M.R.O. 1—77,006—8-6-37.

(1) Number of pages_____

(2) Date of repair_____

(3) Initials of the Referencer_____

MADRAS RECORD OFFICE.

Government of Madras.

Public works DEPARTMENT.

G.O. No. 1461 Press Mis.
207 208

Dated 13- 6- 1872.

Not to be folded or roughly handled

No 2501

Govt. of 1872: Madras.

PUBLIC WORKS.

To The Secy Chief Engr for Irrigation

Dated

Recd. Encl.

G. O 13th June 1872/1461.

Nos. 207 & 208

Chembrumbakum Tank Project, Chengalpat Dist.

Letter from the Govt of Madras
herein orders on pro-

P.M.

Ordnance Office
3 Feb 1812

No 2501.

From.
The Lieutenant General of the Ordnance.

Feb 11th

Recd 13th Ditto.

Rec: 7. ×

Capt Dickson

Paper by order on
Warrant for the Colours
Lieutenant Colonel Sandys
Regt (6 foot volunteers)
the Shropshire
Militia

Ordnance Office
11th Feby 1812

Sir

I am directed to desire you will cause the Colours for the Regiment of Shropshire Militia commanded by Lieutenant Colonel Sandys to be delivered to the Storekeeper at Chester.

I am Sir
Your most obedient
humble Servant
[illegible]

Lieut Colonel Dickson
&c &c &c
Chester

15

Chembrambakkum Project Continued. Brought forward 226173-1-3

G Sundries @ about 5 ℔ Cent 12,713

H Compensation for lands and houses that shall become submerged by raising the Crest of the waste weir 6 feet above its present level 11,000 12284-14-9

I Add. Expenditure Sept. 30th 1869 to March 1870 198,542

Total Estimate Rupees 448,000

Camp Chembrambakkum Park
17th October 1870

Superintending Engineer
Colᵈ R. C. Morris
Sup.ᵗ Engineer 4th Division

R. L. Brown
Asst. Engineer
In Charge of Chembᵐ Projᵗ

M. Narasimhalu
Surveyor P.W.D.

35/1

Improvement of the Supply Channel from Steerperoomatoor Tank Continued — Brought forward — 82 5. 7529 — 49247358 — 27186-1-3

Alteration of a Culvert

Plasterisg part of the Centre of Channel inside the Channel — 1 — 18 — 14 — 261

Retaining walls sides — 2 — 9 — 3 10 — 180

Piers — 2 — 3 — 6 — 69

Sft. 490

Deduction for Cuts — 2 — 7 — 3.0 — Sft. 14.6 — Sft. 475.6 — Sft. 47½ — Sft. — 28 — 11145

Excavation for foundation

Culvert — 1 — 18 — 5 — 5 — 450

Sluice Head — 1 — 15 — 9 — 6 — 270

Cft. 720

Total Cubic yards of Earthwork in Excavation — 27 Cft. — 13 — 2 13 — 313 Cft. — 313 Cft.

Concrete work

over the Sluice Culvert — 1 — 18 — 3 — 0-1½ — 6-9

under Sluice — 1 — 18 — 6-9 0-9 — 91

Do Sluice Head — 1 — 9 — 5 — 0-9 — 33-9 — 32 — 21 2 8

do Retaining wall — 1 — 4 — 6 9 — 0-9 — 10-1½

Cft. 141-7½

Total Concrete work — Cft. 5½ — Cft. — 3 8 — 186

Granite Sluice stones — Running feet — 12 feet — Rft. — 1 — 12

Teakwood wrought and put up.

Sluice Shutters — 1 — 4 — 2-3 3 — 3 — Cft. — 3 — 9

Opening & Closing breach in the bank — 47 47

184 33 — 184 33

Unforeseen Items — 7713 8½ — 7714

Total for the Improvement of Steerperoomatoor Supply Channel

Plan Sheet No 16

Channel of Communication between New Sluices and the Irrigation Channels of the Old Sluices.

