54 00 ..	6,200				
	Do. at 42/64 00 ..	17,600				
	Do. at 43/35 00 ..	7,300				
	Do. at 44/26 00 ..	32,100				
	Total ..		18,07,280			
G. Bridges ..	C. Class bridge at 1/36 10 ..	11,850				69—G G—87 70—G G—84 & 85 71—G G—84 & 85 72—G G—83 & 89 73—G G—86 74—G G—84 & 85 75—G G—84 & 85 76—G G—83 & 85 77—G G—84 & 85 78—G G—84 & 85 79—G G—83 & 85 80—G G—86 81—G G—90 & 91 82—G G—84 & 85 83—G G—92 84—G G—86
	Do. at 2/88 00 ..	11,250				
	Do. at 3/94 553 ..	12,600				
	Railway bridge at 4/14 04 ..	50,963				
	Foot bridge at 5/12 20 ..	3,450				
	C. Class bridge at 5/49 49 ..	12,800				
	Do. at 6/20 00 ..	12,500				
	B. Class bridge at 7/11 50 ..	16,800				
	C. Class bridge at 7/79 12 ..	12,700				
	Do. at 9/03 75 ..	12,700				
	B. Class bridge at 10/25 00 ..	20,060				
	Foot bridge at 11/85 81 ..	3,550				
	Railway bridge at 12/34 50 ..	53,316				
	C. Class bridge at 12/40 79 ..	10,800				
	Special Class bridge at 13/49 07 ..	22,200				
	Foot bridge at 13/65 40 ..	1,150				
	Carried over ..	2,68,719	24,59,620			

Classified Abstract of the Grand Anicut Canal System—Main Canals and Branches—cont.

Sub-head.	Name of work.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2. MAIN CANALS AND BRANCHES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	2,68,719	24,59,620			
	Grand Anicut Canal—cont.					
G. Bridges—cont.	Special Class bridge at 13/67 68 ..	31,900				85—G G—93 86—G G—93 87—G G—93 88—G
	Do. at 13/88 90 ..	20,800				
	Do. at 14/01 50 ..	20,800				
	Railway bridge at 14/07 40 ..	80,794				G—94 & 95 89—G
	C. Class bridge at 15/31 00 ..	11,825				G—84 & 85 90—G
	Do. at 16/40 40 ..	9,090				G—84 & 85 91—G
	Do. at 17/83 35 ..	9,260				G—84 & 85 92—G
	Do. at 18/49 00 ..	9,270				G—84 & 85 93—G
	B. Class bridge at 19/20 00 ..	11,800				G—83 & 85 94—G
	C. Class bridge at 20/52 50 ..	8,340				G—84 & 85 95—G
	Do. at 21/40 00 ..	8,190				G—84 & 85 96—G
	Do. at 22/67 50 ..	8,300				G—84 & 85 97—G
	Do. at 24/37 96 ..	7,650				G—84 & 85 98—G
	Foot bridge at 24/95 30 ..	2,250				G—86 99—G
	C. Class bridge at 25/61 30 ..	7,600				G—84 & 85 100—G
	B. Class bridge at 26/38 30 ..	9,100				G—83 & 85 101—G
	C. Class bridge at 28/51 35 ..	7,370				G—84 & 85 102—G
	Do. at 29/36 35 ..	6,350				G—84 & 85 103—G
	Do. at 31/73 25 ..	6,520				G—84 & 85 104—G
	Do. at 34/65 00 ..	4,520				G—84 & 85 105—G
	Do. at 35/69 00 ..	4,370				G—84 & 85 106—G
	Do. at 37/70 00 ..	4,100				G—84 & 85 107—G
	B. Class bridge and road culvert at 38/80 00 ..	5,960				G—83 & 85 108—G
	C. Class bridge at 39/75 00 ..	3,840				G—84 & 85 109—G
	Foot bridge at 40/25 00 ..	1,200				G—86 110—G
	C. Class bridge at 42/20 00 ..	3,780				G—84 & 85 111—G
	Do. at 43/27 50 ..	3,780				G—84 & 85 112—G
	B. Class bridge at 44/50 00 ..	4,720				G—83 & 85 113—G
	Railway bridge at 44/55 00 ..	18,000				G—88 & 89
	Total ..		5,99,998			114—G
H. Escapes ..	Surplus sluice at 15/90 59 ..	11,450				G—96 115—G
	Do. at 26/74 28 ..	5,800				G—97
	Carried over ..	17,250	30,59,618			

198

Classified Abstract of the Grand Anicut Canal System—Main Canals and Branches—cont.

Sub-head.	Name of work.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2. MAIN CANALS AND BRANCHES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	17,250	30,59,618			
	Grand Anicut Canal—cont.					
H. Escapes—cont.	Surplus sluice at 36/20-00 ..	5,000				116—G G—98
	Do. at 44/28-00 ..	4,000				117—G G—49
	Total ..		26,250			118—G
K. Buildings ..	Quarters for staff, etc. ..	1,11,050				119—G
	Total ..		1,11,050			G—4 to 34 & 210 to 224
L. Earthwork ..	Earthwork, Grand Anicut Main canal. Total ..	15,41,182	15,41,182			120—G
M. Plantations ..	Providing avenues along roads on canal banks. Total ..	25,650	25,650			121—G G—102
O. Miscellaneous.	Irrigation syphon at 0/13-90 ..	11,100				122—G G—103
	Tank supply sluice at 2/15-80 ..	650				123—G G—107
	Irrigation sluice at 2/22-20 ..	360				124—G G—104
	Irrigation syphon at 2/42-00 ..	5,770				125—G G—106
	Tank supply sluice at 2/76-00 ..	990				126—G G—108
	Do. at 4/67-20 ..	1,130				127—G G—107
	Irrigation sluice at 5/05-20 ..	360				128—G G—108
	Tank supply sluice at 5/29-00 ..	770				129—G G—109
	Irrigation syphon at 5/62-00 ..	1,560				130—G G—107
	Irrigation sluice at 5/74-50 ..	570				131—G G—108
	Do. at 6/20-00 ..	720				132—G G—107
	Do. at 6/67-20 ..	570				133—G G—108
	Do. at 7/61-97 ..	730				134—G G—108
	Do. at 10/40-50 ..	760				135—G
	Miscellaneous works in connection with the alignment in Fanjore town.	8,660				136—G
	Tank supply sluice at 14/75-00 ..	1,100				137—G G—110
	Do. at 15/02-80 ..	1,110				138—G G—110
	Do. at 15/37-00 ..	1,090				139—G G—110
	Do. at 16/54-00 ..	1,120				140—G G—110
	Do. at 16/67-40 ..	1,140				141—G G—110
	Do. at 17/08-20 ..	1,160				142—G G—110
	Do. at 17/49-00 ..	1,200				143—G G—109
	Irrigation syphon at 17/85-80 ..	780				
	Carried over ..	43,400	47,63,750			

Classified Abstract of the Grand Anicut Canal system—Main Canals and Branches—cont.

Sub-head.	Name of work.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2-MAIN CANALS AND BRANCHES—cont.	RS.	RS.			
	Brought forward ..	43,400	47,63,750			
	Grand Anicut Canal—cont.					
Miscellaneous out.	Irrigation sluice at 18/90-00 ..	780				144—G G—113
	Do. at 19/35-00 ..	600				145—G G—113
	Irrigation syphon at 20/70-00 ..	72				146—G G—109
	Tank supply sluice at 22/32-00 ..	1,080				147—G G—110
	Do. at 22/50-00 ..	1,090				148—G G—110
	Do. at 22/90-00 ..	1,250				149—G G—111
	Irrigation syphon at 23/71-30 ..	860				150—G G—112
	Do. at 23/77-00 ..	840				151—G G—112
	Irrigation sluice at 24/57-80 ..	890				152—G G—113
	Irrigation syphon at 24/56-30 ..	870				153—G G—112
	Irrigation tunnel at 25/26-30 ..	1,430				154—G G—112
	Irrigation sluice at 25/62-00 ..	800				155—G G—113
	Tank supply sluice at 26/17-30 ..	990				156—G G—110
	Irrigation sluice at 27/94-28 ..	770				157—G G—114
	Irrigation tunnel at 29/01-35 ..	2,180				158—G G—71
	Irrigation sluice at 29/94-35 ..	620				159—G G—114
	Irrigation tunnel at 30/44-35 ..	980				160—G G—112
	Do. at 30/59-35 ..	1,250				161—G G—112
	Irrigation sluice at 30/61-80 ..	460				162—G G—114
	Irrigation syphon at 30/99-35 ..	750				163—G G—114
	Irrigation sluice at 31/14-35 ..	530				164—G G—114
	Irrigation syphon at 31/24-35 ..	970				165—G G—114
	Tank supply sluice at 31/60-00 ..	1,010				166—G G—115
	Irrigation sluice at 32/05-00 ..	890				167—G G—116
	Tank supply sluice at 32/17-50 ..	1,300				168—G G—116
	Irrigation sluice at 32/75-00 ..	1,280				169—G G—117
	Tank supply sluice at 32/90-00 ..	1,120				170—G G—116
	Irrigation sluice at 32/92-50 ..	1,280				171—G G—117
	Do. at 33/05-00 ..	1,280				172—G G—117
	Tank supply sluice at 33/25-00 ..	990				173—G G—116
	Carried over ..	73,260	47,63,750			

Classified Abstract of the Grand Anicut Canal system—Main Canals and Branches—cont.

Sub-head.	Name of work.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2. MAIN CANALS AND BRANCHES—cont.	RS.	RS.	RS.		
	Brought forward ..	73,260	47,63,750			
	<i>Grand Anicut Canal—cont.</i>					
O. Miscellaneous—cont.	Irrigation sluice at 33/80-00 ..	1,310				174-G
	Tank supply sluice at 33/95-00 ..	860				G-117
	Irrigation sluice at 34/32-50 ..	310				175-G
	Do. at 36/85-00 ..	370				G-115
	Do. at 37/20-00 ..	520				176-G
	Do. at 37/25-00 ..	240				G-116
	Do. at 37/50-00 ..	300				177-G
	Irrigation syphon at 37/95-00 ..	550				G-116
	Do. at 38/10-00 ..	550				178-G
	Irrigation sluice at 38/35-00 ..	34				G-117
	Do. at 38/90-00 ..	700				179-G
	Do. at 40/30-00 ..	310				G-117
	Do. at 40/82-50 ..	290				180-G
	Do. at 43/05-00 ..	320				G-118
	Do. at 43/25-00 ..	340				181-G
	Irrigation syphon at 43/50-00 ..	600				G-117
	Irrigation sluice at 43/60-00 ..	340				182-G
	Irrigation syphon at 43/85-00 ..	610				G-117
	Do. at 44/15-00 ..	580				183-G
	Irrigation sluice at 44/45-00 ..	350				G-117
	Irrigation syphon at 44/80-00 ..	600				184-G
P. Maintenance.	Demarcation, R.D. and B.M. stones.	3,530				G-119
	Total ..		87,180			185-G
	Maintenance during construction, Grand Anicut canal.	40,000	40,000			G-118
	Total ..					186-G
	Total, Grand Anicut Canal ..			48,90,930		
	<i>Kalianodai Branch.</i>					
A. Preliminary Expenses.	Preliminary expenses, Kalianodai Branch.	8,500				187-G
	Total ..		8,500			
B. Land	Compensation for land for Kalianodai Branch.	49,350				193-G
	Total ..		49,350			
	Carried over ..		57,850	48,90,930		

Classified Abstract of the Grand Anicut Canal system—Main Canals and Branches—cont.

Sub-head.	Name of work.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2. MAIN CANALS AND BRANCHES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..		57,850	48,90,930		
	<i>Kalianodai Branch—cont.</i>					
D. Regulators ..	Head sluice with 3' drop at Head ..	14,180				199-G
	Regulator at R.D. 1/6/40 ..	9,370				G-17
	Regulator with 3' drop at 6/7830 ..	3,910				200-G
	Total ..		27,460			G-82
E. Falls and Weirs.	3' drop at R.D. 1730 ..	4,280				201-G
	3' drop at R.D. 4,700 ..	4,360				G-184
	3' drop at R.D. 7,340 ..	4,410				202-G
	6' drop at R.D. 2/9450 ..	6,750				G-178
	4' drop at R.D. 4/9250 ..	4,980				203-G
	4' drop at R.D. 5/1230 ..	4,900				G-178
	2' drop at R.D. 5/3210 ..	3,100				205-G
	4' drop at R.D. 5/6840 ..	4,820				G-180
	6' drop at R.D. 6/1130 ..	6,320				206-G
	4' drop at R.D. 7/0370 ..	3,060				G-181
	2' drop at R.D. 7/3340 ..	1,970				207-G
	4' drop at R.D. 8/7370 ..	3,150				G-181
	Total ..		52,010			208-G
G. Bridges	"B" class bridge with 3 ft. drop at R.D. 5,855 ..	11,000				G-182
	"C" class bridge with 3 ft. drop at R.D. 9,650 ..	8,980				209-G
	"B" class bridge at R.D. 2/6:80 ..	7,090				G-181
	"C" do. at R.D. 2/8730 ..	5,170				210-G
	"C" do. at R.D. 4/5370 ..	5,080				G-180
	"C" do. at R.D. 5/4728 ..	4,950				211-G
	"B" do. at R.D. 7/1690 ..	4,910				G-185
	"C" do. at R.D. 8/5230 ..	3,680				212-G
	Total ..		50,860			G-186
K. Buildings	Inspection sheds and staff quarters.	20,800				214-G
	Total ..		20,800			G-179
L. Earth work	Excavating Kalianodai Branch ..	1,18,900				215-G
	Total ..		1,18,900			G-179
M. Plantations	Providing avenues along roads on canal banks.	5,400	5,400			216-G
	Total ..					G-82
	Carried over ..		3,33,310	48,90,930		217-G

Classified Abstract of the Grand Anicut Canal system—Main Canals and Branches—cont.

Sub-head.	Name of work.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.	Remarks. In this column the numerator represent Estimate numbers and the denominator Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2. MAIN CANALS AND BRANCHES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..		3,32,310	43,90,93		
	<i>Kalianodai Branch—cont.</i>					
O. Miscellaneous.	Fixing demarcation stones along Kalianodai Branch.	800				225—G
	Fixing R.D. stones along Kalianodai Branch.	290				226—G
	Fixing B.M. stones along Kalianodai Branch.	110				227—G
	Pipe sluices along Kalianodai Branch.	3,940				228—G
	Total ..		4,640			G—183—205
P. Maintenance.	Maintenance of Kalianodai Branch during construction.	5,000				229—G
	Total ..		5,000			
	Total, Kalianodai Branch ..			3,42,950		
	<i>Vadakadu Branch.</i>					
A. Preliminary Expenses.	Preliminary expenses, Vadakadu Branch.	5,300				230—G
	Total ..		5,300			
B. Land ..	Compensation for land for Vadakadu Branch.	24,700				231—G
	Total ..		24,700			
D. Regulators ..	Regulator at head ..	6,220				232—G
	Do. at R.D. 5/6200 ..	5,620				G—191
	Total ..		11,840			233—G
						G—193
E. Falls and weirs.	2 drop at R.D. 0/1640 ..	2,310				234—G
	3' " at R.D. 1/2680 ..	2,400				G—186
	4' " at R.D. 1/7680 ..	3,520				235—G
	4' " at R.D. 3/3474 ..	3,170				G—200
	1' " at R.D. 4/1474 ..	1,650				236—G
	Total ..		13,050			G—185
G. Bridges ..	"B" Class bridge with 1' drop at R.D. 1/0800.	6,000				237—G
	"C" Class bridge at R.D. 2/0300.	4,100				G—83
	"C" Class bridge with 1' drop at R.D. 2/8780.	5,070				240—G
	"C" Class bridge at R.D. 4/3974.	3,720				G—84
	"C" Class bridge at R.D. 4/9074.	3,710				241—G
	Total ..		22,600			G—84
H. Escapes ..	Surplus sluice at R.D. 5/2474 ..	2,790				242—G
	Total ..		2,790			G—84
	Carried over ..			80,280		

Classified Abstract of the Grand Anicut Canal system—Main Canals and Branches—cont.

Sub-head.	Names of works.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.	Remarks. In this column the numerators represent Estimate numbers and the denominator Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2. MAIN CANALS AND BRANCHES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..		80,280	52,33,880		
	<i>Vadakadu Branch.</i>					
K. Buildings ..	Inspection sheds and staff quarters.	7,400				245—G
	Total ..		7,400			
L. Earthwork ..	Excavating Vadakadu Branch ..	38,300				246—G
	Total ..		38,300			G—187 to 190
M. Plantations ..	Providing avenues along roads on canal banks.	3,200				247—G
	Total ..		3,200			
O. Miscellaneous.	Fixing demarcation stones along Vadakadu Branch.	170				248—G
	Fixing R.D. stones along Vadakadu Branch.	170				249—G
	Fixing B.M. stones along Vadakadu Branch.	70				250—G
	Pipe sluices along Vadakadu Branch.	1,700				251—G
	Total ..		2,200			G—205
P. Maintenance.	Maintenance of Vadakadu Branch during construction.	2,750				252—G
	Total ..		2,750			
	Total, Vadakadu Branch ..			1,34,130		
	<i>Rajamadam Branch.</i>					
A. Preliminary Expenses.	Preliminary expenses, Rajamadam Branch.	3,400				253—G
	Total ..		3,400			
B. Land ..	Compensation for land for Rajamadam Branch.	14,300				254—G
	Total ..		14,300			
D. Regulators ..	Head sluice with 4' drop ..	6,500				255—G
	Regulator with 6' drop at R.D. 3/4795.	6,520				G—197
	Total ..		13,020			256—G
						G—204
E. Falls and weirs.	10' drop at R.D. 0/1320 ..	5,890				257—G
	3' drop at R.D. 1/2370 ..	2,090				G—198
	4' drop at R.D. 1/7620 ..	3,070				258—G
	5' drop at R.D. 2/0120 ..	3,660				G—200
	Total ..		14,710			259—G
						G—185
						260—G
						G—202
F. Cross drainage works.	Undertunnel at 4,000 feet ..	6,550				261—G
	Total ..		6,550			G—192
	Carried over ..		51,980	53,68,010		

Classified Abstract of the Grand Anicut Canal system—Main Canals and Branches—cont.

Sub-head.	Names of works.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.	Remarks. In this column the numerators represent Estimate number and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2. MAIN CANALS AND BRANCHES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..		51,980	53,68,010		
	<i>Rajamadam Branch—cont.</i>					
G. Bridges ..	"C" Class bridge at 7,700 ..	3,650				262—G G—84
	"C" Class bridge with 4' drop at R.D. 1/5120.	5,390				263—G G—201
	"C" Class bridge at R.D. 2/2745.	3,600				264—G G—84
	Total ..		12,940			
H. Escapes ..	Surplus sluice at R.D. right bank, 2/8620.	2,900				265—G G—202
	Total ..		2,900			
K. Buildings ..	Inspection sheds and staff quarters.	30,780				266—G
	Total ..		30,780			
L. Earthwork ..	Excavating Rajamadam Branch ..	31,140				267—G G—194 to 19
	Total ..		31,140			
M. Plantations..	Providing avenues along roads on canal banks.	2,100				268—G
	Total ..		2,100			
O. Miscellaneous.	Fixing demarcation stones along Rajamadam Branch.	110				269—G
	Fixing R.D. stones along Rajamadam Branch.	110				270—G
	Fixing B.M. stones along Rajamadam Branch.	50				271—G
	Pipe sluices along Rajamadam Branch.	1,030				272—G G—205
	Total ..		1,300			
P. Maintenance..	Maintenance of Rajamadam Branch during construction.	1,750				273—G
	Total ..		1,750			
	Total, Rajamadam Branch ..			1,34,890		
	<i>Pudupatnam Branch.</i>					
A. Preliminary Expenses.	Preliminary expenses, Pudupatnam Branch.	1,000				274—G
	Total ..		1,000			
B. Land ..	Compensation for land for Pudupatnam Branch.	1,470				275—G
	Total ..		1,470			
D. Regulators ..	Head sluice with 3' drop ..	7,320				276—G D—207
	Total ..		7,320			
E. Falls and weirs.	6 ft. at R.D. 660 ft. ..	4,620				277—G G—208
	6 ft. at R.D. 1,650 ft. ..	4,620				278—G G—208
	Total ..		9,240			
	Carried over ..		19,030	55,02,900		

Classified Abstract of the Grand Anicut Canal system—Main Canals and Branches—cont.

Sub-head.	Names of works.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2. MAIN CANALS AND BRANCHES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..		19,030	55,02,900		
	<i>Pudupatnam Branch—cont.</i>					
K. Buildings ..	Inspection sheds and staff quarters.	8,200				272—G
	Total ..		8,200			280—G G—208
L. Earthwork ..	Excavating Pudupatnam Branch.	6,480				
	Total ..		6,480			281—G
M. Plantations ..	Providing avenues along road on canal banks.	450				
	Total ..		450			282—G
O. Miscellaneous.	Fixing Demarcation stones along Pudupatnam Branch.	30				283—G
	Fixing R.D. stones along Pudupatnam Branch.	30				284—G
	Fixing B.M. stones along Pudupatnam Branch.	20				285—G
	Pipe sluices along Pudupatnam Branch.	490				G—205
	Total ..		570			286—G
P. Maintenance.	Maintenance of Pudupatnam Branch during construction.	500				
	Total ..		500			
	Total, Pudupatnam Branch ..			35,230		
	Grand Total ..				55,38,130	

Classified Abstract of Estimates

VADAVAR SYSTEM.

MAIN CANALS AND BRANCHES.

Abstract of cost by sub-heads.

Canals.	A. Preliminary Expenses.	B. Land.	D. Regulators.	E. Falls and weirs.	F. Cross drainage works.	G. Bridges.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	RS.	RS.	RS.	RS.	RS.	RS.
The Vadavar and Vadavar Extension canal.	20,500	65,100	17,460	23,500	42,600	52,360
Unforeseen works, 20 per cent ..	..	13,000	3,440	4,700	8,500	10,440
Grand Total ..	20,500	78,100	20,900	28,200	51,100	62,800

Canals.	H. Escapes.	K. Buildings.	L. Earthwork.	M. Plantations.	O. Miscellaneous.	P. Maintenance.	Total.
(1)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	RS.	AS.	RS.	RS.	RS.	RS.	RS.
The Vadavar and Vadavar Extension canal.	14,555	15,950	1,22,500	8,900	5,855	8,000	3,97,330
Unforeseen works, 20 per cent ..	2,935	3,210	24,500	1,800	1,145	1,600	75,270
Grand Total ..	17,500	19,200	1,47,000	10,700	7,000	9,600	4,72,600

Classified Abstract of Vadavar System—Main Canals and Branches.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	VADAVAR SYSTEM.					
	I. WORKS.	RS.	RS.	RS.	RS.	
	2. MAIN CANALS AND BRANCHES.					
	<i>Vadavar and Vadavar Extension Canal.</i>					
A. Preliminary Expenses.	The Vadavar and Vadavar Extension canal.	20,500				
	Total ..		20,500			1-V 2-V
B. Land ..	Compensation for land for the Vadavar and Vadavar Extension canal.	57,000				V-1 to V-17 and V-42 to V-91.
	Compensation for land for Muthalamuthuvuri diversion.	8,100				
	Total ..		65,100			3-V
D. Regulators ..	Supplemental head sluice at the head of the Vadavar at R.D. 0/.	11,100				V-18 to V-20. 4-V
	Regulator at R.D. 10/8300 of the Vadavar.	6,360				V-21 and V-22 5-V
	Total ..		17,460			V-23.
E. Falls and Weirs.	Drop 3' at R.D. 7920 of the Vadavar.	5,000				6-V
	Drop 2' at R.D. 1/6500 of the Vadavar.	4,600				V-24 7-V
	Drop 3' combined with foot bridge at R.D. 8/2500 of the Vadavar.	5,800				V-25 8-V
	Drop 3' at R.D. 9/1080 of the Vadavar.	5,120				V-26 9-V
	Drop 4' at R.D. 11/4180 ..	2,980				V-27 10-V
	Total ..		23,500			V-28.
F. Cross Drainage Works.	Super-passage for the Muthalamuthuvuri diversion at R.D. 2/3100 of the Vadavar.	28,200				11-V V-30.
	Aqueduct across Kalapally channel at R.D. 12/9835.	5,740				12-V
	Aqueduct at R.D. 13/3980 ..	8,660				V-31. 13-V
	Total ..		2,600			V-32.
G. Bridges ..	Bridge "C" class at R.D. 2/112 of the Vadavar.	5,300				14-V
	Foot bridge at R.D. 6/3890 ..	1,650				G-83 and 84. 15-V
	Bridge "C" class at R.D. 6/8145.	5,500				G-85. 16-V
	Bridge "B" class at R.D. 7/4250.	6,900				G-83 and 84. 17-V
	Bridge "C" class at R.D. 7/8375..	5,080				G-82 and 84. 18-V
	Do. do. 9/0255 ..	4,980				G-83 and 84. 19-V
	Do. do. 9/7515 ..	4,680				G-83 and 84. 20-V
	Do. do. 11/8536 ..	3,580				G-83 and 84. 21-V
	Carried over ..	37,670	1,69,160			G-83 and 84.

Classified Abstract of the Vadavar System—Main Canal and Branches—cont.

Sub-head.	Names of works	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks. In this column the numerators represent estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2. MAIN CANALS AND BRANCHES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	37,670	1,69,160			
	<i>Vadavar and Vadavar Extension Canal—cont.</i>					
G. Bridges—cont.	Bridge "B" class at R.D. 12/1836.	4,880				22—V G—82 and 84 23—V
	Bridge "C" class at R.D. 12/8156.	3,180				G—83 and 84 24—V
	Do. do. 13/2726.	3,570				G—83 and 84 25—V
	Do. do. 13/8930.	3,060				G—83 and 84
	Total ..		52,360			
H. Escapes ..	Surplus sluice No. 1 at R.D. 5280.	3,000				26—V V—33 27—V
	Do. No. 2 at R.D. 2/3000.	3,915				V—34 and V—35 28—V
	Improvements to Pulampallam surplus at R.D. 4/910, 5600/2.	2,800				V—36 and V—37 29—V
	Surplus sluice No. 4 at R.D. 10/8300.	4,850				V—38 and V—39
	Total ..		14,565			
K. Buildings ..	Shed for 2 lascars at R.D. 5280 ..	740				30—V G—100 31—V
	Do. do. 2/8100..	740				G—100 32—V
	Do. do. 4/1910..	740				G—100 33—V
	Shed for lascars at R.D. 10/8300 ..	1,400				G—100 34—V
	Store shed at R.D. 10/8300 ..	740				G—100 35—V
	Shed for two lascars at R.D. 14/6520.	740				G—100 36—V
	Inspection Bungalow with out-houses at Satyamangalam.	3,630				G—98 and 99 37—V
	Inspection Bungalow with out-houses at Vaduvur.	3,630				G—98 and 99 38—V
	Inspection Bungalow with out-houses at Ullikota.	3,630				G—98 and 99
	Total ..		15,990			39—V
L. Earthwork ..	Improvements to the Vadavar and Excavating Vadavar Extension canal.	1,15,000				40—V
	Excavating the diversion of Muthalamutha Vari and forming flood banks.	7,500				
	Total ..					41—V
M. Plantations ..	Forming avenues on canal banks ..	8,900	1,22,500			42—V
	Total ..		8,900			43—V
O. Miscellaneous.	Fixing demarcation stones along the Vadavar and Vadavar Extension canal.	350				44—V
	Fixing R.D. stones along the Vadavar and Vadavar Extension canal.	710				45—V
	Fixing Bench mark stones along the Vadavar and Vadavar Extension canal.	190				
	Fixing demarcation stones for the diversion of the Muthalamuthu Vari.	25				
	Carried over ..	1,275	3,83,475			

Classified Abstract of the Vadavar System—Main Canals and Branches—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks. In this column the numerators represent estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2. MAIN CANALS AND BRANCHES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	1,275	3,83,475			
	<i>Vadavar and Vadavar Extension Canal—cont.</i>					
O. Miscellaneous—cont.	Irrigation syphon for Paliyari channel under the Muthalamuthu Vari.	1,700				46—V V—40
	Irrigation syphon for the Punthotam channel under the Muthalamuthu Vari Diversion at R.D. 2/3100 of the Vadavar.	2,000				47—V
	Pipe sluices for the Vadavar Extension canal.	880				48—V V—41
P. Maintenance.	Total ..		5,855			
	Maintenance during construction. The Vadavar and Vadavar Extension canals.	8,000				49—V
	Total ..		8,000	3,97,330	3,97,330	
	Total, Vadavar System, Main Canals and Branches.					

Classified Abstract of Estimates.

VADAVAR SYSTEM.

DISTRIBUTARIES.

Abstract of Cost by sub-heads.

Serial number.	Names of channels.	A. Preliminary expenses.	B. Land.	C. Works.	L. Earthwork.	O. Miscellaneous.	P. Maintenance.	Total.
1	Puthur Channel ..	Rs. 1,410	Rs. 10,630	Rs. 14,525	Rs. 11,000	Rs. 220	Rs. 710	Rs. 38,495
2	Do. No. 1 Channel ..	180	255	3,265	130	10	5	3,845
3	Do. " 2 do. ..	90	270	380	240	10	5	995
4	Do. " 3 do. ..	500	7,010	11,395	8,120	100	80	27,205
5	Do. " 4 do. ..	100	230	2,850	80	10	10	3,280
6	Do. " 5 do. ..	360	2,530	4,045	1,290	55	45	8,325
	Total for Puthur Channel and its off-takes.	2,640	20,925	36,460	20,860	405	855	82,145
7	Chettichattram Channel ..	510	5,020	4,690	3,650	135	115	14,120
8	Do. No. 1 Channel ..	90	410	510	200	10	15	1,235
9	Do. " 2 do. ..	140	250	195	160	10	5	760
	Total for Chettichattram Channel and its off-takes.	740	5,680	5,895	4,010	155	135	16,115
10	Huppadi Channel ..	1,370	11,620	5,865	6,310	160	530	25,855
11	Muvallur Channel ..	500	7,620	3,545	3,300	120	310	15,395
12	Do. No. 1 Channel ..	170	1,200	1,575	800	35	20	3,600
13	Do. " 2 do. ..	500	3,670	1,730	2,180	80	50	8,210
	Total for Muvallur Channel and its off-takes.	1,170	12,490	6,850	6,080	235	380	27,205
14	Mannargudi Channel ..	1,745	21,100	10,895	13,060	305	865	48,540
15	Do. No. 1 Channel ..	80	285	780	130	15	10	1,270
16	Do. " 2 do. ..	100	200	100	65	20	15	500
17	Do. " 3 do. ..	50	300	380	150	15	10	905
18	Do. " 4 do. ..	90	560	100	125	10	10	895
19	Do. " 5 do. ..	120	1,075	505	240	25	20	1,985
20	Do. " 6 do. ..	170	1,050	2,055	910	40	25	4,250
21	Do. " 7 do. ..	385	1,500	1,505	980	50	35	4,455
	Total for Mannargudi Channel and its off-takes.	2,740	26,070	16,320	16,200	480	990	62,800
22	Vadavar No. 1 Channel ..	1,550	13,450	7,070	11,900	220	740	34,930
23	Do. Extension Channel ..	2,615	40,020	30,645	34,540	390	1,280	1,09,490
24	Do. No. 2 do. ..	130	1,670	220	470	25	20	2,535
25	Do. " 3 do. ..	560	3,540	1,630	2,990	65	50	8,835
26	Do. " 4 do. ..	400	2,550	3,620	1,240	45	40	7,885
27	Do. " 5 do. ..	210	840	1,275	330	20	15	2,690
28	Do. " 6 do. ..	150	320	185	70	10	5	740
29	Do. " 7 do. ..	205	730	670	200	25	15	1,845
30	Do. " 8 do. ..	200	620	1,095	230	10	10	2,155
31	Do. " 9 do. ..	80	440	360	140	10	10	1,040
32	Do. " 10 do. ..	330	1,300	2,840	490	25	20	5,005
33	Do. " 11 do. ..	110	640	190	140	10	10	1,100
34	Do. " 12 do. ..	210	1,980	1,270	1,780	45	35	5,320
	Total for Vadavar Extension Channel and its minors.	5,200	54,650	44,000	42,610	680	1,510	1,48,650
35	Palaiyur Channel ..	1,630	14,490	21,035	19,960	200	670	54,985
36	Do. No. 1 Channel ..	160	520	805	340	25	20	1,870
37	Do. " 2 do. ..	170	1,265	895	460	20	15	2,825
38	Do. " 3 do. ..	610	6,750	12,425	5,280	95	75	25,235
	Total for Palaiyur and its off-takes.	2,570	23,025	35,160	23,040	240	780	84,915
39	Maharajapuram Channel ..	390	4,100	2,690	3,350	75	215	10,820
40	Do. No. 1 Channel ..	190	450	665	130	40	30	1,505
41	Do. " 2 do. ..	90	350	1,275	220	15	10	1,960
42	Do. " 3 do. ..	590	2,340	1,945	2,080	70	50	7,085
	Total for Maharajapuram Channel and its off-takes.	1,260	7,240	6,575	5,780	200	305	21,570
	Total for Vadavar Extension Channel with all its off-takes.	9,030	84,915	85,735	71,440	1,220	2,595	2,54,935
	Total ..	19,240	1,75,150	1,63,695	1,36,800	2,875	6,225	5,03,985
	Ad 20 per cent for unforeseen contingencies.		35,030	32,745	27,360	575	1,245	96,955
	Grand Total ..	19,240	2,10,180	1,96,440	1,64,160	3,450	7,470	6,00,940

Classified Abstract of the Vadavar System—Distributaries.

Sub-head.	Names of work.	Amount of Estimate for individual works.	of ads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	VADAVAR SYSTEM.	Rs.	Rs.	Rs.		
	I. WORKS.					
	3. DISTRIBUTARIES.					
	<i>Puthur Channel.</i>					
A. Preliminary Expenses.	A. Preliminary Expenses ..	1,410				50—V
			1,410			
B. Land	Land required for excavating the channel.	10,630				51—V V—118 to V—120 and V—123 to V—129
			10,630			
C. Works	Head sluice and 3-feet drop ..	1,450				52—V V—130
	Masonry sluice left bank at 660 feet.	490				53—V
	" B " class girder bridge at 2,640 feet.	2,090				V—131
	" B " class girder bridge at 3,960 feet.	2,010				54—V V—210
	" C " class girder bridge at 3 miles 1,720 feet.	1,800				55—V V—210
	" B " class bridge at 5 miles 198 feet.	860				56—V V—172
	Railway bridge combined with 2 feet drop at 3 miles 3,894 feet.	3,100				57—V V—28
	" C " class bridge at 6 miles 868 feet.	770				58—V 59—V
	2-ft. drop at 6 miles 1,518 feet ..	345				V—93
	3-ft. drop at 6 miles 2,508 feet ..	400				60—V V—107
	22 pipe sluices ..	1,300				61—V V—110
L. Earthwork	Excavating the channel ..	11,000				62—V V—101 to V—105
			11,000			63—V V—118 to V—120 and V—123 to V—128
O. Miscellaneous.	Fixing demarcation stones ..	90				
	Do. mile and furlong stones ..	130				64—V 65—V
P. Maintenance.	Maintenance during execution ..	710				66—V
			710			
	Total, Puthur Channel ..			38,495		
	<i>Puthur No. 1 Channel.</i>					
A. Preliminary Expenses.	Preliminary expenses ..	180				67—V
			180			
B. Land	Land required for excavating the channel.	255				68—V V—120
			255			69—V
C. Works	Head sluice and bridge at 33 feet ..	390				V—214
	Railway bridge at 0 mile 660 feet.	2,750				70—V 71—V
	Two pipe sluices ..	100				V—101 to V—105
	Gross wall with vent at 0 mile, 1,320 feet.	25				72—V V—117
L. Earthwork	Excavating the channel ..	130				73—V V—120
			130			
	Carried over ..		3,830	38,495		

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont.	RS.	RS.	RS.		
	Brought forward ..	..	3,820	39,495		
	Puthur No. 1 Channel—cont.					
O. Miscellaneous.	Fixing demarcation stones ..	5				74—V
	Fixing mile and furlong stones ..	5				75—V
P. Maintenance.	Maintenance during execution ..	5	10			76—V
	Total, Puthur No. 1 Channel ..	..	5	3,846		
	Puthur No. 2 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	90				77—V
B. Land ..	Land required for excavating the channel.	270	90			78—V
						V—120
C. Works ..	Head (pipe) sluice ..	100	270			79—V
	3 feet drop at 0 mile 1,370 feet ..	280				V—101 to V—1
L. Earthwork ..	Excavating the channel ..	240	380			80—V
						V—109
O. Miscellaneous.	Fixing demarcation stones ..	5	240			81—V
	Fixing mile and furlong stones ..	5				V—120
P. Maintenance.	Maintenance during execution ..	5	10			82—V
			5			83—V
	Total, Puthur No. 2 Channel ..	..	..	995		
	Puthur No. 3 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	500	500			85—V
B. Land ..	Land required for excavating the channel.	7,010				86—V
						V—12, to V—
						and V—129
C. Works ..	Head sluice and 2-5 feet drop ..	500	7,010			87—V
	1 foot drop at 2,772 feet ..	230				V—132
						88—V
	Aqueduct at 0 mile 3,631 feet ..	3,180				V—133
						89—V
	Undertunnel at 0 mile 4,158 feet ..	730				V—134
	Do. at 0 mile 4,356 feet ..	850				90—V
	"C" class Bridge at 0 mile 5,214 feet.	730				V—135
	Undertunnel at 1 mile ..	800				91—V
						V—136
	Regulator at 1 mile 1,983 feet ..	130				92—V
	4 feet drop at 1 mile 4,620 feet ..	320				V—137
	Do. at 2 miles 691 feet ..	320				93—V
	Undertunnel at 2 miles 4,636 feet.	700				V—138
	Aqueduct at 2 miles 4,950 feet ..	2,300				94—V
	Nine pipe sluices ..	530				V—139
	Cross wall with vent at 3 miles 1,320 feet.	25				95—V
L. Earthwork ..	Excavating the channel ..		11,395			V—140 to V—
		8,120	8,120			and V—
	Carried over ..	..	27,025	43,335		

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	..	27,025	43,335		
	Puthur No. 3 Channel—cont.					
O. Miscellaneous.	Fixing demarcation stones ..	40				102—V
	Fixing mile and furlong stones ..	60				103—V
P. Maintenance.	Maintenance during execution ..	80	100			104—V
	Total, Puthur No. 3 Channel ..	..	..	27,205		
	Puthur No. 4 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	100				105—V
B. Land ..	Land required for excavating the channel.	230	100			106—V
						V—122
C. Works ..	Head (pipe) sluice and bridge ..	100	230			107—V
	Railway bridge at 0 mile 1,584 feet.	2,760				V—101 to V—106
L. Earthwork ..	Excavating the channel ..	80	2,560			108—V
O. Miscellaneous.	Fixing demarcation stones ..	5				109—V
	Fixing mile and furlong stones ..	5				V—122
P. Maintenance.	Maintenance during execution ..	10	10			110—V
						111—V
	Total, Puthur No. 4 Channel ..	..	..	3,280		112—V
	Puthur No. 5 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	360				113—V
B. Land ..	Land required for excavating the channel.	2,530	360			114—V
						V—122
C. Works ..	2 feet drop at 0 mile 1,188 feet ..	260	2,530			115—V
	Regulator at 1 mile 495 feet ..	105				V—106
	Aqueduct at 1 mile 2,640 feet ..	3,010				116—V
	3 feet drop at 1 mile 2,338 feet ..	280				V—143
	Six sluices ..	390				117—V
						V—136
L. Earthwork ..	Excavating the channel ..	1,290	4,045			118—V
						V—109
O. Miscellaneous.	Fixing demarcation stones ..	25				119—V
	Fixing mile and furlong stone ..	30				V—101 to V—106
P. Maintenance.	Maintenance during execution ..	45	45			120—V
						V—122
	Total, Puthur No. 5 Channel ..	..	..	8,325		
	Total, Puthur Channel and its offtakes.	..	..	..	82,145	
	Chettichattram Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	510				121—V
B. Land ..	Land required for excavating the channel.	5,020	510			122—V
						V—137 to V—138
C. Works ..	Head sluice ..	1,070	5,020			123—V
	"B" class masonry bridge at 0 mile 1,320 feet.	850				V—139
	Carried over ..	1,920	5,630	..	82,145	V—140

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate or individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks In this column the numerals represent Estimate numbers and the denominators Plan numbers
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont. Brought forward ..	Rs. 1,920	Rs. 5,530	Rs. ..	Rs. 82,145	
	Chettichatram Channel— cont.					
C. Works—cont.	Outlet at 4,290 feet ..	460				128—V
	"B" class bridge at 2 miles 396 feet.	760				V—116
	Outlet at 2 miles 1,914 feet ..	600				129—V
	2½ feet drop at 3 miles 2,970 feet.	270				V—99
	1 foot drop at 4 miles 330 feet ..	200				130—V
	Seven sluices ..	480				V—116
						131—V
L. Earthwork ..	Excavating the channel ..	3,650	4,690			V—140
						132—V
O. Miscellaneous.	Fixing demarcation stones ..	55				V—141
	Fixing mile and furlong stones ..	80				133—V
P. Maintenance.	Maintenance during execution ..	115				V—101 to V—
						134—V
	Total, Chettichatram Channel ..	..	..	14,120		V—137 to V—
	Chettichatram No. 1 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	90				135—V
B. Land ..	Land required for excavating channel.	410	410			136—V
C. Works ..	5 feet drop at 0 mile 1,320 feet.	280				137—V
	Four sluices ..	230				
			510			142—V
L. Earthwork ..	Excavating the channel ..	200				V—138
O. Miscellaneous.	Fixing demarcation stones ..	5				143—V
	Fixing mile and furlong stones ..	5				144—V
P. Maintenance.	Maintenance during execution ..	15				
	Total, Chettichatram No. 1 Channel.	..	15	1,235		145—V
	Chettichatram No. 2 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	140	140			146—V
B. Land ..	Land required for excavating the channel.	250	250			147—V
C. Works ..	Regulator at head ..	100				V—138
	Pipe sluice L.B. at 0 mile 990 feet.	75				148—V
	Cross wall with vent at 0 mile 1,320 feet.	20				V—143
L. Earthwork ..	Excavating the channel ..	160	195			149—V
O. Miscellaneous.	Fixing demarcation stones ..	5				V—101 to V—
	Fixing mile and furlong stones ..	5				150—V
P. Maintenance.	Maintenance during execution ..	5				V—117
						151—V
	Total, Chettichatram No. 2 Channel.	..	..	760		V—138
	Total, Chettichatram Channel and its offtakes.	..	..	..	15,115	152—V
	Carried over ..	..	..	..	98,260	153—V

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks In this column the numerals represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont. Brought forward ..	Rs. ..	Rs. ..	Rs. ..	Rs. 98,260	
	Iluppadi Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	1,370				155—V
B. Land ..	Land required for excavating the channel.	11,620	11,620			156—V
C. Works ..	Head sluice and bridge at 33 feet ..	1,290				V—144 to V—151
	Dividing dam at 1 mile 1,950 feet..	1,210				157—V
	3 feet drop at 2 miles 1,980 feet ..	400				V—152
	Bridge at 2 miles 3,584 feet ..	770				158—V
	3 feet drop at 2 mile, 4,818 feet ..	400				V—153
	Regulator at 3 miles 4,950 feet ..	150				159—V
	3 feet drop at 4 miles 990 feet ..	320				V—110
	2 feet drop at 4 miles 2,310 feet ..	260				160—V
	2 feet drop at 4 miles 4,950 feet ..	245				V—99
	Thirteen sluices ..	820				161—V
						V—110
L. Earthwork ..	Excavating the channel ..	6,310	6,310			162—V
O. Miscellaneous.	Fixing demarcation stones ..	65				V—154
	Fixing mile and furlong stones ..	95				163—V
P. Maintenance.	Maintenance during execution ..	530				V—109
	Total, Iluppadi Channel ..	..	..	25,855	25,855	164—V
	Muvanallur Channel					
A. Preliminary Expenses.	Preliminary expenses ..	500	500			V—106
B. Land ..	Land required for excavating the channel.	7,820	7,820			165—V
C. Works ..	Head sluice ..	730				V—105
	1 foot drop and bridge at 4,818 feet.	790				V—101 to V—105
	4 feet drop and bridge at 1 mile 1,551 feet.	670				167—V
	4 feet drop at 2 mile 1,188 feet ..	640				V—144 to V—151
	1 foot drop at 2 miles 3,828 feet ..	270				168—V
	Eight sluices ..	445				169—V
L. Earthwork ..	Excavating the channel ..	3,300	3,300			170—V
O. Miscellaneous.	Fixing demarcation stones ..	65				
	Fixing mile and furlong stones ..	55				171—V
P. Maintenance.	Maintenance during execution ..	310				172—V
						V—155
	Total, Muvanallur Channel ..	..	..	15,395	15,395	173—V
	Carried over ..	..	..	15,395	1,24,115	V—158

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each main head.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	..	..	15,395	1,24,115	
	<i>Muvallur No 1 Channel.</i>					
A. Preliminary Expenses.	Preliminary expenses ..	170	170			183—V
B. Land ..	Land required for excavating the channel.	1,200	1,200			184—V V—156
C. Works ..	Head sluice ..	260				185—V V—161
	3 feet drop at 0 mile 990 feet ..	300				186—V V—109
	2 feet drop at 0 mile 2,178 feet ..	240				187—V V—106
	Under tunnel at 0 mile 3,630 feet.	620				188—V V—162
	Three sluices ..	120				189—V V—101 to V—105
	Cross wall with vent at 0 mile 4,290 feet.	25	1,575			190—V V—117
L. Earthwork ..	Excavating the channel ..	600	600			191—V V—156
O. Miscellaneous.	Fixing demarcation stones ..	20				192—V
	Fixing mile and furlong stones ..	15	35			193—V
P. Maintenance..	Maintenance during execution ..	20	20			194—V
	Total, Muvallur No. 1 Channel.	..	..	3,660		
	<i>Muvallur No. 2 Channel.</i>					
A. Preliminary Expenses.	Preliminary expenses ..	500	500			195—V 196—V
B. Land ..	Land required for excavating the channel.	3,670	3,670			V—156 & V—157 197—V
C. Works ..	Regular at head ..	145				V—163 198—V
	2 feet drop at 1 mile 1,914 feet ..	280				V—108 199—V
	4 feet drop at 1 mile 2,706 feet ..	500				V—112 200—V
	2 feet drop at 1 mile 3,594 feet ..	240				V—106 201—V
	Nine sluices ..	560				V—101 to V—105 202—V
	Cross wall with vent at 2 miles 330 feet.	25	1,730			V—117 203—V
L. Earthwork ..	Excavating the channel ..	2,180	2,180			V—156 & V—157
O. Miscellaneous.	Fixing demarcation stones ..	45				204—V
	Fixing mile and furlong stones ..	35	80			205—V
P. Maintenance.	Maintenance during execution ..	50	50			206—V
	Total, Muvallur No. 2 Channel.	..	..	8,210		
	Total, Muvallur Channel and its offtakes ..	..	..	..	27,205	
	<i>Mannargudi Channel.</i>					
A. Preliminary Expenses.	Preliminary expenses ..	1,745	1,745			207—V
B. Land ..	Land required for excavating the channel.	21,100	21,100			208—V V—164 & V—166
	Carried over ..	..	22,845	..	1,51,320	

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each main head.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	..	22,845	..	1,51,320	
	<i>Mannargudi Channel—cont.</i>					
C. Works ..	Head sluice ..	1,980				209—V V—170
	1 foot drop at 2 miles 1,980 feet ..	500				210—V V—171
	"C" class girder bridge at 2 miles 3,300 feet.	1,800				211—V V—172
	Bridge at 4 miles 170 feet ..	850				212—V V—98
	Outlet at 5 miles 2,300 feet ..	490				213—V V—116
	Regulator at 6 miles 990 feet ..	250				214—V V—173
	Bridge at 7 miles 495 feet ..	770				215—V V—99
	4-feet drop at 7 miles 1,452 feet	610				216—V V—113
	2-feet drop at 7 miles 2,970 feet ..	305				217—V V—107
	Masonry sluice at 7 miles 4,340 feet.	550				218—V V—174
	Bridge at 8 miles 1,320 feet ..	790				219—V V—99
	Twenty-nine sluices ..	1,960				220—V V—101 to V—105
L. Earth work ..	Excavating the channel ..	13,630	10,895			221—V V—164 to V—166
O. Miscellaneous	Fixing demarcation stones ..	150	13,630			222—V
	" mile and furlong stones ..	155				223—V
P. Maintenance.	Maintenance during execution ..	865	305			224—V
	Total, Mannargudi Channel ..	..	..	48,640		
	<i>Mannargudi No. 1 Channel.</i>					
A. Preliminary Expenses.	Preliminary expenses ..	80	80			225—V
B. Land ..	Land required for excavating the channel.	285				226—V V—167
C. Works ..	2-feet drop and bridge at 792 feet.	610	285			227—V V—216
	Three sluices ..	170				228—V V—101 to V—107
L. Earthwork ..	Excavating the channel ..	100	780			229—V V—167
O. Miscellaneous.	Fixing demarcation stones ..	10	100			230—V
	" mile and furlong stones ..	5				231—V
P. Maintenance.	Maintenance during execution ..	10	15			232—V
	Total, Mannargudi No. 1 Channel.	..	..	1,270		
	<i>Mannargudi No. 2 Channel.</i>					
A. Preliminary Expenses.	Preliminary expenses ..	100	100			233—V
B. Land ..	Land required for excavating the channel.	200				234—V V—167
C. Works ..	Head (pipe) sluice and bridge at 200 feet.	100	200			235—V V—101 to V—105
	Carried over ..	..	400	49,810	1,51,320	

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	..	400	49,810	1,51,320	
	Mannargudi No. 2 Channel—cont.					
L. Earthwork ..	Excavating the channel ..	65	65			236—V V. 167
O. Miscellaneous.	Fixing demarcation stones ..	10				237—V
	„ mile and furlong stones ..	10				238—V
P. Maintenance.	Maintenance during execution ..	15	20			239—V
	Total, Mannargudi No. 2 Channel.	..	15	500		
	Mannargudi No. 3 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	50				240—V
B. Land ..	Land required for excavating the channel.	300	50			241—V V. 167
C. Works ..	6-feet drop and bridge at 790 feet..	260	300			242—V V. 175
	Two sluices ..	120	380			243 V. 101 to V. 106
L. Earthwork ..	Excavating the channel ..	150				244—V V. 167
O. Miscellaneous.	Fixing demarcation stones ..	10	150			245—V
	„ mile and furlong stone ..	5				246—V
P. Maintenance.	Maintenance during execution ..	10	15			247—V
	Total, Mannargudi No. 3 Channel.	..	10	905		
	Mannargudi No. 4 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	90				248—V
B. Land ..	Land required for excavating the channel.	560	90			249—V V. 167
C. Works ..	Head (pipe) sluice and bridge at 330 feet.	100	100			250—V V. 101 to V. 106
L. Earthwork ..	Excavating the channel ..	125	125			251—V V. 167
O. Miscellaneous.	Fixing demarcation stones ..	5				252—V
	„ mile and furlong stones ..	5				253—V
P. Maintenance.	Maintenance during execution ..	10	10			254—V
	Total, Mannargudi No. 4 Channel.	..	10	895		
	Mannargudi No. 5 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	120	110			255—V
B. Land ..	Land required for excavating the channel.	1,075				256—V V. 167 to V. 186
C. Works ..	4-feet drop at 0 mile 2,640 feet ..	290	1,075			257—V V. 111
	Three sluices ..	215				258—V
L. Earthwork ..	Excavating the channel ..	240	505			V. 101 to V. 104 259—V
	Carried over ..	..	240			V. 167 to V. 164
			1,940	52,110	1,51,320	

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	..	1,940	52,110	1,51,320	
	Mannargudi No. 5 Channel—cont.					
O. Miscellaneous.	Fixing demarcation stones ..	15				260—V
	„ mile and furlong stones ..	10				261—V
P. Maintenance.	Maintenance during execution ..	20	25			262—V
	Total, Mannargudi No. 5 Channel.	..	20	1,985		
	Mannargudi No. 6 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	170	170			263—V
B. Land ..	Land required for excavating the channel ..	1,050	1,050			264—V V. 168
C. Works ..	Bridge at 0 mile 1,420 feet ..	650				265—V V. 100
	3 ft. drop and bridge at 0 mile 3,430 feet.	600				266—V V. 176
	2 ft. drop and bridge at 1 mile 40 feet.	505				267—V V. 216
	Five sluices ..	300				268 V. 101 and V. 165
L. Earthwork ..	Excavating the channel ..	910	2,055			269—V V. 168
O. Miscellaneous.	Fixing demarcation stones ..	20	910			270—V
	Do. mile and furlong stones ..	20				271—V
P. Maintenance.	Maintenance during execution ..	25	40			272—V
	Total, Mannargudi No. 6 Channel.	..	25	4,250		
	Mannargudi No. 7 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	385	385			273—V
B. Land ..	Land required for excavating the channel.	1,500	1,500			274—V V. 168 and V. 169
C. Works ..	4 ft. drop and bridge at 1,320 feet.	525				275—V V. 112
	Bridge at 1 mile 2,110 feet ..	640				276—V V. 100
	Six sluices ..	340				277—V V. 101 to V. 106
L. Earthwork ..	Excavating the channel ..	980	1,505			278—V V. 168 and V. 169
O. Miscellaneous.	Fixing demarcation stones ..	25				279—V
	Do. mile and furlong stones ..	25				280—V
P. Maintenance.	Maintenance during execution ..	35	50			281—V
	Total, Mannargudi No. 7 Channel.	..	35	4,455	62,800	
	Total, Mannargudi Channel and its off-takes ..	..	..	..	..	282—V
	Vadavar No. 1 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	1,550	1,550			283—V V. 177 to V. 179
B. Land ..	Land required for excavating the channel.	13,450	13,450			284—V V. 180
	Carried over ..	..	15,000	..	2,14,120	

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	..	16,000	..	2,14,120	
	Vadavar No. 1 Channel—cont.					
C. Works	Head sluice	820				285—V
	Outlet at 0 mile 1,452 feet ..	430				V. 116
	Do. at 1 mile 1,782 feet ..	340				286—V
	4 ft. drop at 1 mile 3,366 feet ..	910				V. 116
	2 ft. drop at 2 miles 2,970 feet ..	570				287—V
	Do. at 3 miles 66 feet ..	330				V. 114
	Bridge at 4 miles 2,607 feet ..	940				288—V
	Regulator and bridge at 5 miles 1,815 feet.	650				V. 108
	4 ft. drop at 6 miles 957 feet ..	500				289—V
	Do. and bridge at 6 miles 3,729 feet.	280				V. 107
	Nineteen sluices	1,300				290—V
						V. 99
						291—V
						V. 181
						292—V
						V. 112
						293—V
						V. 111
						294—V
						V. 101 to V. 105
						295—V
						V. 177 to V. 179
L. Earthwork	Excavating the channel ..	11,900	7,070			
O. Miscellaneous.	Fixing demarcation stones ..	90	11,900			296—V
	Do. mile and furlong stones ..	130				297—V
P. Maintenance.	Maintenance during execution ..	740	220			298—V
			740			
	Total, Vadavar No. 1 Channel ..	..	..	34,930		
	Vadavar Extension Channel.				34,930	
A. Preliminary Expenses.	Preliminary expenses	2,615				299—V
B. Land	Land required for excavating the channel.	40,020	2,615			300—V
C. Works	Head sluice	3,100	40,020			V. 182 to V. 186 and V. 191
	"C" class girder bridge at 4,554 feet.	3,240				301—V
	Do. at 1 mile 2,508 feet.	3,240				V. 192
	Outlet at 2 miles 4,158 feet ..	440				302—V
	"D" class girder bridge at 3 miles 1,518 feet.	2,740				V. 172
	3 ft. drop at 3 miles 2,310 feet ..	1,250				303—V
	"B" class girder bridge at 4 miles 1,518 feet.	2,840				V. 172
	2 ft. drop and girder bridge at 4 miles 4,224 feet.	2,670				304—V
	2 ft. drop at 5 miles 3,960 feet ..	900				V. 118
	Outlet at 7 miles 198 feet ..	380				305—V
	Do. at 7 miles 3,254 feet ..	320				V. 172
	4 ft. drop at 8 miles 858 feet ..	1,340				306—V
	2 ft. drop and bridge at 8 miles 4,422 feet.	1,300				V. 193
						307—V
						V. 210
						308—V
						V. 194
						309—V
						V. 195
						310—V
						V. 116
						311—V
						V. 116
						312—V
						V. 196
						313—V
						V. 197
	Carried over ..	23,780	42,635	..	2,49,050	

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	23,780	42,635	..	2,49,050	
	Vadavar Extension Channel—cont.					314—V
C. Works—cont.	2 ft. drop at 9 miles 1,650 feet ..	610				V. 108
	4 ft. drop and bridge at 9 miles 2,640 feet.	940				315—V
	2 ft. drop at 10 miles	590				V. 114
	3 ft. drop at 10 miles 2,970 feet ..	440				316—V
	Do. at 10 miles 4,950 feet ..	420				V. 108
	Bridge at 11 miles 1,650 feet ..	710				317—V
	Regulator at 12 miles 2,310 feet ..	150				V. 110
	Forty-three sluices	3,025	30,645			318—V
L. Earthwork	Excavating the channel	34,540				V. 110
O. Miscellaneous.	Fixing demarcation stones ..	160				319—V
	Do. mile and furlong stones ..	230	390			V. 99
P. Maintenance.	Maintenance during execution ..	1,280	1,280			320—V
	Total, Vadavar Extension Channel.			1,09,490		V. 163
	Vadavar No. 2 Channel.					321—V
A. Preliminary Expenses.	Preliminary expenses	130	130			V. 101 to V. 105
B. Land	Land required for excavating the channel.	1,670				322—V
						V. 182 to V. 186 and V. 191.
						323—V
						324—V
						325—V
						326—V
						327—V
						V. 179
						328—V
						V. 101 to V. 105.
						329—V
						V. 117
						330—V
						V. 179
						331—V
						332—V
						333—V
						334—V
						835—V
						V. 187
						336—V
						V. 198
						337—V
						V. 199
						338—V
						V. 101 to V. 105.
						339—V
						V. 117
	Carried over ..	..	5,730	1,12,025	2,49,050	

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont. Brought forward ..	RS.	RS.	RS.	RS.	
	Vadavar No. 3 Channel—cont.		5,730	1,12,025	2,49,050	
L. Earthwork ..	Excavating the channel ..	2,900	2,990			340—V V. 157
O. Miscellaneous.	Fixing demarcation stones ..	25				341—V
	Do. mile and furlong stones ..	40				342—V
P. Maintenance..	Maintenance during execution ..	50	50			343—V
	Total, Vadavar No. 3 Channel ..	..	..	8,835		
	Vadavar No. 4 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	400	400			344—V 345—V V. 187 and V. 188
B. Land ..	Land required for excavating the channel.	2,550	2,550			846—V
C. Works.	Head sluice ..	470				V. 200 347—V
	Bridge at 0 mile 2,442 feet ..	600				V. 100 348—V
	4 ft. drop and bridge at 3,960 feet.	510				V. 112 349—V
	2 ft. drop at 0 mile 5,016 feet ..	250				V. 106 350—V
	4 ft. drop at 1 mile 462 feet ..	320				V. 111 351—V
	2 ft. drop and bridge at 1 mile 1,221 feet.	810				V. 217 352—V
	4 ft. drop at 1 mile 2,310 feet ..	320				V. 111 353—V
	Six sluices ..	340				V. 101 to V. 105 354—V
L. Earthwork ..	Excavating the channel ..	1,230	1,230			V. 157 and V. 18 355—V
O. Miscellaneous.	Fixing demarcation stones ..	20				356—V
	Do. mile and furlong stones ..	25	45			267—V
P. Maintenance.	Maintenance during execution ..	40	40			
	Total, Vadavar No. 4 Channel ..	..	..	7,885		
	Vadavar No. 5 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	210	210			358—V 359—V
B. Land ..	Land required for excavating the channel.	340	840			V. 188 390—V
C. Works.	Head sluice ..	250				V. 215 361—V
	4 ft. drop and bridge at 1,518 feet.	500				V. 112 362—V
	3 ft. drop at 0 mile 2,310 feet ..	290				V. 109 363—V
	Four sluices ..	210				V. 101 to V. 10 364—V
	Cross wall with vent at 0 mile 3,300 feet.	25	1,275			V. 117
L. Earthwork ..	Excavating the channel ..	330	330			365—V V. 188
O. Miscellaneous.	Fixing demarcation stones ..	10				366—V
	Do. mile and furlong stones ..	10	20			367—V
P. Maintenance.	Maintenance during execution ..	15	15			368—V
	Total, Vadavar No. 5 Channel ..	..	..	2,690		
	Carried over ..	..	..	1,31,435	2,49,050	

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont. Brought forward ..	RS.	RS.	RS.	RS.	
	Vadavar No. 6 Channel.			1,31,435	2,49,050	
A. Preliminary Expenses.	Preliminary expenses ..	150	150			369—V 370—V V. 188
B. Land ..	Land required for excavating the channel.	320	320			371—V V. 101 to V. 105
C. Works ..	Two sluices ..	160				372—V V. 117
	Cross wall with vent at 0 mile 1,452 feet.	25	185			373—V V. 188
L. Earthwork ..	Excavating the channel ..	70	70			374—V
O. Miscellaneous.	Fixing demarcation stones ..	5				375—V
	Do. mile and furlong stones ..	5	10			376—V
P. Maintenance.	Maintenance during execution ..	5	5			
	Total, Vadavar No. 6 Channel ..	..	..	740		
	Vadavar No. 7 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	205	205			377—V 378—V V. 189
B. Land ..	Land required for excavating the channel.	730	730			379—V V. 215 380—V
C. Works ..	Head sluice ..	250				V. 106 381—V
	2 ft. drop at 0 mile 1,320 feet ..	245				V. 101 to V. 105
	Three sluices ..	150				382—V V. 117 383—V
	Cross wall with vent at 0 mile 2,640 feet.	25	670			V. 189 384—V 385—V
L. Earthwork ..	Excavating the channel ..	200	200			386—V
O. Miscellaneous.	Fixing demarcation stones ..	10				
	Do. mile and furlong stones ..	15	25			
P. Maintenance.	Maintenance during execution ..	15	15			
	Total, Vadavar No. 7 Channel ..	..	..	1,345		
	Vadavar No. 8 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	200	200			387—V 388—V V. 189
B. Land ..	Land required for excavating the channel.	620	620			389—V V. 215 390—V
C. Works ..	Head sluice ..	250				V. 112 391—V
	4 ft. drop at 0 mile 330 feet ..	320				V. 201 392—V
	6 ft. drop at 0 mile 1,320 feet ..	300				V. 101 to V. 105 393—V
	Four sluices ..	200				V. 117
	Cross wall with vent at 0 mile 1,980 feet.	25	1,095			
	Carried over ..	..	1,915	1,34,020	2,49,020	

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	..	1,915	1,34,020	2,49,050	
	Vadavar No. 8 Channel—cont.					
L. Earthwork ..	Excavating the channel ..	230	230			394—V V. 189
O. Miscellaneous.	Fixing demarcation stone ..	5				395—V
	Do. mile and furlong stones ..	5	10			396—V
P. Maintenance.	Maintenance during execution ..	10	10			397—V
	Total, Vadavar No. 8 Channel ..	..	..	2,165		
	Vadavar No. 9 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	80	80			398—V
B. Land ..	Land required for excavating the channel.	440	440			399—V V. 189
C. Works ..	Head (pipe) sluice ..	70				400—V
	4-ft. drop at 0 mile 990 feet ..	290	360			V. 101 to V. 105 401—V
L. Earthwork ..	Excavating the channel ..	140	140			V. 111 402—V
O. Miscellaneous.	Fixing demarcation stones ..	5				V. 189
	Do. mile and furlong stones ..	5	10			403—V 404—V
P. Maintenance.	Maintenance during execution ..	10	10			405—V
	Total, Vadavar No. 9 Channel ..	..	..	1,040		
	Vadavar No. 10 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	330	330			406—V
B. Land ..	Land required for excavating the channel.	1,300	1,300			407—V V. 189 and V. 190
C. Works ..	Head sluice and 2-25 feet drop ..	580				408—V
	4-ft. drop at 0 mile 990 feet ..	500				V. 202 409—V
	6-ft. drop at 0 mile 2,310 feet ..	500				V. 112 410—V
	4-ft. drop at 0 mile 2,970 feet ..	500				V. 203 411—V
	Do. at 0 mile 3,630 feet ..	500				V. 112 412—V
	Six sluices ..	260				V. 112 413—V
L. Earthwork ..	Excavating the channel ..	490	2,840			V. 101 to V. 105 414—V
O. Miscellaneous.	Fixing demarcation stones ..	10	490			V. 189 and V. 190
	Do. mile and furlong stones ..	15	25			415—V 416—V
P. Maintenance.	Maintenance during execution ..	20	20			417—V
	Total, Vadavar No. 10 Channel ..	..	..	5,005		
	Vadavar No. 11 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	110	110			418—V
	Carried over ..	..	110	1,42,230	2,49,050	

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	..	110	1,42,230	2,49,050	
	Vadavar No. 11 Channel—cont.					
B. Land ..	Land required for excavating the channel.	640	640			419—V V. 190
C. Works ..	Two sluices ..	170				20—V V. 101 & V. 105
	Cross wall with vent at 0 mile 1,980 feet.	20	190			421—V V. 117
L. Earthwork ..	Excavating the channel ..	140	140			422—V V. 190
O. Miscellaneous.	Fixing demarcation stones ..	5				423—V
	Do. mile and furlong stones ..	5	10			424—V
P. Maintenance.	Maintenance during execution ..	10	10			425—V
	Total, Vadavar No. 11 Channel ..	..	..	1,100		
	Vadavar No. 12 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	210	210			426—V
B. Land ..	Land required for excavating the channel.	1,980	1,980			427—V V. 190
C. Works ..	3-ft. drop at 0 mile 396 feet ..	290				428—V V. 109
	Do. at 0 mile 2,542 feet ..	290				429—V V. 109
	Do. at 1 mile 1,980 feet ..	280				430—V V. 109
	Seven sluices ..	410	1,270			431—V V. 101 to V. 105
L. Earthwork ..	Excavating the channel ..	1,780	1,780			432—V V. 190
O. Miscellaneous.	Fixing demarcation stones ..	20				433—V
	Do. mile and furlong stones ..	25	45			434—V
P. Maintenance.	Maintenance during execution ..	35	35			435—V
	Total, Vadavar No. 12 Channel.	..	..	5,320		
	Palaiyur Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	1,630	1,630			436—V 437—V
B. Land ..	Land required for excavating the channel.	14,490	14,490			V. 204 to V. 206 & V. 208.
C. Works ..	Head sluice ..	1,060				438—V V. 209
	4-ft. drop at 6 mile 3,300 feet ..	1,320				439—V V. 115
	"B" class girder bridge at 4,470 feet.	2,020				440—V V. 210
	6-ft. drop and bridge at 1 mile 2,937 feet.	980				441—V V. 211
	4-ft. drop and bridge at 1 mile 3,765 feet.	920				442—V V. 211
	"B" class girder bridge at 2 miles 330 feet.	1,900				443—V V. 210
	Outlet at 2 miles 2,475 feet ..	400				444—V V. 116
	Do. at 3 miles 660 feet ..	300				445—V V. 106
	Carried over ..	8,900	16,120	1,48,850	2,49,050	

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont. Brought forward ..	Rs. 8,900	Rs. 16,120	Rs. 1,48,650	Rs. 2,49,050	
	Palaiyur Channel—cont.					
	2-ft. drop at 4 miles 297 feet ..	600				446—V
	Do. at 4 miles 1,617 feet ..	520				V—108 447—V
	Do. at 4 miles 3,597 feet ..	590				V—108 448—V
	2-ft. drop and bridge at 5 miles 3,927 feet ..	810				V—108 449—V
	Undertunnel at 6 miles 827 feet ..	3,410				V—212 450—V
	Bridge at 6 miles 1,353 feet ..	810				V—213 451—V
	Undertunnel at 6 miles 1,452 feet ..	3,840				V—99 452—V
	Twenty sluices	1,485				V—213 453—V
			21,035			V. 101 to V. 105 454—V
L. Earthwork ..	Excavating the channel ..	16,960	16,960			V. 204 to V. 208 & V. 208
O. Miscellaneous.	Fixing demarcation stones ..	80				455—V
	Do. mile and furlong stones ..	120		200		456—V
P. Maintenance.	Maintenance during execution ..	670		670		457—V
	Total, Palaiyur Channel ..			54,985		
	Palaiyur No. 1 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	160	160			458—V
B. Land ..	Land required for excavating the channel ..	520	520			459—V
C. Works ..	Head sluice and bridge at 0 mile 132 feet ..	390				V—206 460—V
	Two sluices	125				V—214 461—V
	4-ft. drop at 0 mile 2,640 feet ..	290				V. 101 to V. 105 462—V
			805			V—111 463—V
L. Earthwork ..	Excavating the channel ..	340	340			V—206 464—V
O. Miscellaneous.	Fixing demarcation stones ..	10				465—V
	Do. mile and furlong stones ..	15		25		466—V
P. Maintenance.	Maintenance during execution ..	20		20		
	Total, Palaiyur No. 1 Channel ..			1,870		
	Palaiyur No. 2 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	170	170			467—V
B. Land ..	Land required for excavating the channel ..	1,265	1,265			468—V
C. Works ..	Head sluice	240				V. 206 469—V
	2-ft. drop and bridge at 0 mile 1,716 feet ..	505				V—215 470—V
	Two sluices	130				V. 216 471—V
	Cross wall with vent at 0 mile 6,303 feet ..	20		895		V. 101 to V. 105 472—V
L. Earthwork ..	Excavating the channel ..	460	460			V. 117 473—V
O. Miscellaneous.	Fixing demarcation stones ..	10				V. 206 474—V
	Do. mile and furlong stones ..	10		20		475—V
P. Maintenance ..	Maintenance during execution ..	15		15		476—V
	Total, Palaiyur No. 2 Channel ..			2,825		
	Carried over ..			59,680	2,49,050	1,48,650

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont. Brought forward ..	Rs. ..	Rs. ..	Rs. 1,48,650	Rs. 2,49,050	
	Palaiyur No. 3 Channel.			59,680		
A. Preliminary Expenses.	Preliminary expenses ..	610	610			477—V
B. Land ..	Land required for excavating the channel ..	6,750	6,750			478—V
C. Works ..	Regulator and bridge at 0 mile 660 feet ..	630				V—207 & V. 208 479—V
	Undertunnel at 0 mile 1,782 feet ..	5,160				V. 217 480—V
	Do. at 0 mile 2,310 feet ..	2,590				V. 213 481—V
	2-ft. drop at 1 mile 1,980 feet ..	260				V. 218 482—V
	Undertunnel at 2 miles 594 feet ..	1,690				V. 106 483—V
	Do. at 2 miles 2,574 feet ..	1,320				V. 218 484—V
	Regulator at 2 miles 1,620 feet ..	100				V. 143 485—V
	Twelve sluices	675				V. 101 to V. 105 486—V
			12,425			487—V
L. Earthwork ..	Excavating the channel ..	5,280	5,280			V. 207 & 208 488—V
O. Miscellaneous.	Fixing demarcation stones ..	40				489—V
	Do. mile and furlong stones ..	55		95		
P. Maintenance.	Maintenance during execution ..	75		75		
	Total, Palaiyur No. 3 Channel ..			25,235		490—V
	Total, Palaiyur Channel and its off-takes.			84,915		491—V
	Maharajapuram Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	390	390			492—V
B. Land ..	Land required for excavating the channel ..	4,100	4,100			V. 221 493—V
C. Works ..	Head sluice	690				V. 223 494—V
	Bridge at 0 mile 3,432 feet ..	840				V. 98 495—V
	1-ft. drop at 0 mile 4,752 feet ..	360				V. 160 496—V
	3-ft. drop at 2nd mile ..	400				V. 110 497—V
	Eight sluices	400				V. 101 to V. 105 498—V
			2,690			V. 221
L. Earthwork ..	Excavating the channel ..	3,350	3,350			499—V
O. Miscellaneous.	Fixing demarcation stones ..	35				500—V
	Fixing mile and furlong stones ..	40		75		501—V
P. Maintenance.	Maintenance during execution ..	215		215		
	Total, Maharajapuram Channel ..			10,829		
	Maharajapuram No. 1 Channel.					
A. Preliminary Expenses.	Preliminary expenses ..	190	190			502—V
B. Land ..	Land required for excavating the channel ..	450	450			503—V
	Carried over ..		640	10,820	2,49,050	2,33,565

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	..	640	2,33,565 10,820	2,49,050	
	<i>Maharajapuram No. 1 Channel—cont.</i>					
C. Works	Head sluice ..	240				504—V
	3-ft. drop at 0 mile 650 feet ..	300				V. 215 505—V
	Two sluices ..	100				V. 109 506—V
	Cross wall with vent ..	25				V. 101 to V. 105 507—V
L. Earthwork	Excavating the channel ..	130	665			V. 117 508—V
O. Miscellaneous.	Fixing demarcation stones ..	20	130			V. 221 509—V
	Do. mile and furlong stones ..	20				510—V
P. Maintenance.	Maintenance during execution ..	30	40			
	Total, Maharajapuram No. 1 Channel.	..	30	1,505		511—V
	<i>Maharajapuram No. 2 Channel.</i>					
A. Preliminary Expenses.	Preliminary expenses ..	90				512—V
B. Land	Land required for excavating channel.	350	90			513—V
						V. 222
C. Works	Bridge at 792 feet ..	580	350			514—V
	4-ft. drop at 0 mile 990 feet ..	290				V. 100 515—V
	6-ft. drop at 0 mile 1,650 feet ..	260				V. 111 516—V
	Two sluices ..	145				V. 201 517—V
L. Earthwork	Excavating the channel ..	220	1,275			V. 101 to V. 105 518—V
O. Miscellaneous.	Fixing demarcation stones ..	10	220			V. 222 519—V
	Do. mile and furlong stones ..	5				520—V
P. Maintenance.	Maintenance during execution ..	10	15			
	Total, Maharajapuram No. 2 Channel.	..	10	1,960		521—V
	<i>Maharajapuram No. 3 Channel.</i>					
A. Preliminary Expenses.	Preliminary expenses ..	590				522—V
B. Land	Land required for excavating the channel.	2,340	590			523—V
						V. 222
C. Works	2 ft. drop at 0 mile 792 feet ..	310	2,340			524—V
	4-ft. drop at 0 mile 2,310 feet ..	560				V. 107 525—V
	3-ft. drop at 0 mile 3,960 feet ..	320				V. 224 526—V
	Regulator at 1 mile 3,300 feet ..	110				V. 108 527—V
	Ten sluices ..	645				V. 143 528—V
L. Earthwork	Excavating the channel ..	2,090	1,945			V. 101 to V. 105 529—V
			2,090			V. 222
	Carried over ..	..	6,965	14,285 2,33,565	2,49,050	

Classified Abstract of the Vadavar System—Distributaries—cont.

Sub-head.	Names of works.	Amount of Estimate for individual works.	Total of Sub-heads.	Total for each Canal or Distributary.	Total of each Main head.	Remarks. In this column the numerators represent Estimate numbers and the denominators Plan numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3. DISTRIBUTARIES—cont.	RS.	RS.	RS.	RS.	
	Brought forward ..	..	6,965	2,33,565 14,285	2,49,050	
	<i>Maharajapuram No. 3 Channel—cont.</i>					
O. Miscellaneous.	Fixing demarcation stones ..	35				530—V
	Do. mile and furlong stones ..	35				531—V
P. Maintenance.	Maintenance during execution ..	50	70			
	Total, Maharajapuram No. 3 Channel.	..	50	7,085		532—V
	Total, Maharajapuram Channel and its off-takes.	..	..	21,370		
	Total, Vadavar Extension Channel and off-takes.	..	..	..	2,54,935	
	Grand total ..	..	..	..	5,03,985	

PART IV.

TABULAR STATEMENTS OF WORKS.

Tabular Statement of works to accompany

(1)	(2)	(3)	Channel.							Discharge.		
			(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Reduced distance from head.	Serial number.	Name of work.	Area irrigable.	Bed width.	Depth of water, full supply.	Depth of water, maximum.	Side slope.	Bed fall.	Width of land occupied.	Mean velocity.	Discharge calculated.	Discharge required.

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Actual 1 : 1; calculation of discharges $\frac{1}{2}$: 1.

Estimate for the Cauvery Reservoir Project.

Cross drainage.			Falls.		Bridges.			Sluices.					Remarks.		
Area of drainage basin.	Calculated flood discharge.	Discharge provided for.	Bays.		Crest level above and below.	Opening.			Description.	Right or left bank.	Number and area of vent.	Airage.		Sill level.	
			Number.	Width.		Number.	Span.	Width of roadway.							
(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)

CANAL SYSTEM.

AND BRANCHES.

Canal.

SQUARE MILES.	C. FT. PER SECOND.	C. FT. PER SECOND.		FT.	FT.		FT.	FT.	FT.					
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	84	..
..	..	..	..	..	..	..	..	..	..	..	..	..	80	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	40	..
..	..	..	..	..	..	..	..	..	..	..	..	..	130	..
..	..	..	..	..	..	..	..	..	..	..	..	..	2,024	..
96-5	12,623	12,825	..	..	..	5	35	10	180-00	..	..	..	..	..
..	..	..	..	..	..	4	50	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	Masonry sluice.	L.	1 of 6' X 3'	300	178-90
10-5	2,877	2,938	..	..	..	..	..	..	..	Pipe sluice.	L.	3" hole with 6" diameter pipe.	21	178-40
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	6	34	5	178-25	Masonry sluice.	L.	1 of 2' X 2'	75	178-00
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	5	35	10	177-70	..	..	..	..	..
30	5,793	5,775	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	Pipe sluice.	L.	6" hole with 9" diameter pipe.	359	177-30
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9-8	2,747	2,820	..	..	..	5	35	10	176-60	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	Masonry sluice.	L.	1 of 2' X 2'	255	176-60
..	..	..	..	..	..	..	..	..	..	Pipe sluice.	L.	8" hole with 12" diameter pipe.	229	175-91
..	..	..	..	..	..	5	35	14	175-25	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	Masonry sluice.	L.	1 of 2' X 2½'	240	174-50
..	..	..	..	..	..	5	35	10	174-20	..	..	..	497	..
10-4	2,859	2,870	..	..	..	..	..	..	..	..	..	..	4,179	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	5	35	10	172-35	..	..	..	926	..
41-25	7,163	7,370	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	5	35	14	170-65	Masonry sluice.	L.	1 of 1¼' X 1¼'	292	170-20
..	..	..	..	..	..	..	..	..	..	..	..	..	572	..
5-6	1,892	2,000	..	..	..	..	..	..	..	..	..	..	425	..
..	..	..	..	..	..	6	34	5	168-15	..	..	..	..	..
2-15	1,000	1,150	..	..	..	7	40	..	..	..	..	..	..	..
..	..	..	..	..	..	5	35	10	..	..	..	..	..	..

Tabular Statement of works to accompany

(1)	(2)	Name of work.	Channel.							Discharge.		
			(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Reduced distance from head	Serial number.		Area irrigable.	Bed width.	Depth of water, full supply.	Depth of water, maximum.	Side slope.	Bed fall.	Width of land occupied.	Mean velocity.	Discharge calculated.	Discharge required.

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Estimate for the Cauvery Reservoir Project—cont.

Cross drainage.			Falls.			Bridges.			Reduced level of bed.	Sluices.				Remarks.	
Area of drainage basin.	Calculated flood discharge.	Discharge provided for.	Bays.		Crest level above and below.	Openings.		Width of roadway.		Description.	Right or Left bank.	Number and area of vent.	Acreage.		Sill level.
			Number.	Width.		Number.	Span.		(24)					(25)		(26)	(27)	(28)	(29)
(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)

CANAL SYSTEM—*cont.*

AND BRANCHES—*cont.*

Canal—cont.

SQUARE MILES.	C. FT. PER SECOND.	C. FT. PER SECOND.	FT.	FT.		FT.	FT.	FT.						
3-0	1,248	1,320	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	3	27	45	162-12	..	..	..	..	..
..	..	..	..	..	..	2	36' 10"	5	161-61	..	..	..	..	..
..	..	..	..	..	..	2	40'	66	161-56	..	..	..	..	..
0-16	178	178	..	..	..	..	..	..	..	..	..	..	..	..
0-16	178	300	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	2	40	36	161-06	..	..	..	..	..
..	200	300	..	..	..	..	..	..	..	..	..	..	..	..
..	300	300	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	2	40	36	160-74	..	..	..	..	..
..	..	..	..	..	..	3	50	..	..	..	..	..	..	..
..	..	..	..	..	..	20	6	11	163-06	..	..	..	..	..
0-5	388	380	..	..	..	..	..	..	..	..	..	..	..	..
1-0	600	667	..	..	..	..	..	..	..	..	..	..	..	..
2-375	1,068	1,071	..	..	..	..	..	..	162-68	..	..	..	..	..
..	..	..	..	..	..	..	..	..	161-94	Masonry.	L.	2' x 1½'	50	162-18
..	..	..	..	..	..	..	..	..	..	..	..	..	8,160	..
..	..	..	..	..	..	..	..	..	161-73	Masonry.	L.	1 vent.	..	161-73
..	..	..	..	..	..	4	40	10	161-33	..	..	3½' x 2'	..	..
..	..	..	..	..	..	..	..	..	161-24	Masonry.	L.	3¾' x 2'	..	161-24
1-00	600	630	..	..	..	..	..	..	161-01	..	..	..	..	..
..	..	..	..	..	..	..	..	..	160-60	..	..	..	..	..
16-00	2,951	3,978	..	..	..	..	..	..	160-19	..	..	..	..	..
..	..	..	..	..	..	..	..	..	159-76	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	159-58	..	L.	..	87,819	..
1-00	600	630	..	..	..	..	..	..	159-56	..	..	..	..	..
..	..	..	..	..	..	3	38	10	159-48	..	..	..	..	..
..	..	..	..	..	..	..	..	..	158-94	..	..	..	..	..
..	..	..	..	..	..	..	..	..	158-71	Masonry.	L.	2½' x 2'	..	158-71
..	..	..	..	..	..	..	..	..	158-52	Do.	L.	2' x 1½'	..	158-52
..	..	..	..	..	..	..	..	..	158-20	..	L.	..	1,018	..
2-3	1,044	1,071	..	..	..	..	..	..	157-88	Masonry.	L.	2¼' x 2'	..	157-93
..	..	..	..	..	..	..	..	..	157-52	..	L.	..	..	..
..	..	..	..	..	..	3	38	10	157-24	Masonry.	L.	3' x 3'	..	157-24
..	..	..	..	..	..	..	..	..	157-02	..	..	..	..	..
..	..	..	..	..	..	..	..	..	157-00	..	..	..	1,250	..
..	..	..	..	..	..	..	..	..	156-69	Pipe.	Across	6" pipe.	..	..

Tabular Statement of Works to accompan

Reduced distance from head.	Serial number.	Name of work.	Channel.							Discharge.		
			Area irrigable.	Bed width.	Depth of water, full supply.	Depth of water, maximum.	Side slope.	Bed fall.	Width of land occupied.	Mean velocity.	Discharge calculated.	Discharge required.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)

GRAND ANICUL													
MAIN CANAL													
Grand Anic													
R.D.			ACS.	FT.	FT.	FT.		PER 1,000	FT.	FT. PER SECOND.	C. FT. PER SECOND.	C. F. PER SECOND.	
19/2580	79	Regulator (13 spans of 6' each).	..	..	..	..	Actual 1 : 1; for calculation of discharges 4 : 1.	..	..	..	..	..	
19/3165	80	Syphon aqueduct	..	..	..	..		..	..	..	..	..	
19/3500	81	Irrigation sluice, 190 acres ..	..	..	..	..		..	..	..	..	..	
19/9150	82	Syphon aqueduct	..	..	..	..		..	..	..	..	..	
20/0500	..	Head of No. 9 channel, 700 acres.	..	..	..	..		..	..	..	..	..	
20/5250	83	"C" class bridge	..	..	..	..		..	..	..	..	..	
20/6000	..	Head of Silathur channel, 5,101 acres.	129,734	106 101	6	..		..	16	..	2.94	1,834	1,834
20/7000	84	Irrigation syphon (for ayacut of Karoppadipatti Eri).	..	..	..	..		..	..	..	..	..	..
20/7600	85	Syphon aqueduct	..	..	..	..		..	..	..	..	..	..
21/0000	..	Head of No. 10 channel, 400 acres.	..	..	..	..		..	..	..	..	..	..
21/4000	86	"C" class bridge	..	..	..	..		..	..	..	..	..	..
21/8750	87	Syphon aqueduct	..	..	..	..		..	..	..	..	..	..
22/3000	..	Head of channel No. 11, 994 acres.	128,340	101 100	6	..		..	16	..	2.94	1,834 1,817	1,834 1,817
22/3200	88	Sluice to supply a tank ..	..	..	..	..		..	..	..	..	..	..
22/5000	89	Do.	..	..	..	..		..	..	..	..	..	..
22/6700	90	"C" class bridge	..	..	..	..		..	..	..	..	..	..
22/9000	91	Sluice to supply Kirathur tank.	..	..	..	..		..	..	..	..	..	..
23/3360	92	Syphon aqueduct (Maharaja-samudram river).	128,340	..	..	..		..	..	..	..	..	..
23/6000	93	Syphon Regunathapuram tank surplus.	..	..	..	..		..	..	..	..	..	..
23/7130	94	Irrigation syphon, Regunathapuram and tank ayacut, 92 acres.	..	..	..	..		..	..	..	..	..	..
23/7700	95	Do.	..	..	..	..		..	..	..	..	..	..
23/9130	..	Head of Kallinadai channel, 200 acres.	126,340	98	6	6		..	0.16	..	2.94	1,781	1,781
24/3796	96	"C" class bridge	..	..	..	..		..	..	..	..	..	..
24/5630	97	Irrigation syphon for Pappapatti tank ayacut, 50 acres.	..	..	..	..		..	..	..	..	..	..
24/5780	98	Irrigation sluice, 221 acres ..	..	..	..	..		..	..	..	..	..	..
24/5430	99	Syphon aqueduct (surplus of Pappapatti tank).	..	..	..	..		..	..	..	..	..	..
24/9530	100	Foot-bridge (Peyadipatti to Gandaravidudi).	..	..	..	..	..	..	..	..	..	..	
25/0830	..	Head of Odappaviduthi channel, 12.79 acres.	124,840	97	6	6	..	0.16	..	2.93	1,757	1,757	
25/2630	101	Irrigation tunnel for Konichi tank ayacut, 162 acres.	..	..	..	..	..	..	..	..	..	..	
25/3560	102	Syphon aqueduct Korichikulam surplus.	..	..	..	..	..	..	..	..	..	..	
25/6130	103	"C" class bridge	..	..	..	..	..	..	..	..	..	..	
25/6200	104	Irrigation sluice, 351 acres ..	..	..	..	..	..	..	..	..	..	..	
25/9530	105	Syphon aqueduct	..	..	..	..	..	..	..	..	..	..	
26/1730	106	Tank supply sluice to Kodikarambai Eri 127 acres.	..	..	..	..	..	..	..	..	..	..	
26/3830	107	"B" class bridge	..	..	..	..	..	..	..	..	..	..	
26/6428	..	Head of Akkaravattan channel, 4,870 acres.	119,619	93	6	6	..	0.16	..	2.92	1,682	1,680	
26/7428	108	Surplus sluice 6 vents of 6' each	..	..	..	..	..	..	..	..	..	..	
26/9428	109	Syphon aqueduct, Pannikondan Viduthi Eri supply channel.	..	..	..	..	..	..	..	..	..	..	
26/9328	..	Head of Alivalen channel, 14,018 acres.	105,601	93	5½	5½	..	0.165	..	2.81	1,490	1,492	

Actual 1 : 1; for calculation of discharges 1 : 1.

Estimate for the Cauvery Reservoir Project—cont.

Cross drainage.			Falls.			Bridges.			Reduced level of bed.	Sluice.					Remarks.
Area of drainage basin.	Calculated discharge.	Discharge provided for.	Number.	Width.	Crest level above and below.	Number.	Span.	Width of roadway.		Description.	Right or left bank.	Number and area of vent.	Area.	Sill level.	
(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)

CANAL SYSTEM—cont.

AND BRANCHES—cont.

Canal—cont.

SQUARE MILES.	C. FT. PER SECOND.	C. FT. PER SECOND.						FT.	FT.	FT.						
..	..	..	..	..	..	..	..	..	..	154.52	..	..	..	..	..	..
1.06	624	630	..	..	..	..	..	..	..	154.42	Pipe sluice.	L.	9" Dr.	190	154.36	..
3.75	1,448	1,429	..	..	..	..	..	..	..	153.46	..	..	..	700	..	..
..	..	..	..	..	..	..	..	..	..	153.24	..	..	..	..	..	..
..	..	..	..	..	..	..	..	3	35	10	152.48	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	152.36	..	..	..	5,101	..	..
..	..	..	..	..	..	..	..	..	..	..	Pipe	..	Across	6" Dr.	..	..
1.00	600	630	..	..	..	..	..	..	..	152.11	..	..	..	400	..	..
..	..	..	..	..	..	..	..	..	..	151.72	..	..	..	..	..	..
35	6,420	6,365	..	..	..	..	..	3	35	10	151.08	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	150.32	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	149.64	..	..	..	694	..	..
..	..	..	..	..	..	..	..	..	..	149.60	Masonry	..	L.	1 vent.	..	149.60
..	..	..	..	..	..	..	..	..	..	149.32	..	..	L.	3½' X 2'	..	149.32
..	..	..	..	..	..	..	..	3	35	10	149.04	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	149.68	Masonry	..	L.	4' X 4'	..	148.68
66.15	9,814	9,896	..	..	..	..	..	..	..	147.98	..	..	..	..	..	..
2.40	1,060	1,048	..	..	..	..	..	..	..	147.56	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	8	35	10	146.32	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	146.10	Pipe sluice.	L.	12" pipe	221	146.10	..
0.65	450	520	..	..	..	..	..	..	..	145.90	..	..	..	..	..	..
..	..	..	..	..	..	..	..	4	34	5	145.40	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,279	..	..
..	..	..	..	..	..	..	..	..	..	144.90	..	..	..	..	..	..
3.03	1,209	1,240	..	..	..	..	..	..	..	144.74	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	144.54	..	..	..	..	..	..
..	..	..	..	..	..	..	..	3	35	10	144.32	Pipe sluice.	L.	12" Dr. pipe.	351	144.32
0.73	486	520	..	..	..	..	..	..	..	143.80	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	143.44	Tank supply.	L.	3½' X 2½'	..	143.44	..
..	..	..	..	..	..	..	..	3	33	14	143.10	..	..	..	4,870	..
8.965	2,589	2,475	..	..	..	..	..	..	..	142.40	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	142.22	..	..	..	14,018	..	..

Estimate for the Cauvery Reservoir Project—*cont.*

CANAL SYSTEM—cont.

Can: cont.

109

MAIN CA1

Grand An

R.D.			ACS.	FT.	FT.	FT.	PER 1,000	FT. PER SECOND.	C. FT. PER SECOND.	C. FT. PER SECOND.
26/9428	110	Regulator of 11 spans of 6 feet.	..	..	..	..	..	..	..	..
27/9428	111	Irrigation sluice, 315 acres ..	..	..	..	..	..	..	..	..
28/2135	112	Syphon aqueduct	..	..	..	..	..	..	..	..
28/5185	113	"C" class bridge	..	..	..	..	..	..	..	..
28/6135	..	Kayavur channel head, 6,576 acres.	98,710	85	5½	5½	165	..	2.80	1,397
28/9500	114	Syphon aqueduct (supply channel to Cholam Kulam ..	..	..	..	..	..	..	..	..
29/0185	115	Irrigation drainage undertunnel ..	..	..	..	..	..	..	..	..
29/2635	..	Head of Ponnayal channel, 9,386 acres.	89,324	79	5½	5½	165	..	2.80	1,262
29/3635	116	"C" class bridge (Karanbakudi to adjacent villages)	..	..	..	..	..	..	..	..
29/9435	117	Irrigation sluice, 180 acres ..	..	..	..	..	..	..	..	..
30/2135	118	Kumarakulam undertunnel ..	..	..	..	..	..	..	..	..
30/2685	120	Naraya syphon aqueduct ..	..	..	..	..	..	..	..	..
30/4435	121	Irrigation syphon (Karamba-kudi tank ayaout, 150 acres). Do.	..	..	..	..	..	..	..	..
30/5935	122	Irrigation sluice for Karamba-kudi tank ayaout, 150 acres.	..	..	..	..	..	..	..	..
30/6180	123	Agaiar syphon aqueduct ..	..	..	..	..	..	..	..	..
30/7835	124	Irrigation syphon for Adaya-kulam, 58 acres.	..	..	..	..	..	..	..	..
31/9935	125	Irrigation sluice for 133 acres.	..	..	..	..	..	..	..	..
61/1435	126	Irrigation syphon, 75 acres ..	..	..	..	..	..	..	..	..
31/2435	127	Sluice (to supply Tirumanjeri tank).	88,621	79	5.5	5.5	165	..	2.80	1,262
31/7327	129	Bridge, "C" class	..	..	..	..	..	..	..	..
32/0500	130	Sluice (Irrigation)	88,351	78	..	..	..	..	1,246	1,246
32/1750	131	Sluice (to supply Pattatikadu kulam).	87,803	..	..	..	..	..	..	..
32/6400	132	Syphon aqueduct	..	..	..	..	..	..	..	..
32/7500	133	Irrigation syphon	..	..	..	..	..	..	..	..
32/9000	134	Sluice (tank)	..	..	..	..	..	..	..	..
32/9250	135	Irrigation syphon	..	..	..	..	..	..	..	..
33/0500	136	Do.	..	..	..	..	..	..	..	..
33/2500	137	Sluice (for Irrigation)	..	..	..	..	..	..	..	..
33/6000	138	Irrigation syphon	..	..	..	..	..	..	..	..
33/6500	..	Head of Pudukattam Branch Canal.	50,530	52	5	5	175	..	2.62	712
33/6600	139	Regulator combined with bridge.	..	..	..	..	..	..	..	..
33/8334	140	Syphon aqueduct	..	..	..	..	..	..	..	..
33/9500	141	Sluice (to supply Mudukavayal tank).	50,063	52	..	..	..	..	..	..
34/2400	142	Syphon aqueduct	..	..	..	..	..	..	..	..
34/3250	143	Sluice (for irrigation)	..	..	..	..	..	..	..	..
34/6250	144	Syphon aqueduct	..	..	..	..	..	..	..	..
34/6500	145	Girder bridge, "C" class ..	..	..	..	..	..	..	..	..
34/9000	..	Head of No. 12 channel ..	48,336	50	5	5	..	2.61	685	685
35/3750	146	Syphon aqueduct	..	..	..	..	..	..	..	..
35/6900	147	Girder bridge, "C" class ..	..	..	..	..	..	..	..	..
35/9500	..	Head of Ananthanalipuram channel.	46,578	49	5	5	175	..	..	672
36/1570	148	Syphon aqueduct	..	..	..	..	..	..	..	..
36/2600	149	Surplus sluice	..	..	..	..	..	..	..	..
36/2500	..	Head of Kalanivasal channel..	40,119	49	4.5	4.5	18	..	2.49	574
36/2600	159	Regulator combined with bridge.	..	..	..	..	..	..	..	..

Tabular Statement of Works to accompany

(1)	(2)	(3)	Channel.							Discharge.		
			(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Distance from head.	Serial number.	Name of work.	Area irrigable.	Bed width.	Depth of water, full supply.	Depth of water, maximum.	Side slope.	Bed fall.	Width of land occupied.	Mean velocity.	Discharge calculated.	Discharge required.

GRAND
M
G

R. I.			ACS.	FT.	FT.	FT.	PER. 1,000	FT.	FT. PER SECOND.	C. P SECOND.	SECOND.
36/3100	151	Syphon aqueduct	.. ..	..	..	..	..	..	..	..	..
36/2500	152	Sluice	.. ..	..	..	..	..	..	..	..	..
37/0800	153	Syphon aqueduct	.. ..	..	..	..	..	..	..	..	..
37/2000	154	Irrigation syphon	.. ..	..	..	..	..	..	..	..	..
37/2500	155	Sluice	39,644	..	..	..	..	..	..	..	..
37/5000	156	Sluice for Irrigation	39,294	49	4-5	4-5	0-18	..	2-19	574	564
37/7000	157	Bridge "C" class	.. ..	..	..	..	..	..	..	..	..
37/8300	158	Syphon aqueduct	.. ..	..	..	..	..	..	..	..	..
37/9500	159	Irrigation syphon	.. ..	..	..	..	..	..	..	..	..
38/1000	160	Do.	.. ..	..	..	..	..	..	..	..	..
38/3500	161	Sluice	38,941	..	..	..	..	..	..	..	..
38/7800	162	Syphon aqueduct	.. ..	..	..	..	..	..	..	..	..
38/8000	163	Bridge "B" class	.. ..	..	..	..	..	..	..	..	..
38/9000	164	Sluice (to supply a tank)	38,584	..	..	..	..	..	..	..	..
39/2500	..	Head of Pinnavasal Vadapadi channel.	38,054	44	4-5	4-5	0-22	..	2-42	505	50
39/7500	165	Bridge "C" class	.. ..	..	..	..	..	..	..	..	..
39/8300	166	Syphon aqueduct	.. ..	..	..	..	..	..	..	..	..
40/2500	167	Foot bridge	.. ..	..	..	..	..	..	..	..	..
40/3000	168	Irrigation sluice	35,804	..	..	..	..	..	..	..	..
40/6000	169	Syphon aqueduct	.. ..	..	..	..	..	..	..	..	..
40/8250	170	Sluice	35,654	..	..	..	..	..	..	..	..
41/3400	..	Head of Pinnavasal Tenpady channel.	28,290	42	4	4	..	..	2-24	395	393
41/3500	171	Regulator with bridge	28,877	..	..	..	..	..	..	..	..
41/6000	172	Syphon aqueduct	.. ..	..	..	..	..	..	..	..	..
42/1000	..	Head of Perianoor channel	27,406	41	..	..	..	..	..	386	379
42/1400	173	Syphon aqueduct	.. ..	..	..	..	..	..	..	..	..
42/2000	174	Bridge "C" class	.. ..	..	..	..	..	..	..	..	..
42/5400	175	Syphon aqueduct	.. ..	..	..	..	..	..	..	..	..
42/6400	176	Do.	.. ..	..	..	..	..	..	..	..	..
42/9000	..	Head of Ayyanagudi channel.	25,306	38	4	..	..	..	2 22	355	350
43/0500	177	Sluice (for irrigation)	25,156	..	..	..	..	..	..	..	..
43/2500	178	Sluice	24,996	..	..	..	..	..	..	..	..
43/2750	179	Bridge "C" class	.. ..	..	..	..	..	..	..	..	..
43/3000	180	Irrigation syphon	.. ..	..	..	..	..	..	..	..	..
43/3500	181	Syphon aqueduct	.. ..	..	..	..	..	..	..	..	..
43/5000	182	Irrigation syphon	.. ..	..	..	..	..	..	..	..	..
43/6000	183	Sluice	.. ..	..	..	..	..	..	..	..	..
43/8500	184	Irrigation syphon	.. ..	..	..	..	..	..	..	..	..
44/1500	185	Do.	.. ..	..	..	..	..	..	..	..	..
44/2600	186	Syphon aqueduct	.. ..	..	..	..	..	..	..	..	..
44/2800	187	Surplus sluice	.. ..	..	..	..	..	..	..	..	..
44/4500	188	Sluice	24,500	..	..	..	..	..	..	..	..
44/5000	189	Bridge "B" class	.. ..	..	..	..	..	..	..	..	..
44/5500	190	Railway bridge	.. ..	..	..	..	..	..	..	..	..
44/8000	191	Irrigation syphon	.. ..	..	..	..	..	..	..	..	..
45/0500	..	Head of Ammanichuttram channel.	9,500	..	..	..	..	..	..	..	..
45/0500	..	Taruvappadie channel	.. ..	..	..	..	..	..	..	..	..