Excavation of Channels

1 From Pomanallee Sluice to Malayumbakum Sluice Channel — Yards 167 — 2.43 — 405.81 Cft. — 1 — 256

2 From Iranapaukum to Chetty Sluice Channel — 383.37.0 — 2683 Cft. — 13 — 20999

3 From No 2 Sluice to the Old Channel of No 3 or 4 Thiroomoodiwakum Sluice Channel — 386.02.0 — 772 Cft. — 1 — 484

2 From Coonathoor or No 4 Sluice to the Old Sluice Channel of Thiroomoodiwakum — Feet — 200 — 20 — 10-0 — 40000; 700 — 14-75 — 6-5 — 67112; 900 — 15-725 — 7-15 — 101190; 1650 — 13-10 — 5-10 — 116721

Cft. 285023

Cft. 10556½ Cft. — 16 — 989109

1272 146

1411 16 — 1411 129

1273 — 1273 — 7273

Total for Excavation Communication Channels — 325923

Add Unforeseen Items — 12068

Carried over — 288345

22617-1-3

1 Improvement of the Straspieromiation Chamel Cont. Brought forward — 38926

Strengthening the south bank —

3	18+19	133.33	14.20	1892	
	19+20	200	14.62	2924	
	20+21	200	10.40	2080	
	21+22	200	8.34	1668	
	22+23	200	17.22	3444	
	23+24	200	14.90	2980	
	24+25	200	9.30	1860	
	25+26	133.32	11.60	1546	
	26+27	200	7.95	1590	
	27+28	200	8.03	1606	
	28+29	200	6.20	1240	
	29+30	200	5.40	1080	
	30+31	200	4.00	800	

Total Cubic yards of Earthwork — 63636 C.Y. - 16 596514 59 65 M.

2 Turfing to the bank — 6000 10 60,000 Sq.ft Sq.Y. - 4 1250 .. 1250 ..

3 Surplus Calvigulah

Altering the Do

Brick work Chunam work

Raising the bodywall 1 70 — 4 — 3 — 840

do both side wings 2 41-6 2-6 3 — 311-6

Cft 1151-6

Total Brick in Chunam work — C.F. 42-6437 C.F. 4 8 - 191-14

Plastering with 2 Coats of Chunam

To the Bodywall	1	70	10	700	
wing walls top	2	41	2	166	
do sides	2	6	5	60	
do	2	9	6-6	117	
do	2	10	8	160	
do	2	15	7-3	217-6	
do	2	6	6	72	

Total Square feet of Plastering — 8162

Squares 8.62 Sq.F. 28 - 21 89

Granite upright stones 25 Each 4 .. 100 ..

each 5 feet in length

Total for altering the Calvigulah — 313 69

3614 9

4 Alteration of a Culvert.

Foundation to the Body	1	18	6-9	91-1½	
Side walls above	2	18	1-2	98	
Retaining wall above	2	9	1-6	182-3	
Foundation to the Head of the Sluice	1	9	3-6	47-3	
Foundation to Rear Retaining wall	1	9	1-6	20-3	
Piers to Sluice Head	2	3	6 3-10	80-6	
				519-4½	
Deduction for the Sluice in Retaining wall	2	7-3	Ft. Thick 1-6	21-9	
				Cft 497-4½	

Brick in Chunam work — C.F. 18.43 C.F. 4 8 - 8215

Carried over — 8215 - 7529 49

D 1 Improvement of the Old Benzaroo Ch. Excavation Continued

No of Cross Sections of the Channel	Length in Yards.	Sectional Area.	Brought forward			
			321610			
19+20	200	114.30	22860			
20+21	200	105.33	21066			
21+22	200	102	20400			
22+23	200	101.7	20340			
23+24	200	95.4	19080			
24+25	200	97.5	19500			
25+26	200	102.78	20556			
26+27	200	92.05	18410			
27+28	200	96.17	19234			
28+29	200	96.17	19234			
29+30	200	70.84	14168			
30+31	200	30.17	6034			
31+32	200	53.70	10740			
32+33	200	48.04	9608			
33+34	200	36.44	7288			
34+35	200	30.2	6040			
Total Cubic yards of Excavation in the Bed			466168	C.Y.	13	364812