Estimate for the Cauvery Reservoir Project—cont.

Cross drainage.			Falls.			Bridges.			Sluices.					Remarks.	
Area of drainage ^a basin.	Calculated flood discharge.	Discharge pro- vided for.	Bays.		Crest level above and below.	Openings.		Width of roadway	Reduced level of bed.	Description.	Right or Left bank.	Number and area of vent.	Acreage.		Still level.
			Number.	Width.		Number.	Span.								
(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)

CANAL SYSTEM—*cont.*

AND BRANCHES—*cont.*

Canal—cont.

SQUARE MILES.	C. FT. PER SECOND.	C. FT. PER SECOND.	FT.	FT.	FT.	FT.	FT.						
0.37	309	309	..	..	..	..	..	126.50	..	..	..	..	..
1.38	744	744	..	..	..	..	..	126.52	Pipe sluice.	L.	12" dia.	335	125.52
..	..	..	..	..	..	..	..	125.10	..	..	..	..	..
..	..	..	..	..	..	..	..	124.89	..	..	..	..	..
..	..	..	..	..	..	..	..	124.80	Pipe sluice.	L.	8" dia.	140	124.80
..	..	..	..	..	..	..	..	124.35	Do.	L.	12 1/4" dia.	350	124.35
..	..	..	..	..	2	25	10	123.99	..	..	..	..	..
..58	8,990	8,990	..	..	..	..	..	123.76	..	..	..	..	..
..	..	..	..	..	..	..	..	123.54	..	..	..	..	..
..	..	..	..	..	..	..	..	123.27	..	..	..	..	..
..	..	..	..	..	..	..	..	122.82	Pipe sluice.	L.	13 1/4" dia.	350	122.82
1.13	651	651	..	..	..	..	..	122.05	..	..	..	..	..
..	..	..	..	..	2	25	14	122.01	..	..	..	..	..
..	..	..	..	..	..	..	..	121.83	Masonry	L.	10 sq. ft.	360	121.83
..	..	..	..	..	..	..	..	121.20	Head sluice.	L.	..	2,530	..
..53	393	393	..	..	2	22	10	120.10	..	..	..	..	..
..	..	..	..	..	..	..	..	119.90	..	..	..	..	..
..	..	..	..	..	3	25	5	119.00	..	..	..	..	..
2.94	1,231	1,231	..	..	..	..	..	118.89	Pipe sluice.	L.	11 1/2" dia.	250	118.89
..	..	..	..	..	..	..	..	118.23	..	..	..	..	..
..	..	..	..	..	..	..	..	116.59	Pipe sluice.	L.	8 1/2" dia.	120	117.73
..	..	..	..	..	..	..	..	..	Head sluice.	L.	..	7,864	..
20.33	4,477	4,477	..	..	..	..	..	116.58	..	..	..	..	..
0.20	205	205	..	..	..	..	..	116.03	..	..	..	..	..
0.22	219	219	..	..	..	..	..	114.93	Head sluice.	..	..	884	..
5.20	1,801	1,801	..	..	1	40	10	114.86	..	..	..	..	..
..	..	..	..	..	..	..	..	114.71	..	..	..	..	..
..	..	..	..	..	..	..	..	113.96	..	..	..	..	..
..	..	..	..	..	..	..	..	113.74	..	..	..	..	..
..	..	..	..	..	..	..	..	113.17	Head sluice.	..	..	2,100	..
..	..	..	..	..	..	..	..	112.51	Pipe sluice.	L.	8 1/2" dia.	150	..
..	..	..	..	..	..	..	..	112.40	Do.	L.	9" dia.	160	112.40
..	..	..	..	..	1	38	10	112.34	..	..	..	..	..
0.35	315	315	..	..	..	..	..	112.18	..	..	..	..	..
..	..	..	..	..	..	..	..	111.85	..	..	..	..	..
..	..	..	..	..	..	..	..	111.63	Pipe sluice.	L.	11 1/2" dia.	246	111.63
..	..	..	..	..	..	..	..	111.08	..	..	..	..	..
..	..	..	..	..	..	..	..	110.42	..	..	..	..	..
26.2	5,293	5,293	..	..	..	..	..	110.20	..	..	..	..	..
..	..	..	..	..	..	..	..	110.14	..	..	..	..	..
..	..	..	..	..	..	..	..	109.76	Pipe sluice.	L.	11 1/2" dia.	250	109.76
..	..	..	..	..	1	38	14	109.65	..	..	..	..	..
..	..	..	..	..	..	..	..	109.54	..	..	..	..	..
..	..	..	..	..	..	..	..	108.99	..	..	..	..	..
..	..	..	..	..	..	..	..	..	Head sluice.	..	..	15,000	..
..	..	..	..	..	..	..	..	..	..	..	..	2,500	..
..	..	..	..	..	..	..	..	108.44	..	..	..	..	..

Tabular Statement of Works to accompany

(1)	(2)	(3)	Channel.							Discharge.		
			(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Distance from head.	Serial number.	Name of work.	Area irrigable.	Irrig. width.	Depth of water, full supply.	Depth of water, maximum.	Side slope.	Fed fall.	Width of land occupied.	Mean velocity.	Discharge calculated.	Discharge required.

GRAND ANICUT

MAIN CANAL

Kalianodai Branch

R.D.			ACS.	FT.	FT.	FT.		PER. 1,000	FT.	FT. PER SECOND.	C. FT. PER SECOND.	C. FT. PER SECOND.
0/0000	1	Head sluice	87,819	68	6.0	6.0		0.165	..	2.89	1,233	1,229
0/1400	2	Sluice		..	..	..		..	..	..	..	..
0/1400	3	Do.		..	..	..		..	..	..	..	..
0/1730	4	3-ft. drop	87,456	..	..	..		..	..	..	..	..
0/4700	5	Do.		..	..	..		..	..	..	..	..
0/5855	6	"B" class bridge and 3' drop.		..	..	..		..	..	..	..	..
0/6680	7	Head of No. 1 channel	87,456	67	6.0	6.0	0.165	..	2.89	1,214	1,212	
0/6630	..	Sluice										
0/7240	8	3-ft. drop	86,712	..	..	..		..	..	..	..	..
0/9650	9	"C" class bridge with 3' drop.		..	..	..		..	..	..	..	..
1/6910	..	Head of Melavannipattu chan- nel.		..	..	..		..	..	..	..	..
1/6916	..	Head of No. 2 channel	86,712	60	5.5	5.5	0.17	..	2.76	954	941	
1/6940	10	Regulator										
2/0280	11	"B" class bridge	86,712	..	..	..		..	..	..	..	..
2/7140	..	Head of No. 3 channel		..	..	..		..	..	..	..	..
2/7140	..	Do. No. 4 do.		58	5.5	5.5	0.17	..	2.76	921	909	
2/8730	12	"C" class bridge	64,987	..	..	..		..	..	..	..	..
2/9450	13	6-ft. drop		..	..	..		..	..	..	..	..
3/7370	..	Head of No. 5 channel		..	..	..		..	..	..	..	..
3/7370	..	Do. No. 6 channel	64,187	57	5.5	5.5	0.17	..	2.75	905	896	
4/5870	14	"C" class bridge		..	..	..		..	..	..	..	..
4/6610	..	Head of No. 7 channel..		..	..	..		..	..	..	..	..
4/6610	..	Do. No. 8 channel..	56	5.5	5.5	0.17	..	2.75	888	880		
4/9250	15	4-ft. drop	63,119	..	..	..		..	..	..	..	..
5/1230	16	Do.		..	..	..		..	..	..	..	..
5/3210	17	2-ft drop.		..	..	..		..	..	..	..	..
5/4728	18	"C" class bridge	62,439	..	..	..		..	..	..	..	..
5/5850	..	Head of No. 9 channel		..	..	..		..	..	..	..	..
5/5850	19	Sluice		55	5.5	5.5	0.17	..	2.74	872	869	
5/6840	20	4-ft drop.. .. .	61,599	..	..	..		..	..	..	..	..
5/8820	..	Head of No. 10 channel		..	..	..		..	..	..	..	..
5/8820	21	Sluice		..	..	..		..	..	..	..	..
6/1120	22	6 ft. drop	61,599	..	..	..		..	..	..	..	..
6/3440	23	Sluice		54	5.5	5.5	0.17	..	2.74	855	853	

Actual 1: 1; for calculation of discharges 1: 1.

Estimate for the Cauvery Reservoir Project—cont.

Cross drainage.			Falls.		Bridges.			Reduced level of bed.	Sluices.					Remarks.		
Area of drainage basin.	Calculated flood discharge.	Discharge provided for.	Notches.		Crest level above and below.	Opening.			Description.	Right or Left bank.	Number and area of vent.		Acreage.		Still level.	
			Number.	Width.		Number.	Span.	Diameter of vent required.			Diameter of pipe provided.					
(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)

CANAL SYSTEM--cont.

AND BRANCHES—*cont.*

Canal.

[illegible]

Tabular Statement of Works to accompany

Distance from head	Serial number.	Name of work.	Channel.						Discharge.		
			Area irrigable.	Bed width.	Depth of water, full supply.	Depth of water maximum.	Side slope.	Bed fall.	Width of land occupied.	Mean velocity.	Discharge calculated.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

GRAND ANICUT

MAIN CANAL

Kalianodai Branch

R. D.			ACS.	FT.	FT.	FT.	PER. 1,000.	FT.	FT. PER SECOND.	C. FT. PER SECOND.	G. FT. PER SECOND.
6/7730	..	Head of Vadakadu branch channel.	61,383	..	..	..	..	..	..	..	..
6/7730	..	Head of Tirumangalakota branch channel	..	..	..	..	..	..	..	..	..
6/7830	24	Regulator with 3-ft. drop	..	35	4-0	4-0	0-225	..	2-23	330	325
7/9370	25	4-ft drop	..	..	..	..	..	..	..	..	..
7/1690	26	"B" class bridge	..	..	..	..	..	..	..	..	..
7/3340	27	2-ft drop	..	..	..	..	..	..	..	..	..
7/4960	..	Head of No. 11 channel	..	..	..	..	..	..	..	..	..
7/4960	28	Sluice	22,920	31	4-0	4-0	0-225	..	2-22	320	316
8/4630	..	Head of No. 12 channel	..	..	..	..	..	..	..	..	..
8/5230	29	"C" class bridge	22,600	..	..	..	..	..	2-21	312	310
8/6060	..	Head of No. 13 channel	..	..	..	..	..	..	..	..	..
8/7370	30	4-ft. drop	22,209	..	..	..	..	..	..	..	..
9/1320	31	Sluice	..	..	..	..	..	..	..	..	..
9/4760	32	Do.	22,079	..	..	..	..	..	..	..	..

Actual 1:1; for calculation of discharges 1/2 to 1.

Vadakadu Branch

R. D.			ACS.	FT.	FT.	FT.	PER. 1,000.	FT.	FT. PER SECOND.	C. FT. PER SECOND.	G. FT. PER SECOND.
0/0900	1	Regulator	32,936	49	4-0	4-0	0-215	..	2-24	458	454
0/1160	..	Head of No. 1 channel	..	..	..	..	..	..	..	..	..
0/1640	2	2-ft. drop	..	..	..	..	..	..	..	..	..
0/6680	3	Sluice	32,116	48	4-0	4-0	0-215	..	2-24	449	447
0/6680	4	Do	27,998	42	4-0	4-0	0-22	..	2-24	395	390
1/0180	..	Head of Ethipulikadu channel.	..	..	..	..	..	..	..	..	..
1/0800	5	"B" class bridge with 1-ft. drop combined.	..	..	..	..	..	..	..	..	..
1/1180	6	Sluice	..	..	..	..	..	..	..	..	..
1/2180	7	Do	..	..	..	..	..	..	..	..	..
1/2180	8	Do.	27,668	41	4-0	4-0	0-22	..	2-24	385	385
1/2680	9	3-ft. drop	..	..	..	..	..	..	..	..	..
1/5680	10	Sluice	..	..	..	..	..	..	..	..	..
1/5680	11	Do.	..	..	..	..	..	..	..	..	..
1/7680	12	4-ft. drop	..	..	..	..	..	..	..	..	..
2/0300	13	"C" class bridge	..	..	..	..	..	..	..	..	..
2/3680	14	Sluice	..	..	..	..	..	..	..	..	..
2/5780	15	"C" class bridge with 1-ft. drop combined.	..	..	..	..	..	..	..	..	..
2/9180	16	Sluice	..	..	..	..	..	..	..	..	..
2/9180	..	Head of No. 2 channel	26,093	39	4-0	4-0	0-22	..	2-23	365	361
3/1680	..	Do No. 3 channel	25,819	38	4-0	4-0	0-225	..	2-25	360	356
3/4688	..	Head No. 4 channel	..	..	..	..	..	..	..	..	..
3/8974	17	Sluice	25,146	37	4-0	4-0	0-225	..	2-24	..	346
3/9474	18	4-ft. drop	..	..	..	..	..	..	..	..	..

Actual 1:1; for calculation of discharges 1/2 to 1.

Estimate for the Cauvery Reservoir Project—cont.

Cross Drainage.			Falls.		Bridges.		Reduced level of bed.	Sluices.					Remarks.
Area of drainage basin.	Calculated flood discharge.	Discharge provided for.	Bays.	Crest level above and below.	Openings.	Width of roadway.		Description.	Height or left bank.	Number and area of vent.	Acreeage.	Sill level.	
(14)	(15)	(16)	Number.	Width.	Number.	Span.	(23)	(24)	(25)	Diameter of vent required.	(28)	(29)	(30)

CANAL SYSTEM—cont.

AND BRANCHES—cont.

Canal—cont.

SQUARE MILES.	C. FT. PER SECOND.	C. FT. PER SECOND.	FT.	FT.	FT.	FT.	FT.	FT.						
..	..	..	..	..	..	..	..	105-14	..	R.	..	..	32,936	..
..	..	..	..	..	..	..	..	105-14	..	L.	..	..	4,963	..
..	..	..	..	..	104-99	..	..	104-99	..	..	..	..	..	2 vents of 3' 9" X 5' 6".
..	..	..	..	..	101-99	..	..	101-99	..	..	..	..	..	..
..	..	..	6	1' 3 1/2"	101-55	..	..	101-55	..	..	..	..	..	..
..	..	..	..	1/2"	97-55	..	..	97-55	..	..	..	..	..	..
..	..	..	..	1' 2"	96-58	1	35	97-25	..	..	..	..	..	..
..	..	..	..	..	..	..	..	96-88	..	..	..	..	..	..
..	..	..	..	1/2"	94-88	..	..	94-88	..	..	..	..	..	..
..	..	..	..	..	..	..	..	94-51	..	R.	..	..	318	..
..	..	..	..	..	..	..	..	94-51	..	L.	13	15"	246	94-51
..	..	..	..	..	..	..	..	92-34	..	..	..	..	320	..
..	..	..	..	..	..	1	33	92-21	..	L.	..	..	..	..
..	..	..	..	..	..	..	..	92-02	..	R.	..	..	391	..
..	..	..	..	1' 2"	91-72	..	..	91-72	..	..	..	..	..	..
..	..	..	6	1/2"	87-72	..	..	87-72	..	..	..	..	..	..
..	..	..	..	..	..	..	..	86-84	..	R.	9 1/2"	12"	130	86-84
..	..	..	..	..	..	..	..	86-05	..	R.	9"	12"	110	86-06

cates into No. 14 channel for 795 acres and Kalianodai channel for 21,174 acres.

6 vents of 6' X 3'.

Tabular Statement of Works to accompa

Distance from head.	Serial number.	Name of work.	Channel.					Discharge.				
			Area irrigable.	Bed width.	Depth of water, full supply.	Depth of water, maximum.	Side slope.	Bed fall.	Width of land occupied.	Mean velocity.	Discharge calculated.	Discharge required.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)

GRAND ANICU

MAIN CANAL

Vadakkadu Branch

R.D.			ACS.	FT.	FT.	FT.	IN.	PER 1,000	FT.	FT. PER SECOND	C. FT. PER SECOND	C. FT. PER SECOND
4/0474	..	Head of Mullurpattikadu channel.	23,938	36	4.0	4.0	Actual 1:1; for calculation of discharges 1/2 to 1.	0.225	..	2.23	330	330
4/1474	19	1-ft. drop	..	..	..	..	..	..	..	..	..	..
4/3974	20	"C" class bridge	23,243	34	4.0	4.0	..	0.225	..	2.22	320	319
4/5974	..	Head of No. 5 channel	..	..	..	..	..	..	..	..	..	..
4/9974	21	"C" class bridge	..	..	..	..	..	..	..	..	..	..
5/2474	22	Surplus sluice	21,423	32	4.0	4.0	..	0.225	..	2.21	300	293
5/4974	..	Head of Vadakkadu channel.	..	..	..	..	..	..	..	..	..	..
5/6200	23	Regulator and bridge	..	..	..	..	..	..	..	..	..	..

Rajamadam

0/0000	1	Head sluice with 4-ft. drop ..	25,590	39	4.0	4.0	Actual 1:1; for calculation of discharges 1/2 to 1.	0.22	..	2.23	365	357
0/1000	..	Head of No. 1 channel ..	..	..	..	..		..	..	..	..	..
0/1000	..	Do. No. 2 do. ..	..	..	..	..		..	..	..	..	..
0/1320	2	10-ft. drop	24,778	37	4.0	4.0		0.225	..	2.24	350	345
0/4000	3	Under tunnel	..	..	..	..		..	..	..	..	..
0/6950	..	Head of No. 3 channel ..	..	..	..	..		..	..	..	..	..
0/7700	4	"C" class bridge	24,155	36	4.0	4.0		0.225	..	2.24	340	336
3/9900	..	Head of No. 4 channel ..	..	..	..	..		..	..	..	..	..
0/9900	5	Sluice	..	..	..	..		..	..	..	..	..
1/2370	6	3-ft. drop	23,356	35	4.0	4.0		0.225	..	2.23	330	324
1/4370	7	Sluice	..	..	..	..		..	..	..	..	..
1/4370	..	Head of No. 5 channel ..	..	..	..	..		..	..	..	..	..
1/5120	8	4-ft. drop with "C" class bridge	..	..	..	..		..	..	..	..	..
1/7620	9	4-ft. drop	..	..	..	..		..	..	..	..	..
1/8620	..	Head of No. 6 channel ..	22,789	34	4.0	4.0		0.225	..	2.22	320	315
2/0120	10	6-ft. drop	..	..	..	..		..	..	..	..	..
2/2745	11	"C" class bridge	..	..	..	..		..	..	..	..	..
2/8620	12	Surplus sluice right tank ..	..	..	..	..		..	..	..	..	..
2/9120	13	Sluice	..	..	..	..		..	..	..	..	..
2/9120	14	Do.	..	..	..	..		..	..	..	..	..
3/2370	15	Do.	21,974	33	4.0	4.0		0.225	..	2.22	310	302
3/4370	16	Do.	..	..	..	..		..	..	..	..	..
3/4795	17	Regulator with 6-ft. drop and bridge.	21,590	32	4.0	4.0		0.225	..	2.21	300	296

Pudupatnam

00	1	Head sluice with 3-ft. drop ..	37,043	45	4.5	4.5	Actual 1:1; for calculation of discharges 1/2 to 1.	0.22	..	2.42	515	509
330	2	Sluice	..	..	..	..		..	..	..	..	..
230	3	Do.	36,863	..	..	..		..	..	..	..	..
660	4	4-ft. drop	..	..	..	..		..	..	..	..	..
1,450	5	6-ft. drop	..	..	..	..		..	..	..	..	..
4,540	6	Sluice	..	..	..	..		..	..	..	..	..
4,540	..	Head of No. 1 channel ..	35,973	44	4.5	4.5		0.22	..	2.42	504	494
7,180	7	End of canal portion	..	..	..	..		..	..	..	..	..

Estimate for the Cauvery Reservoir Project—cont.

Cross drainage.			Falls.		Bridges.			Reduced level of bed.	Sluices.					Remarks.
Area of drainage in sq. in.	Calculated discharge.	Discharge provided for.	Number.	Width.	Number.	Span.	Width of roadway.		Description.	Right or Left Bank.	Diameter of vent required.	Number and area of vent.	Diameter of pipe provided.	
(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)

CANAL SYSTEM—cont.

AND BRANCHES—cont.

Canal—cont.

SQ. MILES.	C. FT. PER SECOND.	C. FT. PER SECOND.	FT.	FT.	FT.	FT.	FT.	FT.							
..	..	..	..	1'-4 1/2"	80.02	..	..	80.24	..	L.	..	..	1,208	..	..
..	..	..	5	1/2"	79.02	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	1	35	10	78.45	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	78.00	..	R.	..	..	695	..
..	..	..	..	..	..	1	34	10	77.10	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	76.54	..	R.	..	..	..	..
..	..	..	..	..	..	..	..	..	75.98	..	..	..	..	1,820	..
..	..	..	..	..	..	..	..	..	75.70	..	..	..	..	..	Below this point the canal is treated as distributary channel.

Branch Canal.

..	..	..	2	6'-0"	..	..	..	154.52	..	..	..	..	..	..	Vents rectangular.
..	..	..	..	..	..	..	..	150.32	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	150.30	Head sluice.	L.	..	..	678	..	..
..	..	..	..	..	..	..	..	150.30	Do.	R.	..	..	136	..	..
..	..	..	5	1'-7"	..	..	..	150.23	..	..	..	..	..	..	..
..	..	..	..	1/2"	..	..	..	140.23	..	..	..	..	..	..	..
..	312	..	..	..	..	..	..	139.00	Head sluice.	L.	..	..	623	..	..
..	..	..	..	..	..	1	37	10	138.82	..	..	..	..	..	..
..	..	..	..	..	..	..	..	138.37	Head sluice.	L.	..	..	734	..	..
..	..	..	..	..	..	..	..	138.32	Pipe sluice.	R.	7"	9"	65	..	..
..	..	..	..	1'-5"	..	..	..	137.74	..	..	..	..	..	..	..
..	..	..	5	1/2"	..	..	..	134.74	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	134.29	Pipe sluice.	R.	10"	12"	144	..	..
..	..	..	..	..	..	..	..	134.29	Head sluice.	L.	..	..	423	..	..
..	..	..	5	1'-6"	..	..	34	10	134.12	..	..	..	..	..	..
..	..	..	5	1'-6"	..	..	..	130.12	..	..	..	..	..	..	..
..	..	..	5	1'-6"	..	..	..	129.15	..	..	..	..	..	..	..
..	..	..	..	1/2"	..	..	..	125.55	Head sluice.	L.	..	..	241	..	..
..	..	..	..	1'-6"	..	..	..	125.32	..	..	..	..	..	..	..
..	..	..	5	1'-6"	..	..	..	124.99	..	..	..	..	..	..	..
..	..	..	..	1/2"	..	..	..	118.99	..	..	..	..	..	..	..
..	..	..	..	..	..	1	35	10	118.42	Pipe sluice.	L.	13"	15"	231	..
..	..	..	..	..	..	..	..	117.08	Do.	R.	15 1/2"	18"	313	..	..
..	..	..	..	..	..	..	..	116.96	Do.	L.	12 1/2"	15"	210	..	..
..	..	..	..	..	..	..	..	116.96	Do.	R.	11"	12"	174	..	..
..	..	..	..	..	..	..	..	115.79	..	..	..	..	..	..	..
..	..	..	3	3'-75"	..	..	..	115.69	Do.	..	..	..	..	..	Vents rectangular.
..	..	..	..	..	..	..	..	109.69	..	..	..	..	..	..	..

Branch Canal.

..	..	..	..	..	..	..	..	131.15	..	..	..	..	..	..	4 vents of 6' x 3'6"
..	..	..	..	..	..	..	..	128.15	Pipe sluice.	L.	75"	9"	80	128.08	..
..	..	..	..	..	..	..	..	128.08	Do.	R.	85"	9"	100	128.08	..
..	..	..	..	..	..	..	..	128.08	..	..	..	..	..	..	..
6	1 11"	128.01	..	..	..	..	..	128.01	..	..	..	..	..	..	..
..	..	122.01	..	..	..	..	..	..	..	..	..	..	..	..	..
6	1 11"	121.79	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	115.79	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	121.79	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	115.16	Pipe sluice.	L.	12-75"	15"	231	115.16	..
..	..	..	..	..	..	..	..	..	..	R.	..	..	660	115.16	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Bifurcates into Pudupatnam channel for 17,221 acres and Sethubava chatrams channel for 18,752 acres and these are treated as distributaries.

Tabular Statement of Works to accompany

NOTE.—The existing works are noted in Roman type

(1)	Name of work.	Channel.							Discharge		
		Area irrigable.	Bed width.	Depth of water full supply.	Depth of water maximum.	Side slope.	Bed fall.	Width of land occupied.	Mean velocity.	Discharge calculated.	Discharge required.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

VADAVAR.

MAIN CANAL

FT.		ACS.	FT.	FT.	FT.	PER 1,000	FT. PER SECOND.	C. FT. PER SECOND.	C. FT. PER SECOND.
..	Supplemental Head Sluice ..	57,950	70	4.5	7.0	.18	2.54	826.34	822.87
5,260	Surplus Sluice No. 1 ..	..	..	..	..	..	..	..	..
5,676	Venulodai channel sluice ..	57,886	70	4.5	7.0	.18	2.54	826.34	822.87
5,808	Vadakkal channel ..	..	..	..	..	..	..	..	..
7,920	Drop 3 feet ..	..	..	..	..	..	..	..	..
11,286	Palliyeri channel ..	..	..	..	..	..	..	..	..
13,794	Maravapattu channel ..	57,397	69	4.5	7.0	.18	2.54	818.14	811.97
16,500	Drop 2 feet ..	..	..	..	..	..	..	..	..
19,008	Pudu ottam channel ..	..	..	..	..	..	..	..	..
21,120	Bridge C class ..	..	..	..	..	..	..	..	..
23,000	Surplus Sluice No. 2 ..	..	..	..	..	..	..	..	..
23,100	Maravapattu surplus ..	..	..	..	..	..	..	..	..
23,100	Super-passage for the Muthla- muthuvari diversion over the Vadavar.	57,204	58	5	{ 7.0 6.7 }	.18	2.67	807.45	807.13
23,100	Irrigation syphon (under Mu- thalamuthuvari) Irrigation syphon for Palliyeri channel under Muthalamuthuvari.	..	..	..	..	..	..	..	..
25,014	Panganatharam channel ..	..	..	..	..	..	..	..	..
26,664	Valamburi channel ..	..	..	..	..	..	..	..	..
31,350	Masonry Bridge No. 1. ..	56,824	63	4.7	10	..	2.61	802	799.94
32,670	Do. No. 2 ..	56,824	68	4.5	10	.18	2.53	800.94	799.94
35,244	Panavali channel ..	..	..	..	..	..	..	..	..
37,620	Masthanthottam drainage ..	..	..	..	..	..	..	..	..
38,676	Velur channel ..	..	..	..	..	..	..	..	..
41,910	Puliampallam surplus ..	..	..	..	..	..	..	..	..
..	Improvements to the Surplus Sluice No. 3 ..	..	..	..	..	..	..	..	..
42,240	Sarukkai channel ..	..	..	..	..	..	..	..	..
45,540	South Indian Railway bridge on Tanjore-Madras line.	..	..	..	..	..	..	..	..
46,606	Sittakatta channel ..	..	..	..	..	..	..	..	..
50,490	Killurtottam channel ..	56,329	67	4.5	7.5	.18	2.53	788.76	788.99
52,404	Alangudi channel ..	..	..	..	..	..	..	..	..
54,384	Pirandaimottu channel ..	..	..	..	..	..	..	..	..
55,704	Kottalai channel ..	55,441	66	4.5	7.5	.18	2.53	776.62	775.63
57,288	Perandaipalla channel ..	..	..	..	..	..	..	..	..
59,862	Pulavanattam channel ..	..	..	..	..	..	..	..	..
60,522	Mottu channel ..	..	..	..	..	..	..	..	..
62,304	Nellitoppu mottu channel ..	54,671	65	4.5	7.5	.18	2.53	764.43	763.58
63,288	Nellitoppu palla channel ..	..	..	..	..	..	..	..	..
63,650	Foot bridge ..	..	..	..	..	..	..	..	..
63,822	Vaumanadevi channel ..	..	..	..	..	..	..	..	..
67,066	Kumal-kudi channel ..	..	..	..	..	..	..	..	..
63,145	Bridge C class ..	..	..	..	..	..	..	..	..
68,574	Vandandi channel ..	53,979	64	4.5	7.5	.18	2.52	752.24	752.7
69,828	Andipilliar channel ..	..	..	..	..	..	..	..	..
70,092	Pundi channel ..	..	..	..	..	..	..	..	..
73,590	Mela channel ..	..	..	..	..	..	..	..	..
74,250	Pundi Bridge B class ..	..	..	..	..	..	..	..	..
75,636	Manalavari channel ..	53,042	63	4.5	7.5	.18	2.52	740.06	738.28
76,692	Ilumbalatti channel ..	..	..	..	..	..	..	..	..
78,375	Bridge C class ..	..	..	..	..	..	..	..	..
79,530	Head of Puthur channel ..	..	..	..	..	..	..	..	..

Actual 1 : 1 ; for calculation of discharges 1 : 1.

Actual 1 : 1 : 1 : for calculation of discharges $\frac{1}{2}$; 1.

Estimate for the Cauvery Reservoir Project.

and the proposed works in thick (clarendon) type. *

Cross drainage.			Falls.			Bridges.			Reduced level of bed.	Sluices.					Remarks.
Area of drainage basin.	Calculated flood discharge.	Discharge provided for.	Bays.		Crest level above and below.	Openings.		Width of road way.		Description.	Right or Left bank.	Number and area of vent.	Acres.	Bill level.	
(13)	(14)	(15)	Number.	Width.	(18)	Number.	Span.	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)

SYSTEM.

AND BRANCHES.

[illegible]

VADAVAR
MAIN CANAL

SYSTEM—*cont.*
AND BRANCHES—*cont.*

Tabular Statement of Works to accompany

(1) Distance from head.	(2) Name of work.	Channel.							Discharge.		
		(3) Area irrigable.	(4) Bed width.	(5) Depth of water full supply.	(6) Depth of water maximum.	(7) Side slopes.	(8) Bed fall.	(9) Width of land occupied.	(10) Mean velocity.	(11) Discharge calcu- lated.	(12) Discharge required.

VADAVAR

DISTRIB

Puthur

MDS.	FT.		ACS.	FT.	FT.		PER. 1,000	FT.	FT. PER SECOND.	C. FT. PER SECOND.	C. FT. PER SECOND.
0	..	Head sluice and 3' drop	6,047	18 00	2.5	..	28	5	1.74	83.71	82.82
0	660	Sluice left bank	5,366	15.00	2.5	..	30	..	1.76	71.46	73.50
0	2,640	" B " class girder bridge	..	..	..	..	..	..	..	..	..
0	3,960	" B " class girder bridge	..	..	..	..	..	..	..	..	..
0	4,290	Sluice right bank	..	..	..	..	30	..	1.75	68.87	68.81
1	3,960	Sluice left bank	5,023	14.5	2.5	..	..	..	..	..	..
2	330	Sluice right bank	..	..	..	..	..	..	..	..	..
2	1,650	Sluice left bank	..	..	..	..	..	..	..	..	..
2	3,630	Sluice right bank	..	..	..	..	..	..	..	..	..
2	4,290	Sluice left bank	4,776	14.0	2.5	..	30	74	1.74	66.40	65.42
2	630	Do.	4,686	13.5	2.5	..	30	74	1.73	63.94	64.19
3	990	Sluice right bank	..	..	..	..	..	..	..	..	..
3	1,720	" C " class girder bridge	..	..	..	..	..	..	..	..	..
3	2,875	Sluice left bank	4,417	13 0	2.5	..	30	74	1.75	62.48	60.50
3	4,365	Do.	4,235	12.0	2.5	..	31	84	1.76	58.32	58.01
4	725	Sluice right bank	4,065	11.5	2.5	..	32	69	1.75	55.74	55.69
4	725	Sluice left bank	..	..	..	..	..	..	..	..	..
4	3,564	Head of Puthur No. 1 channel ..	3,609	10.5	2.5	..	32	71	1.72	50.46	49.43
4	4,686	Sluice right bank	..	..	..	..	..	..	..	..	..
5	198	Bridge	..	..	..	..	..	..	..	..	..
5	3,300	Sluice left bank	..	..	..	..	..	..	..	..	..
5	3,498	Head of Puthur No. 2 channel ..	..	..	..	..	..	..	..	..	..
5	3,894	Railway bridge combined with 2' drop	3,090	10.5	2.25	..	32	62	1.62	42.52	42.33
5	4,158	Sluice right bank	..	..	..	..	..	..	..	..	..
5	4,158	Sluice left bank	..	..	..	..	..	..	..	..	..
6	198	Sluice right bank	..	..	..	..	..	..	..	..	..
6	358	Bridge	..	..	..	..	..	..	..	..	..
6	1,518	Head of Puthur No. 3 channel ..	1,416	7.00	1.75	..	35	62	1.37	18.89	19.40
6	1,518	Sluice right bank	..	..	..	..	..	..	..	..	..
6	1,518	Sluice left bank	..	..	..	..	..	..	..	..	..
6	1,518	2' drop	..	..	..	..	..	..	..	..	..
6	2,508	3' drop	..	..	..	..	..	..	..	..	..
6	3,168	Sluice left bank	..	..	..	..	..	..	..	..	..
6	4,488	Sluice right bank	..	..	..	..	..	..	..	..	..
7	528	Sluice left bank	..	..	..	..	..	..	..	..	..
7	528	Head of Puthur No. 4 channel ..	..	..	..	..	..	..	..	..	..
7	528	Head of Puthur No. 5 do. ..	..	..	..	..	..	..	..	..	..

Actual 1 : 1; for calculation of discharges : 1.

Puthur No. 1

[illegible]

Puthur No. 2

..	..	Head sluice	220	2-0	1-3	..	Actual 1 : 1 for calcula- tion for discharges $\frac{1}{8}$: 1.	.35	34	.87	3-00	3-01
0	1,320	3' drop	..	..	..	..		..	..		..	

Estimate for the Cauvery Reservoir Project.

Cross drainage.			Falls.		Bridges.			Sluices.					Remarks.		
Area of drainage basin.	Calculated flood discharge.	Discharge provided for.	Bays.		Crest level above and below.	Openings.			Reduced level of bed.	Description.	Right or Left bank.	Number and area of vent.		Acreage.	Still level.
			Number.	Width.		Number.	Span.	width of roadway.							
(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)

SYSTEM.

PUTARIES.

Channel.

[illegible]

Channel.

[illegible]

Channel.

..	..	..	0' 4 1/2"	100.02	..	..	100.49	Pipe sluice.	..	10" diameter.	..
..	..	..	1/4	97.02	..	..	100.02	..	..	..	..
..	..	..			..	..	97.02	..	..	..	..

Tabular Statement of Works to accompany

Distance from head.	Name of work.	Area irrigable.	Channel.						Discharge.		
			Bed width.	Depth of water full supply	Depth of water maximum	Side slope.	Bed fall.	Width of land occupied.	Mean velocity.	Discharge calcu- lated.	Discharge required.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

VADAVAR

DISTR

Puthur No. 3

MLS.	FT.		ACS.	FT.	FT.	FT.		PER. 1,000	FT.	FT. PER SECOND.	C. FT. PER SECOND.	C. FT. PER SECOND.
0	0	Head sluice and 2 5' drop	1,232	6.00	1.75	..		0.37	47	1.37	16.48	16.67
0	2,310	Sluice right bank	..	..	..	..		..	..	..	..	..
0	2,310	Sluice left bank	..	..	..	..		..	..	..	..	..
0	2,772	1 foot drop	..	..	..	..		..	..	..	..	..
0	3,630	Aqueduct	..	..	..	..		..	..	..	..	..
0	4,158	Undertunnel	..	..	..	..		..	..	..	..	..
0	4,356	Do.	..	..	..	..		..	..	..	..	..
0	5,214	Bridge	..	..	..	..		..	..	..	..	..
1	0,000	Undertunnel	..	..	..	..		..	..	..	..	..
1	1,980	Sluice right bank	871	5.5	1.5	..		0.37	51	1.24	11.57	11.93
1	1,980	Sluice left bank	..	..	..	..		..	..	..	..	..
1	1,980	Regulator	..	..	..	..		..	..	..	..	..
1	2,970	Sluice right bank	680	5.0	1.5	..		38	51	1.23	10.61	9.32
1	2,970	Sluice left bank	..	..	..	..		..	..	..	..	..
1	4,620	Sluice right bank	390	3.0	1.3	..		45	55	1.14	5.44	5.34
1	4,620	Sluice left bank	..	..	..	..		..	..	..	..	..
1	4,620	4 feet drop	..	..	..	..		..	..	..	..	..
2	891	Do.	..	..	..	..		..	..	..	..	..
2	4,686	Undertunnel	..	..	..	..		..	..	..	..	..
2	4,950	Aqueduct	..	..	..	..		..	..	..	..	..
3	1,320	Sluice left bank	..	..	..	..		..	..	..	..	..
3	1,320	Cross wall with vent	..	..	..	..		..	..	..	..	..

Actual 1: 1; for calculation of discharges $\frac{1}{2}$: 1.

Actual 1 : 1;
for calcula-
tion of
discharges .
 $\frac{1}{2}$: 1.

Puthur No. 4

[illegible]

Puthur No. 5.

0	990	Sluice right bank	..	..	..	889	5.5	1.75	..	for calculation of	0.37	55	1.35	14.94	12.13
0	1,118	2 feet drop	..	..	..	803	5.5	1.5	..	charges 1/2 l.	.37	55	1.24	11.57	11.00
0	3,300	Sluice left bank	..	..	..	750	5.0	1.5	..		.38	..	1.23	10.61	10.27
1	495	Sluice right bank	..	..	..	365	3.00	1.3	..		.50	..	1.16	5.23	5.00
1	495	Sluice left bank	..	..	..	..	..	..	..		..	..	..	..	..
1	495	Regulator	..	..	..	..	..	..	..	Act.	..	..	..	..	..
1	2,640	Aqueduct	..	..	..	..	..	..	..		..	..	..	..	..
1	2,838	Sluice right bank	..	..	..	..	..	..	..		..	..	..	..	..
1	2,838	Sluice left bank	..	..	..	208	2.00	..	..		.35	..	0.87	3.00	2.85
1	2,838	3 feet drop	..	..	..	..	..	..	..		..	..	..	..	..

Actual 1:1;
for calcula-
tion of
discharges
 $\frac{1}{2}$:1.

Chettichatram:

0	0	Head sluice	..	..	..	1.810	10.50	1.70	..	Actual 1:1 for calcula- tion of discharges = 1:1.	0.30	65	1.83	25.66	24.79
0	1,320	Bridge	..	..	..	..	..	..	..		..	..	..	..	..
0	4,290	Outlet	..	..	..	..	..	2.70	..		..	..	..	..	..

227-

Estimate for the Cauvery Reservoir Project—*cont.*

Cross drainage.			Falls.		Bridges.			Sluices.					Remarks.		
Area of drainage basin.	Calculated flood discharge.	Discharge provided for.	Bays.		Crest level above and below.	Openings.		Width of road way.	Reduced level of bed.	Description.	Right or left bank.	Number and area of vent.		Average.	Fill level.
(13)	(14)	(15)	Number.	Width.		(18)	Number.						Span.			(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)

SYSTEM—cont.

BUTARIES—*cont.*

Channel.

SQUARE MILES.	C. FEET PER SECOND.	C. FEET PER SECOND.		FT.	FT.		FT.	FT.	FT.										
										97.42									
..	..	..	..	..	..	..	..	..	..	94.92	Pipe sluice.	R.	5 $\frac{1}{2}$ "	69	94.06				
..	..	..	..	..	..	..	..	..	..	94.06	"	L.	3 $\frac{1}{2}$ "	26	94.06				
..	..	..	..	..	..	..	..	..	..	94.06									
..	..	..	1	1'-2 $\frac{1}{2}$ "	93.89	..	..	..	..	93.89									
..	..	..	..	$\frac{1}{4}$	92.89	..	..	..	..	92.89	..	..	..	..	..	..	..	..	..
10.56	2,886	2,860	..	..	..	..	..	..	..	92.58	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	92.39	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	92.32	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	1	8'	10'	..	91.98	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	91.96	Pipe sluice.	R.	12"	186	91.20				
..	..	..	..	..	..	..	..	..	..	91.20	"	L.	7 $\frac{1}{2}$ "	80	91.20				
..	..	..	..	..	..	..	..	..	..	91.20	..	..	..	..	..	..	..	..	..
..	..	..	1	2'-1 $\frac{1}{2}$ "	91.20	..	..	..	..	91.20	..	..	..	..	..	..	..	..	..
..	..	..	..	$\frac{1}{4}$	91.20	..	..	..	..	91.20	Pipe sluice.	R.	7"	67	90.84				
..	..	..	..	..	..	..	..	..	..	90.84	"	L.	9 $\frac{1}{2}$ "	124	90.84				
..	..	..	..	..	..	..	..	..	..	90.84	..	R.	9"	111	90.22				
..	..	..	..	..	..	..	..	..	..	90.22	"	L.	11 $\frac{1}{2}$ "	179	90.22				
..	..	..	..	..	..	..	..	..	..	90.22	..	..	..	..	..	..	..	..	..
..	..	..	1	7"	90.22	..	..	..	..	90.22	..	..	..	..	..	..	..	..	..
..	..	..	..	$\frac{1}{8}$ "	86.22	..	..	..	..	86.22	..	..	..	..	..	..	..	..	..
..	..	..	1	9 $\frac{1}{2}$ "	85.52	..	..	..	..	85.52	..	..	..	..	..	..	..	..	..
..	..	..	..	$\frac{1}{8}$ "	81.52	..	..	..	..	81.52	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	79.81	..	..	..	..	..	..	..	..	..
9.5	2,694	2,775	..	..	..	..	..	..	..	79.60	Pipe sluice.	L.	8"	90	78.94				
..	..	..	..	..	..	..	..	..	..	78.94	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	78.94	..	..	14 $\frac{3}{4}$ "	300	78.94				

Channel.

[illegible]

Channel.

Machine.													
..	..	..	..	1'-0"	90-46	..	..	90-90 90-53 90-46	Open head. Pipe sluice.	R.	8"	86	90-53
..	..	..	1	$\frac{1}{2}$ "	88-46	..	..	88-46	..	..	..	..	..
..	..	..	..	..	..	..	..	87-68	Pipe sluice.	L.	7 $\frac{1}{2}$ "	53	87-68
..	..	..	..	..	..	..	..	86-73	..	R.	10"	99	86-73
..	..	..	..	..	..	..	..	86-73	..	L.	14 $\frac{1}{2}$ "	286	86-73
..	..	..	1	10 $\frac{1}{2}$ "	86-73	..	..	86-73	..	..	..	..	..
..	..	..	..	$\frac{3}{8}$ "	86-73	..	..	85-68	..	..	..	..	..
12-0	3,144	3,161	..	..	..	..	..	85-55	Pipe sluice.	R.	6 $\frac{1}{2}$ "	85	85-55
..	..	..	..	..	..	..	..	85-55	..	L.	6"	72	85-55
..	..	..	..	4"	85-55	..	..	85-55		..	..	..	..
..	..	..	1	1"	82-55	..	..	82-55	..	..	..	..	..

Channel.

0.27	251	253				1	12'	14'	108.15 107.75 106.86		One vent, $\frac{1}{2} \times 25 \times 1.7 = 5.52$ s.f.	
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Tabular Statement of Works to accompany

Distance from head.	Name of work.	Channel.					Discharge.				
		Area irrigable.	Bed width.	Depth of water full supply.	Depth of water maximum.	Side slope.	Bed fall.	Width of land occupied.	Mean velocity.	Discharge calculated.	Discharge required.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

VADAVAR

DISTR.

Chettichatram.

MLS.	FT.		ACS.	FT.	FT.	FT.		PER 1,000.	FT.	FT.	C. FT. PER SECOND.	C. FT. PER SECOND.
1	3,630	Sluice right bank	1,723	10.0	1.70	..	..	0.30	59	1.32	24.35	28.50
2	396	Bridge	..	..	..	..	..	..	..	..	..	..
2	1,320	Sluice right bank	1,607	9.0	1.70	..	..	0.32	55	1.35	22.54	22.01
2	1,914	Outlet	..	..	..	2.70	..	..	..	..	..	..
3	380	Sluice right bank	1,336	7.50	1.70	..	..	0.34	54	1.35	19.11	18.30
3	660	Do. left bank	1,159	6.50	1.70	..	..	0.33	48	1.35	16.87	15.88
3	2,970	Do. right bank	..	..	..	..	..	..	..	..	..	..
3	2,970	Do. left bank	..	..	..	..	..	..	..	..	..	..
..	..	2.5 feet drop	629	4.50	1.50	..	..	0.40	57	1.23	9.67	8.62
..	..	One foot drop	..	..	..	..	..	..	..	..	..	..
4	330	One foot drop	..	..	..	..	..	..	..	..	..	..
4	990	Sluice right bank	586	4.0	1.50	..	..	0.40	44	1.20	8.58	8.03
4	2,640	Head of Chettichatram channel.	..	..	..	..	..	..	..	..	..	..
4	2,640	Head of Chettichatram channel.	..	..	..	..	..	..	..	..	..	..

Chettichatram.

..	..	Head sluice	220	2.0	1.30	..	..	0.40	32	0.94	3.74	3.02
..	..	Sluice left bank	165	2.0	1.30	..	..	0.20	36	0.64	2.20	2.27
..	990	Do. right bank	68	..	..	..	..	..	..	..	..	0.94
..	990	Do. left bank	..	..	..	..	..	..	..	..	..	..
..	1,320	Five feet drop	..	..	..	..	..	..	..	..	..	..

Chettichatram.

..	..	Regulator	366	3.0	1.30	..	..	0.45	46	1.11	5.26	5.01
..	990	Sluice right bank	190	2.0	1.30	..	..	0.30	42	0.80	2.75	2.60
..	1,320	Cross wall with vent	..	..	..	..	..	..	..	..	..	..

Iluppay.

..	33	Head sluice and bridge combined	3,030	10.5	2.25	..	..	0.32	14	1.62	42.41	41.5
1	1,980	Dividing dam	1,950	8.0	2.0	..	..	0.34	86	1.49	26.84	26.71
1	3,366	Sluice left bank	1,739	7.0	2.0	..	..	0.35	62	1.45	23.68	23.82
2	660	Do. right bank	1,605	..	..	..	..	..	54	..	..	20.62
2	660	Do. left bank	..	..	..	..	..	..	..	..	..	..
2	1,980	Three feet drop	..	..	..	..	..	..	..	..	..	..
4	3,564	Bridge	..	..	..	..	..	..	..	..	..	..
2	3,564	Sluice right bank	..	..	..	..	..	..	..	..	..	..
2	3,564	Do. left bank	1,350	..	..	..	..	..	..	..	18.49	..
2	4,818	Three feet drop	1,350	7.00	1.75	..	..	0.35	..	1.37	18.89	18.49
3	1,718	Sluice right bank	1,128	5.5	1.75	..	..	0.37	47	1.35	15.06	15.45
3	1,718	Do. left bank	..	..	..	..	..	..	..	..	..	..
3	4,950	Do. right bank	..	..	..	..	..	..	..	..	..	..
3	4,950	Do. left bank	..	..	..	..	..	..	..	..	..	..
..	4,950	Regulator	802	5.0	1.5	..	..	0.40	47	1.26	10.87	10.99

Estimate for the Cauvery Reservoir Project—cont.

Cross drainage.			Falls.			Bridges.			Sluices.					Total.	
Area of drainage basin.	Calculated flood discharge.	Discharge provided for.	Number.	Width.	Crest level above and below.	Number.	Span.	Width of roadway.	Reduced level of bed.	Description.	Right or left bank.	Number and area of vent.	Acres.		Still level.
(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)

SYSTEM—cont.

BUTARIES—cont.

Channel—cont.