2 Strengthening the Embankments.

South Bank	up to the Cast end of Salkarey Tope	35+62	5800	18.0	104400		
North Bank	beyond the Junction of Comm Bheer	35+62	5800	5.28	30624		
Total Earthwork for Strengthening the Embkt					135024	C.Y.	1 8439 ✓

3 Brick in Chunam work for Bed

	1	76	4	66	2052	C.F.	
Total Brick in Chunam work					76 C.Y.	C.F.	4 8. 342 ✓

45200 45200

Total for the Improvement of the Old Benzaroo Channel 45466 45466 45466

45200 ✓

E 11 Choudrycal or Improvement of the Supply Channel from Streeperoomatoor Tank

Plan Sheet No.	No of Cross Sections of the Channel	Length in Yards.	Sectional Area.			
Earthwork						
Strengthening the South bank	1+2	200	2.4	480	C.Y.	17 3025 30 ✓
	2	200	3.6	720		
	3+4	268	3.09	10828		
	4+5	200	7.93	1586		
	5+6	200	11.56	2312		
	6+7	200	13.71	2742		
	7+8	200	17.76	3552		
	8+9	200	19.32	3864		
	9+10	200	23.06	4612		
	10+11	200	20.81	4162		
	11+12	200	11.20	2240		
	12+13	200	9.50	1900		
	13+14	200	9.01	1802		
	14+15	200	9.40	1880		
	15+16	200	8.70	1740		
	16+17	200	9.83	1966		
	17+18	200	12.70	2540		
Carried over				38926		

217358
217186-1-3
217186-1-3

The new Bungawroo Channel. Brought forward. 1949-8 33381 25 1057
1 5 8 14472 154 156099
1 5 8 1117 15 12 15 1 3

2 Vellavadi Bridge Contd.

Plastering with 2 Coats of Chunam.

To two sides of Piers & abutments	2	16-6		4	132	
D Culverts	2	5-6		4	44	
D Coping of Piers & abt	2	22		1	44	
D Caps of Piers	2	5-6	1½	10-8	109-4	
D intrados of arch	1	23		16-6	379-6	
D face walls	2	25-3		6-6	328-3	
D face of return walls	2	4-9		5-6	49-3	
D wings	2	13	5	10-9	279-6	
D bridge	2	43-6		1-6	130-6	
D face of Blocking Course	2	43-6		4	344-0	
D sides of Parapets	4	43		2	109-5	
top of D	2	43-9	1-3		21-3	
D the sides of Pedestals	2	5-3		2	18 38-9	
Deduct segmental space from face walls	2	3	6	38	208	

Sft. 16.30 or 16-3 Sft. 2 8 - 40 10/12 - ✓

Breaking the one end of the bridge and Cutting the Bank to admit the additional opening 1588 -

Rough stone Apron 4 19 — 73-6 7-6 Cft 1539

Cft. 57 - 6 Cft 1 4 - 71 4 - ✓

Total for Vellavadi Bridge 1320 - - 1320 - -
1327 146
1579.2-12-0

Add:
Widening Masonry Steps 108
Total for the Improvement of the New Bungawroo Ch. 1571913 - - 1571913

D 1 Improvement of the Old Bungawroo Ch. from Kasaveram Anicut down to its junction with the River Coovum

Excavation of the Body the channel beginning from its head

W.S. of Canal cutting of the Channel	Length in Yards.	Decimal area	
1+2	100	33.2	3320
2+3	100	14.0	1400
3+4	100	5.24	524
4+5	100	5.42	542
5+6	100	11.20	1120
6+7	100	28.80	2380
7+8	200	32.80	6560
8+9	200	33.50	6700
9+10	200	24.60	4920
10+11	200	35.80	7160
11+12	200	99.92	19984
12+13	200	97	19400
13+14	200	101.27	20254
14+15	200	119.36	23872
15+16	200	102.2	20440
16+17	200	118.1	23620
17+18	200	123.47	24694
18+19	200	123.60	24720
Carried over			211610

171892
171986-1-

The New Bungalow Supply Channel

Improving the Bridge at Vellavadey built across the Supply Channel & Carry Trunk Road No 3.

Brought forward 33981-10-10 13607
14472-15-4 156099
15693-1-3

Excavation for foundations				1140	
Do for Abutments	21	20 — 6 — 9 — 6		420	
Wing walls	2	17 — 5 — 9 — 6		595	
Retaining wall	8	19 — 2 — 3 — 6		1330 — 0	
	4	19 — 13 — 1 — 6		1539 — 0	
				5604 3884	
Total Earthwork in Excavating foundations			Cft 144	Cft 26	18

Wells of 6' diameter & depth under Abut.	4			Each 30	120
Wells of 5' Dia. & depth under Wing walls	6			Each 25	150
Brick in Cement work:					
Foundation to abutments	1	20 — 4 — 9	3 — 6	332 — 6	
do Wings	2	16 — 4 — 3	3 — 6	483 — 5	
Retaining to the floor	8	19 — 1 — 9	2 — 0	532 —	
additional to the sides of Pier	1	18 — 0 — 2	4 —	54 —	
Mounting to Wing & abutments	2	22 — 0 — 3	0 — 6	111 — 6	
Skew backing to Pier	1	12 — 6 — 2	8 — 10	27 — 9	
do to abutments	1	12 — 6 — 2	1 — 10 — 10	30 — 4	
Caps to Pinnacles	3	3 — 9 — 0	8	7 — 6	
Backing to arch on abutt.	1	12 — 6 — 1	9 — 2 — 6	54 — 8	
do 8	1	12 — 6 — 6	1 —	75 —	
Spandrils	1	12 — 6 — 5	1 —	36 — 5½	
Face walls	2	25 — 3 — 2	6 — 6	656 — 6	
Blocking Course	2	45 — 6 — 2	1 —	182 —	
mounting about the face of blocking Course	2	43 — 6 — 0	6 — 1 —	43 — 6	
Parapets	2	43 — 7 — 3	2 —	215 —	
Pedestals at the termination of wing walls	2	1 — 9 — 1	9 — 2 —	12 — 3	
Pillasters at the front of Parapets	5	3 — 9 — 0	3 — 2 —	9 — 4	
mounting to Parapet	2	43 — 6 — 0	3 — 3 —	5 — 5	
Abutments above	1	19 — 3 — 3	6 — 4 —	269 — 6	
Wings do	2	16 — 9 — 2	10 — 6	923 — 1	
				3955 — 8	
Deduct sequential Spaces from Face wall				400 —	
				3555 — 8	
Total Brick in Cement work			Cft 131⅓	Cft 49	5928

Archwork with brick & Cement		24 — 6 — 16 — 6	1 — 6	Cft 606 — 5	
Total arch work			Cft 22½	Cft 6	135
Centering at ⅓ of the Cost of archwork					34

Carried over 10698 — 14472 — 15 — 4 — 156099
15693-1-3
10698

New Buncauroo Supply Channel from Coratoor anicut to Chembm Tank.
Deepening the Ch.

Brought forward — 17730 18908 — 156097

156193-1-3

		Sectional area	
1000	144.65		144650
1000	75.75		75750
1000	68.80		68800
1000	286.55		286550
1000	292.6		292600
1000	100.75		100750
1000	116.40		116100
1000	115.45		115450
1000	111.10		111100
1000	131.55		131550
1000	155.5		155500
1000	157		157000
1037	162.62		168637
1000	167.1		167100
1000	160.1		160100
1800	181.7		181900
1000	192.8		192800
1000	165.2		165200
1000	176.83		176830
1000	144.60		144600
1000	171.20		171200
1000	279.75		279750
1000	250.5		250500
1000	136.80		136800
537	38		20406
		Cubic ft.	3971623