SQUARE MILES.	C. FT. PER SECOND.	C. FT. PER SECOND.	FT.	FT.	FT.	FT.	FT.	FT.							
..	..	..	..	..	..	1	10	14	105.48	Pipe sluice.	R.	8"	87	105.48	
..	..	..	..	..	..	..	..	..	104.86	..	..	..	..	..	
..	..	..	..	..	..	..	..	..	104.59	Pipe sluice.	R.	9 1/2"	416	104.59	
0.44	31	348	..	..	..	..	..	..	104.40	..	..	..	..	..	
..	..	..	..	..	..	..	..	..	103.21	Pipe sluice.	R.	14"	271	103.21	
..	..	..	..	..	..	..	..	..	103.10	..	L.	11 1/2"	177	103.10	
..	..	..	..	..	..	..	..	..	102.27	..	R.	12 1/2"	293	102.27	
..	..	..	..	..	..	..	..	..	102.27	..	L.	11 1/2"	237	102.27	
..	..	..	1	9 1/2"	102.27	..	..	..	102.27	..	..	..	..	..	
..	..	..	1	11"	99.77	..	..	..	99.77	..	..	..	..	..	
..	..	..	1	11"	98.71	..	..	..	98.71	..	..	..	..	..	
..	..	..	..	..	..	..	..	..	97.71	..	..	..	..	..	
..	..	..	..	..	..	..	..	..	97.45	Pipe sluice.	R.	5 1/2"	43	97.45	
..	..	..	..	..	..	..	..	..	96.79	Head sluice.	R.	..	220	..	
..	..	..	..	..	..	..	..	..	96.79	..	..	..	860	..	

No. 1 Channel.

..	..	..	..	..	..	..	..	..	95.29	Pipe sluice.	..	11 1/2" Dr.	..	..	
..	..	..	..	..	..	..	..	..	96.29	..	L.	7 1/2"	55	96.29	
..	..	..	..	..	..	..	..	..	96.09	..	R.	6"	52	96.09	
..	..	..	..	..	..	..	..	..	96.09	..	L.	6"	45	96.09	
..	..	..	..	3"	96.03	..	..	..	96.03	..	..	..	..	..	
..	..	..	..	1/8"	91.03	..	..	..	91.03	..	..	..	..	..	

No. 2 Channel.

..	..	..	1	10 1/2"	96.79	..	..	..	96.79	..	..	..	..	..	
..	..	..	..	5"	96.79	..	..	..	96.79	..	..	..	..	..	
..	..	..	..	..	..	..	..	..	96.34	Pipe sluice.	L.	11 1/2"	176	96.34	
..	..	..	..	..	..	..	..	..	96.24	..	..	10 1/2"	190	96.24	

Channel.

..	..	..	..	1 1/8"	99.86	..	..	..	102.18	..	..	One vent, 4' x 2 1/2' = 9 sq. ft.	..	..	
..	..	..	1	3/4"	99.61	..	..	..	99.61	..	..	..	..	..	
..	..	..	..	..	..	..	..	..	99.14	Pipe sluice.	L.	12 1/2"	211	99.14	
..	..	..	..	..	..	..	..	..	98.26	..	R.	10"	161	98.26	
..	..	..	..	..	..	..	..	..	98.26	..	L.	6 1/2"	73	98.26	
..	..	..	1	1 7/8"	97.80	..	..	..	97.80	..	..	..	..	..	
..	..	..	..	1/2"	94.80	..	..	..	94.80	..	..	..	..	..	
..	..	..	..	..	..	..	..	..	94.24	Pipe sluice.	R.	6"	85	94.24	
..	..	..	..	..	..	..	..	..	94.24	..	L.	5 1/2"	70	94.24	
..	..	..	..	..	..	..	..	..	94.24	..	..	..	..	..	
..	..	..	1	1 5/8"	93.81	..	..	..	93.81	..	..	..	..	..	
..	..	..	..	1/2"	90.81	..	..	..	90.81	Pipe sluice.	R.	11"	116	90.81	
..	..	..	..	..	..	..	..	..	90.04	..	L.	10 1/2"	106	90.04	
..	..	..	..	..	..	..	..	..	90.04	..	..	..	..	..	
..	..	..	..	..	..	..	..	..	88.84	..	R.	12 1/2"	273	88.84	
..	..	..	..	..	..	..	..	..	88.84	..	L.	5 1/2"	53	88.84	
..	..	..	1	1 1/2"	88.84	..	..	..	88.84	..	..	..	..	..	
..	..	..	..	1/2"	88.84	..	..	..	88.84	..	..	..	..	..	

One notch in the body wall of the existing channel with 10 1/2" sill width and slope 3/4 is provided.

Tabular Statement of Works to accompany

(1)	Distance from head.	(2)	Name of work.	Channel.							Discharge.								
				(3)	Area irrigable.	(4)	Bed width	(5)	Depth of water full supply.	(6)	Depth of water maximum.	(7)	Side slope.	(8)	Bed fall.	(9)	Width of land occupied.	(10)	Mean velocity.	(11)	Discharge calculated.	(12)	Discharge required.

VADAVAR

DISTR I

Iluppadi

MLS.	FT.					ACS.	FT.	FT.	FT.		PER 1,000.	FT.	FT. PER SECOND.	C. FT. PER SECOND.	C. FT. PER SECOND.
4	999	Three feet drop	..	..	..	..	..	..	..	Actual 1 : 1 ; for calculation of discharges $\frac{1}{4}$: 1.	..	..	..	..	..
4	2,145	Sluice, right bank	..	..	..	542	..	..	..		..	..	..	..	7.42
4	2,145	Sluice, left bank	..	..	..	..	..	..	..		..	..	..	..	..
4	2,310	Two feet drop	..	..	..	542	4.0	1.30	..		0.45	53	1.18	7.15	7.32
4	4,950	Sluice, right bank	..	..	..	..	..	..	..		..	..	..	..	..
4	4,950	Sluice, left bank	..	..	..	..	..	..	..		..	..	..	..	..
4	4,950	Two feet drop	..	..	..	316	2.0	1.3	..		0.45	46	1.11	5.22	4.33

Muranallur

0	Head sluice	2,680	9-0	2-25	..		.33	60	1-60	36-54	36-71
0	4,818 One foot drop and bridge	..	..	..	..		..	..	..	..	..
1	198 Sluice, left bank	2,436	8-5	2-25	..		.34	62	1-61	34-91	33-37
1	1,551 Four feet drop and bridge	..	..	..	..		..	..	..	..	..
1	3,828 Sluice, left bank	2,123	7-5	2-25	..		.34	62	1-57	30-5	29-08
1	3,828 Sluice, right bank	..	..	..	..		..	..	..	..	..
2	1,188 Sluice, left bank	1,909	8-0	2-0	..		.35	70	1-52	27-29	26-15
2	1,188 Sluice, right bank	..	..	..	..		..	..	..	..	..
2	1,188 Four feet drop	..	..	..	..		..	..	..	..	..
2	3,828 Sluice, left bank	1,739	7-0	2-0	..		.35	64	1-48	23-65	23-82
2	3,828 Sluice, right bank	..	..	..	..		..	..	..	..	..
2	3,828 One feet drop	..	..	..	..		..	..	..	..	..
3	528 Sluice, left bank	1,258	..	1-5	..		.35	..	1-28	..	17-23
3	528 Head of Muvanallur, No. 1 channel.	..	..	..	..		..	..	..	..	..
3	528 Head of Muvanallur, No. 2 channel.	..	..	..	..		..	..	..	..	..

Muvanalur

0	0 Head sluice	433	3·5	1·30	..			·45	45	1·15	6·20	5·93
0	990 Three feet drop	..	..	..	..			..	..	..	..	..
0	1,980 Sluice, left bank	381	3·0	4·30	..			·48	45	1·14	5·44	5·22
0	1,980 Sluice, right bank	..	..	..	..			..	..	..	..	..
0	2,178 Two feet drop	..	..	..	..			..	..	..	..	..
0	3,630 Under tunnel	..	..	..	..			..	..	..	..	..
0	4,290 Sluice, left bank	..	..	..	..			..	..	..	..	..
0	4,290 Cross wall with vent	..	..	..	..			..	..	..	..	..
						Actual 1 : 1, for calculation of discharges at 1.						

Cross drainage.			Falls.			Bridges.			Reduced level of bed.	Sluices.					Remarks.
Area of drainage basin.	Calculated flood discharge.	Discharge provided for.	Bays.		Crest level above and below.	Openings.				Description.	Right or Left bank.	Number and area of vent.	Acreage.	Sill level.	
			Number.	Width.		Number.	Span.	Width of roadway.							
(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)

SYSTEM—cont.

BUTARIES—cont.

Channel—cont.

SQUARE MILES.	C. FT. PER SECOND.	C. FT. PER SECOND.		FT.	FT.		FT.	FT.	FT.						
..	..	..	1	1' 2 $\frac{1}{2}$ "	88-31	..	..	..	88-31						
..	..	..	..	$\frac{1}{2}$	85-31	..	..	..	85-31	Pipe sluice.	R.	9"	156	84-84	3
..	..	..	..	..	..	..	..	..	84-84	"	L.	7 $\frac{1}{2}$ "	104	84-84	
..	..	..	..	10"	84-76	..	..	..	84-76						
..	..	..	1	$\frac{5}{8}$	82-76	..	..	..	82-76	Pipe sluice.	R.	6"	68	81-56	
..	..	..	..	..	..	..	..	..	81-56	"	L.	9"	160	81-56	
..	..	..	..	7 $\frac{1}{4}$ "	81-56	..	..	..	81-56						
..	..	..	1	$\frac{1}{2}$	79-56	..	..	..	79-56						

Channel.

..	..	..							99-28		One vent 4-5' × 2-25' = 10-12 s. ft.			
..	..	..		1' 6"	97-69	1	10	14	97-69	..	..	..	..	..
..	..	..	1	1 to 1	96-69				96-69	..	..	..	..	..
..	..	..	..	2' 0 1/2'	96-02	..	..	..	96-47	Pipe sluice.	L.	11"	244	96-47
..	..	..	1			..	..	14	96-02	..	..	..	..	..
..	..	..	..	i	92-02				92-02	..	..	..	..	..
..	..	..	..	..	..	..	..	..	91-24	Pipe sluice.	L.	11 1/2"	180	91-24
..	..	..	..	..	..	..	..	..	91-24	"	R.	10 1/2"	133	91-24
..	..	..	..	..	..	..	..	..	90-34	"	L.	8"	129	90-34
..	..	..	..	..	..	..	..	..	90-34	"	R.	6 1/2"	85	90-34
..	..	..	..	1' 8 1/4"	90-34				90-34	..	..	..	..	..
..	..	..	1	1/2	86-34	..	..	..	86-34	..	..	..	..	..
..	..	..	..	..	..	..	..	..	85-42	Pipe sluice.	L.	6 1/2"	79	85-42
..	..	..	..	..	..	..	..	..	85-42	"	R.	7"	91	85-42
..	..	..	1	1' 9"	85-42				85-42	..	..	..	..	..
..	..	..	..	1/2	84-42	..	..	..	84-42	..	..	..	..	..
..	..	..	..	..	..	..	..	..	83-73	Pipe sluice.	L.	5 1/2"	48	83-73
..	..	..	..	..	..	..	..	..	83-73	Head sluice.	L.	..	433	..
..	..	..	..	..	..	..	..	..	83-73	..	..	..	..	..

No. 1 Channel.

										One vent 1' 6" $\wedge$ 1' 3" = 1' 95 s. ft.			
..	..	..	..	11"	83 52	..	83-97	..	..	..	..	..	..
..	..	..	1	$\frac{3}{8}$	80-52	..	83-52	..	..	..	..	..	..
..	..	..	..	9"	79-97	..	80-52	Pipe sluice.	L.	5"	35	80-07	..
..	..	..	..	$\frac{1}{2}$	77 97	..	80-07	"	R.	3 $\frac{1}{2}$ "	17	80-07	..
..	..	..	1	$\frac{3}{8}$	77 97	..	79-97	..	..	..	..	..	..
..	..	..	..	..	..	..	77-27	Pipe sluice.	R.	6 $\frac{1}{2}$ "	70	76-95	..
..	..	..	..	..	..	..	76-95	..	..	13 $\frac{3}{8}$ "	311	76-95	..
..	..	..	..	..	..	..	76-95	..	..	..	..	..	..

Tabular Statement of Works to accompany

(1)	(2)	Channel.							Discharge.		
		(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		Area irrigable.	Bed width.	Depth of water full supply.	Depth of water maximum.	Side slope.	Bed fall.	Width of land occupied.	Mean velocity.	Discharge calculated.	Discharge required.

VADAVAR

DISTRIB.

Muvanallur

MLS.	FT.		ACS.	FT.	FT.	FT.		PER 1,090	FT.	FT. PER SECOND.	C. FT. PER SECOND.	C. FT. PER SECOND.
0	0	Regulator	1,228	8-0	1-5	..		35	55	1-28	18-89	17-23
0	2,409	Sluice left bank	1,074	7-0	1-5	..		35	69	1-25	14-60	14-71
0	2,409	Sluice right bank	..	..	..	..		..	..	..	..	..
1	759	Sluice left bank	793	5-0	1-5	..		40	58	1-26	10-89	10-88
1	759	Sluice right bank	..	..	..	..		..	..	..	..	..
1	1,914	Sluice left bank	738	..	..	..		..	..	..	..	10-10
1	1,914	Two feet drop	..	..	..	..		..	..	..	..	..
1	2,706	Four feet drop	..	..	..	..		..	..	..	..	..
1	3,894	Sluice left bank	433	3-0	1-5	..		48	53	1-23	6-94	5-93
1	3,894	Sluice right bank	..	..	..	..		..	..	..	..	..
1	3,894	Two feet drop	..	..	..	..		..	..	..	..	..
2	330	Sluice left bank	..	..	..	..		..	..	..	..	..
2	330	Sluice right bank	..	..	..	..		..	..	..	..	..
2	330	Cross wall with vent ..	..	..	..	..		..	..	..	..	..

Mannargudi

[illegible]

Estimate for the Cauvery Reservoir Project—*cont.*

Cross drainage.			Falls.		Bridges.			Reduced level of bed.	Sluices.					Remarks.	
Area of drainage basin.	Calculated flood discharge.	Discharge provided for.	Bays.		Crest level above and below.	Openings.			Description.	Right or Left bank.	Number and area of vent.	Acreage.	Sill level.		
			Number.	Width.		Number.	Span.								Width of roadway.
(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)

SYSTEM—cont.

BUTARIES—*cont.*

No. 2 Channel.

SQUARE MILES.	C. FT. PER SECOND.	C. FT. PER SECOND.	FT.	FT.	FT.	FT.	FT.	FT.						
..	..	..	1	2' 0"	..	..	..	..	83-73	..	..	..	..	..
..	..	..	..	$\frac{1}{8}$	..	..	..	..	82-88	Pipe sluice.	L.	4 $\frac{1}{8}$ "	48	82-88
..	..	..	..	..	..	..	..	..	82-88	"	R.	8"	136	82-88
..	..	..	..	..	..	..	..	..	81-61	"	L	6"	60	81-61
..	..	..	..	..	..	..	..	..	81-64	"	R.	12 $\frac{3}{4}$ "	221	81-61
..	..	..	..	..	..	..	..	..	81-14	"	L.	5 $\frac{1}{2}$ "	55	81-14
..	..	..	..	..	..	..	..	..	81-14	"	..	..	..	..
..	..	..	1	1' 3"	81-44	..	..	..	79-14	..	..	..	..	..
..	..	..	..	$\frac{1}{8}$	79-14	..	..	..	78-80	..	..	..	..	..
..	..	..	1	1' 3"	78-80	..	..	..	74-80	..	..	..	..	..
..	..	..	..	$\frac{1}{8}$	74-80	..	..	..	74-32	Pipe sluice,	L.	7"	97	74-32
..	..	..	..	..	..	..	..	..	74-32	"	R.	10 $\frac{1}{4}$ "	208	74-32
..	..	..	..	8"	74-32	..	..	..	74-32	..	..	..	..	..
..	..	..	1	..	..	..	..	..	72-32	..	..	..	..	..
..	..	..	..	$\frac{1}{8}$	72-32	..	..	..	71-50	Pipe sluice.	L.	7 $\frac{1}{2}$ "	101	71-50
..	..	..	..	..	..	..	..	..	71-50	"	R.	11"	239	71-50
..	..	..	..	..	..	..	..	..	71-50	"	..	7"	93	71-50

Channel.

..	..	..	..	..	..	..	..	..	..	91.79	..	3 vents (5' X 2½') = 37.5 s. ft.	..	..	..
..	..	..	..	..	..	..	..	..	..	91.43	Pipe sluice.	R.	10"	140	91.43
..	..	..	..	..	..	..	..	..	..	90.80	Head sluice.	L.	..	200	90.80
..	..	..	..	..	..	..	..	..	..	90.80	Pipe sluice.	R.	3"	23	90.80
..	..	..	..	..	..	..	..	..	..	89.41	"	L.	6½"	60	89.41
..	..	..	..	..	..	..	..	..	..	89.41	Head sluice.	L.	..	246	89.41
..	..	..	..	..	..	..	..	..	..	89.41	Pipe sluice.	R.	11½"	172	89.41
..	..	..	..	..	..	..	..	..	..	89.41	"	L.	8½"	100	89.41
..	..	..	..	..	..	..	..	..	..	88.86	"	R.	10¾"	162	88.86
..	..	..	..	..	..	..	..	..	..	88.86	"	L.	7"	67	88.86
..	..	..	..	..	..	..	..	..	..	88.28	Head sluice.	L.	..	190	88.28
..	..	..	..	..	..	..	..	..	..	88.28	..	..	..	..	..
..	..	..	2	1' 7"	88.28	..	..	..	..	87.28	..	..	..	..	..
..	..	..	..	½	87.28	1	15'	10'	..	87.28	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	86.90	..	R.	12"	197	86.04
..	..	..	..	..	..	..	..	..	..	86.04	Pipe sluice.	L.	6"	52	85.84
..	..	..	..	..	..	..	..	..	..	85.84	"	L.	..	228	85.84
..	..	..	..	..	..	..	..	..	..	85.84	Head sluice.	L.	..	..	..
..	..	..	..	..	..	..	..	..	..	85.84	Pipe sluice.	L.	4½"	28	85.84
..	..	..	..	..	..	..	..	..	..	85.35	"	L.	4¾"	30	85.35
..	..	..	..	..	..	..	..	..	..	85.35	Head sluice.	L.	..	288	..
..	..	..	..	..	..	..	..	..	..	85.35	Pipe sluice.	L.	5"	44	85.84
..	..	..	..	..	..	..	..	..	..	84.71	"	R.	12¼"	209	85.35
..	..	..	..	..	..	..	..	..	..	84.66	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	84.18	Pipe sluice.	L.	9"	110	84.18
..	..	..	..	..	..	..	..	..	..	83.55	"	R.	8"	89	83.55
..	..	..	..	..	..	..	..	..	..	83.55	"	L.	5¾"	44	83.55
..	..	..	..	..	..	..	..	..	..	83.44	"	R.	10"	139	83.44
..	..	..	..	..	..	..	..	..	..	83.44	"	R.	14"	275	83.44
..	..	..	..	..	..	..	..	..	..	81.92	..	..	..	..	..
0.24	232	233	..	..	..	..	..	..	..	81.74	Pipe sluice.	R.	11½"	180	81.74

Tabular Statement of Works to accompany

(1)	Distance from head.	Name of work.	Channel.							Discharge.		
			(3) Area irrigable.	(4) Bed width.	(5) Depth of water full supply.	(6) Depth of water maximum.	(7) Side slope.	(8) Bed fall.	(9) Width of land occupied.	(10) Mean velocity.	(11) Discharge calculated.	(12) Discharge required.

VADAVAE

DISTR

Mannargud

MLS.	FT.		ACS.	FT.	FT.	FT.		PER 1,000	FT.	FT. PER SECOND.	C. FT. PER SECOND.	C. FT. PER. SECOND.
6	990	Sluice left bank	2,301	9.5	2.0	..		33	59	1.51	31.82	31.52
6	990	Sluice left bank	..	..	..	..		..	..	..	..	..
6	990	Sluice right bank	..	..	..	..		..	..	..	..	..
6	990	Regulator	..	..	..	..		..	..	..	..	..
6	3,135	Sluice left bank	1,978	8.0	2.0	..		35	60	1.52	27.29	27.10
7	495	Bridge	..	..	..	..		..	..	..	..	..
7	680	Sluice right bank	1,730	7.0	2.0	..		35	60	1.48	23.65	23.70
7	660	Sluice left bank	..	..	..	..		..	..	..	..	..
7	1,452	4 feet drop	..	..	..	..		..	..	..	..	..
7	2,970	2 feet drop	..	..	..	..		..	..	..	..	..
7	4,340	Sluice left bank (municipal sluice).	..	..	..	..		..	..	..	..	..
7	4,620	Sluice right bank	1,528	6.0	2.0	..		38	62	1.49	20.92	20.93
7	4,620	Sluice left bank	..	..	..	..		..	..	..	..	..
8	0	Sluice right bank	1,474	..	..	..		..	..	..	..	20.2
8	1,320	Bridge	..	..	..	..		..	..	..	..	..
8	3,500	Sluice left bank	..	..	..	..		..	..	..	..	..
8	3,500	Head of Mannargudi No. 6 chan- nel.	..	..	..	..		..	..	..	..	..
8	3,500	Head of Mannargudi No. 7 chan- nel.	..	..	..	..		..	..	..	..	..

Mannarqua

[illegible]

Mannargud

0	200	Head sluice and bridge	..	..	246	2.0	1.3	..			45	50	0.99	3.44	3.37
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Mannarqud

0	0	Head sluice	..	..	190	..	..	Actual : 1	..	..	..	2.60
0	0	Sluice right bank	..	..	152	2.0	1.3	Calculation of	0.20	41	0.65	2.23
0	790	6 drop and bridge	..	..	..	..	..	charges 1	..	..	..	2.08

Mannargud.

0	330	Head sluice and bridge	..	..	228	2.0	1.3	..	al-	ges	0 40	39	0.94	3.23	3.12
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Mannargudi

[illegible]

Estimate for the Cauvery Reservoir Project—*cont.*

Cross Drainage.			Falls.		Bridges.			Sluices.					Remarks.	
Area of drainage basin.	Calculated flood discharge.	Discharge provided for.	Bays.		Crest level above and below.	Openings.		Reduce level of bed.	Description.	Right or left bank.	Number and area of vent.	Acreage.		Sill level.
			Number.	Width.		Number.	Span								Width of roadway.
(13)			(16)		(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)

SYSTEM—cont.

BUTARIES--cont.

Channel—cont.

SQUARE MILES.	C. FT. PER SECOND.	C. FT. PER SECOND.		FT.	FT.		FT.	FT.	FT.							
..	..	..	..	..	..	..	..	..	80.94	Pipe sluice.	L.	14½"	265	80.94		
..	..	..	..	..	..	..	..	..	80.94	"	L.	11"	162	80.94		
..	..	..	..	..	..	..	..	..	80.94	"	R.	9½"	120	80.94		
..	..	..	..	2' 8"	80.94	..	..	..	80.94	..	..	..	..	..		
..	..	..	1	½	80.94	..	..	..	80.23	Pipe sluice.	L.	15½"	323	80.23		
..	..	..	..	..	..	1	10'	14'	79.31	..	..	..	..	..		
..	..	..	..	..	..	..	..	..	79.25	Pipe sluice.	R.	9½"	144	79.25		
..	..	..	..	..	..	..	..	..	79.25	"	L.	8"	104	79.25		
..	..	..	..	1' 11"	78.97	..	..	..	78.97	..	..	..	..	..		
..	..	..	1	..	..	..	..	..	74.97	..	..	..	..	..		
..	..	..	..	1' 11"	74.44	..	..	..	74.44	..	..	..	..	..		
..	..	..	1	..	..	..	..	..	72.44	..	..	..	..	..		
..	..	..	..	½	72.44	..	..	..	72.44	Masonry	L.	1 vent 2' × 2'	71.95			
..	..	..	..	..	..	..	..	..	71.95	sluice.	..	= 4 sq. ft	..			
..	..	..	..	..	..	..	..	..	71.86	Pipe sluice.	R.	7½"	78	71.86		
..	..	..	..	..	..	..	..	..	71.86	"	L.	9½"	124	71.86		
..	..	..	..	..	..	..	..	..	71.61	"	R.	6½"	54	71.61		
..	..	..	..	..	..	1	8'	14'	71.11	..	..	..	..	..		
..	..	..	..	..	..	..	..	..	70.28	Pipe sluice.	L.	9"	78	70.28		
..	..	..	..	..	..	..	..	..	70.28	Head sluice.	L.	..	417	70.28		
..	..	..	..	..	..	..	..	..	70.23	Open head.	..	..	..	..		

No. 1 Channel.

..	..	..	..	..	..	..	..	..	90-80	Pipe sluice.	..	8 $\frac{1}{2}$ " Dr.	..	..
..	..	..	..	..	..	..	..	..	89-30	"	R.	51"	53	89 30
..	..	..	..	..	..	..	..	..	89-30	"	L.	4 $\frac{1}{2}$ "	40	89 30
..	..	..	..	..	..	..	..	..	89-30	"	..	..	..	..
..	..	..	..	..	..	..	..	..	89-14	"	..	..	..	..
..	..	..	1	24"	89 14	..	..	..	87-14	..	..	..	..	..
..	..	..	..	1/14	87-14	..	..	..	87-14	..	..	..	..	..

No. 2 Channel

14'	89.32	Pipe sluice.	10 $\frac{1}{2}$ "	Dr.
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No. 3 Channel

..	..	..	3½	88-12	..	..	88-28	Pipe splice.	R.	98	117	..	33	88-28
..	..	..	..	88-12	..	..	88-28	"	..	..	6¼"	..	..	..
..	..	..	1	82-12	..	..	82-12	..	..	..	..	..	..	..

No 4 Channel.

[illegible]

No. 5 Channel

[illegible]

459

Estimate for the Cauvery Reservoir Project—cont.

Cross Drainage.			Falls.			Bridges.			Reduced level of bed.	Sluices.					Remarks.
Area of drainage basin.	Calculated flood discharge.	Discharge provided for.	Bays.		Greatest level above and below.	Openings.									
			Number.	Width.		Number.	Span.	Width of roadway.							
(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)

SYSTEM—*cont.*

BUTARIES--cont.

No. 6 Channel.

SQUARE MILES.	C. FT. PER SECOND.	C. FT. PER SECOND.	FT.	FT.	FT.	FT.	FT.						
..	..	..	..	..	..	70.28	Pipe sluice.	..	16" Dr.	..	..	..	..
..	..	..	..	..	1	4	14	69.68	"	..	..	..	..
..	..	..	..	..	..	..	..	69.08	R.	8"	85	69.08	..
..	..	..	..	..	..	..	..	..	L.	5"	36	69.08	..
..	..	..	1	6 $\frac{1}{2}$ "	68.76	..	..	68.76	..	..	..	..	..
..	..	..	..	$\frac{1}{8}$	65.76	..	..	65.76	..	..	..	..	..
..	..	..	..	..	..	..	..	65.55	Pipe sluice.	R.	6 $\frac{1}{2}$ "	57	65.55
..	..	..	..	3 $\frac{1}{2}$ "	65.04	..	..	65.01	"	L.	6"	47	65.55
..	..	..	1	$\frac{1}{4}$	63.04	1	3	14	..	..	..	..	..
..	..	..	..	..	..	..	..	63.04	..	..	..	..	..

No. 7 Channel

..	..	..	..	..	..	70-28	..	..	Open head.	..	..	..
..	..	..	..	..	..	70-28	Pipe sluice.	L.	4 1/2	21	70-28	..
..	..	..	..	..	..	69-78	..	R.	12 1/2	210	70-28	..
..	..	..	1	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	65-78	..	..	..	..	..	..
..	..	..	..	..	..	65-10	Pipe sluice.	R.	10"	136	65 10	..
..	..	..	..	..	..	65-10	..	L.	5 1/2"	39	65 10	..
..	..	..	..	..	..	64 41	..	R.	9 1/2"	130	64 41	..
..	..	..	..	..	..	64 41	..	L.	8 1/2"	104	64 41	..
..	..	..	..	1	4	62-82	..	..	..	..	..	..

No. 1 Channel.

..	..	..	..	..	..	..	..	..	..	87-22	..	One vent 6' 4" X 2' 3" = 14.25 sq. ft.			..
0-19	198-6	199-5	..	..	..	..	..	..	..	86-74	Pipe sluice.	L.	8"	86	86-18
..	..	..	..	..	..	..	..	..	..	86-18	"	L.	10 1/2"	174	86-79
..	..	..	..	..	..	..	..	..	..	86-79	"	L.	10 1/2"	174	86-79
0-12	145-8	146-1	..	..	..	..	..	..	..	84-95	Pipe sluice.	L.	9"	104	84-78
..	..	..	..	..	..	..	..	..	..	84-78	"	R.	9 1/2"	172	84-46
..	..	..	..	..	..	..	..	..	..	84-46	"	R.	9 1/2"	172	84-46
..	..	..	..	..	..	..	..	..	..	84-46	"	..	..	..	..
..	..	..	1	2' 4"	84-46	..	..	..	..	80-46	Pipe sluice.	L.	10 1/2"	275	79-00
..	..	..	..	2	80-46	..	..	..	..	79-00	"	R.	10 1/2"	240	78-89
..	..	..	..	1' 9"	78-89	..	..	..	..	78-89	"	..	..	..	..
..	..	..	..	..	..	..	..	..	..	78-89	"	..	..	..	..
..	..	..	1	2	76-89	..	..	..	..	76-89	Pipe sluice.	L.	6"	93	76-11
..	..	..	..	..	..	..	..	..	..	76-11	"	..	..	..	..
..	..	..	..	1' 9"	76-11	..	..	..	..	76-11	"	..	..	..	..
..	..	..	1	1	74-11	..	..	..	..	74-11	Pipe sluice.	L.	5"	43	72-99
..	..	..	..	1/2	74-11	..	..	..	..	72-99	"	R.	7"	91	72-99
..	..	..	..	..	..	..	..	..	..	72-99	"	L.	9 1/2"	85	72-40
..	..	..	..	..	..	..	..	..	..	72-40	"	R.	9 1/2"	84	72-40
..	..	..	..	..	..	..	..	..	..	72-40	"	L.	12 1/2"	272	72-33
..	..	..	..	..	..	..	..	..	..	72-33	"	R.	8"	108	72-33
..	..	..	..	..	..	1	8	14	..	71-48	"	..	..	..	..
..	..	..	..	..	..	..	..	..	..	70-60	Pipe sluice.	R.	12 1/2"	306	70-60
..	..	..	..	..	..	..	..	..	..	69-91	"	L.	13 1/2"	262	69-91
..	..	..	1	1' 4 1/2"	69-91	..	..	..	..	69-91	"	..	..	..	..
..	..	..	..	1	6	14	..	..	..	69-91	"	..	..	..	..
..	..	..	..	2	69-91	..	..	..	..	68-71	Pipe sluice.	L.	14 1/2"	210	68-71
..	..	..	..	..	..	..	..	..	..	68-71	"	..	..	..	..

Tabular Statement of Works to accompany

Distance from head	Name of work.	Channel.							Discharge.		
		Area irrigable.	Bed width.	Depth of water full supply.	Depth of water maximum.	Side slope.	Bed fall.	Width of land occupied.	Mean velocity.	Discharge calcu- lated.	Discharge required.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

VADAVAR

DISTRIB

Vadavar No. 1

MLS.	FT.		ACS.	FT.	FT.	FT.		PER 1,000	FT.	FT. PER SECOND.	C. FT. PER SECOND.	C. FT. PER SECOND.
5	5,247	Sluice right bank	..	..	..	..	Actual 1:1; for calculation of discharges §. 1.	..	..	..	..	..
6	957	4 feet drop	495	4.0	1.3	..		.42	59	1.14	6.90	6.78
6	3,729	Sluice right bank	103	2.0	0.75	..		.77	34	0.99	1.75	1.41
6	3,729	Sluice left bank	..	..	..	..		..	..	..	..	..
6	2,729	4 feet drop and bridge	..	..	..	..		..	..	..	..	..

Vadavar Extensio

	Read sluice ..	..	20,960	36-0	3-5	..	0-25	110	2 17	287-10	287-12
0	660 Head of Vadavar No. 2 channel ..	..	..	..	..	..	..	..	..	..	..
0	726 Sluice right bank ..	..	20,490	..	..	..	..	..	..	..	280-68
0	2,310 Sluice right bank ..	..	20,092	35-0	3-5	..	.25	116	2 17	278-75	275-24
0	2,310 Sluice right bank ..	..	..	..	..	..	..	..	..	..	..
0	4,554 "C" class girder bridge ..	..	..	..	..	..	..	..	..	..	..
0	4,818 Sluice right bank ..	..	19,962	..	..	..	..	..	..	..	273-45
0	4,518 Sluice left bank ..	..	..	..	..	..	..	..	..	..	..
1	1,584 Sluice right bank ..	..	19,730	34-0	3-5	..	.25	120	2-16	270-41	270-27
1	1,584 Sluice left bank ..	..	..	..	..	..	..	..	..	..	..
1	2,508 "C" class girder bridge ..	..	..	..	..	..	..	..	..	..	..
1	5,148 Sluice left bank ..	..	19,405	..	..	..	..	..	..	..	..
2	198 Head of Vadavar No. 3 channel ..	..	17,991	31-0	3-5	..	.25	130	2-14	245-42	265 82
2	2,376 Sluice right bank ..	..	17,528	30-0	3-5	..	.26	115	2-18	242-02	246-45
2	2,376 Sluice left bank ..	..	..	..	..	..	..	..	..	..	240-11
2	4,158 Outlet ..	..	..	..	3-5	4-5	..	..	..	..	..
3	726 Sluice right bank ..	..	17,481	..	..	..	..	..	..	..	239-46
3	1,518 "C" class girder bridge ..	..	..	..	..	..	..	..	..	..	..
3	2,310 Head of Palaiyur channel ..	..	11,494	28-0	3-0	..	0-26	115	1-95	161-27	157-45
3	2,310 Sluice right bank ..	..	..	..	..	..	..	..	..	..	..
3	2,310 3 feet drop ..	..	..	..	..	..	..	..	..	..	..
3	3,960 Sluice left bank ..	..	11,456	..	..	..	..	..	..	..	93
4	660 Sluice right bank ..	..	11,254	25-0	3-0	..	.26	100	1-95	154-75	154-16
4	660 Sluice left bank ..	..	..	..	..	..	..	..	..	..	..
4	1,518 "B" class girder bridge ..	..	..	..	..	..	..	..	..	..	..
4	1,550 Sluice right bank ..	..	11,045	..	..	..	..	..	..	..	151-30
4	1,550 Sluice left bank ..	..	..	..	..	..	..	..	..	..	..
4	3,960 Sluice left bank ..	..	10,755	..	..	..	..	..	..	..	147-33
4	4,224 2 feet drop and bridge ..	..	10,755	24-0	3-0	..	.26	115	1 94	148-70	147-33
5	1,452 Sluice right bank ..	..	10,640	..	..	..	..	..	..	..	145-75
5	3,762 Head of Vadavar No. 4 channel ..	..	9,113	..	..	..	..	..	..	..	124 83
5	3,762 Sluice right bank ..	..	..	..	..	..	..	..	..	..	..
5	3,762 Sluice right bank ..	..	..	..	..	..	..	..	..	..	..
5	3,762 Sluice left bank ..	..	..	..	..	..	..	..	..	..	..
5	3,560 2 feet drop ..	..	9,113	24-0	2-75	..	.26	85	1-84	128-28	124-83
6	2,640 Sluice right bank ..	..	8,537	22-0	2-75	..	.26	90	1-82	117-02	116-94
6	2,640 Sluice left bank ..	..	..	..	..	..	..	..	..	..	..
7	198 Outlet ..	..	..	..	3-5	..	..	..	..	..	..
7	1,650 Head of Vadavar No. 5 channel ..	..	8,014	20-0	2-75	..	.28	90	1-86	109-65	109-78
7	3,254 Outlet ..	..	..	..	3-75	..	..	..	..	..	..
8	528 Head of Vadavar No. 6 channel ..	..	7,410	19-0	2 71	..	.28	85	1-85	103-86	101-50

Estimate for the Cauvery Reservoir Project—cont

Cross drainage.			Falls.		Bridges.			Sluices.					Remarks.		
Area of drainage basin.	Calculated flood discharge	Discharge provided for.	Bays.		Crest level above and below.	Openings.			Reduced level of bed.	Description.	Right or left bank.	Number and area of vent.		Acreage.	Sill level.
			No. of bays.	Width.		Number.	Span.	Width of roadway.							
(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)

SYSTEM—*cont.*

BUTARIES—*cont*

Channel—cont.

SQUARE MILES.	C. FT. PER SECOND.	C. FT. PER SECOND.		FT	FT		FT.	FT.	FT.						
..	..	..	..	9"	68-31	..	..	..	68-71 68-31	Pipe sluice.	R.	15"	217	68-71	
..	..	..	1	64-31	..	..	..	..	64-31 63-15	..	..	..	..	..	
..	..	..	..	63-15	..	..	..	..	63-15 63-15	Pipe sluice.	R.	12"	266	63-15	
..	..	..	..	63-15	..	..	..	..	63-15 63-15	"	L.	8"	126	63-15	
..	..	..	notch with slope	59-15	..	..	14'	..	59-15	..	..	..	..	..	

Channel.

							4 cents (4' 0" x 2' 8")					
..	..	..	..	..	..	..	88-13	Head sluice.	R.	..	319	85-96
..	..	..	..	..	..	..	85-96	Pipe sluice.	R.	9" Dr.	151	85-95
..	..	..	..	..	..	..	85-55	"	R.	5 1/2"	39	85-55
..	..	..	..	..	..	..	85-55	"	K.	16"	359	85-55
..	..	..	..	1	36'	10'	81-99	Pipe sluice.	R.	7 1/2"	79	84-93
..	..	..	..	..	..	..	84-93	"	L.	6"	51	84-93
..	..	..	..	..	..	..	84-41	"	R.	8 1/2"	183	84-41
..	..	..	..	..	..	..	84-41	"	L.	5 1/2"	69	84-41
..	..	..	..	1	36'	10'	84-17	Pipe sluice.	I.	11"	325	83-50
..	..	..	..	..	..	..	83-50	Head sluice.	R.	..	1,414	82-87
..	..	..	..	..	..	..	83-42	Pipe sluice.	R.	6 1/2"	194	82-87
..	..	..	..	..	..	..	82-87	"	L.	10 1/2"	339	82-87
..	..	..	..	..	..	..	82-42	Pipe sluice.	K.	6"	47	81-93
..	..	..	..	..	..	..	81-93	Head sluice.	L.	..	5,901	..
..	..	..	..	1	32'	10'	81-72	Pipe sluice.	R.	6 1/2"	86	81-52
..	..	..	..	..	..	..	81-52	"	..	..	..	..
..	..	..	..	..	..	..	81-52	"	..	..	..	..
..	..	..	3	1' 8"	81-52	..	78-52	Pipe sluice.	L.	4"	38	78-09
..	..	..	..	..	..	..	78-09	"	R.	8"	85	77-57
..	..	..	..	..	..	..	77-57	"	L.	9 1/2"	117	77-57
..	..	..	..	..	..	..	77-57	Pipe sluice.	R.	8"	117	77-31
..	..	..	..	..	..	..	77-34	"	L.	7"	92	77-31
..	..	..	..	..	..	..	77-31	"	L.	10"	290	76-70
..	..	..	..	..	..	..	76-70	"	..	..	..	..
..	..	..	..	..	..	..	76-61	Pipe sluice.	R.	6 1/2"	115	73-97
..	..	..	3	1' 8"	76-61	1	74-61	"	L.	15 1/2"	348	73-36
..	..	..	..	..	..	..	74-61	"	R.	7"	65	73-36
..	..	..	..	..	..	..	73-97	"	L.	9 1/2"	119	73-34
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
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..	..	..	..	..	..	..	73-36	"	..	..	..	..
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..	..	..	..	..	..	..	73-36	"	..	..	..	..
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..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
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..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
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..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
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..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..	..	73-36	"	..	..	..	..
..	..	..	..	..	..</							

Tabular Statement of Works to accompany

Distance from head.	Name of work.	Channel.							Discharge.		
		Area irrigable.	Bed width.	Depth of water full supply.	Depth of water maximum.	Side slope.	Bed fall.	Width of land occupied.	Mean velocity.	Discharge calcu- lated.	Discharge required.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

VADAVAR

DISTRIB

Vadavar Extension

[illegible]

Vadavar No. 2

[illegible]

Estimate for the Cauvery Reservoir Project—*cont.*

Cross drainage.			Falls.			Bridges.				Sluices.					Remarks.
Area of drainage basin.	Calculated flood discharge.	Discharge provided for.	Number.	Width.	Crest level above and below.	Number.	Span.	Width of roadway.	Reduced level of bed.	Description.	Right or left bank	Number and area of vent.	Arrage.	Sill level.	
(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)

SYSTEM—cont.

BUTARIES—*cont.*

Channel—cont.

[illegible]

Channel.

..	..	..	..	..	..	..	..	85 96	Pipe sluic.	..	10 1/2"	..	85 96
..	..	..	..	..	..	..	..	84 61	"	L.	12 1/2"	144	84 5
..	..	..	..	..	..	..	..	84 30	"	S.	11 1/2"	175	84 30

Tabular Statement of Works to accompany

[illegible]

VADAVAR.

DISTR.

Vadavar No. 3

WLS.	FT.		ACS.	FT.	FT.	FT.	PER 1,000	FT.	FT. PER SECOND.	C. FT. PER SECOND.	C. FT. PER SECOND.
0	..	Head sluice and 75 feet drop	1,414	..	..	..	..	..	..	..	19.37
0	0	Sluice left bank	1,353	9.50	1.5	..	33	52	1.22	18.66	18.53
0	2,772	Do. right bank	1,083	7.0	1.5	..	35	59	1.25	14.60	14.83
0	2,772	Do. left bank	..	..	..	..	..	..	..	..	..
1	1,782	Do. right bank	570	4.0	1.5	..	42	49	1.23	8.80	7.81
1	1,782	Do. left bank	..	..	..	..	..	..	..	..	..
1	4,422	Do. right bank	437	3.0	1.3	..	42	36	1.14	6.90	6.00
1	4,422	Do. left bank	..	..	..	..	..	..	..	..	..
1	4,422	Regulator and bridge	..	..	..	..	..	..	..	..	..
2	792	Sluice left bank	..	..	..	..	..	..	..	..	..
2	792	Cross wall with vent	..	..	..	..	..	..	..	..	..

Actual 1:1; for calculation of discharges $\frac{1}{2}$: 1.

Vadavar No. 4

[illegible]

Vadavar No. 5

0	..	Head sluice	528	4 0	1-3	..		0-12	51	1-14	6-90	7-16
0	1,518	4 feet drop and bridge	..	..	..	..		..	..	..	..	..
0	1,980	Sluice right bank	390	3-0	1-3	..		0-45	41	1 11	5-22	5-34
0	1,980	Sluice left bank	..	..	..	..		..	..	..	..	..
6	2,310	3 feet drop	..	..	..	..		..	..	..	..	..
0	3,300	Sluice right bank	..	..	..	..		..	..	..	..	..
0	3,300	l'o. left bank	..	..	..	..		..	..	..	..	..
0	3,500	Cross wall with vent	..	..	..	..		..	..	..	..	..

Vadavar No. 6.

[illegible]

Estimate for the Cauvery Reservoir Project—*cont.*

Cross drainage.			Falls.		Bridges.			Sluices.					Remarks.		
Area of drainage basin.	Calculated flood discharge.	Dis-charge provided for.	Bays.		Crest level above and below.	Openings.		Width of roadway.	Reduced level of bed.	Description.	Right or left bank.	Number and area of vent.		Acreage.	Sill level.
			Number.	Width.		Number.	Span.								
(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)

SYSTEM- cont.

BUTARIES—*cont.*

Channel

SQUARE MILE.	C. FT. PER SECOND.	O. FT. PER SECOND.	FT.	PT.		FT.	PT.	PT.					
..	..	..	..	..	..	..	..	83-42	..	One vent 1' 8" x 1' 6"	..		
..	..	..	..	..	..	..	..	82-67	Pipe sluice.	L.	8'	61	82-67
..	..	..	..	..	..	..	..	82-67	"	R.	11 $\frac{1}{2}$ "	234	81-75
..	..	..	..	..	..	..	..	81-75	"	L.	4 $\frac{1}{2}$ "	36	81-75
..	..	..	..	..	..	..	..	80-23	"	R.	15 $\frac{1}{2}$ "	334	80-23
..	..	..	..	..	..	..	..	80-23	"	L.	11 $\frac{3}{4}$ "	179	80-23
..	..	..	..	..	..	..	..	79-10	"	R.	5"	56	79-10
..	..	..	..	..	..	..	..	79-10	"	L.	6"	77	79-10
..	..	..	1	1' 1 $\frac{1}{2}$ "	79-10	1	4	10	79-10	..	..	..	..
..	..	..	..	..	..	..	..	78-41	"	L.	11"	124	78-41
..	..	..	..	..	..	..	..	78-41	"	..	15"	313	78-41

Channel.

[illegible]

Channel.

										One vent 1'×1.3'×1.35'					
..	..	..	..	1'	0 $\frac{1}{2}$ "	68.51	..	..	..	69.14	..	..	..	..	
..	..	..	..	1			..	..	10	68.51	..	..	..	..	
..	..	..	..		$\frac{1}{4}$	64.51	..	..		64.51	Pipe sluice.	R.	9"	52	64.30
..	..	..	..	..			..	..		64.30	"	L.	7 $\frac{1}{2}$ "	51	64.30
..	..	..	..	..	8 $\frac{1}{2}$ "	64.15	..	..		64.30	..	..	..	..	
..	..	..	..	1			..	..		64.15	..	..	..	..	
..	..	..	..		$\frac{1}{4}$	61.15	..	..		61.15	Pipe sluice.	R.	7 $\frac{1}{2}$ "	113	60.70
..	..	..	..	..			..	..		60.70	"	L.	6 $\frac{1}{2}$ "	85	60.70
..	..	..	..	..			..	..		60.70	..	..	10 $\frac{1}{2}$ "	192	60.70
..	..	..	..	..			..	..		63.70	..	..			

Channel.

..	..	..	..	..	..	..	..	67-98	Pipe sluice.	R.	124"	..	..
..	..	..	..	..	..	..	..	67-30	"	..	8"	82	67-30
..	..	..	..	..	..	..	..	67-30	"	..	144"	303	67-30
..	..	..	..	..	..	..	..	67-30	"	..	Dr.		

Tabular Statement of Works to accompany

Distance from head.	Name of work.	Channel.							Discharge.		
		Area irrigable.	Bed width.	Depth of water full supply.	Depth of water maximum.	Side slope.	Bed fall.	Width of land occupied.	Mean velocity.	Discharge calculated.	Discharge required.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

VADAVAR

DISTRI

Vadavar

MILE.	FT.	ACS.	FT.	FT.	FT.	PER 1,000.	FT.	FT.	C. FT. PER SECOND.	C. T. PER SECOND.
0	0	Head sluice	527	..	..	..	..	..	..	7.22
0	0	Sluice, right bank	480	4.0	1.3	..	42	42	1.14	6.90
0	1,320	2 feet drop	..	..	..	..	..	..	..	..
0	2,640	Sluice, right bank	..	..	..	..	..	..	..	..
0	2,640	Sluice, left bank	..	..	..	..	..	..	..	..
0	2,640	Cross wall with vent	..	..	..	..	..	..	..	..

Vadavar

0	0	Head sluice	522	..	..	..	..	..	..	7.15
0	0	Sluice, right bank	366	3.0	1.3	..	48	42	1.14	5.01
0	0	Sluice left bank	..	..	..	..	..	..	..	..
0	330	Four feet drop	..	..	..	..	..	..	..	..
0	1,320	Six feet drop	..	..	..	..	..	..	..	..
0	1,980	Sluice, right bank	..	..	..	..	..	..	..	..
0	1,980	Sluice, left bank	..	..	..	..	..	..	..	..
0	1,980	Cross wall with vent	..	..	..	..	..	..	..	..

Vadavar

0	0	Head sluice	187	2.0	1.3	..	30	36	0.80	2.75
0	990	Four feet drop	..	..	..	..	..	..	..	..

Vadavar

0	0	Head sluice and 2.25 feet drop	846	5.5	1.5	..	37	52	1.24	11.58
0	990	Sluice, right bank	718	4.5	1.5	..	40	52	1.23	9.67
0	990	Sluice, left bank	..	..	..	..	..	..	..	..
0	990	Four feet drop	..	..	..	..	..	..	..	..
0	2,310	Sluice, right bank	..	..	..	..	..	..	..	..
0	2,310	Sluice, left bank	581	4.0	1.5	..	42	61	1.23	8.80
0	2,310	Six feet drop	..	..	..	..	..	..	..	..
0	2,970	Four feet drop	..	..	..	..	..	..	..	..
0	3,300	Sluice, right bank	..	..	..	..	..	..	..	..
0	3,300	Sluice, left bank	..	..	..	..	..	..	..	..
0	3,630	Four feet drop	..	..	..	..	..	..	..	..

Vadavar

0	0	Head sluice and 3 feet drop	278	..	..	..	..	..	..	3.67
0	0	Sluice, left bank	187	2.0	1.3	..	30	43	0.80	2.75
0	1,980	Cross wall with vent	..	..	..	..	..	..	..	..

Estimate for the Cauvery Reservoir Project—cont.

Cross drainage.			Falls.			Bridges.			Reduced level of bed.	Sluice.					Remarks
Area of drainage basin.	Calculated discharge.	Discharge provided for.	Number.	Width.	Crest level above and below.	Number.	Span.	Width of roadway.		Description.	Right or left bank.	Number and area of vent.	Ageage.	Sill level.	
(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)

SYSTEM—cont.

BUTANIES—cont.

No. 7 Channel.

..	..	..	..	..	..	..	..	..	62.94	..	..	One vent 1' X 1.3' = 13 sq. ft.	..	..	..
..	..	..	..	..	..	..	..	..	62.94	Pipe sluice.	R.	6"	47	62.94	..
..	..	..	..	1' 0"	62.38	..	..	..	62.38	..	..	..	..	..	..
..	..	..	1	1/2	60.38	..	..	..	60.38	Pipe sluice.	R	7"	83	59.82	..
..	..	..	..	..	59.82	..	..	..	59.82	..	L	7"	84	59.82	..
..	..	..	..	..	59.82	..	..	..	59.82	..	..	13 1/2	3.3	59.82	..