Total Cubic yards of Earthwork in the Excavation of the Supply Channel 147097 C.Y. 16 13790 56 13790 56

Turfing and forming the Embankment — 21574 12 — Sft. 294888 Sft. 32765 1/3 Sft. 4 682 9 10 682 9 10

Carried over. 14472 154 156099

156193-1-3

Head Sluice at Coraloor

(Continued)

Brought forward ① 9358 94694 1178 131701-1-3 131607

Dressed Laterite Stone in Chunam

Front Apron	1	140	6	14	01	6	2952	6			
Rear do	1	225	0	16	02	0	7200	0			
Paving below Piers & Vents	1	217	0	14	01	6	4557	0			
							Cubft 14757	6			
Total Dressed Laterite Stone in Chunam							Cubyds 547		Cubyds	7	3815

Pointing

do 2 sides of Cutwaters	20	8	0	2	7	0	1120	0			
do 6 sides of Piers under the Arches	20	9	6	4	6	0	855	0			
do do 6 outsides of Northwing	1	120	0	2	9	0	1120	0			
do 6 insides of Arches	21	8	0	3	0	0	3528	0			
do 6 face walls	2	226	0	3	6	0	1582	0			
do 6 top of paving on Sluice	1	226	0	1	3	0	678	0			
							Sqft 5670	0			
Total Pointing							Sqrs 567		Squares	1	57
											1377
Teakwood Shutters for Vents	21	2	0	2	2	9	159 490		Cubfeet	3	1470
Iron Bars to support the Shutters	21	9	0	2½	diameter	R	189 3118½ lbs		lbs	3	584 16
							457			2	564 10
Rough Stone Apron front of Sluice	1	140	6	4	02	0	1124				
do rear of do	1	250	0	30	02	6	18750				
							Cubfeet 19874				
Total Rough Stone Aprons							Cubyds 736 27/27		Cubyds	14	920
Granite landing Stones at the sides of Shutters	42	9	6	02	0		122700				
	42	9	6	1			1323				
do do do	21	9	8	2	1	0	1814	6			
							Cubfeet 5986	22 27/27	Cubyds	27	6001 2
Granite Ground Stones for Shutters on sides of Pier	42	1000	12	1	1	0	Cubfeet 1060	10			
		1008	12	1	1	0					
		1032	12	1	1	0	Cubfeet 12401	31	Cubfeet	2	814
		Plan Sheet 15	1000	12			122000				
			1000	122			122200				
Widening the Southern Side of the Coovum River on account of the Extension of the Head Sluice at Coraloor	2500	1000	6	12			131220				
		1000	111	10			111100				
							Cft 1485000				
		1000	1140				Cft 55000		Cft	1	4583 54
Compensation for land, Houses &c		1000	100	12			100120				
		1000	1000				100000				1000
		1000	1242				124230				24492 10
Deduct amount Stone		1000	1280				128000				10
		1000	1212				121220				24492
		1000	1141				114180				

Total 1773011 6 — 1773011 6

1707 1/4 × 13 — 1707 1/4 × 13

Widening the Southern Side of the Coovum River on account of the Extension of the Head Sluice at Coraloor — 2500 — 1000 — 6 — 12

Compensation for land, Houses &c

Deduct amount Stone

Carried over ① 24492 10 — 24492

Total 1773011 6 — 1773011 6 — 1707 1/4 × 13

Carried over ① 24492 10 — 24492

Total 1797503 6 — 1797503 6

Carried over ① 24492 10 — 24492

Total 1821995 6 — 1821995 6

Carried over ① 24492 10 — 24492

Total 1846487 6 — 1846487 6

Carried over ① 24492 10 — 24492

Total

B 2 Head sluice & Contn Reconstructing and extending the sluice at the head of the New Bungawarra Supply Channel

Brought forward 1178 .. 131607

Excavation								
For the foundation of Body of the Head sluice	1	140 – 6	14 – 4 – 6	8851 – 6				
South wing wall	1	144 – 6	4 –	3456 –				
Front Laterite Apron	1	140 – 6	14 – 2 –	3934 –				
Do Roughstone do	1	140 – 6	4 – 2 –	1405 –				
Rear Laterite Stone Apron	1	140 – 6	13 – 03 – 6	6392 – 9				
do Rough do do	1	250 –	30 – 03 – 0	22500 –				
Front Retaining wall of Sluice	1	140 – 6	4 – 04 – 0	2248 –				
Rear do do	2	245 –	4 – 04 – 0	7840 –				
				Cubyds 56627 –				
Total Excavating Foundation				Cubyds 2097 – 27	Cubyds	16	19696	
	No	Diameter	Depth					
Wells under foundation of Piers	70	5'	8'					
Do Do of wing	30	5'	8					
Do below Apron	39	5'						
Do & Retg wall on the Apron	42	5'			Each	25.	4725	
	189							
Concrete below Rear Apron	224	17 – 0	1 – 0	Cubyds 3908 –				
				Cubyds 1145	Cubyds	38	5078	
Brick in Chunam work								
Foundation for Floor	1	200 – 0	9 – 6	2 – 6	5438 – 9			
Do & South wing	1	144 – 0	5 – 4	0	2880 –		3	1110
Piers above	20	3 – 3	3 – 0	4 – 6	877 – 6		1	2410
Do Do	20	2 – 6	3 – 0	7 – 9	1367 – 6			
Cutwaters front of Sluice	20	1 – 6	1 – 6	7 – 9	340 – 9			
Abutment on South Side	1	12 – 6	3 – 5	8 – 9	378 – 3			
South wing at the front of Sluice	1	80 – 6	2 – 9	8 – 9	1937 – 0			
Do Rear of do	1	37 – 6	2 – 9	7 – 9	1087 – 0			
Buttresses to South wing	4	2 – 0	3 – 0	8 – 3	198 – 0			
Skew Backing to Piers	20	3 – 0	2 – 0	1 – 0	120 – 0			
Spandrils triangular shaped Arches	20	2 – 0	3 – 0	2 – 3	405 – 0			
Paving over Arches	1	226 –	3 – 0	1 – 0	678 – 0			
Retaining wall to front Apron	1	140 – 0	3 – 3	4 – 0	1820 – 0			
Do walls to rear do	1	249 –	2 – 3	4 – 0	2241 – 0		1	2312
					32337 – 0			
				Cubyds 2280	8 – 9			
Total Brick in Chunam work				Cubyds 845	3/4 Cubyds	40	38028	
Arch work Brick in Chunam	21	10 – 0	3 – 0	1 – 3	707 – 0 – 6			
				Cubyds 29 – 1/4	Cubyds	68	1902	
Centering @ 1/4 Cost of Archwork							4786	
			Carried over				94694	1178 .. 131607
							93	131701-1-3

Chambrambakium Tank Bund. 121790 53

A 19 Proposed Natural Brought forward 659 1. 121705 93
waste Weir @ the S.W.
end of the Bund
Plastering with 2 Coats
of Chunam to the Body 1 400 — 5 — Sft 2000
Square 20 Sft 28 50 ✓
Total for Constructing the new Calingulah 709 1. 709 1.

20 Cutting the new Surplus
Channel from the
Natural Calingulah } 1 600 — 104½ 3 — 1881000 Cft
to the River Cedar — } Earthwork Cyds 69666⅔ Cyds 1 3 54420 ✓

21 Turfing to the Embankment formed
along the Surplus Chl 1 6000 12 — Sft feet 72000
Total Turfing Sft yds 8000 Sft yds 0 0 250
Total for the Surplus Channel 5692 11. 5692 11.