No. 8 Channel.

..	..	..	..	..	..	..	..	..	60.06	Pipe sluice.	R.	7"	66	60.06	..
..	..	..	..	..	..	..	..	..	60.06	..	L.	8 1/2"	90	60.06	..
..	..	..	..	8"	59.90	..	..	..	59.90	..	..	..	..	..	..
..	..	..	1	1/2	55.90	..	..	..	55.90	..	..	..	..	..	..
..	..	..	..	..	55.42	..	..	..	55.42	..	..	..	..	..	..
..	..	..	1	1/2	49.42	..	..	..	49.42	..	..	..	..	..	..
..	..	..	..	..	49.10	..	..	..	49.10	Pipe sluice.	R.	6"	71	49.10	..
..	..	..	..	..	49.10	..	..	..	49.10	..	L	6"	72	49.10	..
..	..	..	..	..	49.10	..	..	..	49.10	..	..	10 1/2"	223	49.10	..

No. 9 Channel.

..	..	..	..	..	..	..	..	..	53.42	Pipe sluice.	..	10" Dr.	..	..	..
..	..	..	1	3 1/2"	53.12	..	..	..	53.12	..	..	..	..	..	..
..	..	..	..	1/2	49.12	..	..	..	49.12	..	..	..	..	..	..

No. 10 Channel.

..	..	..	..	..	..	..	..	..	49.93	..	..	One vent, 1' 4" X 1' 6" = 2.00 sq. ft.	..	..	..
..	..	..	..	..	..	..	..	..	47.68	Pipe sluice.	R.	5 1/2"	61	47.31	..
..	..	..	..	..	..	..	..	..	47.31	..	L.	5 1/2"	67	47.31	..
..	..	..	..	1' 1 1/2"	47.31	..	..	..	47.31	..	..	..	..	..	..
..	..	..	..	1/2	43.31	..	..	..	43.31	Pipe sluice.	R.	5"	57	42.78	..
..	..	..	..	..	42.78	..	..	..	42.78	..	L.	6"	80	42.78	..
..	..	..	..	11 1/2"	42.78	..	..	..	42.78	..	..	..	..	..	..
..	..	..	1	1/2	36.78	..	..	..	36.78	..	..	..	..	..	..
..	..	..	..	..	36.50	..	..	..	36.50	..	..	..	..	..	..
..	..	..	1	1/2	32.50	..	..	..	32.50	Pipe sluice.	R.	5"	42	32.36	..
..	..	..	..	..	32.36	..	..	..	32.36	..	L.	6"	57	32.36	..
..	..	..	..	..	32.22	..	..	..	32.22	..	..	..	..	..	..
..	..	..	1	1/2	28.22	..	..	..	28.12	..	..	..	..	..	..

No. 11 Channel.

..	..	..	..	..	..	..	..	..	39.45	Pipe sluice.	..	12"	..	..	..
..	..	..	..	..	..	..	..	..	36.45	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	36.45	..	L.	10"	91	36.45	..
..	..	..	..	..	..	..	..	..	35.85	..	..	10"	187	35.85	..

Estimate for the Cauvery Reservoir Project—*cont.*

Cross drainage.			Falls.		Bridges.			Sluices.					Remarks.		
Area of drainage basin.	Cul. dated flood charge.	charge as fixed ft.	Bays.	Crest level above and below.	Openings.	Width of roadway.	Reduced level of bed.	Description.	Right or left bank.	Number and area of vent.	Acresage.	Still level.			
(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)

SYSTEM—*cont.*

BUTARIES—cont.

No. 12 Channel.

SQUARE MILES.	C. FT. PER SECOND.	C. FT. PER SECOND.	FT. IN.	FT. IN.	FT.	FT.	FT.
..	..	..	..	..	..	..	39-45
..	..	..	..	..	..	Pipe sluice.	L. 4"
..	..	..	..	..	..	"	R. 6 1/2"
..	..	..	..	..	..	"	L. 4 1/2"
..	..	..	6 1/2"	39-25	..	"	39-25
..	..	..	1	..	..	..	39-25
..	..	..	1/8	36-25	..	..	36-25
..	..	..	..	..	..	Pipe sluice.	R. 5 1/2"
..	..	..	..	..	..	"	L. 5"
..	..	..	5 1/4"	35-42	..	..	56
..	..	..	1	..	..	..	46
..	..	..	1/8	32-22	..	..	..
..	..	..	..	..	..	Pipe sluice.	R. 5 1/8"
..	..	..	..	..	..	"	L. 5 1/2"
..	..	..	2 1/2"	30-29	..	..	53
..	..	..	1	..	..	..	58
..	..	..	1/8	27-29	..	..	..
..	..	..	..	..	..	..	27-29

Channel.

[illegible]

471

Estimate for the Cauvery Reservoir Project—cont.

SYSTEM—*cont.*

Channel—cont.

SQUARE MILES.	C. FT. PER SECOND.	C. FT. PER SECOND.	FT.	FT.		FT.	FT.	FT.							
..	..	..	..	..	..	..	..	52-90	Pipe sluice.	R.	11 $\frac{1}{8}$ '	333	52-90		
..	..	..	..	..	..	..	..	52-43	"	L.	12 $\frac{3}{8}$ "	210	52-43.		
..	..	..	..	..	..	..	..	52-20	"	R.	8 $\frac{1}{2}$ "	193	52-20		
			1' 7 $\frac{1}{2}$ "	51-97				51-97							
..	..	..	1			1	8	10	..	..	..	..	..	..	..
			$\frac{1}{3}$	49-97					49-97	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	49-21	..	..	..	..	..	..
..	..	..	..	..	..	1	8	14	49-01	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	48-98	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	48-22	Pipe sluice.	L.	8 $\frac{1}{2}$ "	98	48-22	
..	..	..	..	..	..	..	..	..	48-22	Head sluice.	L.	1-1 X 1-3	427	..	
												= 1-43			
												sq. ft.			
..	..	..	..	..	..	..	..	..	48-22	Open head.	..	..	..	..	..

..	..	..	..	..	..	..	..	10	60.97	..	One vent 1' × 1' = 1 sq. ft.	
..	..	..	..	..	..	..	..	..	59.91	Pipe sluice.	L. 10 1/2	59.91
..	..	..	..	..	..	..	..	..	59.61	"	L. 7"	59.91
..	..	..	..	..	..	..	..	..	59.75	..	..	156
..	..	..	1	..	..	..	..	..	55.75	..	..	655
..	..	..	1	..	..	..	..	..	55.75	..	..	..

..	..	..	..	..	..	..	..	..	48.22	..	One vent $1.3' \times 1.1' = 1.43$ sq. ft.			
..	..	..	1	$10\frac{1}{2}$	47.44	1	4	10	47.44	..	..	..	..	
..	..	..	1	$\frac{1}{6}$	45.44	..	..	..	45.44	Pipe sluice.	R.	5"	46	45.32
..	..	..	..	..	..	..	..	..	45.32	..	L.	7 $\frac{1}{2}$ "	97	45.32
..	..	..	..	..	..	..	..	..	45.32	..	..	12"	284	44.35
..	..	..	..	..	..	..	..	..	44.35	..	..	..	..	..

[illegible]

DISTR

Palaiyur

Palaiyur

Palaiyur

Palaiyi

Distance from head.	Name of work.	Channel.							Discharge.		
		Area irrigable.	Bed width.	Depth of water full supply.	Depth of water maximum.	Eide slope.	Bed fall.	Width of land occupied.	M. in velocity.	Discharge calculated.	Discharge required.
(1)	(4)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

VADAVAR

DISTRIB.

Maharajapuram

[illegible]

Maharajapuram

[illegible]

Maharajapuram

..	..	Head sluice and 3 feet drop	..	214	2·0	1·3	..		40	48	0·93	3·23	2·93
..	792	Bridge	..	..	..	..	..		..	..	..	..	..
..	990	Sluice left bank	..	..	..	..	..		..	..	..	..	..
..	"	4 feet drop	..	151	2·0	1·3	..		20	48	0·64	2·20	2·06
..	1,650	6 feet drop	..	..	..	..	..		..	..	..	..	..

Maharajapuram

Makaragapuram															
..	..	Sluice right bank	..	..	1,503	7.0	2.0	..	Actual 1 : 1 ; for calculation of discharges : 1.	35	57	1.48	28.65	20.60	
..	..	Sluice left bank	..	..	..	..	..	..		..	..	..	..	..	..
..	792	2 feet drop	..	..	1,356	7.0	1.75	..		35	57	1.37	18.90	18.57	..
..	2,310	Sluice right bank	..	..	..	..	..	..		..	..	..	..	..	..
..	"	4 feet drop	..	..	1,118	5.5	1.75	..		37	68	1.35	14.94	15.31	..
..	3,630	Sluice right bank	..	..	963	..	..	..		..	..	..	..	..	13.20
..	"	Sluice left bank	..	..	..	..	..	..		..	..	..	..	..	..
..	3,960	3 feet drop	..	..	963	6.0	1.5	..		37	57	1.25	12.74	13.20	..
1	..	Sluice left bank	..	..	..	..	..	..		..	..	..	..	..	..
1	3,300	Sluice right bank	..	..	875	..	..	..		..	..	..	..	..	12.00
..	"	Do.	..	..	..	..	..	..		..	..	..	..	..	..
..	"	Do.	..	..	..	..	..	..		..	..	..	..	..	..
..	"	Sluice left bank	..	..	..	..	..	..		..	..	..	..	..	..
..	"	Regulator	..	..	280	2.0	1.3	..		55	48	1.11	3.83	3.83	..

Estimate for the Cauvery Reservoir Project—*cont.*

Cross drainage.			Falls.		Bridges.			Reduced level of bed.	Sluices.					Remarks.	
Area of drainage basin.	Calculated flood discharge.	Discharge provided for.	Bays.		Crest level above and below.	Openings.			Description.	Right or Left bank.	Number and area of vent.	Acreage.	Sill level.		
			Number.	Width.		Number.	Span.	Width of roadway.							
(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)

SYSTEM—cont.

BUTARIES—*cont.*

Channel.

SQUARE MILES.	C. FT. PER SECOND.	C. FT. PER SECOND.	FT.	FT.		FT.	FI.	FT.												
..	..	..	..	..	..	..	..	62-94	One vent 5' 3"	R.	6 $\frac{1}{8}$ "	88	62-94							
..	..	..	..	..	..	..	..	"	Pipe sluice.	L.	5 $\frac{7}{8}$ "	67	"							
..	..	..	..	..	..	..	..	62-30	"	R.	5 $\frac{7}{8}$ "	42	62-30							
..	..	..	..	..	..	..	..	"	"	L.	7 $\frac{1}{2}$ "	75	"							
..	..	..	..	..	..	..	..	61-84	"	R.	8 $\frac{3}{8}$ "	99	61-84							
..	..	..	..	..	..	..	..	"	"	L.	7 $\frac{3}{8}$ "	75	"							
..	..	..	..	..	1	12	14	61-44	Head sluice.	..	..	487	..							
..	..	..	1	1' 6"	61-39	..	..	61-39	..	..	..	..	..							
..	..	..	..	60-39	..	..	..	60-39	..	..	..	..	..							
..	..	..	..	..	..	..	..	58-89	Pipe sluice.	R.	10"	199	58-89							
..	..	..	..	..	..	..	..	"	"	L.	8 $\frac{1}{2}$ "	142	"							
..	..	..	1	1' 9"	58-86	..	..	58-86	..	..	..	..	..							
..	..	..	..	55-36	..	..	..	55-36	..	..	..	..	..							
..	..	..	..	..	..	..	..	55-12	Head sluice.	L.	..	214	..							
..	..	..	..	..	..	..	..	..	Open head.	..	..	..	..							

No. 1 Channel.

61.44	Head sluice.	One vent 1' 1" × 1' 3"	61.44
61.14	Pipe sluice.	R. 7½"	52
58.14	"	"	"
57.84	Pipe sluice.	R. 8½"	94
57.70	"	" 16"	341

No. 2 Channel.

[illegible]

No. 3 Channel.

No. 5 Channel.														55-12
..	..	..	..	1' 5"	54-85	..	..	55-12	Pipe sluice.	R.	6"	67	55-12	
..	..	..	..	1	54-85	..	..	"	"	L.	6 1/2"	80	"	
..	..	..	..	1	52-85	..	..	52-85	..	..	..	..	..	
..	..	..	..	1' 5"	52-32	..	..	52-32	Pipe sluice.	R.	10 1/2"	238	52-32	
..	..	..	..	1	52-32	..	..	52-32	..	..	..	..	..	
..	..	..	..	1	48-32	..	..	48-32	..	..	..	..	..	
..	..	..	..	1' 2"	47-70	..	..	47-70	Pipe sluice.	R.	6"	90	47-83	
..	..	..	..	1	47-70	..	..	47-70	"	L.	5 1/2"	65	"	
..	..	..	..	1	44-70	..	..	44-70	..	..	..	..	..	
..	..	..	..	1	44-21	..	..	44-21	Pipe sluice.	L.	7 1/2"	88	44-21	
..	..	..	..	1	42-98	..	..	42-98	"	R.	7 1/2"	80	42-98	
..	..	..	..	1	42-98	..	..	42-98	"	R.	15 1/2"	333	"	
..	..	..	..	1	42-98	..	..	42-98	"	R.	5"	32	"	
..	..	..	..	1	42-98	..	..	42-98	"	L.	10 1/2"	160	"	
..	..	..	..	1	42-98	..	..	42-98	..	..	..	..	..	
..	..	..	..	1	42-98	..	..	42-98	..	..	..	..	..	

APPENDICES.

APPENDIX

Tabular statement of particulars regarding cross

Serial number.	Reduced distance in feet.	Particulars.	Drainage								
			Catchment basin in square miles.	Maximum flood discharge in cusecs.	Bed level.	Drop wall crest.	Floor of tunnel.	Lift wall crest.	M.F.L. in front of drop wall.	M.F.L. in front of tunnel.	M.F.L. in rear.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1	2/3960	Syphon aqueduct	17.75 sq. miles.	4,083	180.50	180.50	172.32	177.32	188.36	187.26	185.70
2	4/0784	Do.	96.5	12,623	174.00	174.00	169.80	174.00	182.52	181.68	180.00
3	4/7582	Do.	10.5	2,877	178.78	178.78	168.78	173.78	185.33	182.83	180.28
4	5/5070	Do.	30	5,793	174.65	174.65	167.65	172.65	181.53	179.93	178.15
5	5/9750	Do.	9.8	2,747	176.43	176.43	166.96	171.96	182.97	180.72	178.46
6	8/6247	Do.	10.4	2,859	164.47	164.47	162.97	164.47	173.60	172.90	170.97
7	10/0049	Do.	41.25	7,163	166.90	166.90	160.90	165.90	174.75	173.64	171.90
8	11/2430	Do.	5.6	1,892	163.05	163.05	159.05	163.05	171.28	170.22	168.05
9	12/0970	Do.	2.15	1,000	167.77	167.77	158.77	Level width floor. Do.	172.47	165.70	163.77
10	12/5569	Do.	3	1,248	165.09	165.09	158.09	Do.	169.73	165.08	163.09
11	12/1719	Superpassage	Existing waterway of inlet is provided and the drain is diverted by side drain to R. 11. 12/5569.		182.32	182.32	182.32	182.32	Level		
12	13/6850	Inlet sluice	0.16	43.2 for 10" run off.	165.56	165.56	165.56	Dropped 4.0' into canal bed	..	172.20	171.56
13	13/6850	Surplus sluice	0.16	43.2 for 10" run off.	161.56	161.56	161.56	..	..	171.56	166.56
14	14/0090	Inlet sluice	0.3	81 cusecs for 10" run off.	162.50	162.50	162.50	Dropped 1.7' into canal bed.	..	171.40	170.80
15	14/0090	Surplus sluice	0.3	81 cusecs for 10" run off.	160.80	160.80	160.80	..	..	170.80	165.80
16	14/2095	Syphon aqueduct	0.5	378	160.50	160.50	154.00	158.00	165.47	163.67	162.00
17	14/3930	Do.	1.00	600	158.60	158.70	153.70	157.70	165.32	164.47	162.70
18	14/6200	Do.	2.375	1,068	160.65	160.65	152.85	157.85	165.29	164.09	162.62
19	15/5250	Do.	1.00	600	158.44	158.36	152.51	156.51	162.41	161.64	159.48
20	15/6750	Canal syphon	16.90	3,951	162.30	..	162.30	..	..	168.80	168.30
21	15/6540	Syphon aqueduct	1.00	600	159.11	159.11	150.48	154.48	162.97	162.03	160.00
22	17/3200	Do.	2.30	1,045	156.16	158.00	147.52	152.52	162.02	158.41	156.52
23	18/0989	Do.	5.40	1,848	154.41	154.41	146.31	151.31	160.68	159.58	157.70
24	18/5450	Do.	1.75	872	156.28	156.45	146.44	150.44	160.01	155.46	153.44

DIX I.

drainage works of the Grand Anicut Canal.

course.					Canal.							Remarks.
Waterway provided rise 2 feet. (13)	Discharge provided for in cusecs. (14)	Fall of stream. (15)	Proposed fall for cutting out rear channel where necessary. (16)	Bed width of rear Channel to be cut. (17)	Bed width in feet. (18)	Bed level (19)	F.S.L. (20)	Waterway provided. (21)	Discharge provided for in cusecs. (22)	Discharge required in cusecs. (23)		
529 6 of 12' X 6'	4,083	Stream diverted into Vennar at level. + 77.32 in 2 furlongs			87	180	182.32	189.32	120	4,136	4,115	
1,590 18 of 12' X 6'	12,623	7.4 per mile.	..	250	177	179.80	186.80	117	4,068	4,073		
312.70 7 of 6' X 6'	2,877	7.6 per mile.	1 in 1,470	68	177	178.78	185.78	Full width.	4,068	4,073		
708.80 8 of 12' X 6'	5,793	15	1 in 800	130	177	177.65	184.65	117	4,068	4,073		
312.70 7 of 6' X 6'	2,747	12.7	1 in 1,000	70	177	176.96	183.96	Full width.	4,068	4,073		
357 8 of 6' X 6'	2,859	14.2	..	65	177	172.97	179.97	..	4,068	4,073		
883.3 10 of 12' X 6'	7,163	7.5	..	160	172	170.90	177.90	115	3,956	3,960		
223.4 5 of 6' X 6'	1,892	9.75	..	45	172	169.05	176.05	Full canal width.	3,956	3,960		
120 4' X 6' X 5'	1,000	45	1 in 800	30	172	167.77	174.77	Do.	3,956	3,960		
150 5' X 7' X 5'	1,248	55	1 in 500	30	172	167.09	174.09	Do.	3,956	3,960		
19 X 4	380	5	..	25	84	162.84	172.84	81	3,905	3,905		
36 6 X 6	178	45	1 in 200	..	84	161.56	171.56	Full canal width.	3,905	3,905		
25 5 X 4	300	45	1 in 1,000	15	84	161.56	171.56	Do	3,905	3,905		
12.5 3 X 3 X rise 1 1/2	300	45	1 in 600	..	84	160.80	170.80	Do.	3,905	3,905		
5' X 5'	300	45	..	15	84	160.80	170.80	Do.	3,905	3,905		
52.56 2 of 4' X 5'	378	26.5	..	14	171	163.00	170.00	Do.	3,905	3,905		
78.84 4' X 5'	600	15.5	1 in 800	25	171	162.70	169.90	Do.	3,905	3,905		
3 spans 6 X 6 = 134.	1,071	25'	1 in 2,000	50'	171	162.85	169.85	Do.	3,905	3,898		
3 spans 4 X 5 = 78.7 sq. ft.	631	15'	1 in 1,000	45'	166	161.01	168.01	Do.	3,789	3,808		
109'	3,937	Existing fall and bed width.			156	160.49	167.49	8 vents of 12' X 6'	3,572	3,572		
3 spans 4 X 5' or 78.7 sq. ft.	631	15'	1 in 2,000	23'	115	159.48	165.98	Full canal width and depth.	2,342	2,352		
3 spans 6 X 6 or = 134.	1,072	30'	1 in 1,000	50'	114	157.52	164.02	Do.	2,328	2,328		
5 spans 6 X 6 or 234 sq. ft.	1,787	25'	1 in 2,000	50'	113	156.31	162.81	Do.	2,303	2,312		
4 spans 4 X 5' or 105 sq. ft.	841	20'	1 in 1,000	57'	112	154.44	161.94	Do.	2,288	2,292		

Tabular statement of particulars regarding cro-

Serial number. (1)	Reduced distance in feet. (2)	Drainage									
		Particulars. (3)	Catchment basin in square miles. (4)	Maximum flood discharge in cusecs. (5)	Bed level. (6)	Drop wall crest. (7)	Floor of tunnel. (8)	Lift wall crest. (9)	M.F.L. in front of drop wall. (10)	M.F.L. in front of tunnel. (11)	M.F.L. in rear. (12)
25	19/3165	Syphon aqueduct	..	1.06	624	155.53	155.61	145.44	149.44	158.91	155.44
26	19/9150	Do.	..	3.75	1,448	149.31	149.31	143.48	148.48	155.35	154.35
27	20/7600	Do.	..	1.00	600	152.03	152.02	143.10	147.10	155.22	152.04
28	21/8750	Do.	..	35.00	6,420	143.48	143.95	140.42	143.95	153.47	152.57
29	23/3360	Do.	..	88.96	11,957	142.57	142.50	137.98	142.50	149.81	148.19
30	23/6000	Do.	..	2.40	1,080	144.24	144.26	139.56	142.56	149.32	148.46
31	24/6430	Do.	..	0.65	450	142.26	142.26	137.90	140.90	146.29	145.80
32	25/3560	Do.	..	3.03	1,209	143.27	143.24	135.74	139.74	147.33	145.59
33	25/9530	Do.	..	0.73	486	145.06	143.00	135.80	138.80	145.91	144.19
34	26/8428	Do.	..	8.965	2,589	140.30	140.40	133.40	137.40	145.49	143.75
35	28/2135	Do.	..	2.33	1,056	135.44	135.44	132.12	135.12	141.15	140.51
36	28/9500	Do.	..	1 sq. mile	600	136.71	136.80	129.86	133.86	140.09	138.70
37	30/2135	Under tunnel	..	1.22	634	128.80	128.80	137.47	137.47	137.47	136.77
38	30/2685	Syphon aqueduct	..	294.67 sq. miles.	132.05	126.95	127.71	122.71	127.71	138.19	136.31
39	30/7835	Do.	..	39.615	127.21	127.21	121.97	127.21	137.62	135.80	134.77
40	32/6400	Do.	..	28.00	5,533	129.64	129.55	122.80	127.83	136.64	134.89
41	33/8334	Do.	..	3.08	1,270	129.90	129.83	121.83	125.83	133.65	131.65
42	34/2400	Do.	..	2.64	1,146	129.25	129.12	121.12	125.12	132.63	130.35
43	34/6250	Do.	..	0.46	358	130.60	130.44	121.44	124.44	130.50	129.69
44	35/3750	Do.	..	7.27	22.52	123.78	123.63	118.13	123.13	130.64	129.50
45	36/1570	Do.	..	0.31	275	128.86	127.02	115.77	121.77	128.17	126.06
46	36/3100	Do.	..	0.37	309	125.60	125.50	118.50	121.50	128.16	126.82
47	37/0800	Do.	..	1.38	744	124.06	124.10	117.10	120.10	127.89	126.34
48	37/8300	Do.	..	38	8,990	118.52	118.76	113.76	118.76	126.71	125.82

drainage works of the Grand Anicut Canal—cont.

course.					Canal.							Remarks.
Water way provided rise 2 feet. (13)	Discharge provided for in cusecs. (14)	Fall of stream. (15)	Proposed fall for cutting out rear channel where necessary. (16)	Bed width of rear channel to be cut. (17)	Bed width in feet. (18)	Bed level (19)	F.S.L. (20)	Water way provided. (21)	Discharge provided for in cusecs. (22)	Discharge required in cusecs. (23)	(24)	
3 spans 4 × 5 or 78.8 sq. ft.	630	25'	1 in 1,000	46'	106	154.44	160.44	Full canal width and depth.	1,923	1,923		
4 spans 6 × 6 or 78.7 sq. ft.	1,430	15'	"	60'	106	153.48	159.48	Do.	1,923	1,923		
3 spans 4 × 5 or 78.7 sq. ft.	630	20'	"	45'	101	152.10	158.10	Do.	1,833	1,834		
9 spans 12 × 6' or 795 sq. ft.	6,360	15'	"	110'	62	150.32	156.32	62 × 6'	1,823	1,834	Kattar river.	
17 spans 12 × 6 or 616	12,012	Existing fall and bed width.			100	147.98	6'	Contracted width 61'.	1,816	1,813	Maharajasamudram river.	
4 spans 6 × 4 or 131 sq. ft.	1,048	15'	1 in 1,000	50'	100	147.56	6'	Full canal width.	1,816	1,813		
2 spans 6 × 4 or 65	520	30'	"	35'	98	146.90	6'	Do.	1,781	1,779		
4 spans 6 × 5 or 155	1,240	15'	1 in 700	50'	97	144.74	6'	Do.	1,758	1,750		
2 spans 6 × 4 or 65	520	16'	1 in 1,000	30'	97	143.80	6'	Do.	1,758	1,750		
8 spans 6 × 5 or 309	2,475	Discharges into tank.		1 in 900	100'	93	142.40	6'	Full canal width.	1,682	1,680	
4 spans 6 × 4 or 131	1,048	40'	1 in 800	52'	93	140.12	5½'	Do.	1,480	1,480		
2 spans 6 × 5 or 73	586	"	"	40'	88	138.86	5½'	Do.	1,397	1,387		
2 spans 12 × 4 or 129 sq. ft.	645	Discharges into tank.			79	136.80	5½'	Do.	1,252	1,254		
12 spans 12 × 10 or 1,636	13,088	Existing fall and bed width.			79	136.71	5½'	46'	1,252	1,254	Nariyar river.	
24 spans 12 × 10 or 3,272	26,176	Do.			79	135.85	5½'	46'	1,252	1,254	Agniar river.	
12 × 6	5,533	12'	1/1,000	139'	78	132.83	138.33	45'	1,246	1,237		
8 6 × 5	1,270	30'	1/1,000	54'	52	130.83	135.83	Full canal width.	Full canal dis- charge. Do.	Full canal dis- charge. Do.		
4 6 × 5	1,146	25'	1/1,000	54'	52	130.12	135.12	Do.	Do.	Do.		
4 4 × 4	358	30'	1/2,000	19'	52	129.44	134.44	Do.	Do.	Do.		
2 6 × 6	2,252	8'	1/1,000	78'	50	128.13	133.13	Do.	Do.	Do.		
6 4 × 7	275	35'	1/1,000	16'	49	126.77	131.77	Do.	Do.	Do.		
1 4 × 4	309	35'	1/1,000	22'	49	126.50	131.00	Do.	Do.	Do.		
2 4 × 4	744	15'	1/1,000	33'	49	125.10	129.60	Do.	Do.	Do.		
4 12 × 6	8,990	1/1,000	1/1,000	225	49	123.76	128.26	25	564	564	Ambuliar river.	
13												

Tabular statement of particulars regarding cro.

Serial number.	Reduced distance in feet.	Drainage									
		Particulars.	Catchment basin in square miles.	Maximum flood discharge in cusecs.	Bed level.	Drop wall crest.	Floor of tunnel.	Lift wall crest.	M.F.L. in front of drop wall.	M.F.L. in front of tunnel.	M.F.L. in rear.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
49	38/7800	Syphon aqueduct ..	1.13	651	121.20	121.05	112.05	117.05	124.29	122.51	121.0
50	39/8300	Do. ..	0.53	393	119.90	119.93	111.93	114.93	123.32	121.07	18.9
51	40/6000	Do. ..	2.94	1,231	119.43	119.23	108.23	113.23	123.22	120.08	118.2
52	41/6000	Do. ..	20.38	4,477	110.98	111.03	106.03	111.03	119.07	118.11	116.2
53	42/1400	Do. ..	0.20	205	114.82	114.84	105.84	109.84	117.79	116.07	113.3
54	42/5400	Do. ..	0.22	219	112.31	122.46	104.96	108.96	115.83	114.44	112.4
55	42/6400	Do. ..	5.20	1,801	112.67	112.74	103.74	108.74	117.73	115.48	113.7
56	43/3500	Do. ..	0.38	315	112.18	112.18	104.18	107.18	115.06	112.56	111.1
57	44/2600	Do. ..	26.2	5,293	107.80	107.70	100.20	105.20	114.28	112.54	110.7

drainage works of the Grand Anicut Canal—cont.

course.					Canal.							Remarks.
Water way provided rise 2 feet. (13)	Discharge provided for in cusecs. (14)	Fall of stream. (15)	Proposed fall for cutting out rear channel where necessary. (16)	Bed width of rear channel to be cut. (17)	Bed width in feet. (18)	Bed level. (19)	F.S.L. (20)	Water way provided (21)	Discharge provided for in cusecs. (22)	Discharge required cusecs. (23)		
$\frac{4 \times 6}{3}$	651	30' per mile	1/1,000	31	49	122.05	126.55	Full canal section.	Full dis- charge.	..	Maruthangudiar river.	
$\frac{4 \times 4}{2}$	392	15' "	1/1,000	19	44	119.93	124.43	Do.	Do.	..		
$\frac{4 \times 6}{5}$	1,231	10' "	1/1,000	36	44	118.23	123.73	Do.	Do.	..		
$\frac{12 \times 6}{6}$	4,477	10' "	1/800	107	12	116.03	120.03	20	Do.	..		
$\frac{4 \times 5}{1}$	205	20' "	1/1,000	12	41	114.84	118.84	Full canal section.	Do.	..		
$\frac{4 \times 5}{1}$	219	15' "	1/1,000	12	41	113.96	117.96	Do.	Do.	..		
$\frac{6 \times 6}{5}$	1,801	15' "	1/800	53	41	113.74	117.74	Do.	Do.	..		
$\frac{4 \times 4}{2}$	315	25' "	1/2,000	21	38	112.18	116.18	Do.	Do.	..		
$\frac{12 \times 6}{7}$	5,293	38' "	1/1,320	158	38	110.20	110.20	18	..	..		

APPENDIX II.

List of Bridges on Main and Branch Canals.

Serial number.	Class of bridge.	Particulars.	R.D.	Remarks.
(1)	(2)	(3)	(4)	(5)
<i>Grand Anicut Canal.</i>				
1	C	Regulator with bridge on cart-track from Grand Anicut to Togur.	0/00-00	
2	C	Cart-track from Kiliyur to Solingampatti Railway station.	1/36-10	
3	C	Cart-track from Kaohamangalam to Solingampatti	2/88-00	
4	C	Cart-track from Maraneri to Solingampatti	3/94-53	
5	Railway bridge	South Indian Railway	4/14-04	
6	Foot bridge	Footpath from Kattarapatti to Vinnaur	5/12-20	
7	C	Cart-track from Pungavur to Iyanapuram station.	5/49-49	
8	C	Cart-track from Viramaresampatti to Budalur	6/20-00	
9	B	Road from Singepatti to Thirukattupalli	7/11-50	
10	C	Cart-track from Sellappampatti to Sittarakudi	7/79-12	
11	C	Cart-track from Kuruvadipatti to Alakkudi	9/03-75	
12	B	Road from Vellam to Alakkudi	10/25-00	
13	Foot bridge	Footpath from South Manasampatti to North Manasampatti.	11/8-81	
14	..	Railway bridge	12/34-50	
15	C	Cart-track from Reddipaliam to Vallam	12/40-75	
16	Special	Road from Tanjore town to Vallam	13/49-07	
17	Foot bridge	Muhammadan cemetery	13/65-40	
18	Special	Tanjore town to Railway station road	13/67-68	
19	Do.	Cadell's road bridge	13/88-90	
20	Do.	Negapatam road bridge	14/01-50	
21	..	Railway bridge	14/07-40	
22	C	Regulator combined with bridge for cart-track from Vilar to Vetturkar street.	14/16-40	
23	C	Cart-track from Kandumpatti to Karamuthirakota	15/31-00	
24	C	Regulator with bridge	15/99-40	
25	C	Cart-track from Kandudampatti to Pudunur	16/40-40	
26	C	Cart-track from Tanjore to Kuttakurichi	17/63-35	
27	C	Cart-track from Tanjore to Rayakudi	18/49-00	
28	B	Road from Vallam to Orthanad	19/20-00	
29	C	Regulator with bridge	19/25-80	
30	C	Bridge connecting Karuppadipatti village.	20/52-50	
31	C	Bridge connecting villages	21/40-00	
32	C	Cart-track to Kirathoor	22/67-50	
33	C	Cart-track from Peyadipatti to Pappapatti	24/37-96	
34	Foot bridge	Footpath to Gandharanidudi	24/95-30	
35	C	Cart-track from Chinnakornidudi to Thoppuvududi	25/61-30	
36	B	Road from Gandharvakota to Patukota	26/38-30	
37	C	Regulator with bridge	26/94-28	
38	C	Cart-track from Karambakudi to adjacent villages.	28/51-35	
39	C	Do.	29/36-35	
40	C	Cart-track from Thirumananjeri to Korambakudi.	31/73-25	
41	C	Regulator combined with bridge on cart-track from Kelatheru to Seruvavidudi.	33/66-00	
42	C	Cart-track from Neduvasal-Kilapadi to Siruvavidudi.	34/65-00	
43	C	Cart-track from Periyarayakipuram to Mangadu.	35/69-00	
44	C	Regulator combined with bridge on cart-track from Pulicheugadu, etc., to Nagaram road.	36/25-50	
45	C	Cart-track from Mangadu to Nagaram	37/70-00	
46	B	Road from Pattukkottai to Nagaram	38/80-00	
47	C	Cart-track from Nagaram to Vembankudi	39/76-00	
48	Foot bridge	Footpath from Keeramangalam to adjacent villages.	40/25-00	
49	C	Regulator combined with bridge on cart-track from Ayangudi to Nagaram.	41/36-00	
50	C	Cart-track from Mangudi to Ayangudi Railway station.	45/27-00	
51	B	Road from Pattukkottai to Aranthangi	44/50-00	
52	..	Railway bridge	44/55-00	
<i>Kalyanodai Branch Canal.</i>				
1	..	Regulator with bridge	9/0000	
2	B	Tanjore-Pattukkottai road	0/58-55	With 3' drop.
3	C	Cart-track from Madigai leading to Tanjore-Vaduvur road.	0/26-50	
4	..	Regulator with bridge	1/69-40	
5	B	Tanjore-Pattukkottai road	2/02-80	

List of bridges on Main and Branch Canals—cont.

Serial number.	Class of bridge.	Particulars.	R.D.	Remarks.
(1)	(2)	(3)	(4)	(5)
<i>Kalyanodai Branch Canal—cont.</i>				
6	C	Cart-track from Kollangarai to Ulavur	2/87-30	
7	C	Cart-track from Alyapdikal to Thumawanada	4/58-70	
8	C	Cart-track from Neduvakotah to Orthanad	5/47-28	
9	B	Tanjore-Pattukkottai road	7/15-90	
10	C	Cart-track from Poovathoor to Thendarampet	8/52-30	
<i>Vadakkadu Branch Canal.</i>				
1	B	Tanjore-Pattukkottai road	1/08-00	With 1' drop combined.
2	C	Cart-track from Chinnakunti to Vallur	2/03-00	
3	C	Cart-track from Papanad to Thondarampattu	2/67-80	With 1' drop combined.
4	C	Cart-track from Ambalapattu to Kannukudi	4/39-74	
5	C	Cart-track from Ambalapattu to Mullurkudikadu.	4/99-74	
6	B	Mannargudi-Pattukkottai road	5/63-00	Regulator combined.
<i>Rajamadam Branch Canal.</i>				
1	..	Regulator with bridge	0/0000	
2	C	Cart-track from Vadakkur to Sethurankudikadu	0/77-00	
3	C	Cart-track from Karapadapatti to Orthanad	1/51-20	With 4' drop combined.
4	C	Cart-track from Kakkarakota to Orthanad	7/27-45	
5	..	Regulator with bridge	3/47-75	
<i>Pudupatnam Branch.</i>				
1	..	Regulator with bridge at head	0/0000	
<i>Vadavar and Vadavar Extension Canal.</i>				
1	C	Cart-track from Palliyeri to Vennalodai	2/11-20	
2	Masonry bridge	From Tanjore to Tiruvadi	3/13-50	Existing.
3	Do.	Do.	3/26-70	Do.
4	..	Railway bridge for Madras to Tanjore line	4/55-40	Do.
5	Foot bridge	Footpath from Raramathuraikota to Pulavanatham.	6/36-90	
6	C	Cart-track from Nellitope to Vanamadavi	6/81-45	
7	B	Road to Negapatam from Tanjore	7/42-50	In place of an existing bridge.
8	C	Cart-track from Malayanatham to Edavakkudi	7/83-75	
9	..	Five vents of 20' span Railway bridge, Tanjore to Negapatam line.	8/15-10	Railway bridge.
10	C	Cart-track from Jambugammalpuram to Kambayanatham.	9/02-55	
11	C	Cart-track from Arasapattu to Kambayanatham	9/75-15	
12	C	Regulator at head of Vadavar Extension canal	10/83-00	
13	C	Road from Arumapettai to Vaduvur	11/85-36	
14	B	Road from Tanjore to Mannargudi	12/18-36	
15	C	Cart-track from Vaduvur Thenpatti to Palukota.	12/81-56	
16	C	Cart-track from Vaduvur Thenpatti to Karakota.	13/27-26	
17	C	Cart-track from Karavakurichi to Edangakota Kilayur.	13/89-30	

Note.—All drops on the Kalyanodai, Vadakkadu, Rajamadam and Pudupatnam branches and also in the Vadavar extension canal may be used as foot-bridges by providing foot planks over the notches in the drop-walls.

APPENDIX III

Calculations to find the lines of Pressures, Reservoir full and empty and the maximum stresses on the base at different depths in the profile of dam (Plan No. 5 H. and attached small scale profile).

CAUVERY DAM AT METUR SITE.

1. Data—

- (i) Maximum water level for calculations (full reservoir level is + 785) + 788.00
 (ii) Level of top of dam without the parapets + 793.00
 (iii) Top width of dam (exclusive of piers and arches) ... 10 feet.
 (iv) Bottom width of dam at the lowest level of foundation ... 193.10 feet.
 (v) Specific gravity of masonry = $2\frac{1}{4}$
 (vi) Specific gravity of earth-filling in front = 1.80
 (vii) The weight of 1 cubic foot of masonry is taken as unity.
 (viii) Batters—

	LEVEL.	LEVEL.	
Upstream face ...	+ 793.00 to + 750.00	...	Vertical.
	+ 750.00 to + 730.00	...	1 in 10
	+ 730.00 to + 690.00	...	1 in 20
	+ 690.00 to + 650.00	...	1 in 10
	+ 650.00 to + 592.00	...	1 in 2
Downstream face ...	+ 793.00 to + 772.00	...	Vertical.
	+ 772.00 to + 750.00	...	1 in 2
	+ 750.00 to + 690.00	...	7 in 10
	+ 690.00 to + 592.00	...	19 in 20

- (ix) + 698.00 is the deepest level of foundations of the right section of the dam estimated.
 (x) + 640.00 is the deepest level of foundation of the middle section of the dam estimated.
 (xi) + 592.00 is the deepest level of foundation of the left or the deep section of the dam as estimated.

2. The method adopted in these calculations to find out the points of intersection of the resultant pressures on the base is by taking moments of all the forces acting on the element of dam standing on any particular layer about some convenient vertical line and in this case about the vertical front face of the dam (A. B. plan No. 5 H).

* Derived from formula Wegmann, page 12, of 1903 edition.

The maximum pressures on any layer are obtained from the formulae $\frac{2w}{l} \left\{ 2 - \frac{3u}{l} \right\} \sec \alpha$

† Minutes, Proceedings of Institute of Civil Engineers, Volume CLXXII, page 156.

for Bouvier's value and from $\frac{2w}{l} \left\{ 2 - \frac{3w}{l} \right\} \sec \alpha$

for Unwin's value †, where w = the resultant vertical weight in tons; l = the length of the base in feet; u = outer third of the base in feet.

α = the angle which the resultant of the vertical weight and the water pressure compounded makes with the vertical; and α = the angle which the face of dam makes with the vertical.

In the case of reservoir empty, the water pressure becomes zero.

Then the maximum pressure formula becomes simply $\frac{2w}{l} \left\{ 2 - \frac{3u}{l} \right\}$.

3. Taking sections of the dam profile in succession from the top, we obtain the following results:—

I. Layer 770.00—

	Weights.	Moments about A.B.
Weight of portion of dam above + 770.00, rectangular portion	230.0	1,150
Weight of portion of dam above + 770.00, triangular portion	1.0	11
Downstream parapet with corbelling	13.0	215
Road metalling = $\frac{14 \times 75 \times 8}{9}$	9.3	77
Upstream parapet with corbelling	12.0	0
Portion of bridge between + 793.00 and 790.00	18.0	234
Arch per foot run = $\frac{531}{26}$	= 20.5	266
Spandrills per foot run = $\frac{447}{26}$	= 18.3	238
Pier above + 770.00 = $\frac{(7\frac{1}{2} \times 6 - 1) 6}{26}$	= 10.2	133
Total ...	332.3	2,324

$$\therefore \text{Up stream third} = \frac{2,324}{332.3} = 6.99 \text{ feet.}$$

$$\text{Water thrust} = \frac{18 \times 18}{2} \times \frac{4}{9} = 72.$$

$$\text{Moment of water thrust} = \frac{72 \times 18}{3}$$

$$\therefore \text{Centre third} = \frac{72 \times 18}{3 \times 332.3} = 1.30 \text{ feet.}$$

II. Layer 760.00. Base width = 16 feet—

Portion of dam above 760.00, rectangular portion	330.0	1,650
Do. triangular portion downstream	36.0	432
Bridge, parapets, roadways, etc., same as in the previous layer but for the last item "pier"	91.1	1,030
Pier per foot run, above + 760.00 = $\frac{414}{26}$	15.9	215
Total ...	473.0	3,327

$$\therefore \text{Upstream third} = \frac{3,327}{473} = 7.03 \text{ feet.}$$

$$\text{Water thrust} = \frac{28 \times 28}{2} \times \frac{4}{9} = 174.$$

$$\therefore \text{Centre third} = \frac{174 \times 28}{3 \times 473} = 3.43 \text{ feet.}$$

$$\therefore \text{Downstream third} = 16.00 - 7.03 - 3.43 = 5.54 \text{ feet.}$$

III. Layer 750.00. Base width = 21.00 feet—

Weight of dam above + 750.00, rectangular portion	430	2,150
Weight of dam above + 750.00 triangular portion downstream	121	1,654
Bridge, parapets, road metalling, pier, etc, per foot run, same as in the case of layer + 760.00	107	1,245
Total ...	658	5,049

$$\therefore \text{Upstream third, reservoir empty} = \frac{5,049}{658} = 7.67 \text{ feet.}$$

$$\text{Water thrust} = \frac{38 \times 38}{2} \times \frac{4}{9} = 321.$$

$$\therefore \text{Centre third} = \frac{321 \times 38}{3 \times 658} = 6.18 \text{ feet.}$$

$$\therefore \text{Downstream third} = 21.00 - 7.67 - 6.18 = 7.15 \text{ feet.}$$

IV. Layer 730.00. Base width = 37.00 feet—

Reservoir empty.	Weights.	Moments about A.B.
Portion above 750.00	658.0	5,049
Between 750 and 730.00 rectangular portion	420.0	4,410
Between 750 and 730.00 triangular portion downstream	140.0	3,593
Portion upstream of A.B.	20.0	— 13
Total ...	1,238	13,039

$$\text{Upstream third} = \frac{13,039}{1,238} + 2.00 = 10.53 + 2 = 12.53 \text{ feet.}$$

Reservoir full.	Weights.	Moments about A.B.
As for reservoir empty	1,238	13,039
Add weight of water on the slant upstream face	42.7	— 46
Total ...	1,280.7	12,993

$$\therefore \text{Upstream third reservoir full} = \frac{12,993}{1,280.7} + 2.00 = 10.15 + 2.00 = 12.15 \text{ feet.}$$

$$\text{Water thrust} = \frac{58 \times 58}{2} \times \frac{4}{9} = 748$$

$$\text{Centre third} = \frac{748 \times 58}{3 \times 1280.7} = 11.29 \text{ feet.}$$

$$\therefore \text{Downstream third} = 37.00 - 12.15 - 11.29 = 37.00 - 23.44 = 13.56 \text{ feet}$$

V. Layer 710.00. Base width = 52.00 feet—

Reservoir empty.	Weights.	Moments about A.B.
Portion above 730.00	1,238	13,039
Portion between 730 and 710.00 rectangular portion	700	12,250
Portion between 730 and 710.00 triangular portion downstream	140	5,553
Portion upstream of the line A.B.	50	— 64
Total ...	2,128	30,778

$$\therefore \text{Upstream third reservoir empty} = \frac{30,778}{2,128} + 3.00 = 14.46 + 3.00 = 17.46 \text{ feet}$$

Reservoir full.	Weights.	Moments about A.B.
As for reservoir full in the case of layer 730.00	1,280.7	12,993
Between 730.00 and 710.00 masonry as in the case of reservoir empty	890	17,739
		30,732

Water load on the slant upstream face	30.3	— 77
Total ...	2,201	30,655

$$\therefore \text{Upstream third reservoir full} = \frac{30,655}{2,201} + 3.00 = 16.93 \text{ feet.}$$

$$\text{Water thrust} = \frac{78 \times 78}{2} \times \frac{4}{9} = 1,352.$$

$$\therefore \text{Centre third} = \frac{1352 \times 78}{3 \times 2201} = 15.97 \text{ feet.}$$

$$\therefore \text{Downstream third} = 52.00 - 16.93 - 15.97 = 52.00 - 32.90 = 19.10 \text{ feet.}$$

VI. Layer 698.00. Base width = 61.00 feet—

Reservoir empty.	Weights.	Moments about A.B.
Portion above 710.00 reservoir empty	2,128	30,778
Portion between 710.00 and 698.00 rectangular portion	588	14,406
Portion between 710.00 and 698.00 triangular portion downstream	50.4	2,611
Portion upstream of line A.B.	39.6	— 67
	2,806	47,728

$$\therefore \text{Upstream third reservoir empty} = \frac{47,728}{2,806} + 3.6 = 20.61 \text{ feet.}$$

Reservoir full.	Weights.	Moments about A.B.
Portion above 710.00 reservoir full	2,201	30,655
Contents in layer 710.00 to 698.00 as in the case of reservoir empty above	678	16,950
Water load on the slant upstream face	22.4	— 74
	2,901.4	47,531

$$\therefore \text{Upstream third reservoir full} = \frac{47,531}{2,901.4} + 3.6 = 16.38 + 3.6 = 19.98 \text{ feet.}$$

$$\text{Water thrust} = \frac{90 \times 90}{2} \times \frac{4}{9} = 1,800$$

$$\text{Centre third} = \frac{1,800 \times 30}{2,901.6} = 18.61 \text{ feet.}$$

$$\therefore \text{Downstream third} = 61.00 - 19.98 - 18.61 = 61.00 - 38.59 = 22.41 \text{ feet.}$$

Maximum stresses on the base.

Reservoir full. Downstream.

$$\tan \alpha = \frac{1,800}{2,901} \therefore \alpha = 31^\circ 49'$$

$$\therefore \text{Maximum stress, bouvier} = \frac{5,802.8}{16 \times 61} \left\{ 2 - \frac{67.23}{61} \right\} \sec^2 31^\circ 49'$$

(vertical pressure).

$$= 5.34 \times 1.382 = 7.37 \text{ tons per square foot.}$$

$$\text{Unwin} = 5.34 \times \frac{149}{100} = 7.95 \text{ tons per square foot.}$$

Reservoir empty. Upstream.

$$\text{Bouvier} = \frac{2 \times 2,806}{16 \times 61} \left\{ 2 - \frac{61.83}{61} \right\} = 5.75 \times .986 = 5.67 \text{ tons per square foot.}$$

$$\text{Unwin} = 5.67 \text{ tons per square foot.}$$

This is the deepest level of the foundation of the Right section as estimated.

VII. Layer 690.00. Base width = 67.00 feet—

Reservoir empty.	Weights.	Moments about A.B.
Portion above 698.00, reservoir empty	2,806	47,728
Rectangular portion between 698.00 and 690.00	459.2	13,179
Triangular portion between 698.00 and 690.00 downstream	22.4	1,327
Portion upstream of A.B.	30.4	— 58
Total ...	3,318	62,176

$$\therefore \text{Upstream third reservoir empty} = \frac{62,176}{3,318} + 4.00 = 18.74 + 4.00 = 22.74 \text{ feet.}$$

VII. Layer 690.00. Base width = 67.00 feet—cont.

Reservoir full.	Weights.	Moments about A.B.
Portion above 695.00 reservoir full	2,901.4	47,531
Contents between 695.00 and 690.00 as in the case of reservoir empty above	512.0	14,448
Water load on the slant upstream face	16.7	61,979
Total	3,430.1	61,915

$$\therefore \text{Upstream third reservoir full} = \frac{61,915}{3,430.1} + 4.00 = 22.05 \text{ feet.}$$

$$\text{Water thrust} = \frac{98.98}{2} \times \frac{4}{9} = 2,134.2.$$

$$\text{Centre third} = \frac{2,134.2 \times 98}{3 \times 3,430.1} = 20.32 \text{ feet.}$$

$$\therefore \text{Downstream third} = 67.00 - 42.37 = 24.63 \text{ feet.}$$

Maximum stresses on the base.