22 Relaying the Revetment with the
Rough Stones in Stock } Cyds 7000 — Cyds 0 8 3500 ✓ 3500

Deduct uneven Item
to be left for the Chambrambakium Tank Bund 53
131607 53 131607 53
131701 13 131701 1 3

Concrete below Rear Apron 221 12 0 1 0 Cubic Feet

Man Sheet No 2

B 1 Annicut & Head Sluices @ Coratoor
Raising the Annicut
Dressed Laterite Stone
in Chunam work
Raising the Annicut
Closing the Sandlet @
the Southern end

1	312	1	0	1	0	1560		
1	286	2	4	07	6	1716		
1	120	20	02	0		11200		
1	25	3	4	4	6	454	6	
						Cft 2170	6	
Total Laterite Stone in Chunam work						Cyds 80⅓	Cyds 7	562 54 ✓
Brick work in Chunam								
to Buttresses front of Annicut	8	17	2	3	09	Cft 229	6	
						Cyds 8½	Cyds 48	384 ✓
Granite pointed upright								
stones for Sandlet	12	6	6	1	1	Cft 78	Cft 2	156 ✓
Pointing to the Annicut								
Counterfort & Apron &c						30 Square	Sqrs 1	30 ✓
Additional Rough Stone								
Apron @ the pier of Annicut	1	422	10	2		8440 Sft		
						Cyds 312⅔	Cyds 11	3901 34 ✓
Add Uneven Item								1177 68
Total for raising the Coratoor Annicut								1178 — 131607
								1178 —

Carried over

Chembraimbakkum Tank Bund. Brought forward — 120359 53

A 18 Raising the present waste weir No. 3.

Concrete work

under the Retaining wall & the front of Body wall	2	31 — 6	3 — 1-6	Cft. 283½	Cft. 10½	Cft.	3 8	361 2 ✓
Brick in Chunam work.								
Retaining wall @ the front of the body of the Calinjulah	2	31 — 6	2 — 7	Cft. 882	32⅔	Cft.	4 8	147 — ✓
Dressed Laterite stone in Chunam work.								
Raising the wings' front	2	25 —	2 — 2-9	275				
D° rear part	2	15 — 6	2 — 3 3-9	261	½			
D° D°	2	14 —	2 — 3 3-6	220 — 6				
side walls of the additional parts of the steps	4	4 —	1-6 2 —	48 —				
addition to the steps	2	5 —	7-6 1 —	75 —				
Raising the body wall	1	114 —	6 — 6 —	4104 —				
Step of the Body wall	1	114 —	2-9 3 —	940 — 6				
				Cft. 5924	7½			
Total Laterite stone in Chunam work				Cft. 219	½	Cft.	5 8	1207 4 ✓

Pointing to the sides of the body wall	1	114 —	20-9 —	2365 — 6				
add Pointing for kerbs &c.				2000				
Total Square of Pointing work				Sft. 4365	43½	Sft.	1 —	438 — ✓
Breaking and removing some Granite Casing work							58 —	
Total for raising the Waste weir No 3							1440 — 4	1440

19 New Calinjulah @ the South west end of the Tank Bund —

Excavating foundation and forming Natural Berge				[illegible]		Cft.	1 3	[illegible]
Removing High ground 210		50 —	2 —	12½ 500				
Foundation & Masonry Dam 400		4 —	2-6	4000				
Removing high ground Tank bund 350		50 —	1 — 0	17500				
				Cft. 32000				
				Cft. 1185		Cft.	1 —	741 — ✓
Concrete work								
under the Masonry Dam.	1	400 —	3 —	1-6	1800			
Brick in Chunam work for the Dam & weir	1	400 —	2-6	1 —	1000			
	2	399 —	1-9	1-0	698			
				Cft. 3498				
				Cubic Ft. 130		Cft.	4 8	585 — ✓

Carried over — 6591 — 121705-7-3

121799-5-3

Chembrambakkam Tank Bund. — Brought forward. — 22896 — 116355 93
116449-53

A 17 Raising the present waste weir No. 5.

Brick in Chunam work. — Brought forward Cft 5803.