Downstream. Reservoir full.

$$\text{Bouvier} = \frac{2 \times 3,430.1}{67 \times 16} \left(2 - \frac{73.89}{67} \right) \sec^2 31.54' = 6.40 \times .898 \times 1.39$$

vertical pressure.
 $= 5.74 \times 1.39 = 7.98 \text{ tons per square foot.}$

$$\text{Unwin} = \frac{5.74 \times 149}{100} = 8.55 \text{ tons per square foot.}$$

Upstream. Reservoir empty.

$$\text{Vertical stress} = \frac{2 \times 3,318}{76 \times 16} \left(2 - \frac{68.22}{67} \right) = 6.19 \times .982 = 6.07 \text{ tons per square foot (Bouvier).}$$

VIII. Layer 670.00. Base width = 88.00 feet—

Reservoir empty.	Weights.	Moments about A.B.
Portion above 690.00 reservoir empty	3,318	62,176
Portion between 690 and 670.00 rectangular portion	1,260	39,690
Portion between 690 and 670.00 triangular portion downstream	190	13,173
Portion upstream of the line A.B.	100	115,029
Total	4,868	114,786

$$\therefore \text{Upstream third reservoir empty} = \frac{114,786}{4,868} + 6.00 = 29.58 \text{ feet.}$$

Reservoir full.	Weights.	Moments about A.B.
Portion above 690.00 reservoir full	3,430.1	61,915
Contents between 690 and 670.00 as in the case of reservoir empty above	1,550	52,610
Water load on the slant upstream face	96	483
Total	5,076.1	114,042

$$\therefore \text{Upstream third reservoir full} = \frac{114,042}{5,076.1} + 6.00 = 28.47 \text{ feet.}$$

$$\text{Water thrust} = \frac{118 \times 119}{2} \times \frac{4}{9} = 3,094.2.$$

$$\text{Centre third} = \frac{3,094.2 \times 118}{5,076.1 \times 3} = 23.98 \text{ feet.}$$

$$\therefore \text{Downstream third} = 88.00 - 52.45 = 35.55 \text{ feet.}$$

VIII. Layer 670.00. Base width = 88.00 feet—cont.

Maximum stresses on the base.

Reservoir full. Downstream.

$$\text{Bouvier} = \frac{2 \times 5,076.1}{16 \times 88} \left\{ 2 - \frac{106.65}{88} \right\} \sec^2 31.22' = 7.21 \times .788 \times 1.36$$

vertical pressure.
 $= 5.68 \times 1.36 = 7.72 \text{ tons per square foot.}$

$$\text{Unwin} = 5.68 \times 1.9 = 10.79 \text{ tons per square foot.}$$

Reservoir empty. Upstream.

$$\text{Bouvier} = \frac{2 \times 4,868}{16 \times 88} \left\{ 2 - \frac{88.74}{88} \right\} = 6.91 \times .992 = 6.85 \text{ tons per square foot.}$$

$$\text{Unwin} = 6.85 \times \frac{101}{100} = 6.92 \text{ ton per square foot.}$$

IX. Layer 650.00. Base width = 109.00 feet—

Reservoir empty.	Weights.	Moments about A.B.
Portion above 670.00 reservoir empty	4,868	114,786
Portion between 670.00 and 650.00 rectangular portion	1,640	67,240
Portion between 670.00 and 650.00 triangular portion downstream	190	16,783
Portion upstream of A.B.	140	198,809
Total	6,838	198,316

$$\therefore \text{Upstream third reservoir empty} = \frac{198,316}{6,838} + 8.00 = 37.00 \text{ feet.}$$

Reservoir full.	Weights.	Moments about A.B.
Portion above 670.00 reservoir full	5,076.1	114,042
Contents between 670.00 and 650.00 same as in reservoir empty above	1,970	83,530
Water load on the slant upstream face between 650 and 670	113.8	—800
Total	7,159.9	196,772

$$\therefore \text{Upstream third reservoir full} = \frac{196,772}{7,159.9} + 8.00 = 35.48 \text{ feet.}$$

$$\text{Water thrust} = 4,232$$

$$\therefore \text{Centre third} = \frac{4,232}{7,159.9} \times \frac{138}{3} = 27.19 \text{ feet.}$$

$$\therefore \text{Downstream third} = 109.00 - 62.67 = 46.33 \text{ feet.}$$

Maximum stresses on the base—Reservoir full—downstream.

$$\text{Bouvier} = \frac{2 \times 7,159.9}{16 \times 109} \left\{ 2 - \frac{138.99}{109} \right\} \sec^2 30.35' = 8.21 \times .725 \times 1.35$$

vertical pressure.
 $= 5.95 \times 1.35 = 8.03 \text{ tons per square foot.}$

$$\text{Unwin} = 5.95 \times 1.9 = 11.31 \text{ tons per square foot.}$$

Reservoir empty—upstream.

$$\text{Bouvier} = \frac{2 \times 6,838}{16 \times 109} \left\{ 2 - \frac{111.00}{109} \right\} = 7.84 \times .982 = 7.70 \text{ tons per square foot.}$$

$$\text{Unwin} = 7.70 \times \frac{101}{100} = 7.78 \text{ tons per square foot.}$$

247

X-A. Layer 640.00. Base width = 123.50 feet—

Neglecting the earth filling on the upstream face of the dam below 650.00:

Reservoir empty.	Weights.	Moments about A.B.
Portion above 650.00 reservoir empty ...	6,838	198,316
Portion between 650.00 and 640.00 rectangular portion ...	1,010	51,005
Do. triangular portion downstream ...	47.5	4,948
	7,895.5	2,54,269
Portion upstream of A.B. ...	80	— 320
Do. ...	25	— 242
	8,000.5	253,707

$$\therefore \text{Upstream third reservoir empty} = \frac{253,707}{8,000.5} + 13 = 44.71 \text{ feet.}$$

Reservoir full.	Weights.	Moments about A.B.
Portion above 650.00 reservoir full ...	7,159.9	196,772
Contents between 650.00 and 640.00 same as in the case of reservoir empty ...	1,162.5	55,391
		252,163
Water load on the slant upstream face ...	317.8	— 3,346
	8,640.2	248,817

$$\therefore \text{Upstream third reservoir full} = \frac{248,817}{8,640.2} + 13.00 = 41.80 \text{ feet.}$$

$$\text{Water thrust} = \frac{148 \times 148}{2} \times \frac{4}{9} = 4,867.6.$$

$$\therefore \text{Centre third} = \frac{4,867.6}{8,640.2} \times \frac{148}{3} = 27.79 \text{ feet.}$$

$$\therefore \text{Downstream third} = 53.91 \text{ feet.}$$

Maximum stresses on the base.

Reservoir full.	Downstream.
Bouvier =	$\frac{17,280.4}{16 \times 123.5} \left\{ 2 - \frac{161.73}{123.5} \right\} \text{Sec}^2 29^\circ 24'$
	$= 8.75 \times .69 \times 1.32$
	(vertical pressure).
	$= 6.04 \times 1.32 = 7.97 \text{ tons per square foot.}$
Unwin =	$6.04 \times 1.9 = 11.48 \text{ tons per square foot.}$
Reservoir empty. Upstream.	
Bouvier =	$\frac{16,001}{16 \times 123.5} \left\{ 2 - \frac{134.13}{123.5} \right\}$
	$= 8.10 \times .914 = 7.40 \text{ tons per square foot.}$
Unwin =	$\frac{7.40 \times 5}{4} = \frac{37.00}{4} = 9.25 \text{ tons per square foot.}$

Note.—This is the lowest level of foundation as estimated of the middle section of the Cauvery dam; earth filling on the upstream face of the dam below + 650.00 is omitted from the calculations.

X-B. Layer 640.00. Base width = 123.50 feet—

Taking into account the earth filling on the upstream face—

Reservoir empty.	Weights.	Moments about A.B.
Same as in the previous case ...	8,000.5	253,707
Earth filling on the upstream face ...	17.5	— 198
	8,018	253,509

$$\therefore \text{Upstream third reservoir empty} = \frac{253,509}{8,018} + 13.00 = 44.62 \text{ feet.}$$

X-B. Layer 640.00. Base width = 123.50 feet—cont.

Reservoir full.	Weights.	Moments about A.B.
Same as in the previous case ...	8,640.2	248,817
Earth filling in front ...	17.5	— 198
Subtract for this earth filling amount of water that has already been added on in the water load of the previous calculations ...	— 9.7	+ 110
	8,648	248,729

$$\therefore \text{Upstream third reservoir full} = \frac{248,729}{8,648} + 13.00 = 41.76 \text{ feet.}$$

$$\text{Centre third} = \frac{4,867.6 \times 148}{8,647.8 \times 3} = 27.77 \text{ feet.}$$

$$\therefore \text{Downstream third reservoir full} = 123.50 - 69.53 = 53.97 \text{ feet.}$$

Maximum stresses on the base.

Reservoir full.	Downstream.
Bouvier =	$\frac{2 \times 8,648}{16 \times 123.5} \left\{ 2 - \frac{161.91}{123.5} \right\} \text{Sec}^2 29^\circ 22'$
	$= 8.75 \times .689 \times 1.32$
	(vertical pressure).
	$= 6.03 \times 1.32 = 7.96 \text{ tons per square foot.}$
Unwin =	$6.03 \times 1.9 = 11.46 \text{ tons per square foot.}$

Reservoir empty. Upstream.

Bouvier =	$\frac{2 \times 8,018}{16 \times 123.5} \left\{ 2 - \frac{133.86}{123.5} \right\} = 8.12 \times .916 = 7.44 \text{ tons per square foot.}$
Unwin =	$\frac{7.44 \times 5}{4} = \frac{37.20}{4} = 9.30 \text{ tons per square foot.}$

XI. Layer 630.00. Base width = 133.00 feet—

Reservoir empty.	Weights.	Moments about A.B.
Portion above 650.00 reservoir empty ...	6,838	198,316
Portion between 650.00 and 630.00 rectangular portion ...	2,020	102,010
Portion between 650.00 and 630.00 triangular portion downstream ...	190	20,393
		320,719
Portion upstream of A.B. ...	160	— 640
Do. ...	100	— 1,133
Earth filling on upstream face specific gravity of earth being 1.80 ...	70	— 1,027
		— 2,800
Total ...	9,378	317,919

$$\therefore \text{Upstream third reservoir empty} = \frac{317,919}{9,378} + 18.00 = 51.90 \text{ feet.}$$

Reservoir full.	Weights.	Moments about A.B.
Portion above 650.00 reservoir full ...	7,159.9	196,772
Contents between 650.00 and 630.00 same as in the case of reservoir empty, above ...	2,540.0	119,603
		316,375
Water load on the slant upstream face ...	618.9	— 8,052
Total ...	10,318.8	308,323

$$\therefore \text{Upstream third reservoir full} = \frac{308,323}{10,318.8} + 18.00 = 47.88 \text{ feet.}$$

XI. Layer 630.00. Base width = 138.00 feet—cont.

Water thrust = 5,547.5.

$$\text{Centre third} = \frac{5,547.5}{10,318.8} \times \frac{158}{3} = 28.31 \text{ feet.}$$

$$\therefore \text{Downstream third} = 138.00 - 76.19 = 61.81 \text{ feet.}$$

Maximum stresses on the base.

Reservoir full. Downstream.

$$\text{Bouvier} = \frac{2 \times 10,318.8}{16 \times 138} \left\{ 2 - \frac{185.43}{138} \right\} \sec^2 28^\circ 16' = 9.35 \times .656 \times 1.29.$$

(vertical pressure).

$$= 6.13 \times 1.29 = 7.91 \text{ tons per square foot.}$$

$$\text{Unwin} = 6.13 \times 1.90 = 11.65 \text{ tons per square foot.}$$

Reservoir empty. Upstream.

$$\text{Bouvier} = \frac{2 \times 9,378}{16 \times 138} \left\{ 2 - \frac{155.70}{138} \right\} = 8.49 \times .872 = 7.40 \text{ tons per square foot.}$$

$$\text{Unwin} = \frac{7.40 \times 5}{4} = 9.25 \text{ tons per square foot.}$$

XII. Layer 620.00. Base width = 152.50 feet—

	Reservoir empty.	Weights.	Moments about A.B.
Portion above 630.00 reservoir empty	...	9,378	317,919
Portion between 630.00 and 620.00 rectangular portion	...	1,200	72,000
Do. triangular portion downstream	...	47.5	5,851
		10,625.5	395,770
Portion upstream of A.B.	...	180.0	— 1,620
Do.	...	25.0	— 491
Earth filling on the upstream face	...	87.5	— 1,808
			— 3,919
		10,918	391,851

$$\therefore \text{Upstream third reservoir empty} = \frac{391,851}{10,918} + 23.00 = 58.90 \text{ feet.}$$

	Reservoir full.	
Portion above 630.00 reservoir full	...	10,318.8
Contents between 630.00 and 620.00 same as in the case of reservoir empty above	...	1,540.0
		382,255
Water load	...	313.5
		12,172.3
		375,828

$$\therefore \text{Upstream third reservoir full} = \frac{375,828}{12,172.3} + 23.00 = 53.87 \text{ feet.}$$

$$\text{Water thrust} = \frac{168 \times 168}{2} \times \frac{4}{9} = 6,272.$$

$$\therefore \text{Centre third} = \frac{6,272}{12,172.3} \times 56 = 28.85 \text{ feet.}$$

$$\therefore \text{Downstream third} = 152.50 - 82.72 = 69.78 \text{ feet.}$$

Maximum stresses on the base.

Reservoir full. Downstream.

$$\text{Bouvier} = \frac{2 \times 12,172.3}{16 \times 152.50} \left\{ 2 - \frac{209.34}{152.50} \right\} \sec^2 27^\circ 16'$$

$$= 9.98 \times .627 \times 1.265 = 6.26 \times 1.265 = 7.92 \text{ tons per sq. ft.}$$

XII. Layer 626.00. Base width = 152.50 feet—cont.

$$\text{Unwin} = 6.26 \times 1.9 = 11.89 \text{ tons per square foot.}$$

Reservoir empty. Upstream.

$$\text{Bouvier} = \frac{2 \times 10,918}{16 \times 152.50} \left\{ 2 - \frac{176.70}{152.50} \right\} = 8.95 \times .841 = 7.53 \text{ tons per square foot.}$$

$$\text{Unwin} = \frac{7.53 \times 5}{4} = \frac{37.65}{4} = 9.41 \text{ tons per square foot.}$$

XIII. Layer 615.00. Base width = 159.75 feet—

	Reservoir empty.	Weights.	Moments about A.B.
Portion above 630.00 reservoir empty	...	9,378	317,919
Portion between 630 and 615.00 rectangular portion	...	1,800	108,000
Portion between 630 and 615.00 triangular portion downstream	...	106.9	13,336
		11,284.9	439,255
Portion upstream of A.B.	...	270.0	— 2,430
Do.	...	56.2	— 1,152
Earth filling in front	...	144.0	— 3,184
			— 6,766
		11,755.1	432,489

$$\therefore \text{Upstream third reservoir empty} = \frac{432,489}{11,755.1} + 25.50 = 62.29 \text{ feet.}$$

Reservoir full.

Portion above 630.00 reservoir full	...	10,318.8	308,323
Contents between 630.00 and 615.00 same as in the case of reservoir empty above	...	2,377.1	114,570
			422,893

Water load	...	471.7	— 10,266
		13,167.6	412,627

$$\text{Upstream third reservoir full} = \frac{412,627}{13,167.6} + 25.50 = 56.83 \text{ feet.}$$

Water thrust = 6,651.

$$\text{Centre third} = \frac{6,651}{13,167.6} \times \frac{173}{3} = 29.13 \text{ feet.}$$

$$\therefore \text{Downstream third} = 159.75 - 85.96 = 73.79 \text{ feet.}$$

Maximum stresses on the base.

Reservoir full.

Downstream.

$$\text{Bouvier} = \frac{2 \times 13,167.6}{16 \times 159.75} \left\{ 2 - \frac{221.37}{159.75} \right\} \sec^2 26^\circ 48'$$

(Vertical pressure.)

$$= 10.30 \times 0.614 \times 1.255 = 6.324 \times 1.255 = 7.94 \text{ tons per square foot.}$$

$$\text{Unwin} = 6.324 \times 1.90 = 12.02 \text{ tons per square foot.}$$

Reservoir empty. Upstream.

$$\text{Bouvier} = \frac{2 \times 11,755.1}{16 \times 159.75} \left\{ 2 - \frac{186.87}{159.75} \right\} = 9.20 \times .83 = 7.64 \text{ tons per square foot.}$$

$$\text{Unwin} = \frac{7.64 \times 5}{4} = \frac{38.20}{4} = 9.55 \text{ tons per square foot.}$$

XIV. Layer 610.00. Base width = 167.00 feet—

Reservoir empty.	Weights.	Moments about A.B.
Portion above 630.00 reservoir empty	9,378	317,919
Portion between 630.00 and 610.00 rectangular portion	2,400	144,000
Portion between 630.00 and 610.00 triangular portion downstream	190	24,003
	11,968	485,922
Portion upstream of A.B.	360	— 3,240
Do.	100	— 2,133
Earth filling on the upstream face specific gravity = 1.8	210	— 4,948
	—	— 10,321
Total ...	12,638	475,601

$$\therefore \text{Upstream third reservoir empty} = \frac{475,601}{12,638} + 28.00 = 65.63 \text{ feet.}$$

Reservoir full.

Portion above 630.00 reservoir full	10,318.8	308,323
Contents between 630.00 and 610.00 same as in the case of reservoir empty above	3,260.0	157,682
Water load	630.0	— 14,499
	14,208.8	451,506

$$\therefore \text{Upstream third reservoir full} = \frac{451,506}{14,208.8} + 28.00 = 59.77 \text{ feet.}$$

Water thrust = 7,041.

$$\therefore \text{Centre third} = \frac{7,041}{14,208.8} \times \frac{178}{3} = 29.40 \text{ feet.}$$

$$\therefore \text{Downstream thier} = 167.00 - 89.17 = 77.83 \text{ feet.}$$

Maximum stresses on the base.

Reservoir full. Downstream.

$$\text{Bouvier} = \frac{2 \times 14,208.8}{16 \times 167} \left\{ 2 - \frac{233.49}{167} \right\} \sec^2 16^\circ 22'$$

$$= 10.63 \times .602 \times 1.245.$$

(Vertical pressure).

$$= 6.40 \times 1.245.$$

$$= 7.97 \text{ tons per square foot.}$$

Unwin = $6.40 \times 1.90 = 12.16$ tons per square foot.

Reservoir empty. Upstream.

$$\text{Bouvier} = \frac{2 \times 12,638}{16 \times 167} \left\{ 2 - \frac{196.89}{167} \right\}$$

$$= 9.46 \times .821.$$

$$= 7.77 \text{ tons per square foot.}$$

Unwin = $\frac{7.77 \times 5}{4} = \frac{38.85}{4} = 9.71$ tons per square foot.

XV. Layer 605.00. Base width = 174.25 feet—

Reservoir empty.	Weights.	Moments about A.B.
Portion above 610.00, reservoir empty	12,638	475,601
Portion between 610.00 and 605.00, rectangular portion	695	48,303
Portion between 610.00 and 605.00 triangular portion downstream	11.88	1,672
	13,344.88	525,576
Portion upstream of A.B.	140.00	— 1,960
Do. do.	6.25	— 180
Earth-filling on upstream face	74.37	— 21.75
	13,565.5	521,261

$$\therefore \text{Upstream third reservoir empty} = \frac{521,261}{13,565.5} + 30.50 = 68.92 \text{ ft.}$$

Reservoir full.

Portion above 610.00, reservoir full	14,208.8	451,506
Contents between 610.00 and 605.00 same as in the case of reservoir empty above	927.5	45,660
		497,166
Water load on slant upstream face	159.3	— 4,660
	15,295.6	492,506

$$\therefore \text{Upstream third reservoir full} = \frac{492,506}{15,295.6} + 30.50 = 62.70 \text{ feet.}$$

$$\text{Water thrust} = 7,442$$

$$\therefore \text{Centre third} = \frac{7,442}{15,295.6} \times \frac{183}{3} = 29.68 \text{ feet.}$$

$$\therefore \text{Downstream third} = 174.25 - 92.38 = 81.87 \text{ feet.}$$

Maximum stresses on the base.

Reservoir full. Downstream.

$$\text{Bouvier} = \frac{2 \times 15,295.6}{16 \times 174.25} \left\{ 2 - \frac{245.61}{174.25} \right\} \sec^2 25^\circ 56'$$

$$= 10.98 \times .59 \times 1.236 = 6.48 \times 1.236$$

$$= 8.00 \text{ tons per square foot.}$$

$$\text{Unwin} = 6.48 \times 1.90 = 12.31 \text{ tons per square foot.}$$

Reservoir empty. Upstream.

$$\text{Bouvier} = \frac{2 \times 13,565.5}{16 \times 174.25} \left\{ 2 - \frac{206.76}{174.25} \right\}$$

$$= 9.73 \times .814 = 7.924 \text{ tons per square foot.}$$

$$\text{Unwin} = \frac{7.924 \times 5}{4} = \frac{39.62}{4} = 9.905 \text{ tons per square foot.}$$

XVI. Layer 600.00. Base width = 181.50 feet.

Reservoir empty.	Weights.	Moments about A.B.
Portion above 610.00, reservoir empty	12,638	475,601
Portion between 610.00 and 600.00, rectangular portion	1,390	96,605
Do. do.	47.5	6,753
portion, downstream		
	14,075.5	578,959

XVI. Layer 600.00. Base width = 181.50 feet—cont.

	Weights.	Moments about A.B.
Portion upstream of A.B.	280.0	— 3,920
Do. do.	25.0	— 742
Earth filling on the upstream face, specific gravity of earth = 1.80	157.5	— 4,818
		— 9,480
	14,538	569,479

∴ Upstream third reservoir empty =

$$\frac{569,479}{14,538} + 33.00 = 72.17 \text{ feet.}$$

Reservoir full.

Portion above 610.00, reservoir full	14,208.8	451,506
Contents between 610.00 and 600.00 same as in the case of reservoir empty above	1,900.0	93,878

Water load on the slant upstream face	319.2	545,384
	16,428	— 9,737
		535,647

∴ Upstream third reservoir full =

$$\frac{535,647}{16,428} + 33.00 = 65.60 \text{ feet.}$$

$$\text{Water thrust} = \frac{188 \times 188}{2} \times \frac{4}{9} = 7,854.$$

$$\therefore \text{Centre third} = \frac{7,854}{16,428} \times \frac{188}{3} = 29.96 \text{ feet.}$$

$$\therefore \text{Downstream third} = 181.50 - 95.56 = 85.94 \text{ feet.}$$

Maximum stresses on the base.

Reservoir full. Downstream.

$$\text{Bouvier} = \frac{2 \times 16,428}{16 \times 181.50} \left\{ 2 - \frac{27.82}{181.50} \right\} \sec^2 25^\circ 33'.$$

$$= 11.32 \times .579 \times 1.23.$$

(Vertical Pressure).

$$= 6.55 \times 1.23 = 8.05 \text{ tons per square foot.}$$

$$\text{Unwin} = 6.55 \times 1.90 = 12.44 \text{ tons per square foot.}$$

Reservoir empty. Upstream.

$$\text{Bouvier} = \frac{2 \times 14,538}{16 \times 181.5} \left\{ 2 - \frac{216.51}{181.5} \right\}$$

$$= 10.01 \times .807 = 8.08 \text{ tons per square foot.}$$

$$\text{Unwin} = \frac{8.08 \times 5}{4} = 10.10 \text{ tons per square foot.}$$

XVII. Layer 592.00 Base width = 193.10 feet—

	Weights.	Moments about A.B.
Reservoir empty.		
Portion above 610.00, reservoir empty	12,638	475,601
Portion between 610.00 and 592.00, rectangular portion	2,502	173,889
Do. do. triangular portion downstream	153.9	22,269
Portion upstream of A.B.	504.0	— 7,056
Do. do.	81.0	— 2,511
Earth-filling on the upstream face	308.7 (32.78)	— 10,119
	16,187.6	652,073

∴ Upstream third reservoir empty =

$$\frac{652,073}{16,187.6} + 37.00 = 77.28 \text{ feet.}$$

XVII. Layer 592.00. Base width = 193.10 feet—cont.

Reservoir full.	Weights.	Moments about A.B.
Portion above 610.00 reservoir full ...	14,208.8	451,506
Contents between 610.00 and 592.00 same as in the case of reservoir empty above ...	3,549.6	176,472
Water load on the slant upstream face ...	576.5	627,978
	18,334.9	18,743
		609,235

$$\therefore \text{Upstream third reservoir full} = \frac{602359}{18,334.9} + 37.00 = 70.23 \text{ feet.}$$

$$\text{Water thrust} = 8,537.$$

$$\text{Centre third} = \frac{8,537 \times 196}{18,334.9 \times 3} = 30.42 \text{ feet.}$$

$$\therefore \text{Downstream third} = 193.10 - 100.65 = 92.45 \text{ feet.}$$

Maximum stresses on the base.

Reservoir full. Downstream.

$$\text{Bouvier} = \frac{2 \times 18,334.9}{16 \times 193.10} \left\{ 2 - \frac{277.35}{193.10} \right\} \sec^2 24^\circ 58' + -$$

$$= 11.86 \times .564 \times 1.21.$$

(Vertical pressure.)

$$= 6.69 \times 1.21 = 8.09 \text{ tons per square foot.}$$

$$\text{Unwin} = 6.69 \times 1.90 = 12.70 \text{ tons per square foot.}$$

Reservoir empty. Upstream.

$$\text{Bouvier} = \frac{2 \times 16,187.6}{16 \times 193.10} \left\{ 2 - \frac{231.84}{193.10} \right\}$$

$$= 10.48 \times .8 = 8.38 \text{ tons per square foot.}$$

$$\text{Unwin} = \frac{8.38 \times 5}{4} = \frac{41.90}{4} = 10.48 \text{ tons per square foot.}$$

Deep supply sluices. Pressure calculations.

ABSTRACT OF RESULTS.

Case I.—Calculating on horizontal joint at level of sill, viz., + 678.

Taking the whole section of the pier (20 ft. wide) for its whole length and all masonry above it, and neglecting the weight of masonry between piers over the vent and in front of it, we get results—

	FT.
Centre of pressure from downstream toe ...	38.52
Width of piers from up to downstream face at this level ...	90.30
Maximum pressure—	
Downstream toe—	
Reservoir full 7.94 tons per square foot.	(Bouvier)
8.78 do. do.	(Unwin)
Upstream toe—	
Reservoir empty.	
Maximum pressure 8.28 tons per square foot.	

Case II.—On the same horizontal joint.

The same as above but including the weight of masonry over the vent from the back of the grooves to the downstream face.

	FT.
Centre of pressure from downstream toe ...	41.94
Width of pier from upstream to downstream face as in case I ..	90.30
Maximum intensity stress—	
Reservoir full.	
7.42 tons per square foot	(Bouvier)
8.91 do. do.	(Unwin)
Maximum press Reservoir empty = 9.89 tons per square foot.	

Case III.—Neglecting the weight and effect of any part of the structure upstream of the back of the grooves on which the shutter runs.

Centre of pressure from downstream toe	...	...	...	FT.
Width of pier from upstream to downstream face	...	...	...	35.69
Maximum stress on base.	...	...	...	82.8
Reservoir full—8.72 tons per square foot	...	...	...	(Bouvier)
9.92 do. do.	...	...	...	(Unwin)
Reservoir empty—9.79 tons per square foot.	...	...	...	

Deep supply sluices stability of pier (Profile Plan No. 9 H.)

Case I.—In this case the weight of masonry in and above the pier alone is considered and not the masonry over the culvert or upstream of it.

	(Per foot run). contents.	Moments about A.B.
Weight of dam to right of A.B. above		
+ 772.00 = 21×10	210	1,050
Parapet to right of A.B.	...	...
Road metalling	$14 \times \frac{3}{4} = 10.5$	$(12 \times 16\frac{1}{2})$ 198
Parapet to left of A.B.	$2 \times 4 = 8$	$(10\frac{1}{2} \times 8\frac{1}{2})$ 87
Portion of bridge between 790.00 and 793.00	18	$(8 \times -7\frac{1}{2})$ -60
Arch per foot run	$\frac{531}{26} = 20.5$	(20.5×13) 267
Spandrils	$\frac{450}{26} = 17.3$	(17.3×13) 225
Piers	...	...
Triangular piece of masonry in the archway	$\frac{6}{2} \times \frac{60}{7} \times \frac{20}{26} = 19.7$	(7.3×13) 99
Portion of pier between 772.00 and 678.00, rectangular portion	$94 \times 16 = 1,504$	(19.7×12) 236
Portion of pier between 772.00 and 678.00, triangular portion	$65.8 \times 47 = 3,092.6$	$(1,504 \times 8)$ 12,032
Portion of pier upstream of A.B.	986	$(3,092.6 \times 37.9\%)$ 117,302
	5,906.2	4,190
		127,480

$$\therefore \text{Upstream third} = 21.58 + 8.50 = 30.08 \text{ feet.}$$

$$\text{Total length of base} = 81.80 + 8.50 = 90.30 \text{ feet.}$$

$$\text{Moment of water thrust} = \frac{110 \times 110}{2} \times \frac{4}{9} \times \frac{26}{20} \times \frac{110}{3} = 128,170$$

$$\therefore \text{Centre third} = \frac{128,170}{5,906.2} = 21.70' \text{ feet.}$$

$$\therefore \text{Downstream third} = 90.30 - 30.08 - 21.70 = 38.52 \text{ feet.}$$

Maximum stress on the base.

Reservoir full. Downstream.

$$\alpha = \tan^{-1} \frac{3,495.5}{5,906.2}$$

$$= 30^\circ 36',$$

3,495.5 being the water thrust.

$$\text{Bouvier} = \frac{2 \times 5,906.2}{16 \times 90.3} \left\{ 2 - \frac{115.56}{90.3} \right\} \sec^2 30^\circ 36'$$

$$= 8.18 \times 720 \times 1.348 = 5.89 \times 1.348$$

$$= 7.94 \text{ tons per square foot.}$$

$$\text{Unwin} = 5.89 \times \frac{149}{100} = 8.78 \text{ tons per square foot.}$$

Reservoir empty. Upstream.

$$\text{Stress} = \frac{2 \times 5,906.2}{16 \times 90.24} = 8.19 \text{ tons per square foot.}$$

Case II.—Same as case I, but including the weight of the portion of masonry over the culvert, from the back of the grooves to the downstream face.

Pier portion.	Contents per foot run.	Moments about A.B.
Taking moments about A.B. we have as in case I.	5,906.2	127,480
Vent portion.		
Above + 772.00 to downstream of A.B.	323.6	2,336
(refer to calculations in the previous case)		
Rectangular portion between 772.00 and 691.00	1,296	10,368
Triangular portion on the downstream face between		
772.00 and 691.00. $56.7 \times \frac{81}{2}$	2,296.4	$\left\{ \begin{array}{l} \text{arm} \\ 84.9 \end{array} \right\}$ 80,144
Portion to the front or upstream of A.B.	103	-51
Total vent portion per foot run	4,019	92,797

Pier portion 20 feet.	Total contents	Total moments.
Vent portion 6 feet. Do.	...	...
	118,124	2,549,600
	24,114	556,782
Total	142,238	3,106,382

$$\therefore \text{upstream third} = \frac{3,106,382}{142,238} = 21.84 + 8.50 = 30.34 \text{ feet.}$$

$$\text{Water thrust moment} = 128,170.$$

$$\text{Average contents of masonry per foot run} = \frac{142,238}{20} = 7,111.9.$$

$$\therefore \text{centre third} = \frac{128,170}{7,111.9} = 18.02 \text{ feet.}$$

$$\text{Total length of base} = 90.30 \text{ feet.}$$

$$\therefore \text{downstream third} = 90.30 - 30.34 - 18.02 = 41.94 \text{ feet.}$$

Maximum stresses on the base.

Reservoir full. Downstream—

$$\alpha = \tan^{-1} \frac{3,495.5}{7,111.9} = 26^\circ 12', 3,495.5 \text{ being the water thrust.}$$

$$\text{Bouvier} = \frac{2 \times 7,111.9}{16 \times 90.3} \left\{ 2 - \frac{125.82}{90.3} \right\} \sec^2 26^\circ 12'$$

$$= 9.85 \times 607 \times 1.24 = 5.93 \times 124.$$

$$= 7.42 \text{ tons per square foot.}$$

$$\text{Unwin} = 5.93 \times \frac{149}{100} = 8.91 \text{ tons per square foot.}$$

Reservoir empty. Upstream—

$$\text{Stress} = \frac{2 \times 7,111.9}{16 \times 91.02} = 9.77 \text{ tons per square foot.}$$

This excludes the weight of the upstream wall of the well over the sluice gate.

Including this would raise the maximum pressure reservoir empty to about 10 tons per square foot.

Case III.—Stability of the same pier, neglecting the weight of any part of the structure, upstream of the downstream side of the grooves.—

Pier portion.	Contents.	Moments about A.B.
Taking moments about A.B.		
Portion above 772.00	323.6	2,336
Rectangular portion between 772.00 and 678.00	1,504.0	12,036
Triangular portion on the downstream face between 772.00 and 678.00	3,092.6	117,302
Portion of pier in front of A.B.	116	-58
Total	5,736.2	131,612
Vent portion as in case II	4,019	92,797

	Total contents.	Total moments about A.B.
Pier portion 20 feet: Total contents ...	100,724	2,632,210
Vent portion 6 feet do.	24,114	556,782
Total ...	124,838	3,189,022

Total contents of masonry per foot run = 6,241.9

Total length of base = 81.8 feet + 1 = 82.8 feet.

∴ upstream third = $\frac{3,189,022}{124,838} + 1 = 25.55 + 1.00 = 26.55$ feet.

Centre third = $\frac{128,170}{6,241.9} = 20.53$ feet.

Downstream third = 82.80 - 26.55 - 20.53 = 35.72 feet.

Maximum stresses on the base.

Reservoir full. Downstream—

$\alpha = \tan^{-1} \frac{3,495.5}{6,241.9} = 29^\circ 15'$, 3,495.5 being the water thrust.

Bouvier = $\frac{2 \times 6,241.9}{16 \times 82.8} \left\{ 2 - \frac{1,071.6}{82.8} \right\} \sec^2 29^\circ 15'$
 $= 9.42 \times 706 \times 1.31 = 6.66 \times 1.31$
 $= 8.72$ tons per square foot.

Unwin = $6.66 \times \frac{149}{100} = 9.92$ tons per square foot.

Reservoir empty. Upstream—

Stress (vertical) = $\frac{2 \times 6,241.9}{16 \times 79.65} = 9.79$ tons per square foot.

Stability of piers in the central supply sluices, Cauvery dam (Plan No. 12 H).

Ventway = 6 feet wide.

Piers = 12 feet thick.

In this case the pressures and stability of each pier at foundation level are considered on the assumption that the water pressure in the 6 ft. width between the piers below the level of the sluice sill is carried by the solid masonry directly behind it and is not transferred to the piers.

All the portions of the pier upstream of the back of the shutter grooves are neglected in this calculation.

Bridge portion of pier.

Weight of masonry, arch, roadway, etc., between levels + 785.00 and 794.00 in one span of 18 feet centre to centre
 $= 18 \times 9 \times 12\frac{1}{2} \dots = 1,985$
 Blocking course projection $4 \times \frac{3}{2} \times \frac{1}{2} \times 18 \dots = 54$
 Parapet $2 \times 4 \times 18 \dots = 144$
 Pier portion, between 773.0 and 785.0 = $12 \times 12 \times 12\frac{1}{2} \dots = 1,764$

Below level + 773.00 = $\frac{12.25 + 50.5}{2} \times 51 \times 12 \dots = 19,202$

Total ... 23,149
 Deduct for archway between piers area $14.14 \times 12.25 \dots = -173$

Total masonry in the pier less deductions ... 22,976

To find where the vertical line through the C.G. of the pier cuts the base, take moments about the line A.B. the back face of the shutter groove. Then we have:—

Total moments = $1,985 \times 6.125 + 54 \times 12.25 + 144 \times 13 + 1,764 \times 6.125 + 19,202 \times 17.64 - 173 \times 6.125 = 12,131 + 661 + 1,872 + 10,805 + 338,723 - 1,060 = 364,192 - 1,060 = 363,132$.

∴ The upstream third, or, the distance of the C.G. line from the upstream toe $\frac{363,132}{22,976} = 15.81$ feet.

Water thrust = $\left(\frac{66 \times 66}{2} \times \frac{1}{2} \times 12 \right) + \left(\frac{58 \times 58}{2} \times \frac{1}{2} \times 6 \right)$
 $= 11,616 + 4,485$, or 16,101.

Moment due to same = $11,616 \times 22 + 4,485 \times \frac{5.8}{3}$
 $= 255,552 + 86,710 = 342,262$.

Centre third = $\frac{342,262}{22,976} = 14.89$.

Downstream third = 50.5 - 15.81 - 14.89 = 19.80.

Total length of base from the back face of shutter groove to the downstream toe = 50.5 feet.

∴ The resultant cuts the base at a point 3.0 feet within the centre third.

To find the maximum pressure at the downstream toe—

Total masonry in pier = 22,976.

Masonry in pier per foot run = $\frac{22,976}{12} = 1,915$.

Water thrust per foot run = $\frac{16,101}{12} = 1,342$

$\tan \alpha = \frac{1,342}{1,915} = .7007$ ∴ $\alpha = 35^\circ 1'$.

Maximum pressure (Bouvier).

$= \frac{2 \times 1,915}{16 \times 50.5} \left\{ 2 - \frac{3 \times 19.8}{50.5} \right\} \sec^2 35^\circ 1'$
 $= 4.74 \times .824 \times 1.490$
 $= 3.91 \times 1.49 = 5.82$ tons per square foot.

Maximum pressure (Unwin).

$= 3.91 \times 1.563$
 $= 6.11$ tons per square foot.

Right supply sluices (Plan No. 13 H).

Ventway = 16 feet wide.

Piers = 12 feet thick.

Water level for calculation + 788.00.

Specific gravity of masonry = 2.4.

Assumptions, as in case of central sluices.

Bridge portion of pier.

Weight of masonry, arch, roadway, etc., between 779.50 and 794.00
 in one span of 28 feet centre to centre = $28 \times 14.5 \times 12.25 = 4,974$
 Blocking course projection $4 \times \frac{3}{2} \times \frac{1}{2} \times 28 \dots = 84$
 Parapet $28 \times 4 \times 2 \dots = 224$
 Pier portion between 779.5 and 776.00 = $3.5 \times 12\frac{1}{2} \times 12 = 515$
 Do. below + 776.00 = $\frac{12.25 + 45.58}{2} \times 40 \times 12 = 13,879$

Total cubic feet ... 19,676
 Deduct for archway between piers 12.25×101 (area) = 1,237

Total masonry in pier less deductions ... 18,439

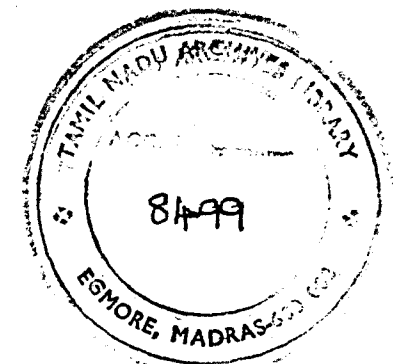
Now, to find, where the line through the C.G. of the pier cuts the base; take moment about the rear groove face, viz., the line A.B.

Moments = $4,974 \times 6.125 + 84 \times 12.25 + 224 \times 13$
 $+ 515 \times 6.125 + 13,879 \times 16.06 - 1,237 \times 6.125$
 $= 30,466 + 1,029 + 2,912 + 3,154 + 222,897 - 7,577$
 $= 260,458 - 7,577$
 $= 252,881$

∴ Upstream third, or, the distance from the upstream toe to where the line through the C.G. cuts the base = $\frac{252,881}{18,439} = 13.71$ feet.

Water thrust = $\left(\frac{52 \times 52}{2} \times \frac{1}{2} \times 12 \right) + \left(\frac{43 \times 43}{2} \times \frac{1}{2} \times 16 \right)$
 $= 7,211 + 6,574 = 13,785$.

Moments due to same = $\frac{7,211 \times 52}{3} + \frac{6,574 \times 43}{3}$
 $= 124,991 + 94,227 = 219,218$.



Calculation of arch thrust in the Cauvery dam, where the two-arched sections meet (the radius of curvature being 4,000 feet).

The horizontal movement due to "sway" at the top of the dam (supposed to be 190 feet high for purposes of calculation) = 0.6 inch.

The strain in the foundations regarded as 160 feet long, allowing a maximum stress of 20 tons per square foot = $\frac{20 \times 2,240}{144} \times \frac{160}{1,000,000} \times 12 = 0.597$ or 0.6 inch.

This is the horizontal movement due to "shift" of the upstream face of the dam.

∴ The total computed deflection of the top of the dam $0.6 + 0.6 = 1.2$ inches.

(2) Strain = $\frac{2u}{3R}$ where u = the deflection and R = the radius.

(Messrs. Wilson & Goris formula.)

In the present case, where $u = 1.2$ inches and $R = 4,000$ feet,

$$\text{Strain} = \frac{2 \times 1.2}{12 \times 3 \times 4,000} L = \frac{1}{60,000} L.$$

$$\frac{\text{Stress}}{\text{Strain}} = E \text{ (modulus of elasticity).}$$

$$\therefore \frac{\text{Stress}}{L} = \frac{3,000,000}{L} \times \frac{1}{60,000} \times L$$

$$= 50 \text{ lbs. per sq. inch } [E = 3,000,000]$$

$$= \frac{50 \times 144}{2,240} = 3.21 \text{ tons per square foot.}$$

This is the mean arch stress at the top of the dam.

The stress at the base is found by strain along arch = $\frac{2u}{3R} L = \frac{2 \times 6 \times 1}{12 \times 3 \times 4,000} \times L$

$$\therefore \text{Strain} = \frac{1}{120,000} L.$$

$$\therefore \text{Stress} = \frac{3,000,000 \times L}{120,000 \times L} = 25 \text{ lbs. per square inch}$$

$$= 1.61 \text{ tons per square foot.}$$

The stress at any height h is given by the expression: $\text{Stress} = 1.61 + \frac{1.61 \times h}{196}$ and from this expression, the following table is deduced:—

V	IV	III	II	I		
Radial moment of these forces about 700.00 in foot tons.	Downstream components of these forces along arch (column III $\times \sin. 6\frac{3}{4}^\circ$) in tons.	Thrust along arch in tons (product of column I and II).	Area in square feet of each slice (taken from plan No. 5-H).	Stress along arch in tons per square foot.		
2,520	30	255.2	80	3.19	784.00	F.T.L. + 788.00
5,957	85.1	724.5	236	2.07	770.00	780.00
7,410	148.2	1,261.5	435	2.90	750.00	760.00
7,128	237.6	2,022.1	738	2.74	730.00	740.00
3,153	315.3	2,683.2	1,040	2.58	710.00	720.00
Total .. 26,168 ft. tons.	816.2 tons.				700.00	Level of Rock + 700.00

Deepest foundation Level 592.00.

* Note.—The angle at the point of inter-section between the radii of curvature of the two arcs = $13\frac{1}{2}^\circ$.
∴ The downstream component = Thrust along arch $\times \sin. 6\frac{3}{4}^\circ$
= Thrust along arch $\times .1175$

The turning moment of the downstream components of the arch thrust, in the deep section arch = 26,168 foot tons.

Taking the turning moment of the arch thrusts in the middle section arch also as equal to the above 26,168 foot tons.

Total turning moment = 52,336 foot tons.

It may be noted that the turning moment will be very much less for the middle section arch as the thrust of this arch is that due to 140 feet head of water, as against the 190 feet head in the previous case.

The assumption made, however, is an error on the side of safety.

It is therefore necessary to design a buttress of suitable dimensions to resist an overturning moment of 52,336 foot tons.

Buttress No. 1 (vide Diagram attached).

Design of a buttress, to resist a turning moment 52,336 foot tons.

Consider a buttress 50 feet thick uniformly from top to bottom and projecting $22\frac{1}{2}$ feet beyond the downstream face of the dam, with its downstream face parallel to the downstream face of the dam.

The buttress proposed is arched over on top of its downstream face, so that there is a clear platform, $50' \times 37'$, available on its top.

Now proceed to find out if this buttress can give the "restoring moment" of 52,336 foot tons required to counteract the arch thrusts.

The abutments carrying the platform over top of rear face of buttress are 5 feet thick and there are 2 piers, $3\frac{1}{2}$ feet thick, so that there are three arches of 11 feet clear span each, to carry the above platform.

$$\text{Quantity of masonry in this portion} = \frac{23.1 \times 33}{2} \times 50 = 19,058 \text{ c. ft.}$$

$$\text{Deduct for archways} = \frac{16.8 \times 24}{2} \times 33 + 47.5 (\text{area}) \times 3 \times 19 = 9,360$$

$$\text{Net quantity} = \frac{9,698 \text{ c. ft.}}{\text{or } 606 \text{ tons.}}$$

Buttress masonry =

$$\left\{ \left(\frac{32.14 \times 21}{2} \right) \times 11.07 + (35.5 \times 32.14) + \left(\frac{32.14 \times 22.5}{2} \right) \right\} \frac{50}{16} \\ = \frac{1,796.68 \times 50}{16} = \frac{89,834}{16} = 5,615 \text{ tons.}$$

∴ Total weight of buttress = 5,615 + 606 = 6,221 tons.

Taking moments about the $\frac{2}{3}$ point of the base from the upstream face of the dam (i.e.), the point M' in the diagram, we have:—

Weight in tons.	Arm in feet.	Restoring moment about M' in foot tons.
920	35.65	32,798
606	22.87	13,859
3,565.5	11.75	41,895
		88,552
1,129.5	— 12.50	— 14,119
6,221 tons		74,433 foot tons.

The total restoring moment from buttress therefore is 74,433 foot tons against an overturning moment of 52,336 foot tons.

The C.G. of this buttress is given by the expression $\frac{74,433}{6,221} = 11.97$ foot to the left of the point M'.

The restoring moment of the buttress, about the downstream toe of the dam (i.e.), the point M in the diagram = $6,221 (11.97 + 5) = 6,221 \times 16.97 = 105,570$ foot tons.

The dimensions chosen for the buttress therefore are suitable and safe and leave ample margin.

In the attached diagram (Buttress No. 1) it is also graphically shown, where the resultant pressure cuts the base of the buttress, taking the buttress and the section of the dam, as one mass—

Downstream components of arch thrusts = 1,632.4 tons, that is, twice the total of column IV in the table.

Overturning moment of these thrusts = 52,336 foot tons.

∴ The resultant of these arch thrusts acts at a point $\frac{52,336}{1,632.4} = 32.06$ feet above the base.

The water thrust on the front face of the buttress = 5,378 tons and acts at 29.33 feet above the base (the width of the face being 50 feet).

The resultant of these thrusts = 1,632.4 + 5,378 = 7,010.4 tons.

The line of action of this resultant thrust is given by the equation $7,010.4 y = 1,632.4 \times 32.06 + 5,378 \times 29.33 = 210,091$.

∴ $y = 29.97$ feet (above the base).

Weight of dam and buttress taken as one mass—

Weight of dam = $\frac{2,579 \times 1.007 \times 50}{16} = \frac{2,579 \times 50}{16} = \frac{128,950}{16} = 8,059.4$ tons.

and this weight acts at a point 20.00 feet to the right of the upstream toe of the dam.

Weight of the buttress portion added = 6,221 tons (see calculations above), acting at a point 11.97 feet to the left of M' (see diagram), i.e., at a point 45.03 feet to the right of the upstream toe of the dam.

∴ Total weight of the dam and buttress in one mass = 8,059.4 + 6,221 = 14,280.4 tons and this acts at a point given by the equation $14,280.4 x = 8,059.4 \times 20 + 6,221 \times 45.03 = 428,878$.

∴ $x = \frac{428,878}{14,280.4} = 30.03$ feet from the upstream toe of the dam.

∴ Centre third = $\frac{7,010.4}{14,280.4} \times 29.97 = 14.71$ feet.

∴ Downstream third = $82.50 - 30.03 - 14.71 = 37.76$ feet.

Buttress No. 2 (vide Diagram attached).

Calculation of horizontal arch thrust in the middle section of the Cauvery dam at the right flank extremity of this section (Vide diagram, buttress No. 2). Radius of curvature = 4,000 feet.

1. The average head of water on this portion of the dam is taken as 140 feet (see L.S. plan No. 4 H.).

The push due to this head = $\frac{140 \times 140}{2 \times 36} = 272$ tons.

Allowing, as in the previous case, a maximum stress of 20 tons per square foot or 311 lbs. per square inch on the foundations and assuming that the length of the base = 110 feet, we have—

Strain on the foundations $\frac{311 \times 110}{1,000,000} \times 12 = \frac{41,052}{100,000}$ inch or .41 inch which is the

"Shift" on the base.

2. To find the maximum horizontal movement at the top of dam due to "Sway"—

Assume—

Average stress, upstream, reservoir empty (—Unwin).
Do. do. full 5 tons per sq. ft.
Do. do. full 2 " "

Difference ... — 3 " "

Average stress, downstream, reservoir full 6 tons per sq. ft.
Do. do. empty 2 " "

Difference ... + 4 " "

For purposes of calculation, let us consider that the upstream face of the dam is vertical and 140 feet in length, the base is 110 feet and that the downstream face is the hypotenuse of this right-angled triangle, the length of the hypotenuse being 178.05 feet.

Now a release of 3 tons per square foot on the upstream face gives with $E = 1,000,000$ an elongation of $\frac{46.7 \times 140}{1,000,000} = .0065$ feet in the length of the upstream face.

The altered length of the upstream face = 140.0065 feet.

An addition of 4 tons per square foot on the downstream face gives a shortage of $\frac{62.2 \times 178.05}{1,000,000}$ feet in the length of the downstream face with the same value of E .

The new length of the downstream face = 178.039 feet.

We thus obtain the altered form for the profile of the dam as shown in the sketch below under the influence of the above stresses:—

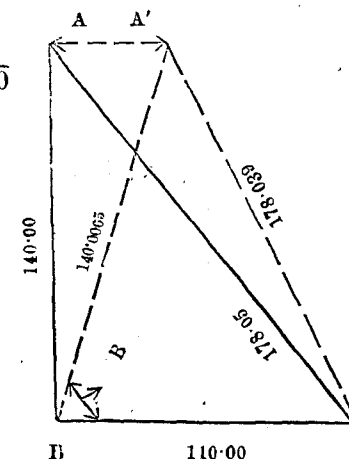
Whence we get—

$$\cos B = \frac{(140.0065)^2 + (110)^2 - (178.039)^2}{2 \times 110 \times 140.0065} = \frac{4}{30,800}$$

Which is roughly $\frac{AA'}{140}$ where

AA' = the horizontal movement at top,

$$AA' = \frac{560}{30,800} \times 12 = \frac{6,720}{30,800} = .22 \text{ inch.}$$



As before this figure is doubled to be quite safe and maximum movement due to sway is taken as 0.45 inch.

i.e., total "sway" = 0.45 inch.

The total computed maximum deflection therefore = 0.41 + 0.45 = 0.86 inch or say 0.9 inch allowing 0.45 inch for "shift" and 0.45 also for "sway".

3. Strain = $\frac{2u}{3R} L$ where u is the total top deflection and R is the radius (Messrs. Wilson and Gore).

Here we have $u = \frac{9}{12}$ feet and $R = 4,000$ feet.

$$\therefore \text{strain} = \frac{2 \times 9}{3 \times 4,000 \times 12} = \frac{1.8}{144,000} L$$

Where we have stress = $\frac{3,000,000 \times 1.8}{144,000}$ (with a modulus of elasticity of 3,000,000) = 2.42 tons per square foot.

The stress at base = $\frac{3,000,000 \times 2 \times .45}{12 \times 3 \times 4,000} = 18\frac{1}{2}$ lb. per square inch

or 1.21 tons per square foot

(taking "shift" at base = .45 inch).

4. The stress at any height h above the base is given by the expression:—

Stress = $\left(1.21 + \frac{1.21h}{148}\right)$ tons from which we derive the following table:—

V	IV	III	II	I		
Radial moments of these forces about +730.00 in foot tons.	Tangential force in tons.	Force along arch in tons.	Area of each slice in sq. feet.	Stress along arch in tons per sq. foot.		
10,314	191	191	80	2.39	784.00	+793.00
21,520	538	538	236	2.28	770.00	788.00 : F.T.L.
18,330	918	918	435	2.11	750.00	780.00
3,265	653	653	330	1.93	735.00	760.00
53,459 ft. tons.	2,300 tons.					740.00
Total						Level of Rock. 730.00
						640.00

∴ The turning moment = 53,459 foot tons or say 54,000 ft. tons.

Design of a Buttness, to resist a turning moment of 54,000 foot tons.

This buttress, as it has to resist the arch thrust, which is purely tangential to the arc, at one of its extremities, will have to be a straight continuation of the dam in the direction of the tangent, and the section of the buttress, will be similar to that of the dam.

Let us now proceed to consider the stability of the buttress which is 20 feet long at top and 62 feet long at base, so that the rear face batter is $\frac{2}{3}$.

We will take moments about a point M (see diagram) which is $20\frac{2}{3}$ feet distant from the rear toe: Then we have—

		Weights in tons.	Arms.	Restoring moments about M.
$\frac{1}{16} (18 \times 20 \times 63)$	= ...	1,417.5	$31\frac{1}{3}$	44,415
$\frac{1}{16} (63 \times \frac{42}{2} \times 18)$	= ..	1,488.4	$7\frac{1}{3}$	10,915
$\frac{1}{16} (42 \times \frac{30+20}{2} \times 5)$	= ...	328.1	$20\frac{1}{3}$	6,671
$\frac{1}{16} (42 \times \frac{20}{2} \times 14)$	= ...	367.5	$20\frac{1}{3}$	7,473
$\frac{1}{16 \times 3} (19 \times 20 \times 27.14)$	= ...	214.7	8.17	1,756
$\frac{1}{16} (\frac{2.86 \times 5}{2} \times \frac{6\frac{2}{3}}{2})$	= ...	1.5	2	3
Total	...	3,817.9 tons		67,715 foot tons.

(i.e.) We have got a restoring moment of 67,715 ft. tons in the buttress against an over turning moment of 53,459 ft. tons for which we are designing our buttress. The dimensions chosen for the buttress therefore are suitable and safe.

By the above calculations it has been shown that the buttress is of sufficient section to withstand the arch thrust, due to the curved form of the dam.

Now to proceed to prove graphically that with the dimensions chosen for the buttress, the resultant pressure, reservoir full falls within the middle third of the base.

The arch thrust in the dam = 2,300 total (total of column IV in above tabular statement).

Moment about the base = 53,459 ft. tons.

∴ the resultant arch thrust acts at a point.

$$\frac{53,459}{2,300} = 23.24 \text{ feet above base.}$$

Now the total weight of the buttress = 3,817.9 tons (please see calculations above).

Restoring moment about M as above = 67,715 ft. tons.

∴ the vertical line through the C.G. of our buttress cuts the base at a point $\frac{67,715}{3,817.9} = 17.74$ ft. to the left of M or 23.59 ft. from the upstream toe of the buttress.

$$\text{Centre third} = \frac{2,300 \times 23.24}{3,817.9} = 14.00 \text{ feet}$$

$$\therefore \text{rear third} = 62.00 - 23.59 - 14.00 = 24.41 \text{ feet}$$

(i.e.) The final resultant pressure falls 3.75 feet within the rear toe of the buttress: the buttress is therefore stable enough.

Calculations of maximum pressures in arch trust on the upstream walls of the wells over sluice shutters.

The formula for maximum pressure in a horizontal arch, subject to water pressure, is—

$$t = R \left(1 - \sqrt{1 - \frac{2HW}{p}} \right)$$

where t = thickness of arch ring in feet;

R = outer radius of arch;

H = head of water on arch ring;

W = weight of 1 cubic foot of water = $\frac{1}{25}$ ton;

and p = the maximum pressure, in tons per square foot on the arch ring.

The above formula is used by Tudsbery and Brightmore in their "Water-works Engineering," and by Captain Garrett (in Professional papers corps of R.E.) in his paper on Theory of arched masonry dams.

1. *Deep supply sluices—*

Span of arch = 9 feet; rise of arch = 2 feet.

$$\therefore R = 6 + 2\frac{1}{2} = 8\frac{1}{2} \text{ feet; } t = 2\frac{1}{2} \text{ and } H = 98 \text{ feet.}$$

Substituting these values in the formula for pressure in arch ring, we get—

$$2\frac{1}{2} = 8\frac{1}{2} \left(1 - \sqrt{1 - \frac{2 \times 98}{36p}} \right)$$

$$\text{or } \frac{5}{17} = 1 - \sqrt{1 - \frac{98}{18p}}$$

$$\text{or } \frac{12}{17} = \sqrt{1 - \frac{98}{18p}}$$

$$\text{or } \frac{98}{18p} = \frac{145}{289.}$$

whence $p = 10.85$ tons square feet.
which is a safe stress to allow for a cutstone arch.

2. *Central supply sluices—*

Front wall considered as a concealed arch.

Span of arch = 9 feet; rise = 2 feet.

$$\therefore R = 6 + 4 = 10 \text{ feet; } t = 4 \text{ feet and } H = 33 \text{ feet.}$$

Substituting these values in the formula, we get—

$$4 = 10 \left(1 - \sqrt{1 - \frac{2 \times 33}{36p}} \right)$$

$$\text{or } \frac{2}{5} = 1 - \sqrt{1 - \frac{33}{18p}}$$

$$\text{or } \frac{9}{25} = 1 - \frac{11}{6p}$$

whence $p = 2.87$ tons per square foot;
which is a safe stress for ordinary rubble in cement.

Note.—For the central, right and construction sluices, the upstream of the well over the sluice gates is rubble in cement wall. The calculations are made for the "concealed arch" in this wall.

3. *Right supply sluices—*

Span of arch = $19\frac{1}{2}$ feet; rise = 2 feet.

$$\therefore R = 24.75 + 4 = 28.75 \text{ feet; } t = 4 \text{ feet and } H = 24 \text{ feet}$$

Substituting these values in the formula for pressure in arch ring, we get—

$$4 = 28.75 \left(1 - \sqrt{1 - \frac{2 \times 24}{36p}} \right)$$

$$\text{or } \frac{24.75 \sqrt{1 - \frac{4}{3p}}}{28.75}$$

$$\text{or } 1 - \frac{4}{3p} = \left(\frac{99}{115} \right)^2$$

whence $p = 5.13$ tons per square foot;
which is a safe stress for rubble in cement.

The uplift at the bottom of arch ring, in the right supply sluices = $\frac{27}{36} \times 6 = 4.5$ tons.

Now, the weight of arch from +777.00 to +761.00, neglecting the extra weight of the box girder = $\frac{16 \times 6}{16} = 6$ tons.

So, there cannot be any uplift on the piece of masonry above +777.00 in the upstream walls of the wells. Above +777.00, the upstream wall is computed as a gravity wall, and will give enough stability to resist the water thrust due to a 11 feet head of water (+788.00—777.00=11 feet). The wall will be 4 feet thick from +794.50 to +779.00 and the bottom 2 feet, down to +777.00, will be 5 feet thick (vide plan of work).

Taking moments about the upstream face, we have—

I. At level + 777.00—

	Weights.	Lever arms.	Moments.
Parapet portion	7	1.00	7
Between + 794.50 and + 779.00	62	2.00	124
Do. + 779.00 and + 777.00	10	2.50	25
Total ...	79		156

$$\therefore \text{Upstream third} = \frac{156}{79} = 1.98 \text{ feet.}$$

$$\text{Centre third} = \frac{11 \times 11}{2} \times \frac{4}{9} \times \frac{11}{3} = 1.25 \text{ feet.}$$

$$\therefore \text{Downstream third} = 5.00 - 3.23 = 1.77 \text{ feet.}$$

This shows that the resultant falls 0.10 foot within the middle third and the wall is therefore stable.

II. At level + 779.00—

	Weights.	Lever arms.	Moments.
Parapet portion	7	1.00	7
Between 794.50 and 779.00	62	2.00	124
Total ...	69		131

$$\therefore \text{Upstream third} = \frac{131}{69} = 1.90 \text{ feet.}$$

$$\text{Centre third} = \frac{9 \times 9}{2} \times \frac{4}{9} \times \frac{9}{3} = 0.78 \text{ foot.}$$

$$\therefore \text{Downstream third} = 4.00 - 2.68 = 1.32 \text{ feet}$$

which shows that the resultant passes through the middle third. The wall is therefore stable.

4. Construction sluices—

Enclosing a concealed arch as below—

Span of arch = 9 feet; rise = 2 feet.

$\therefore R = 6 + 4\frac{1}{2} = 10\frac{1}{2}$ feet; $t = 4\frac{1}{2}$ feet and $H = 94$ feet.
(calculation W.L. being + 730.00).

Substituting these values in the formula for pressure in arch ring, we get—

$$4\frac{1}{2} = 10\frac{1}{2} \left(1 - \sqrt{1 - \frac{2 \times 94}{36p}} \right)$$

$$\text{or } \sqrt{1 - \frac{94}{18p}} = 1 - \frac{9}{2} \times \frac{2}{21} = \frac{4}{7}$$

$$\text{or } 1 - \frac{94}{18p} = \frac{16}{49}$$

$$\text{or } \frac{94}{18p} = \frac{33}{49}$$

whence $p = 7.76$ tons per square foot;

which is a safe stress to allow for rubble in cement.

CAUVERY RESERVOIR. HEAD WORKS.

Surplus and supply sluices. Abstract of arrangements.

Description or name of sluices.	Number of vents.	Cill.	Top.	Area of vent.	Supply discharge.	Surplus power.	Total.
Deep supply sluices.	14	+ 678.00	+ 690.00	6 ft. $\times$ 12 ft.	Gives 20,000 cusecs with water standing at + 700.00.	Nil.	253,101 cusecs.
Central supply sluices.	16	+ 730.00	+ 755.00	6 ft. $\times$ 25 ft.	Gives 20,000 cusecs with water standing at + 748.00.	75,104 cusecs ..	
Right supply sluices.	8	+ 745.00	+ 761.00	16 ft. $\times$ 16 ft.	Gives 20,000 cusecs with water standing at + 760.00.	57,917 cusecs ..	
Main surplus sluices.	19	+ 771.00	..	40 ft. span.	Gives 20,000 cusecs with water standing at + 775.00.	120,080 cusecs.	

Right supply sluices.

Sluices 8 in number of 16' $\times$ 16'.

Cill + 745.00.

Top + 761.00.

The sluices will be capable of passing 20,000 cusecs to delta with water in reservoir at + 760.00.

The sluice will then discharge as a clear overfall notch, without velocity of approach, 15 feet deep.

Discharge per foot run = $\frac{2}{3}$ c. h. $\sqrt{2}$ gh. with $c = .581$ and $h = 15$ ft.

$$\therefore \text{Discharge per foot run} = \frac{2}{3} \times .581 \times 8 \times 15\frac{3}{4} \\ = (3.1 \times 15\frac{3}{4}) \\ = 180 \text{ cusecs.}$$

$$\text{Discharge per vent} = 180 \times 16 \\ = 2,880 \text{ cusecs.}$$

$$\text{Total discharge for 8 vents} \\ = 2,880 \times 8 = 23,040 \text{ cusecs.}$$

Surplus power.

Full reservoir level + 785.00.

Head = 32 feet.

Mean velocity = $.625 \sqrt{2}$ gh.

$$= 5 \sqrt{32} = 28.28 \text{ feet sec.}$$

$$\therefore \text{Surplus capacity for 8 vents} = 28.28 \times 8 \times 256 \\ = 57,917 \text{ cusecs.}$$

Central supply sluices.

Sluices 16 in number 6' $\times$ 25'.

Cill + 730.00

Top + 755.00

With water in reservoir at + 748.00, the sluices will discharge as a clear overfall notch, without velocity of approach 18 feet deep.

Discharge per foot run = $\frac{2}{3}$ c.h. $\sqrt{2}$ gh. with a value of $c = .562$.

$$= \frac{2}{3} \times .562 \times 8 \times 18\frac{3}{4} \\ = 3 \times 76.35 \\ = 229 \text{ cusecs.}$$

$$\text{Discharge per vent} = 229 \times 6 \\ = 1,374 \text{ cusecs.}$$

$$\therefore \text{Total discharge for 16 vents} \\ = 1,374 \times 16 \\ = 21,984 \text{ cusecs,} \\ \text{or say 22,000 cusecs.}$$

Surplus power.

Full reservoir level = + 785.00.

Head = 42.5 feet.

$$\text{Velocity through sluice} = .6 \times 8 \sqrt{42.5} \\ = 31.29 \text{ feet sec.}$$

* A run off depth of 9.5 feet is assumed.

$$\begin{aligned}
 p &= \frac{2 \times 14,208.8}{167} \left(2 - \frac{179.31}{167.00} \right) - \frac{178 \times 178 \times 178}{2.25 \times 167 \times 167} \\
 &+ \left\{ \frac{6 \times 14,208.8}{167} \left(\frac{119.54}{167.00} - 1 \right) + \frac{2 \times 178 \times 178 \times 178}{2.25 \times 167 \times 167} \right\} \frac{x}{167} \\
 &= 170.17 \times .926 - 89.88 + \left\{ 10.63 \times 48 (-.248) + 179.76 \right\} \frac{x}{167}
 \end{aligned}$$

$$\begin{aligned}
 &= 157.58 - 89.88 + \left(\frac{179.76 - 144.91}{167} \right) x \\
 &= 67.70 + \frac{34.85}{167} x \\
 &= 67.70 + .2087 x. \\
 p &= 67.70 + .2087 x \quad \dots \dots \dots (I)
 \end{aligned}$$

Next, substituting in the equation for q , we have—

$$\begin{aligned}
 q &= \left\{ 4 \times 14,208.8 \times .95 (167 - 179.31) + 178 \times 178 \left(\frac{501 - 1.90 \times 178}{2.25} \right) \right\} \frac{x}{(167)^3} \\
 &+ \left\{ .6 \times 14,208.8 \times .95 (179.31 - 167) - 3 \times 178 \times 178 \left(\frac{167 - 0.95 \times 178}{2.25} \right) \right\} \frac{x^2}{(167)^4} \\
 &= \left\{ -(664,659) + 2,292,550 \right\} \frac{x}{4,657,463} + \left\{ 998,989 + (95,052 \times \frac{2.1}{2.25}) \right\} \frac{x^2}{777,796,321} \\
 &= 1,627,891 \times \frac{x}{4,657,463} + (998,989 + 88,715) \frac{x^2}{777,796,321} \\
 &= \frac{1,627,891}{4,657,463} x + \frac{1,085,704}{777,796,321} x^2 \\
 &= 0.3495 x + \frac{1}{716.4} x^2 \\
 q &= 0.3495 x + \frac{1}{716.4} x^2 \quad \dots \dots \dots (II)
 \end{aligned}$$

Thirdly, substituting in the equation for p' , we have—

$$\begin{aligned}
 p' &= \frac{178}{2.25} + \left\{ \frac{25,647}{4,657,463} (2 - \frac{537.93}{167.00}) - \frac{3 \times 178 \times (-2.1)^2}{2.25 \times 777,796,321} + \frac{95}{167} \right\} x^3 \\
 &+ \left\{ \frac{76,941}{777,796,321} (.4316) + \frac{356 (-2.10) (-171.20)}{2.25 \times 129,891,985,607} - \frac{.95}{27,889} \right\} x^2 \\
 &= 79.11 + \left\{ -\frac{1}{148.7} - \frac{1}{743,137} + \frac{1}{175.8} \right\} x^2 + \left\{ \frac{1}{23,422} + \frac{1}{2,283,454} - \frac{1}{29,357} \right\} x^3 \\
 &= 79.11 + \left\{ \frac{1}{175.8} - \frac{1}{148.7} - \frac{1}{743,137} \right\} x^2 + \left\{ \frac{1}{23,422} - \frac{1}{29,357} + \frac{1}{2,283,454} \right\} x^3 \\
 &= 79.11 + \frac{4,227.2 - 4,997.6 - 1}{743,137} x^2 + \frac{97.5 + 1 - 77.8}{2,283,454} x^3 \\
 &= 79.11 - \frac{771.6}{743,137} x^2 + \frac{20.7}{2,283,454} x^3 \\
 &= 79.11 - \frac{1}{963.1} x^2 + \frac{1}{110,312} x^3. \\
 p' &= 79.11 - \frac{1}{963.1} x^2 + \frac{1}{110,312} x^3 \quad \dots \dots \dots (III)
 \end{aligned}$$

5. To determine the values of the vertical pressure p , the shearing force q and the horizontal compressive stress p' , all, acting on a unit element of mass, situated at a distance of x feet from the upstream toe, there are therefore the following equations:—

$$p = 67.70 + .2087 x \quad \dots \dots \dots I$$

$$q = 0.3495 x + \frac{1}{716.4} x^2 \quad \dots \dots \dots II$$

$$p' = 79.11 - \frac{1}{963.1} x^2 + \frac{1}{110,312} x^3 \quad \dots \dots \dots III$$

Now, divide the total base length of 167 feet into so many sections at 10 feet intervals, and consider the elements of mass, situated at 10 feet, 20 feet, 30 feet and so on from the upstream toe and obtain from equations I, II and III above, by actual substitution of these values of x , the magnitudes of the forces p , q and p' at the several points on the base.

The equations directly give the forces only in terms of masonry units, and in the table (page 518) the values are multiplied by $\frac{1}{36} \times Y = \frac{1}{16}$ in order to reduce them to their corresponding values in tons per square foot.

6. Next, to find the principal stresses at these points—

The equation which gives the principal stresses is $(p'' - p)(p' - p) = q^2$ (see page 139 of the Proc. Inst. of the C. E., Vol. CLXXII.), where p'' is the principal stress required.

The solution gives two values, as the equation for p'' is a quadratic equation.

$$\text{Now, } (p'' - p)(p' - p) = q^2$$

$$\text{or } p'' - p' (p + p') + pp' = q^2$$

$$\text{or } p'' - p' (p + p') + (pp' - q^2) = 0 \quad \dots \dots \dots IV$$

The angle θ , which the direction of the greater of the two principal stresses, found as a solution to equation IV, makes with the horizontal, is given by the equation

$$\tan 2\theta = \frac{2q}{p' - p} \quad \dots \dots \dots V$$

(See page 139 of the Proc. Inst. C.E., Vol. CLXXII.)

Now proceed to find the principal stresses p'' and the angle θ , at the several points along the base distant 0, 10, 20, 30 feet and so on from the upstream toe:

(1) When $x = 0$, we have from the tables

$$p = 4.23; q = 0 \text{ and } p' = 4.94$$

and equation IV, then becomes $p''^2 - p'' \times 9.17 + 20.9 = 0$

$$\therefore p'' = \frac{9.17 \pm \sqrt{84.09 - 83.60}}{2}$$

$$= \frac{9.17 \pm 0.70}{2}$$

$$= 4.94 \text{ or } 4.23 \text{ tons per sq. ft.}$$

From equation V, we have $\tan 2\theta = 0$

$$\therefore \theta = 0^\circ$$

(2) When $x = 10$ feet, we have from the tables

$$p = 4.36; q = 0.23; p' = 4.93$$

and equation IV becomes $p''^2 - (9.29)p'' + (21.49 - .05) = 0$

$$\therefore p'' = \frac{9.29 \pm \sqrt{86.30 - 85.76}}{2}$$

$$= \frac{9.29 \pm 0.73}{2}$$

$$= 5.01 \text{ or } 4.28 \text{ tons per sq. ft.}$$

From equation V, we have $\tan 2\theta = \frac{0.46}{0.57} = \tan 38^\circ 24'$

$$\therefore \theta = 19^\circ 12'$$

(3) When $x = 20$ feet, we have from the tables

$$p = 4.49; q = 0.47 \text{ and } p' = 4.92.$$

Equation IV becomes $p''^2 - 9.41 p'' + (22.09 - 0.22) = 0$

$$\therefore p'' = \frac{9.41 \pm \sqrt{88.55 - 87.48}}{2}$$

$$= \frac{9.41 \pm 1.03}{2}$$

$$= 5.22 \text{ or } 4.19 \text{ tons per sq. ft.}$$

From equation V, we have $\tan 2\theta = \frac{0.94}{0.43} = 2.186$

$$= \tan 65^\circ 24'$$

$$\therefore \theta = 32^\circ 42'$$

(4) When $x = 30$ feet, we have from the tables

$$p = 4.62; q = 0.73 \text{ and } p' = 4.90$$

Equation IV becomes $p''^2 - 9.52 p'' + (22.64 - 0.53) = 0$

$$\therefore p'' = \frac{9.52 \pm \sqrt{90.63 - 88.44}}{2} = \frac{9.52 \pm 1.49}{2}$$

$$= 5.51 \text{ or } 4.01 \text{ tons per sq. ft.}$$

From equation V, we have $\tan 2\theta = \frac{1.46}{0.28} = 5.214 = \tan 79^\circ 4'$

$$\therefore \theta = 39^\circ 34'$$

(5) When $x = 40$ feet, we have from the tables

$$p = 4.75; p' = 4.88 \text{ and } q = 1.03.$$

Equation IV becomes $p''^2 - 9.63 p'' + (23.18 - 1.06) = 0$

$$\therefore p'' = \frac{9.63 \pm \sqrt{92.74 - 88.48}}{2} = \frac{9.63 \pm 2.07}{2}$$

$$= 5.85 \text{ or } 3.78 \text{ tons per sq. ft.}$$

From equation V, $\tan 2\theta = \frac{2.06}{0.13} = 15.85 = \tan 86^\circ 24'$
 $\therefore \theta = 43^\circ 12'$

(6) When $x = 50$ feet, we have from the tables
 $p = 4.88$; $q = 1.31$ and $p' = 4.85$.

$$\text{Equation IV becomes } p''^2 - 9.73 p'' + (23.67 - 1.72) = 0$$

$$\therefore p'' = \frac{9.73 \pm \sqrt{94.67 - 87.80}}{2} = \frac{9.73 \pm 2.62}{2}$$

$$= 6.18 \text{ or } 3.55 \text{ tons per sq. ft.}$$

$$\text{From equation V, } \tan 2\theta = \frac{2.62}{-0.03} = -87.333 = \tan 90^\circ 40'$$

$$\therefore \theta = 45^\circ 20'$$

(7) When $x = 60$ feet, we have from the tables

$$p = 5.91$$
; $q = 1.63$ and $p' = 4.83$.

$$\text{Equation IV becomes } p''^2 - 9.84 p'' + (24.20 - 2.66) = 0$$

$$\therefore p'' = \frac{9.84 \pm \sqrt{96.83 - 86.16}}{2} = \frac{9.84 \pm 3.27}{2}$$

$$= 6.56 \text{ or } 3.28 \text{ tons per sq. feet.}$$

$$\text{From equation V, } \tan 2\theta = \frac{3.26}{-0.18} = -18.11 = \tan 83^\circ 10'$$

$$\therefore \theta = 46^\circ 35'$$

(8) When $x = 70$ ft., we have from the tables

$$p = 5.14$$
; $q = 1.96$ and $p' = 4.82$.

$$\text{Equation IV becomes } p''^2 - 9.96 p'' + (24.74 - 3.84) = 0$$

$$\therefore p'' = \frac{9.96 \pm \sqrt{99.20 - 83.72}}{2} = \frac{9.96 \pm 3.94}{2}$$

$$= 6.5 \text{ or } 3.01 \text{ tons per sq. ft.}$$

$$\text{From equation V, } \tan 2\theta = \frac{3.92}{-0.32} = -12.23 = \tan 94^\circ - 40'$$

$$\therefore \theta = 47^\circ - 20'$$

(9) When $x = 80$ ft. we have from the tables

$$p = 5.27$$
; $q = 2.31$ and $p' = 4.82$.

$$\text{Equation IV becomes } p''^2 - 10.09 p'' + (25.40 - 5.34) = 0$$

$$\therefore p'' = \frac{10.09 \pm \sqrt{101.81 - 80.24}}{2} = \frac{10.09 \pm 4.64}{2}$$

$$= 7.37 \text{ or } 2.73 \text{ tons per sq. ft.}$$

$$\text{From equation V, } \tan 2\theta = \frac{4.62}{-0.45} = -10.27 = \tan 95^\circ - 34'$$

$$\therefore \theta = 47^\circ - 47'$$

(10) When $x = 90$ ft. we have from the tables

$$p = 5.40$$
; $q = 2.67$ and $p' = 4.83$.

$$\text{Equation IV becomes } p''^2 - 10.23 p'' + (26.08 - 7.13) = 0$$

$$\therefore p'' = \frac{10.23 \pm \sqrt{104.65 - 75.80}}{2} = \frac{10.23 \pm 5.38}{2}$$

$$= 7.81 \text{ or } 2.42 \text{ tons per sq. ft.}$$

$$\text{From equation V, } \tan 2\theta = \frac{5.34}{-0.57} = -9.370 = \tan 96^\circ 4'$$

$$\therefore \theta = 48^\circ - 2'$$

(11) When $x = 100$ ft., we have from the tables

$$p = 5.53$$
; $q = 3.06$ and $p' = 3.86$.

$$\text{Equation IV becomes } p''^2 - 10.39 p'' + (26.88 - 9.36) = 0$$

$$\therefore p'' = \frac{10.39 \pm \sqrt{107.95 - 70.08}}{2} = \frac{10.39 \pm 6.15}{2}$$

$$= 8.27 \text{ or } 2.12 \text{ tons per sq. ft.}$$

$$\text{From equation V, } \tan 2\theta = \frac{6.12}{-0.67} = -9.134 = \tan 96^\circ 16'$$

$$\therefore \theta = 48^\circ 8'$$

(12) When $x = 110$ ft. we have from the tables

$$p = 5.66$$
; $q = 3.46$ and $p' = 4.91$.

$$\text{Equation IV becomes } p''^2 - 10.57 p'' + (27.79 - 11.97) = 0$$

$$\therefore p'' = \frac{10.57 \pm \sqrt{111.72 - 63.28}}{2} = \frac{10.57 \pm 6.96}{2}$$

$$= 8.77 \text{ or } 1.81 \text{ tons sq. ft.}$$

$$\text{From equation V, } \tan 2\theta = \frac{6.92}{-0.75} = -9.227 = \tan 96^\circ 10'$$

$$\therefore \theta = 48^\circ 5'$$

(13) When $x = 120$ feet, we have from the tables

$$p = 5.79$$
; $q = 3.88$ and $p' = 4.99$.

$$\text{Equation IV becomes } p''^2 - 10.78 p'' + (28.89 - 15.05) = 0$$

$$\therefore p'' = \frac{10.78 \pm \sqrt{116.21 - 55.36}}{2} = \frac{10.78 \pm 7.80}{2}$$

$$= 9.29 \text{ or } 1.49 \text{ tons sq. ft.}$$

$$\text{From equation V, } \tan 2\theta = \frac{7.76}{-0.80} = -9.7 = \tan 95^\circ 52'$$

$$\therefore \theta = 47^\circ 56'$$

(14) When $x = 130$ feet, we have from the tables

$$p = 5.92$$
; $q = 4.31$ and $p' = 5.09$.

$$\text{Equation IV becomes } p''^2 - 11.01 p'' + (30.13 - 18.58) = 0$$

$$\therefore p'' = \frac{11.01 \pm \sqrt{121.22 - 46.20}}{2} = \frac{11.01 \pm 8.69}{2}$$

$$= 9.84 \text{ or } 1.18 \text{ tons sq. ft.}$$

$$\text{From equation V, } \tan 2\theta = \frac{8.62}{-0.83} = -10.39 = \tan 95^\circ 30'$$

$$\therefore \theta = 47^\circ 45'$$

(15) When $x = 140$ ft., we have from the tables

$$p = 6.05$$
; $q = 4.77$ and $p' = 5.23$.

$$\text{Equation IV becomes } p''^2 - 11.28 p'' + (31.64 - 22.75) = 0$$

$$\therefore p'' = \frac{11.28 \pm \sqrt{127.24 - 22.75}}{2} = \frac{11.28 \pm 9.58}{2}$$

$$= 10.43 \text{ or } 0.85 \text{ tons sq. ft.}$$

$$\text{From equation V, } \tan 2\theta = \frac{9.54}{-0.82} = -11.63 = \tan 94^\circ 54'$$

$$\therefore \theta = 47^\circ 27'$$

(16) When $x = 150$ ft., we have from the tables

$$p'' = 6.18$$
; $q = 5.24$ and $p' = 5.39$.

$$\text{Equation IV, becomes } p''^2 - 11.57 p'' + (33.31 - 27.46) = 0$$

$$\therefore p'' = \frac{11.57 \pm \sqrt{133.86 - 23.40}}{2} = \frac{11.57 \pm 10.51}{2}$$

$$= 11.04 \text{ or } 0.53 \text{ tons sq. ft.}$$

$$\text{From equation V, } \tan 2\theta = \frac{10.48}{-0.79} = -13.27 = \tan 94^\circ 18'$$

$$\therefore \theta = 47^\circ 9'$$

(17) $x = 160$ ft.; we have from the tables

$$p = 6.31$$
; $q = 5.73$ and $p' = 5.60$.

$$\text{Equation IV becomes } p''^2 - 11.91 p'' + (35.34 - 32.83) = 0$$

$$\therefore p'' = \frac{11.91 \pm \sqrt{142.45 - 10.04}}{2} = \frac{11.91 \pm 11.51}{2}$$

$$= 11.71 \text{ or } 0.20 \text{ ton sq. ft.}$$

$$\text{From equation V, } \tan 2\theta = \frac{11.46}{-0.71} = -16.14 = \tan 93^\circ 32'$$

$$\therefore \theta = 46^\circ 46'$$

(18) $x = 170$ ft.; we have from the tables

$$p = 6.40$$
; $q = 6.08$; $p' = 5.77$.

$$\text{Equation IV becomes } p''^2 - 12.17 p'' + (36.93 - 36.96) = 0$$

$$\therefore p'' = \frac{12.17 \pm \sqrt{148.11 + 0.12}}{2} = \frac{12.17 \pm 12.17}{2}$$

$$= 12.17 \text{ or } 0.00 \text{ tons sq. ft.}$$

$$\text{From equation V, } \tan 2\theta = \frac{12.17}{-0.63} = -19.33 = \tan 92^\circ 58'$$

$$\therefore \theta = 46^\circ 29'$$

The above results, viz., the values of p'' and θ are all entered in the table on next page.

Table showing computations of stresses at level + 610 (Reservoir full). Base width = 167 feet.
Computed from the formulae of Mr. E. P. Hill (Proceedings Inst. C.E., Vol. CLXXII).

Stresses in tons per square foot.	Distances in feet from the upstream toe.																
	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	167
p = vertical stress ..	4.23	4.36	4.49	4.62	4.75	4.88	5.01	5.14	5.27	5.40	5.53	5.66	5.79	5.92	6.05	6.18	6.40
q = Shearing stress, horizontal or vertical.	0.00	0.23	0.47	0.73	1.01	1.31	1.63	1.96	2.31	2.67	3.06	3.46	3.88	4.31	4.77	5.24	6.08
p' = horizontal stress ..	4.94	4.93	4.92	4.90	4.88	4.85	4.83	4.82	4.82	4.83	4.86	4.91	4.99	5.09	5.23	5.39	5.77
p'' = principal stresses ..	4.94	5.01	5.22	5.51	5.85	6.18	6.56	6.95	7.37	7.81	8.27	8.77	9.29	9.84	10.43	11.04	12.17
θ = The angle which the direction of the first stated principal stress makes with the horizontal.	4.23	4.28	4.19	4.01	3.78	3.55	3.28	3.01	2.73	2.42	2.12	1.81	1.49	1.18	0.85	0.53	0.00
	0°	10° 12'	32° 42'	39° 34'	43° 12'	45° 20'	46° 35'	47° 20'	47° 47'	48° 2'	48° 8'	48° 5'	47° 56'	47° 45'	47° 27'	47° 9'	46° 29'

Computation of stress distribution on the base at level + 600.00.

From calculations for layer + 600.00 of the Cauvery dam profile, we have the following data:—

$$\begin{aligned} W &= 16,428 \text{ masonry units.} \\ d &= 65.60 \text{ feet.} \\ m &= 0.95 \\ b &= 181.50 \text{ feet.} \\ h_1 &= 188 \text{ feet.} \\ \gamma &= 2.25. \end{aligned}$$

Substituting these values in the equations for p , q and p' , we get the following simplified expressions for their values in terms of x , where x is the distance of any point on the base, from the upstream toe:—

$$\begin{aligned} p &= \frac{2w}{b} \left(2 - \frac{3d}{b} \right) - \frac{h_1^3}{\gamma b^3} + \left\{ \frac{6w}{b} \left(\frac{2d}{b} - 1 \right) + \frac{2h_1^3}{\gamma b^3} \right\} \frac{x}{b} \\ &= \frac{2 \times 16428}{181.50} \left(2 - \frac{196.8}{181.5} \right) - \frac{(188)^3}{2.25 (181.5)^3} \\ &\quad + \left\{ \frac{6 \times 16428}{181.50} \left(\frac{131.20}{181.50} - 1 \right) + \frac{2 \times (188)^3}{2.25 (181.5)^3} \right\} \frac{x}{181.50} \\ &= 165.77 - 89.65 + \left\{ 543.07 \times (-2771) + 179.30 \right\} \frac{x}{181.5} \\ &= 76.12 + (-150.48 + 179.30) \frac{x}{181.5} \\ &= 76.12 + \frac{28.82}{181.50} x \\ &= 76.12 + 0.1588 x \\ p &= 76.12 + 0.1588 x \quad \dots \dots \dots \text{I} \\ q &= \left\{ 4wm(b-3d) + \frac{h_1(3b-2mh_1)}{\gamma} \right\} \frac{x}{b^3} \\ &\quad + \left\{ 6wm(3d-b) - \frac{3h_1(b-mh_1)}{\gamma} \right\} \frac{x^2}{b^4} \\ &= \left\{ 4 \times 16428 \times 0.95 (181.50 - 196.80) + \frac{188 \times 188}{2.25} \times (544.50 - 199) \right\} \frac{x}{(181.5)^3} \\ &\quad + \left\{ 6 \times 16428 \times 0.95 (196.80 - 181.50) - \frac{3 \times 188 \times 188}{2.25} (181.50 - 95 \times 188) \right\} \frac{x^2}{(181.5)^4} \\ &= \left\{ 62426.4 (-15.3) + (15708.44) (187.3) \right\} \frac{x}{5979018} \\ &\quad + \left\{ 93639.6 (15.3) - 47125.33 \times 2.90 \right\} \frac{x^2}{10851918.35} \\ &= \left\{ -955124 + 2942191 \right\} \frac{x}{5979018} + \left\{ 1432686 - 136668 \right\} \frac{x^2}{10851918.35} \\ &= \frac{19870.7}{5979018} x + \frac{1296023}{10851918.35} x^2 \\ &= 0.3323 x + \frac{1}{837.3} x^2 \end{aligned}$$

$$\begin{aligned} p' &= \frac{h_1}{\gamma} + \left\{ \frac{2wm^2}{b^3} \left(2 - \frac{3d}{b} \right) - \frac{3h_1(b-mh_1)^2}{\gamma b^3} + \frac{m}{b} \right\} x \\ &\quad + \left\{ \frac{6wm^2}{b^4} \left(\frac{4d}{b} - 1 \right) + \frac{2h_1(b-mh_1)(-2mh_1)}{\gamma b^4} - \frac{m}{b^2} \right\} x^2 \\ &= \frac{188}{2.25} + \left\{ \frac{2 \times 16428 \times (0.95)^2}{(181.50)^3} \left(2 - \frac{196.8}{181.50} \right) - \frac{3 \times 188 \times (2.9)^2}{2.25 \times 10851918.35} + \frac{0.95}{181.50} \right\} x \\ &\quad + \left\{ \frac{6 \times 16428 \times (0.95)^2}{(181.50)^4} \times \frac{80.9}{181.50} + \frac{376(2.9)(-175.7)}{2.25 \times (181.50)^4} - \frac{0.95}{32942} \right\} x^2 \\ &= 83.55 + \left\{ \frac{29632}{5979018} \times \left(\frac{-227.4}{181.50} \right) - \frac{2108.1}{10851918.35} \times \frac{1}{191.05} \right\} x^2 \end{aligned}$$

$$\begin{aligned}
& + \left\{ \frac{88958}{1085191835} \times (4457) + \left(\frac{-85148}{(181.50)^2} \right) - \frac{1}{34676} \right\} x^3 \\
& = 83.55 + \left\{ -\frac{1}{160.9} - \frac{1}{514772} + \frac{1}{191.05} \right\} x^2 + \left\{ \frac{1}{27370} - \frac{1}{2313175} - \frac{1}{34676} \right\} x^3 \\
& = 83.55 + \left(\frac{-3199.3 - 1 + 2694.4}{514772} \right) x^2 + \left(\frac{84.5 - 1 - 66.7}{2313175} \right) x^3 \\
& = 83.55 - \frac{505.9}{514772} x^2 + \frac{16.8}{2313175} x^3 \\
& = 83.55 - \frac{x^2}{1017.5} + \frac{x^3}{137700} \\
p' & = 83.55 - \frac{x^2}{1017.5} + \frac{x^3}{137700} \quad \dots \dots \dots \text{III}
\end{aligned}$$

By substituting $x = 0, 10, 20, 30$ feet and so on, in the above equations I, II and III, we get the values of p, q and p' , the vertical, shearing and the horizontal compressive stresses, respectively, along the base at distances, 0, 10, 20, 30 feet and so on, from the upstream toe. These results are all embodied in the table (page 524).

From the values thus obtained for p, q and p' , proceed to find the two principal stresses at the several points on the base, and also the angles which the direction of the greater of the two principal stresses makes with the horizontal. The equations determining these quantities are, as in the case of layer + 610.00.

$$p'' - p''(p+p') + (p' - q^2) = 0 \quad \dots \dots \dots \text{IV}$$

$$\text{and } \tan 2\theta = \frac{2q}{p' - p} \quad \dots \dots \dots \text{V}$$

where p'' is the principal stress and θ , the angle which the direction of the greater of the two principal stresses makes with the horizontal.

(1) When $x = 0$, we have from the tables

$$p = 4.76; q = 0.00 \text{ and } p' = 5.22.$$

$$\text{Equation IV becomes } p''^2 - 9.98 p'' + 24.85 = 0.$$

$$\therefore p'' = \frac{9.98 \pm \sqrt{99.60 - 99.40}}{2}$$

$$= \frac{9.98 \pm 0.4}{2} = 5.22 \text{ or } 4.76 \text{ tons per sq. ft.}$$

$$\text{From equation V, we have } \tan 2\theta = 0.$$

$$\therefore \theta = 0.$$

(2) When $x = 10$, we have from the tables

$$p = 4.86; q = 0.22 \text{ and } p' = 5.22.$$

$$\text{Equation IV becomes } p''^2 - 10.08 p'' + (25.37 - 0.05) = 0.$$

$$\therefore p'' = \frac{10.08 \pm \sqrt{101.61 - 101.28}}{2}$$

$$= \frac{10.08 \pm 0.58}{2} = 5.33 \text{ or } 4.75 \text{ tons per sq. ft.}$$

$$\text{From equation V, we have } \tan 2\theta = \frac{0.44}{0.86}.$$

$$= 1.22 = \tan 50^\circ 42'.$$

$$\therefore \theta = 25^\circ 21'.$$

(3) When $x = 20$, we have from the tables

$$p = 4.96; q = 0.45 \text{ and } p' = 5.20.$$

$$\text{Equation IV becomes } p''^2 - 10.16 p'' + (25.79 - 0.20) = 0.$$

$$\therefore p'' = \frac{10.16 \pm \sqrt{103.23 - 102.36}}{2}$$

$$= \frac{10.16 \pm 0.94}{2} = 5.50 \text{ or } 4.61 \text{ tons per sq. ft.}$$

$$\text{From equation V, we have } \tan 2\theta = \frac{0.90}{0.21} = 3.75 = \tan 75^\circ 4'.$$

$$\therefore \theta = 37^\circ 32'.$$

(4) When $x = 30$, we have from the tables

$$p = 5.06; q = 0.69 \text{ and } p' = 5.18.$$

$$\text{Equation IV becomes } p''^2 - 10.24 p'' + (26.21 - 0.48) = 0.$$

$$\therefore p'' = \frac{10.24 \pm \sqrt{104.86 - 102.92}}{2}$$

$$= \frac{10.24 \pm 1.40}{2} = 5.82 \text{ or } 4.42 \text{ tons per sq. ft.}$$

$$\text{From equation V, we have } \tan 2\theta = \frac{1.38}{0.12} = 11.50 = \tan 85^\circ 2'.$$

$$\therefore \theta = 42^\circ 31'.$$

(5) When $x = 40$, we have from the tables

$$p = 5.15; q = 0.95 \text{ and } p' = 5.15.$$

$$\text{Equation IV becomes } p''^2 - 10.3 p'' + (26.52 - 0.90) = 0.$$

$$\therefore p'' = \frac{10.30 \pm \sqrt{106.09 - 102.48}}{2}$$

$$= \frac{10.30 \pm 1.90}{2} = 6.10 \text{ or } 4.20 \text{ tons sq. ft.}$$

$$\text{From equation V, we have } \tan 2\theta = \frac{1.90}{0} = \tan 90^\circ.$$

$$\therefore \theta = 45^\circ 0'.$$

(6) When $x = 50$, we have from the tables

$$p = 5.25; q = 1.23 \text{ and } p' = 5.13.$$

$$\text{Equation IV becomes } p''^2 - 10.38 p'' + (26.93 - 1.51) = 0.$$

$$\therefore p'' = \frac{10.38 \pm \sqrt{107.74 - 101.8}}{2}$$

$$= \frac{10.38 \pm 2.47}{2} = 6.43 \text{ or } 3.96 \text{ tons sq. ft.}$$

$$\text{From equation V, we have } \tan 2\theta = \frac{2.46}{0.12} = 20.50 = \tan 92^\circ 48'.$$

$$\therefore \theta = 46^\circ 24'.$$

(7) When $x = 60$, we have from the tables

$$p = 5.35; q = 1.52 \text{ and } p' = 5.10.$$

$$\text{Equation IV becomes } p''^2 - 10.45 p'' + (27.29 - 2.31) = 0.$$

$$\therefore p'' = \frac{10.45 \pm \sqrt{109.20 - 99.92}}{2}$$

$$= \frac{10.45 \pm 3.13}{2} = 6.74 \text{ or } 3.71 \text{ tons sq. ft.}$$

$$\text{From equation V, we have } \tan 2\theta = \frac{3.04}{0.25} = 12.16 = \tan 94^\circ 42'.$$

$$\therefore \theta = 47^\circ 21'.$$

(8) When $x = 70$, we have from the tables

$$p = 5.45; q = 1.82 \text{ and } p' = 5.08.$$

$$\text{Equation IV becomes } p''^2 - 10.35 p'' + (27.69 - 3.31) = 0.$$

$$\therefore p'' = \frac{10.53 \pm \sqrt{110.88 - 97.52}}{2}$$

$$= \frac{10.53 \pm 3.65}{2} = 7.09 \text{ or } 3.44 \text{ tons sq. ft.}$$

$$\text{From equation V, we have } \tan 2\theta = \frac{3.64}{0.37} = 9.838 = \tan 95^\circ 48'.$$

$$\therefore \theta = 47^\circ 54'.$$

(9) When $x = 80$, we have from the tables

$$p = 5.55; q = 2.14 \text{ and } p' = 5.06.$$

$$\text{Equation IV becomes } p''^2 - 10.61 p'' + (28.08 - 4.58) = 0.$$

$$\therefore p'' = \frac{10.61 \pm \sqrt{112.57 - 94.00}}{2}$$

$$= \frac{10.61 \pm 4.31}{2} = 7.46 \text{ or } 3.15 \text{ tons sq. ft.}$$

$$\text{From equation V, we have } \tan 2\theta = \frac{4.28}{0.49} = 8.735 = \tan 96^\circ 32'.$$

$$\therefore \theta = 48^\circ 16'.$$

(10) When $x = 90$, we have from the tables

$$p = 5.65; q = 2.47 \text{ and } p' = 5.06.$$

Equation IV becomes $p''^2 - 10.71 p'' + (28.59 - 6.10) = 0$.

$$\therefore p'' = \frac{10.71 \pm \sqrt{114.70 - 89.96}}{2}$$

$$= \frac{10.71 \pm 4.97}{2} = 7.84 \text{ or } 2.87 \text{ tons sq. ft.}$$

From equation V, we have $\tan 2\theta = \frac{4.94}{-0.59} = -8.373 = \tan 96^\circ 48'$.

$$\therefore \theta = 48^\circ 24'.$$

(11) When $x = 100$, we have from the tables

$$p = 5.75; q = 2.82 \text{ and } p' = 5.06.$$

Equation IV becomes $p''^2 - 10.81 p'' + (29.10 - 7.95) = 0$.

$$\therefore p'' = \frac{10.81 \pm \sqrt{116.86 - 84.60}}{2}$$

$$= \frac{10.81 \pm 5.68}{2} = 8.25 \text{ or } 2.57 \text{ tons sq. ft.}$$

From equation V, we have $\tan 2\theta = \frac{5.64}{-0.69} = -8.174 = \tan 96^\circ 58'$.

$$\therefore \theta = 48^\circ 29'.$$

(12) When $x = 110$, we have from the tables

$$p = 5.85; q = 3.19 \text{ and } p' = 5.08.$$

Equation IV becomes $p''^2 - 10.93 p'' + (29.72 - 10.17) = 0$.

$$\therefore p'' = \frac{10.93 \pm \sqrt{119.46 - 78.20}}{2}$$

$$= \frac{10.93 \pm 6.43}{2} = 8.68 \text{ or } 2.25 \text{ tons sq. ft.}$$

From equation V, we have $\tan 2\theta = \frac{6.38}{-0.77} = -8.286 = \tan 96^\circ 54'$.

$$\therefore \theta = 48^\circ 27'.$$

(13) When $x = 120$, we have from the tables

$$p = 5.95; q = 3.57 \text{ and } p' = 5.12.$$

Equation IV becomes $p''^2 - 11.07 p'' + (30.46 - 12.74) = 0$.

$$\therefore p'' = \frac{11.07 \pm \sqrt{122.54 - 70.88}}{2}$$

$$= \frac{11.07 \pm 7.19}{2} = 9.13 \text{ or } 1.94 \text{ tons sq. ft.}$$

From equation V, we have $\tan 2\theta = \frac{7.14}{-0.83} = -8.602 = \tan 96^\circ 40'$.

$$\therefore \theta = 48^\circ 20'.$$

(14) When $x = 130$, we have from the tables

$$p = 6.05; q = 3.96 \text{ and } p' = 5.18.$$

Equation IV becomes $p''^2 - 11.23 p'' + (31.34 - 15.68) = 0$.

$$\therefore p'' = \frac{11.23 \pm \sqrt{126.11 - 62.64}}{2}$$

$$= \frac{11.23 \pm 7.97}{2} = 9.60 \text{ or } 1.63 \text{ tons sq. ft.}$$

From equation V, we have $\tan 2\theta = \frac{7.92}{-0.87} = -9.104 = \tan 96^\circ 16'$.

$$\therefore \theta = 48^\circ 8'.$$

(15) When $x = 140$, we have from the tables

$$p = 6.15; q = 4.37 \text{ and } p' = 5.26.$$

Equation IV becomes $p''^2 - 11.41 p'' + (32.25 - 19.10) = 0$.

$$\therefore p'' = \frac{11.41 \pm \sqrt{130.19 - 53.00}}{2}$$

$$= \frac{11.41 \pm 8.79}{2} = 10.10 \text{ or } 8.31 \text{ tons sq. ft.}$$

From equation V, we have $\tan 2\theta = \frac{8.74}{-0.89} = -9.82 = \tan 95^\circ 48'$.

$$\therefore \theta = 47^\circ 54'.$$

(16) When $x = 150$, we have from the tables

$$p = 6.25; q = 4.79 \text{ and } p' = 5.37.$$

Equation IV becomes $p''^2 - 11.62 p'' + (33.53 - 22.94) = 0$.

$$\therefore p'' = \frac{11.62 \pm \sqrt{135.02 - 42.48}}{2}$$

$$= \frac{11.62 \pm 9.62}{2} = 10.62 \text{ or } 1.00 \text{ tons sq. ft.}$$

From equation V, we have $\tan 2\theta = \frac{9.58}{-0.88} = -10.886 = \tan 95^\circ 15'$.

$$\therefore \theta = 47^\circ 37\frac{1}{2}'.$$

(17) When $x = 160$, we have from the tables

$$p = 6.34; q = 5.23 \text{ and } p' = 5.51.$$

Equation IV becomes $p''^2 - 11.85 p'' + (34.93 - 27.35) = 0$.

$$\therefore p'' = \frac{11.85 \pm \sqrt{140.42 - 30.32}}{2}$$

$$= \frac{11.85 \pm 10.49}{2} = 11.17 \text{ or } 0.68 \text{ tons sq. ft.}$$

From equation V, we have $\tan 2\theta = \frac{10.46}{-0.83} = -12.60 = \tan 94^\circ 34'$.

$$\therefore \theta = 47^\circ 17'.$$

(18) When $x = 170$, we have from the tables

$$p = 6.44; q = 5.69 \text{ and } p' = 5.68.$$

Equation IV becomes $p''^2 - 12.12 p'' + (35.38 - 32.35) = 0$.

$$\therefore p'' = \frac{12.12 \pm \sqrt{146.89 - 16.80}}{2}$$

$$= \frac{12.12 \pm 11.40}{2} = 11.76 \text{ or } 0.36 \text{ tons sq. ft.}$$

From equation V, we have $\tan 2\theta = \frac{11.38}{-0.76} = -14.98 = \tan 93^\circ 50'$.

$$\therefore \theta = 46^\circ 55'.$$

(19) When $x = 181.5$, we have from the tables

$$p = 6.56; q = 6.23 \text{ and } p' = 5.91.$$

Equation IV becomes $p''^2 - 12.47 p'' + (38.77 - 38.81) = 0$.

$$\therefore p'' = \frac{12.47 \pm 12.47}{2} = 12.47 \text{ or } 0 \text{ tons sq. ft.}$$

From equation V, we have $\tan 2\theta = \frac{12.46}{-0.65} = -19.17 = \tan 92^\circ 58'$.

$$\therefore \theta = 46^\circ 29'.$$

The above results are entered in the table in next page.

Table of stresses at level +600 in tons per square foot. Base width 181.50 ft. (Reservoir full).

Stresses in tons per square foot.		Distances in feet from the upstream toe.																		
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	181.5
p = Vertical stress	4.75	4.86	4.96	5.06	5.15	5.25	5.35	5.45	5.55	5.65	5.75	5.85	5.95	6.05	6.15	6.25	6.34		6.44	6.56
q = Shearing stress, Horizontal or Vertical	0.00	0.22	0.45	0.69	0.93	1.23	1.52	1.82	2.14	2.47	2.82	3.19	3.57	3.96	4.37	4.79	5.23		5.69	6.23
p' = Horizontal stress	5.22	5.22	5.20	5.18	5.15	5.13	5.10	5.08	5.06	5.06	5.06	5.08	5.12	5.18	5.23	5.37	5.61		5.58	5.91
p'' = Principal stresses	5.22 4.76	5.33 4.75	5.50 4.61	5.82 4.42	6.10 4.20	6.43 3.96	6.74 3.71	7.09 3.44	7.46 3.16	7.84 2.87	8.25 2.57	8.68 2.26	9.13 1.94	9.60 1.63	10.10 1.31	10.62 1.00	11.17 0.68		11.76 0.36	12.47 0.00
θ = the angle which the direction of the first <i>sketch</i> principal stresses makes with the horizontal	0°	25° 21'	37° 32'	42° 31'	45° 0'	46° 24'	47° 21'	47° 54'	48° 16'	48° 24'	48° 29'	48° 27'	48° 20'	48° 8'	47° 54'	47° 37'	47° 17'		46° 55'	46° 29'

the angle which the direction of the first stated principal stresses makes with the horizontal

APPENDIX IV.

Calculations in connexion with the hydraulic particulars of the distribution system.

Regulators and Head Sluices.—The vents are in general treated as submerged orifices and the formula $D = C.A. \sqrt{2gh}$ has been used in calculating the discharges, with a value of 0.7 for "C," the co-efficient of discharge. In the case of the Head Regulator, Grand Ancient Canal, where the vents are 30' wide, a co-efficient of discharge of 0.78 is used.

EXAMPLE.

Head Regulator, Grand Ancient Canal.—Cill level + 188.91; Vents, 4' high. F.S.L. front (for calculation) + 193.41; F.S.L. rear + 192.91

Discharge to be provided for = 4,115 cusecs. Waterway provided, 8 vents $30' \times 4' =$
960 sq. ft.

Head taken for calculation = 0.5'

Discharge provided for = C.A. $\sqrt{2gh} = 0.78 \times 960 \times 8 \times 0.7 = 4192$ cu. sec.

Cases in which the top of the vent is higher than the tail water-level have been dealt with in the same way as Surplus Sluices (paragraph 2). But in the case of regulators across the line of canal the velocity of approach is taken into account, whereas in the case of surplus sluices no velocity of approach is counted upon.

2. *Surplus Sluices*.—These sluices generally discharge with a rapid draw-off in rear and the tail water-level is lower than the top of the vent. The discharges through these sluices are worked out with the following formula taking the sluice vent to be a drowned weir :—

$$D = C_1 \Delta \sqrt{2gh} + \frac{2}{3} C_2 lh \sqrt{2gh}.$$

Where l = the length in feet.

$$h = \text{the difference of water levels in front and rear.}$$

„ A = the area of the submerged orifice.

„ C_1 = the co-efficient for the submerged portion (taken as 0.70).

„ C_2 = the co-efficient for the clear-overfall portion (taken as 0.625).

EXAMPLES.

Regulator at R.D. 33/6600 of Grand Anicut Canal.

$$\text{Discharge} = C_1 A \sqrt{2g(h + ha)} + \frac{2}{3} C_2 l \sqrt{2g} \left\{ h + ha^2 - ha^{\frac{3}{2}} \right\}$$

Where h_a = head due to velocity of approach.

Discharge required — 712 cusecs.

Waterway provided = 5 vents, 6' 0" x 5' 6".

Assuming the velocity of approach is equal to the velocity in the canal, viz., 2.62 feet per second.

$$V_a = 2.62; h_a = 0.12'$$

Discharge provided for

$$= 7 \times 5 \times 6 \times 5 \times 8 \sqrt{0.62} \times \frac{2}{3} \times \frac{5}{8} \times 5 \times 6 \times 8 \left\{ (0.5 + 0.12) - 0.12 \right\}.$$

$$= 661.4 + 44.6 = 706 \text{ cusecs.}$$

Surplus sluice at R.D. 36/2000 of the Grand Anicut Canal.

Discharge required = 672 cusecs.

Waterway provided = 4 vents, 6' 0" x 5' 0".

Discharged provided for

$$= 0.7 \times 4 \times 6 \times \frac{7}{2} \times 8 \sqrt{1.5} + \frac{2}{3} \times \frac{5}{8} \times 4 \times 6 \times 1.5 \times 8 \sqrt{1.5}$$

$$= 576 + 147 = 723 \text{ cusecs.}$$

3. *Tank supply sluices.*—As tanks have to be supplied as quickly as possible, liberal waterways have been provided consistent with economy. The tanks to be supplied are mostly small tanks and only one vent is provided. Where this is the case, the provision of a liberal waterway does not materially increase the cost. The discharges required have been calculated by dividing the avacut in acres by 2 in the case of tanks irrigating not more than

80 acres, by $2\frac{1}{2}$ in the case of tanks irrigating from 80 to 200 acres and by 3 in the case of tanks irrigating more than 200 acres. The formula used for calculating the discharge is the same as that for pipe sluices, viz., $D = C A \sqrt{2 g h}$, where C is taken as 0.625.

EXAMPLE.

Tank supply sluice at R.D. 4/6720 of the Grand Anicut Canal.

Area for irrigation = 300 acres.

Duty taken = 3 acres per cusec.

Discharge required = $\frac{300}{3} = 100$ cusecs.

Full supply depth of canal = 7'.

Half do = 4.7'.

Full supply depth of rear channel = 3.0'.

Head available = (4.7 - 3.0) = 1.7'.

$D = C A \sqrt{2 g h} = 100$.

$A = \frac{100}{\frac{0.625}{8} \times \sqrt{2 \times 32.2 \times 1.7}} = \frac{100}{5 \times 1.3} = 15.4$ square feet.

Area of waterway provided

= 1 vent of 6' 0" x 3' 0" = 18 square feet.

4. *Pipe Sluices*.—These sluices are in general designed to carry the requisite discharge with a duty of 73 acres per cusec. The formula used is $D = C A \sqrt{2 g h}$, where C is 0.625. The waterway required is proposed to be provided by providing a vent stone of the required diameter and inserting the next higher diameter pipes in rear of the vent stone.

EXAMPLE.

Irrigation pipe sluice at R.D. 5/7450 of the Grand Anicut Canal.

Area for irrigation = 359 acres.

Duty taken, 73 acres per cusec.

Discharge required = $\frac{359}{73} = 4.9$ cusecs.

Depth at full supply in canal = 7'.

Do. half do. = 4.7'.

Full supply depth in rear channel = 2.0'.

Head available = 4.7 - 2.0 = 2.7'.

$D = C A \sqrt{2 g h} = 4.9$.

$A = \frac{4.9}{\frac{0.625}{8} \times \sqrt{2 \times 32.2 \times 2.7}} = \frac{4.9}{5 \times 1.65} = 0.59$ square foot.

Diameter of vent stone = $10\frac{1}{2}$ ".

Diameter of pipes = 12".

5. *Canal Drainage works*.—The maximum flood discharges from catchment basins have been calculated with Hyve's formula $D = C M^{\frac{2}{3}}$, with a value of 600 for " C ", except in the case of the Agniar which drains 294.67 square miles and in which the largest catchment intercepted. In this case, provision is made for a run-off of 5" in 24 hours. No allowance has been made in the grading of canals for heading up due to contraction of canal waterway through the larger aqueducts. The reason for this is that the heading up is very small, being almost always less than 0.1 of a foot and never exceeding 0.12 of a foot. The heading up in the extreme case of contraction of canal section in the trough of an aqueduct is worked out below. Let V_1 and V_2 be velocity in the full section of the canal and in the aqueduct contracted section, respectively—

h_1 = theoretical head to increase velocity from V_1 to V_2 .

h_2 = Recovery of head on exit from aqueduct.

$h_1 = \frac{V_2^2 - V_1^2}{2g}$; $h_2 = \frac{V_1 (V_2 + V_1)}{g}$

(vide Hydraulics by E S Bellasis), where the enlargement of section on exit from the aqueduct is abrupt.

From the above—

$h_1 - h_2$ = heading up canal above the entry to aqueduct = $\frac{(V_2 - V_1)^2}{2g}$.

If the variation of section is gradual, that is, by a large number of successive steps the heading up becomes smaller as will be seen by applying the formula to such a case. In the case of extreme contraction of aqueduct, Grand Anicut Canal.

$V_1 = 2.22$ f.s.; $V_2 = 5.0$ f.s.

$h_1 - h_2 = \frac{(5 - 2.22)^2}{2 \times 32.2} = 0.12$ foot.

This is the theoretic heading up by abrupt contraction without allowing for losses due to eddies, etc. As the contractions are gradual and not abrupt, this is set-off against the above losses.

In all cases except two, the drainage is passed under the canal, and in these cases Syphon Aqueducts have been proposed. The velocity through the tunnels will be restricted to about 3 feet per second and on this assumption the area of ventway required for passing the maximum flood discharge is determined. The head required for passing the discharge through the waterway provided is calculated with the aid of Unwin's formula—

$H = \left(1 + f_1 + f_2 \times \frac{l}{m}\right) \frac{V^2}{2g}$, where

$f_1 = 0.505$ for cylindrical mouth

$f_2 = a \left(1 + \frac{b}{m}\right)$; a & b are co-efficients varying according to nature of surface and

m is hydraulic mean depth of barrel.

L = the length of barrel and entrances.

With the water-level in rear ascertained by local enquiry or marks, or calculated in cases where the rear channel has to be cut, the M.F.L. in front is arrived at.

This M.F.L. very often gives small depths in the drainage course above the cross drainage work and in such cases the M.F.L. above the drop wall will be higher than the M.F.L. in front of the syphon tunnel and this is determined by taking the drop wall as a weir that has to pass the maximum discharge over it.

If it happens to be a case of clear overfall, the following formula is used:—

$D = \frac{2}{3} c l h \sqrt{2 g h} = 3.33 l h^{\frac{3}{2}}$

If it happens to be a case of submerged weir, the following formula is used:—

$D = l \sqrt{h} (3.33 h + 8 c_2 d)$

Where $c_2 = 0.8$ and d = depth of submerged portion.

Example—

Syphon aqueduct at R.D. 5/5070 of the Grand Anicut Canal.

Drainage area = 30 square miles

Discharge to be provided for = $600 \times 30^{\frac{2}{3}} = 5,793$ cusecs.

Level of lift wall (rear) = + 172.65.

Depth of M.F.L. = 5.5 feet.

M.F.L. rear = 178.15.

Area of waterway provided 8 vents $12' \times 6'$ and rise $2' = 8 \times 88.33 = 706.6$ square feet.

Velocity through tunnel = $\frac{5793}{706.6} = 8.2$ f.s.

Head required to produce velocity and overcome resistance through the tunnel

$= \left(1 + f_1 + f_2 \times \frac{l}{m}\right) \frac{V^2}{2g}$

$= \left\{1 + 0.505 + 0.00316 \left(1 + \frac{0.10}{2.39}\right) \times \frac{138}{2.39}\right\} \times \frac{8.2^2}{64}$

$= 1.78$ feet

M.F.L. in front of tunnel = 179.93.

Length of drop wall = 117 feet.

Discharge per foot run of drop wall = $\frac{5793}{117} = 49.5$ cusecs.

Depth of submerged portion over drop wall + $179.93 - 174.65 = 5.28$ feet.

$D = l \sqrt{h} (3.33 h + 6.4 d)$.

$49.5 = l \times \sqrt{h} (3.33 h + 6.4 \times 5.28)$.

$\therefore h = 1.6$.

M.F.L. above drop wall = $179.93 + 1.6 = 181.53$.

There are two cases in which the canal is proposed to be passed under the drainage courses, viz., the canal syphon for the Grand Anicut Canal at R.D. 15/8750 and the syphon for the Marthandamuthavari over the Vadavar at R.D. 2/3188 and the calculations in connexion with these are given below:—

Canal syphon at R.D. 15/8750 of the Grand Anicut Canal.

Drain catchment area = 16.90 square miles.

Maximum discharge from catchment = $600 \times (16.90)^{\frac{2}{3}} = 3,951$ cusecs.

The velocity of approach has been assumed as 5 feet per second and an afflux of 6" has been assumed.

Head due to velocity of approach

$\frac{V^2}{2g} = \frac{25}{64} = 0.39$.

Total head = $0.5 + 0.39 = 0.89$.

The depth of water in the drain has been fixed from observations to be 6 feet :

$$D = CA \sqrt{2gh}; C = 0.8.$$

$$3,951 = 0.8 \times L \times 6 \times 8 \sqrt{0.89}$$

$$\therefore L \text{ or mean width} = \frac{3951}{0.8 \times 6 \times 8 \sqrt{0.89}} = 109'.$$

The batter of the side walls is 1 in 4; so the bottom width between side walls of the aqueduct is 107' 6".

Canal.—Discharge at full supply = 3,572 cusecs.

Bottom width of canal in front and rear of syphon = 156'.

Head available = 0.73'.

Depth at F.S.L. = 7'.

Size of vents = 12' × 6' with 2 feet rise.

$$V = 8.025 \sqrt{\frac{H}{1 + f_1 + f_2 \frac{L}{m}}} \text{ (Unwin's formula).}$$

$$= 8.025 \sqrt{\frac{0.73}{1 + 0.505 + 0.238}} = 5.2' \text{ f.s.}$$

$\therefore$ Discharge through one vent

$$= 88.33 \times 5.2 = 459.3 \text{ cusecs.}$$

$\therefore$ Number of vents required

$$= \frac{3572}{459.3} = 8 \text{ vents.}$$

Waterway provided

$$= 8 \text{ vents } 12' \times 6' \text{ with } 2' \text{ rise.}$$

Superpassage for the Muthalamuthuvani over the Vadavar at R.D. 2/3100.

Canal Discharge required when full supply is carried = 813 cusecs.

$$\text{Waterway provided} = 3 \text{ vents } 12' \times 5' \text{ with } 2' \text{ rise}$$

$$= 228.75 \text{ square feet.}$$

$$\text{Velocity in the tunnel} = \frac{813}{228.75} = 3.55.$$

Head required to produce velocity and overcome resistance

$$= 1.925 \times \frac{V^2}{2g}$$

$$= 0.38' \text{ or say } 0.4'.$$

Head available for notch

$$= 3.5 - 0.4 = 3.1 \text{ feet.}$$

For half supply—

$$\text{Discharge required} = 406.5 \text{ cusecs.}$$

$$\text{Area of waterway} = 228.75 \text{ square feet.}$$

$$\text{Velocity} = \frac{406.5}{228.75} = 1.78 \text{ f.s.}$$

Head required to produce velocity and overcome resistance

$$= \frac{1.925 \times (1.78)^2}{2g}$$

$$= 0.095 \text{ or say } 0.1.$$

Trapezoidal notches will be provided to maintain the above conditions—

Calculation for notch—

$$\text{Depth of Tail water at full supply} = E_f = 1.4.$$

$$\text{Do. do. at half supply} = E_h = 0.$$

Number of notches provided = 6; slope $\frac{3}{4}$ to 1.

$$\text{Discharge through each notch at full supply} = \frac{813}{6} = 135.5 \text{ cusecs.}$$

$$\text{Cill width} = \frac{135.5 - 50.7}{34.2} = 2.49.$$

$$\text{Discharge through each notch at half supply} = \frac{406.5}{6} = 67.75.$$

$$\text{Cill width} = \frac{67.75 - 18.60}{19.4} = 2.53.$$

vents with cill width 2' 6" and side slopes $\frac{3}{4}$ to 1 are provided.

Calculation for maximum flood discharge.—Maximum flood discharge to be passed through the syphon = 2,000 cusecs.

Area of tunnel = 228.75 square feet.

$$\text{Velocity in the tunnel} = \frac{2000}{228.75} = 8.74 \text{ f.s.}$$

$$\text{Head required to produce velocity and overcome resistance} = \left(1 + f_1 + f_2 \frac{L}{m}\right) \frac{V^2}{2g}$$

$$= \left[1 + 0.505 + \frac{(0.04 \times 232)}{2.2}\right] \frac{(8.74)^2}{64}$$

$$= [1 + 0.505 + 0.42] \times 1.2$$

$$= 1.925 \times 1.2 = 2.31' \text{ as against } 2.4' \text{ allowed.}$$

Calculations for afflux in front of drop wall.

$$\text{Area of submerged portion} \begin{cases} \text{Rectangular} = 61 \times 2.2 = 134.2 \\ \text{Trapezoidal} = 6 \times 19.35 = 116.1 \end{cases}$$

$$\text{Total} = 250.30 \text{ square feet.}$$

$$D = 3.1 \sqrt[3]{h} + 0.4 \sqrt[3]{2gh}$$

$$2,000 = 3.1 \times 61 \times h + 0.8 \times 250.3 \times 8 \sqrt[3]{h}$$

$$h = 1.2'.$$

Drain—Calculations for the Muthalamuthuvani Diversion.

Area of catchment basin = 86 square miles.

$$\text{Maximum flood discharge} = 600 \times (86)^{\frac{2}{3}} = 11690 \text{ cusecs.}$$

Bed width of diversion channel = 180'; side slopes 1 to 1; fall 1 in 1250;

Kutters $n = 0.020$

$$A = (180 + 8) \times 8 = 1504; B = 180 + 2 \times 8 \sqrt{2} = 202.4.$$

$$R = \frac{1504}{202.4} = 7.43; \sqrt{R} = 2.73.$$

$$V = \frac{NR}{\sqrt{R} + D} = \frac{3.839 \times 7.43}{2.73 + 0.903} = 7.852 \text{ f.s.}$$

$$D = 1504 \times 7.852 = 11809 \text{ cusecs.}$$

$$\text{Waterway allowed for the super-passage over the Vadavar} = (180 + \frac{8}{3}) \times 8 = 1461.33'$$

$$\text{and the velocity} = \frac{11690}{1461.33} = 7.93 \text{ or say, } 8 \text{ f.s.}$$

6. Canal and channel sections.—In calculating the required sections for canals and channels, Kutter's formula has been used.

EXAMPLE.

Discharge from R.D. 29/2635 to R.D. 32/0500, Grant Anicut Canal—

Discharge required = 1,257 cusecs.

Bed with = 79'; depth = 5.5'.

Side slopes $\frac{1}{2}$ to 1 (for purposes of calculation).

Kutter's $n = 0.020$ for bed widths above 50'.

$= 0.0225$ for bed widths below 50'.

$$\text{Fall of channel} = 0.165' \text{ per } 1000 = \frac{1}{6060}.$$

$$A = (79 + 2.75) \times 5.5 = 449.6; B = 91.2.$$

$$n = 0.020$$

$$R = \frac{449.6}{91.2} = 4.93; \sqrt{R} = 2.22.$$

$$V = \frac{N.R}{\sqrt{R} + D} = \frac{1.925 \times 4.93}{2.22 + 1.170} = 2.80.$$

$$D = 449.6 \times 2.80 = 1,259 \text{ cusecs.}$$

2. from R.D. 33/2500 to R.D. 41/3500 Grand Anicut Canal—

Discharge required = 503 cusecs.

Bed width = 44'; depth = 4.5'.

Side slopes = $\frac{1}{2}$ to 1; fall = 0.22 per 1000.

$n = 0.0225$

$$A = (44 + 2.25) \times 4.5 = 208.125; B = 51.$$

$$R = \frac{208.125}{54} = 3.855; \sqrt{R} = 1.962$$

$$V = \frac{N.R}{\sqrt{R} + D} = 2.42$$

$$D = 208.125 \times 2.42 = 505 \text{ cusecs.}$$

7. *Bridges.*—The mean width of the canal or channel at sites of bridges has been taken into account and the number and width of spans determined with reference to the above, taking care to see that the reduction of waterway does not materially exceed 5 per cent.

EXAMPLES.

1. *Bridge at R.D. 1/3610 Grand Anicut Canal.*

Bed width = 180'; depth of water = 7'.

Mean width of waterway = 183.5.

Waterway provided = 5 spans of 35' = 175'.

The contraction is 8.5' which is within 5 per cent.

8. *Drops.*—Except in cases where drops on Branch canals are combined with Regulators worked by screw-gearing shutters, trapezoidal notches have been provided for the Drops on Branch Canals and Distributaries, so that the discharge through the drops at different depths of water may be proportional to the canal discharges for the respective depths.

In fixing the dimensions of the trapezoidal notches, Nethersole's formula and tables have been used. The discharge through the triangular portions of notches at ends is calculated by the formula $\Delta = n (2.8 f^{\frac{1}{2}} E^{\frac{3}{2}} + 3.73 f^{\frac{1}{2}} E + 1.492 f)$ and that through the rectangular portions with the formula

where E = submersion or the depth of water down stream of the notch over the sill.
 F = difference between water surfaces front and rear.
 $n = 2 \tan a$ where a = angle made by the side of notch with vertical.

The sill widths required for carrying full supply and half supply are worked out and compared and the side slopes suitably altered to make the sill widths nearly agree in both cases.

EXAMPLES.

(1) *3' drop at R.D. 1730 of Kallianodai Branch Canal.*

Full supply—

Depth in front = 6'.

Do. in rear = 6'.

Discharge = 1,224 cusecs.

Number of notches = 8.

Discharge of each notch = $\frac{1224}{8} = 153$ cusecs.

Side slopes of notch = $\frac{1}{4}$; $E = 3$; $f = 3$

Discharge through triangular portion

$$= \frac{1}{2} \times 2.8 \times (3)^{\frac{1}{2}} \times (3)^{\frac{3}{2}} + 3.73 \times (3)^{\frac{1}{2}} \times 3 + 1.492 \times (3)$$

$$= \frac{1}{2} \times (3) \times 8.022 = \frac{1}{2} \times 125.05 = 62.53 \text{ cusecs.}$$

Discharge through 1 foot of rectangular portion.

$$= 1 (5.6 \times (3)^{\frac{1}{2}} \times 3 + 3.73 \times (3)^{\frac{1}{2}})$$

$$= (3)^{\frac{1}{2}} \times 9.33 = 48.5 \text{ cusecs.}$$

$$\therefore \text{cill width required} = \frac{153 - 62.53}{48.5} = 1.86'.$$

Half supply—

Depth in front = 4'.

do. in rear = 4'.

Discharge = 612 cusecs.

Discharge through each notch = $\frac{612}{8} = 76.5$ cusecs.

Side slopes notch = $\frac{1}{4}$; $E = 1$.

Discharge of triangular portion of notch (from tables) = 23.8 cusecs.

Discharge per foot run of rectangular portion = 29.1 cusecs.

$$\therefore \text{cill width required} = \frac{76.5 - 23.8}{29.1} = 1.81.$$

8 notches of cill width 1' 10" with slopes of $\frac{1}{4}$ are allowed.

(2) *2' drop at R.D. 73340 of Kallianodai Branch Canal.*

Full supply—

Depth in front = 4'.

Do. in rear = 4'.

Discharge = 325 cusecs

Number of notches = 6.

Discharge through each notch = $\frac{325}{6} = 54.2$ cusecs.

Side slopes of notch = $\frac{1}{4}$; $E = 2$.

Discharge through triangular portion (from tables) = 23.7 cusecs.

Discharge per foot run of rectangular portion of notch = 26.4.

$$\text{Cill width} = \frac{54.2 - 23.7}{26.4} = 1.19'.$$

Half supply—

Depth in front = 2.67'.

Depth in rear = 2.67'.

Discharge = 162.5 cusecs.

Discharge through each notch = $\frac{162.5}{6} = 27.1$ cusecs.

Side slopes of notch = $\frac{1}{4}$; $E = 0.67$.

Discharge through triangular portion of notch (from tables) = 8.6 cusecs.

Discharge per foot run of rectangular portion of notch = 15.8 cusecs.

$$\text{Cill width} = \frac{27.1 - 8.6}{15.8} = 1.17'.$$

Six notches of cill width 1' 2" with slopes of $\frac{1}{4}$ are allowed.

9. *Syphon well drops.*—In the case of syphon well drops, the notches in the front well are designed with the aid of Nethersole's formula noted above and the area of the orifice at entry into the tunnel is determined on the supposition that under full supply conditions the water-level in the front well is 6" below the sill of the notch.

EXAMPLES.

(1) *4-ft. syphon well drop at 1 mile, 1,551 feet of Muvallur channel.*

Discharge required = 33.37 cusecs.

Depth of water in rear = 2.25'.

Difference of level from sill of notch to rear water level = 1.75'.

Head for determining area of orifice of entry = 1.25'.

$D = CA \sqrt{2gh}$; $c = 0.625$.

$$A = \frac{33.37}{\frac{1}{2} \times 5 \times \sqrt{1.25}} = 5.96 \text{ sq. ft.}$$

Diameter of circular orifice = 4.9".

(2) *6-ft. syphon well drop at 1 mile 2,970 feet, Palaiyur channel.*

Discharge required = 61.18 cusecs.

Depth of water in rear = 2.5'.

Difference of level from sill of notch to rear water-level = 3.5'.

Hence head for determining the area of the orifice of entry = 3'.

$$A = \frac{61.18}{\frac{1}{2} \times 8 \times \sqrt{3}} = 7.06 \text{ sq. ft.}$$

Diameter of circular orifice = 3'.

10. The following are special calculations in connexion with the proposed Improvements to the Vadavar —

(a) *Supplemental Head Sluice of the Vadavar.*

Discharge required for Irrigation = 823 cusecs.

F.S.L. in front 5' 0"; F.S.L. rear = 4.5'.

Head available = 0.5.

$D = CA \sqrt{2gh}$; $C = 0.7$; $h = 0.5$.

$$A = \frac{823}{0.7 \times 8 \times \sqrt{0.5}} = \frac{823}{0.7 \times 8 \times 0.707} = 208 \text{ sq. ft.}$$

Effective waterway of the existing Head Sluice:

= 4 vents 5' x 4' 6" = 90 sq. ft.

Extra waterway required = 208 - 90 = 118 sq. ft.

Number of vents 5' x 4' 6" required = $\frac{118}{22.5} = 5.2$ or 5 vents.

Discharge required to relieve the Vennar of its floods = 2,000 cusecs.

Water-level in front of Vennar-Vettar regulator = 8.5'.

Water-level in the Vadavar = 7.0'.

Head available = 1.5'.

$$A = \frac{2000}{0.7 \times 8 \times \sqrt{1.5}} = 291.6 \text{ sq. ft.}$$

Waterway of the existing sluice = 4 vents 5' x 5' = 100 sq. ft.

Extra waterway required = $291.6 - 100 = 191.6$ sq. ft.

Number of vents $5' \times 5'$ required = $\frac{191.6}{25} = 7.66$.

8 vents $5' \times 5'$ have been provided.

(b) *Surplus sluice at R.D. 0/5280 to discharge 1,035 cusecs.*

Bed level of the Vadavar + 135.23.

M.W.L. in the Vadavar + 142.23.

Ordinary flood level in the Vennar deduced from the flood levels given by the Executive Engineer, Vennar division = $137.54 + 1.00 = +138.54$.

Discharge per foot run

$$= C_1 A \sqrt{2gh} + \frac{2}{3} C_2 l \sqrt{2g} \left\{ (h_1)^{\frac{3}{2}} - (h_2)^{\frac{3}{2}} \right\}$$

$$= 0.7 \times 3.31 \times 8 \sqrt{3.69} + \frac{2}{3} \times \frac{5}{8} \times 8 \left(3.69^{\frac{3}{2}} - 2^{\frac{3}{2}} \right)$$

$$= 35.20 + 15.94 = 49.14.$$

Total discharge to be passed through = 1,035 cusecs.

Number of vents $5' \times 5'$ required = $\frac{1,035}{5 \times 49.14} = 4.3$.

Number of vents provided = 5.

Discharge provided for = 1,228 cusecs.

(c) *Surplus sluice at R.D. 2/3100 above Maravanapattu surplus*

Discharge to be provided for = 2,000 cusecs.

O.F.L. of the Vennar in rear = 129.51.

Bed of the Vadavar = 127.06.

M.W.L. in the Vadavar = 133.76.

$$D = CA \sqrt{2gh} + \frac{2}{3} cl \sqrt{2g} \left(h_1^{\frac{3}{2}} - h_2^{\frac{3}{2}} \right)$$

$$= 0.7 \times 2.45 \times l \times 8 \sqrt{4.25} + \frac{2}{3} \times \frac{5}{8} \times l \times 8 \left(4.25^{\frac{3}{2}} - 1.7^{\frac{3}{2}} \right)$$

Discharge per foot run = $28.26 + 21.8 = 50.06$ cusecs

Lineal waterway required = $\frac{2,000}{50.06} = 40'$ nearly

8 vents $5' \times 5'$ are provided.

(d) *Improvements to the Pulimpallam surplus or surplus sluice at R.D. 4/1910.*

Maximum flood discharge to be passed through = 3,626 cusecs.

Sill of sluice = + 119.66.

Top of sluice vent = + 125.66.

M.W.L. in front of sluice = + 129.66.

O.F.L. in Vennar in rear of sluices = + 121.66.

Discharge per foot run = $0.7 \times 1 \times 2 \times 8 \sqrt{8} + \frac{2}{3} \times \frac{5}{8} \times 1 \times 8 \left(8^{\frac{3}{2}} - 4^{\frac{3}{2}} \right)$

= $31.6 + 48.75 = 80.35$ cusecs.

Lineal waterway required = $\frac{3,626}{80.35} = 45.1'$.

The existing work has 4' vents each 6' wide or 24 r.ft.

Additional waterway required = 21.1 r.ft.

Additional 4 vents 6' wide each are provided.

(e) *Surplus sluice at R.D. 10/8300.*

Catchment basin = 28.25 sq. miles.

Maximum flood discharge from catchment = 5,565 cusecs

Discharge passing below the Syphon at R.D. 2/3100 = 1,126 cusecs

Total discharge = 6,691 cusecs.

Discharge through surplus sluice No. 3 = 3,626 cusecs.

Balance to be disposed of = $6,691 - 3,626 = 3,065$ cusecs

Discharge through one vent fitted with automatic shutters—

$$= 0.7 \times 7 \times 8 \times 4.5 \times \sqrt{3} + \frac{5}{8} \times 15.75 \times 8 \sqrt{1.75}$$

$$= 305.52 + 103.95 = 409.47 \text{ cusecs.}$$

Note.—It is assumed that one foot is the vertical height blocked by the shutter when the vent is fully open.

Discharge through 7 vents = $7 \times 409.47 = 2,866.29$ cusecs.

Discharge through the vent at left flank which is fitted with screw-gearing shutters

$$= CA \sqrt{2gh} = 0.7 \times 35 \times 8 \sqrt{3} = 339.47 \text{ cusecs.}$$

Total discharge calculated—

$$= 2,866.29 + 339.47 = 3,205.76 \text{ or } 3,206 \text{ cusecs.}$$

(f) *Calculations to show that the depth of F.S.L. is reduced from 5.0' to 4.58' beyond the Maharaja's inam in Tanjore, 0.42' being the loss of head due to afflux at the two bridges.*

(1) Bridge at R.D. 5/1350.

Two spans of 25'.

Discharge required = 807 cusecs.

Velocity of approach = Velocity of canal = 2.67' f.s.

Head due to velocity of approach = $0.0155 \times (2.67)^2 = 0.11$.

An afflux of 0.25 will give a discharge

$$= \frac{2}{3} \times 577 \times 50 \times 8 (0.36 - 0.11) + 0.7 \times 50 \times 4.75 \times 8 \sqrt{0.36}$$

$$= 276 + 798 = 825.6 \text{ cusecs.}$$

Therefore the loss of head due to afflux = 0.25'.

(2) Bridge at R.D. 3/2670 at the Eastern end of Tanjore Town.

Two spans of 30'.

Discharge required = 801 cusecs.

Velocity of approach = 2.53' per inch.

Head due to velocity of approach = $0.0155 \times 2.53^2 = 0.1$

An afflux of 0.17 will give a discharge

$$= \frac{2}{3} \times 0.577 \times 60 \times 8 (0.27 - 0.1) + 0.7 \times 60 \times 4.58 \times 8 \sqrt{0.27}$$

$$= 20.27 + 784.8 = 805.07 \text{ cusecs.}$$

The loss of head due to afflux = 0.17'.

Total loss of head due to afflux = 0.42'.

(g) *Conditions of flow of the maximum flood discharge at the two bridges at R.D. 3/1,350 and R.D. 3/2,670 of the Vadavar.*

Bridge at R.D. 3/1350.

Area of catchment basin = 6.75 square miles.

Flood discharge from above = $600 \times (6.75)^{\frac{3}{2}} = 2,142$ cusecs.

Discharge through Mudalamuthuvary syphon = 1,126 cusecs.

Total maximum flood discharge = 3,268 cusecs.

The flood waters during a maximum flood are expected to spill over the country, flow through the road dam and the road culvert at a short distance on the road and back into the Vadavar.

The bridge consists of 2 spans 25', 6' to springing and 6' rise; the floor of bridge is at level + 121.58.

The road dam is 90' long with approaches of 1 in 30; level + 130.17.

The road culvert consists of 2 spans 25', 3' to springing and 6' rise; floor of culvert is at + 124.75.

Maximum flood level of the Vadavar at M.F.L. = + 131.58.

Area of waterway = $(468 + 187 + 320) = 975$ square feet.

Neglecting velocity of approach, discharge through waterway = $CA \sqrt{2gh}$.

$$\therefore h = \frac{3,268}{64 \times 975} = 0.28'$$

Bridge at R.D. 3/2,670.

Area of catchment basin = 6.75 square miles.

Maximum flood discharge to be passed through as above at Bridge at R.D. 3/1,350 = 3,268 cusecs.

The flood waters during a maximum are expected to spill over the country, flow through the adjoining road culvert and back into the Vadavar.

The bridge is of 2 spans 30' each, 6.28 feet to springing and 6' rise; the floor of bridge is at level + 121.28.

The road culvert consists of three spans, the centre span of 10' and the side spans 9' each. The height above floor at = 126'36" to springing is 3'. The rise of the 2 side arches is 4'25" and of the centre arch 4'5".

Maximum flood level of the Vadavar = + 131'28".

Area of waterway at M.F.L. = 566 + 134 = 700 square feet.

Neglecting velocity of approach, discharge through waterway = C.A. $\sqrt{2gh}$.

$\therefore h = \frac{3,268}{64 \times 700} = 0.53$, where h is the afflux or head required to force the water through.

(h) Calculations for maximum flood discharge in the Vadavar.

C.S. No. 31.

Maximum flood discharge to be provided for = 2,000 cusecs.

M.F.L. of the Vadavar = 7' above bed.

Discharge of central portion.

Area of central portion = 514.5 square feet.

Wetted perimeter = 86'.

$R = 6'$; $\sqrt{R} = 2.45'$; fall = 0.18 in 1,000.

$V = \frac{N.R.}{\sqrt{R} + D} = \frac{1.988 \times 6}{2.45 + 1.143} = 3.32'$.

Discharge calculated = 514.5 $\times$ 3.32 = 1,706 cusecs.

Discharge through margin.

$A = 189$; W.B. = 78; $R = 2.43$; $\sqrt{R} = 1.55$.

$V = \frac{N.R.}{\sqrt{R} + D} = \frac{1.988 \times 2.43}{1.55 + 1.143} = 1.8'$.

Discharge = 189 $\times$ 1.8 = 340 cusecs.

Total discharge = 2,046 cusecs.

C.S. No. 70.

Maximum flood discharge to be provided for = 2,000 cusecs.

Depth of water at M.F.L. = 6'7".

Discharge of central portion.

Area = 529 square feet; W.B. = 88; $R = 5.78$; $\sqrt{R} = 2.40$.

$V = \frac{N.R.}{\sqrt{R} + D} = \frac{1.988 \times 5.78}{2.4 + 1.143} = 3.23'$.

Discharge = 1,708 cusecs.

Discharge through margin.

Area = 182; W.B. = 42; $R = 4.33$; $\sqrt{R} = 2.1$.

$V = \frac{1.988 \times 4.33}{2.1 + 1.143} = 2.64$; discharge = 480 cusecs.

Total discharge provided for 2,188 cusecs.

C.S. No. 72.

(a) Maximum flood discharge to be passed through = 3,142 cusecs

Depth of water at M.F.L. = 10'.

Area = 745 square feet; W.B. = 85'; fall = 0.18' per 1,000.

$R = 8.76$; $\sqrt{R} = 2.96$.

$V = \frac{N.R.}{\sqrt{R} + D} = \frac{1.988 \times 8.76}{2.96 + 1.143} = 4.3'$ per inch.

Discharge calculated = 3,204 cusecs.

(b) Discharge required to relieve Vennar of its floods = 2,000 cusecs.

Depth = 8'3" above bed.

Area = 580 square feet; W.B. = 84'; $R = 6.9$; $\sqrt{R} = 2.62$.

$V = \frac{1.988 \times 6.9}{2.62 + 1.143} = 3.6'$ per inch

Discharge calculated = 2,088 cusecs which is a little over the discharge required.

C.S. No. 163.

Discharge required to relieve Vennar of its floods = 2,000 cusecs.

Discharge through central portion.

Area = 531 square feet; W.B. = 83'; $R = 6.4$; $\sqrt{R} = 2.53$; fall = 0.18' per 1,000.

$V = \frac{1.988 \times 6.4}{2.53 + 1.143} = 3.46'$ per inch.

Discharge = 531 $\times$ 3.46 = 1,834 cusecs.

Discharge through margin.

Area = 255; W.B. = 143; $R = 1.8$; $\sqrt{R} = 1.35$.

$V = \frac{1.988 \times 1.8}{1.35 + 1.143} = 1.4$.

Discharge calculated = 255 $\times$ 1.4 = 357 cusecs.

Total calculated discharge = 1,834 + 357 = 2,191 cusecs which is a little over the required discharge.

C.S. No. 251.

Discharge to be provided for to relieve the Vennar of its floods = 2,000 cusecs.

Discharge through central portion.

Area = 428 square feet; W.B. = 72; $R = 5.94$; $\sqrt{R} = 2.44$; fall = 0.18 per 1,000.

$V = \frac{1.988 \times 5.94}{2.44 + 1.143} = 3.3$ per inch.

Discharge = 1,412 cusecs.

Discharge through margin.

Area = 262 square feet; W.B. = 81; $R = 3.22$; $\sqrt{R} = 1.8$.

$V = \frac{1.988 \times 3.22}{1.8 + 1.143} = 2.18'$ per inch.

Discharge = 262 $\times$ 2.18 = 571 cusecs.

Total discharge = 1,412 + 571 = 1,983 cusecs which is nearly the discharge required.

C.S. No. 282.

Maximum flood discharge to be provided for = 3,065 cusecs.

Depth of water = 9'85".

Area = 737 square feet; W.B. = 128'; fall = 0.35 per 1,000.

$R = 5.75$; $\sqrt{R} = 2.4$.

$V = \frac{2.625 \times 5.75}{2.4 + 0.9935} = 4.45'$ per inch.

Discharge = 3,242 cusecs which is a little over the required discharge.

C.S. No. 322.

Maximum flood discharge to be provided for = 3,065 cusecs.

Depth of water = 8'73".

Area = 800 square feet; W.B. = 167'; fall = 0.35 per 1,000.

$R = 4.8$; $\sqrt{R} = 2.2$.

$V = \frac{2.625 \times 4.8}{2.2 + 0.9235} = 3.95'$ per inch.

Discharge = 3,160 cusecs.

Note.—The maximum flood discharge will be passed with a depth of 10' at C.S. No. 275 and a depth of 8'6" at the tail end. The fall of the stream is 0.35 foot per 1,000.

APPENDIX V.

No. 65 I. OF 20TH FEBRUARY 1909.

Note on the Observations regarding velocities in Vennar and Cauvery in the reach just below the Head Regulators and Remarks on probable Critical Velocities for Cauvery sand.

There are available cross sections taken in various years in the reaches below Cauvery and Vennar regulators across these rivers at distances from the head regulators varying from 400 to 800 feet.

These sections have been examined and the attached table shows position of cross section, year and month of taking the same, average bed level of cross section reduced to M.S.L., zero of rear gauge of regulators with reference to average bed level.

From this, it will be seen that the average level of the river beds in the limits referred to have altered to no appreciable degree since 1889.

For both Cauvery and Vennar we have a section at 600 feet from the regulator taken in 1888 } —1900—1906—1909.
1889 }

For the Cauvery the extreme variation of average bed level of this section is 0.31 feet.

For the Vennar it is 0.41.

In the Cauvery the present bed level (1909) on this section is exactly what it was in 1889.

In the Vennar the bed is 0.26 lower than it was then.

The other sections bear out the general conclusion that both rivers may be said to be in a state of permanent régime in these reaches.

2. As regards velocities we have on record the details of observations made with surface floats in 1900, in 1905, in 1906. There is also on record a curve of discharges of 1889 evidently based on somewhat similar observations, but of these no details are forthcoming.

The observations were somewhat rough and are briefly described as follows for the years 1900, 1905, 1906.

Description of float observations.—For 1900, the velocity observations were taken with bottles as floats and generally when there was no wind. The floats were thrown in from the regulator when the rivers had a good supply.

For Cauvery the cross section was divided into nine parts and a float was let go from each of eight equally-spaced intermediate points on the regulator.

In times of good supply, the floats run generally straight, that is, for rear gauge readings 3 feet and upwards in the Vennar or 2 feet in the Cauvery.

For Vennar the cross section is divided into six spaces and five floats let loose.

The cross sections of observation were 400, 600 and 800 feet below the regulators.

In times of low water, men were sent in just above the upper section to let go the floats; in these cases the exact measurement of the points where floats were loosed were not made.

3. In 1905 the same procedure obtained, but floats of light wood about 1 foot long $4\frac{1}{2}$ inches square section were used instead of bottles. The floats were not evenly shaped, but all were sawn and roughly squared.

In 1905 the sections were two in number 400 and 500 feet from regulator.

In 1906 the same procedure as in 1905 but with section 600 and 700 feet from regulator.

4. As regards the velocity observations taken in 1888-89 no detail of these is available and they have been deduced from a curve showing on it the position of a large number of discharge observations of this year.

Each mean velocity corresponding to such discharge has been computed and plotted on the attached diagram for 1889 (Cauvery only).

It is believed the velocities were taken in 1888-89 as described for those of 1900, but no detail or description of this is on record, and the man who took them is believed to be dead.

These velocities may therefore be regarded with some suspicion.

5. The average surface velocities from the runs of the floats for each set of observations has been multiplied by 0.8 which has been assumed as average mean velocity.

These mean velocities for various rear gauge readings have been plotted and curves deduced. As might be expected from the rough nature of the observations, there are considerable variation in the readings.

In spite of this for the depths of ordinary supply, deductions not very greatly in error as to the velocity can, it is believed, be made.

The attached diagram shows these mean velocities plotted.

The range of gauge readings involving ordinary to maximum supply is as under—

		From	To
Rear gauge—			
Cauvery	...	3.0	5 feet.
Vennar	...	4.5	8 "

6. On the diagrams have been plotted a series of points showing, for various depths of water above mean bed level, velocities $1.3 V_0$ and $1.1 V_0$ where V_0 is Kennedy's critical velocity for Punjab sand.

7. Study of the diagrams lead one to believe that the critical velocity for Cauvery sand will be slightly in excess of $1.1 V_0$ and $1.15 V_0$ is suggested as about the average figure.

8. As regards scouring of margins we see that Cauvery and Vennar and most Tanjore channels are very wide in comparison to depth, and we may assume that the new channels should be rather wide than deep, with a view to attaining suitable velocities without trouble from scouring margins.

The Cauvery and Vennar carry maximum supplies (not counting floods) at velocities of about 3.3 feet, and it is reasonable to limit the velocities in our new main canal to this figure or something near it, and 3.33 feet is suggested as suitable.

9. These observations are much the best available, indeed they are the only ones on which reliance can be placed which I have been able to obtain.

W. M. ELLIS, Colonel, R.E.

Vennar.

COMPARATIVE statement of areas of waterways at cross section lines taken below Vennar Regulator in different years with reference to rear gauge reading 7.0 feet.

Zero of gauge + 184.25. Delta Datum.

Year.	Distance below Regulator.								Remarks.
	400 feet.		500 feet.		600 feet.		700 feet.		
	Area.	Mean bed level.	Area.	Mean bed level.	Area.	Mean bed level.	Area.	Mean bed level.	
Rear gauge reading of 7.0 feet.									
1888-89	2,983	185.09	.. ..	..	2,929	185.07	.. ..	..	Average mean bed level + 185.11.
1900	2,871	185.17	.. ..	..	2,761	185.06	.. ..	..	
1905	2,964	185.10	2,910	185.12	.. ..	..	.. ..	..	Average mean bed level + 185.11.
1906 .. ..	..	..	.. ..	..	2,986	184.66	3,068	184.74	Average mean bed level + 184.70.
1929	3,161	184.97	.. ..	..	3,109	184.81	3,073	184.70	Average mean bed level + 184.83.

Cauvery.

COMPARATIVE statement of areas of waterways at cross section lines taken below Cauvery Regulator in different years with reference to rear gauge reading 4.5 feet.

Zero of gauge + 184.25. Delta Datum.

Year.	Distance below Regulator.								Remarks.
	400 feet.		500 feet.		600 feet.		700 feet.		
	Area.	Mean bed level.	Area.	Mean bed level.	Area.	Mean bed level.	Area.	Mean bed level.	
For rear gauge reading 4.5 feet.									
1883-89	4,300	182.75	..	..	4,509	182.03	..	..	
1900	4,521	182.97	..	..	4,963	182.85	..	..	Average mean bed level + 182.91.
1903	5,292	181.52	5,042	182.03	..	..	..	..	Average mean bed level + 181.77.
1906	..	..	..	..	4,323	182.64	4,555	182.38	Average mean bed level + 182.51.
1909	4,618	182.84	..	..	4,670	182.93	4,484	182.04	Average mean bed level + 182.77.

Note.—To convert levels on Delta Datum to levels G.T.S. Datum add 1.7 feet.

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