Foundation & Additional thickness to the wing on Northern side	1	30	3	4	360			
Foundation to the returns of wing @ the N end of the Calingulah	4	3	3	4	144			
Additional returns of wings above at the end of the Calingulah	4	3	2	12	288			
					Cft 6595			
Total Brick in Chunam work					Cft 244⅓	Cft	48	10992

Pressed Laterite in Chunam work.

Body of the Calingulah	1	231	6	6	8316			
Second step @ the rear of Body	1	231	3	3	2079			
Additional thickness to the wing on Northern side	1	29	2	6 12	870			
Raising the present wing	1	29	1	6 3	130 6			
Do — Do — Do including steps	1	40	6 1	6 3	182 3			
Additional step to the walls of the North side	1	6	8	1	48			
Do Step Do	1	19	1	6 3	85 6			
Raising the wing walls at Southern side	1	38	3	3	342			
Raising the rear side walls of the Steps	2	7	6 1	3 3	56 3			
Additional Steps @ S side	1	5	10	1	50			
Raising the rear portion of the wing wall @ South	1	24	3	3	216			
					Cft 12375-6			
Pressed Laterite in Chunam work					Cft 458⅓	Cft	5 8	2520 13 4

Pointing with Chunam work.

To the sides & top of the Body walls and 2nd step of the Calingulah	1	231	21		4851			
To the outside of the Northside wing wall	31-6	15	6		488 3			
To the top of the North wing	1	40	4	3	170			
Do Do	1	19	4	6	85 6			
Do additional Steps	1	5	8		40			
Do sides of the South wing	1	38	6		228			
sides of Steps Do	1	16	4	3	68			
Do Do	1	4	10		40			
Do Rear portion of Do	1	24	6		144			
					Sqft 6114-9			
Total squares of pointing work add measure Item					Squares 61.14	Sqrs	1	6123
Total for raising the present waste weirs No 5 Carried over							40	3910
								3910
								120265 93
								120359-53

Chembiamba Rund Tank Bund — Brought forward — 2580 16 10848993
1055023-53

A 15 Raising & extending the present
Intake weirs Nos 1 & 2

Dressed Laterite Stone in
Chunam work

	Brought forward				Cft	15908		
Front wing above of No 2 Calk	1	25	2	9	11	756	3	
Rear wing D°	1	37	2	7	8-6	812	5	
Raising the side walls of Steps	1	20	1	9	4	140		
D° D° D° D°	1	28	1	9	4	196		
D° Steps above	1	4	5	9	1	23		
Rear Apron of No 1 Caliguilah	1	58	12	1		696		
					Cft	18531-8		
Total Dressed Laterite Stone in Chunam					Cyd	686½	Cyds 5 8	377512 ✓
Dressed Granite Stone for the Apron of the proposed additions between the existing Nos 1 & 2 Caliguilahs	1	91	8	1	9	Cft 1092	Cft 1 4	1365 ✓
Rough Stone Apron	1	92	13	6	2	Cft 24084		
						Cyd 92	Cyd 1 4	115 ✓
Breaking & Removing the presents wings & Apron	3					Cft 2200		
						Cyd 81½	Cyd 6	309 ✓
								7866 66
Deduct the uneven items								66
Total for Raising and extending the Caliguilahs Nos 1-2						7866	7866	7866

A 16 Raising the present
waste Weir No 5.

Excavation

For front Retaining	1	231	5	13-6	15592-6	
for additional wings on North side	1	31	5	5-6	852-6	
Total Earthwork in the Excavation					Cft 16445	
					Cyd 609	Cyds 16 5716 ✓
Concrete work under front retaining wall below the Body of Caliguilah No 5	1	231	3	1-6	1039-6	
under the foundation of additional wings on N sides	1	31	4	1-6	186	
under foundation of the returns at the termination of wings	4	4	4	1-6	96	
					Cft 1321-6	
Total Concrete work					Cyd 49	Cyds 3 8 1718 ✓
Brick in Chunam work						
Front Retg wall below the Body of the Caliguil	1	231	2	12	5544	
Addition to the flooring next to the Caliguilahs	1	231	1-6	0-9	259	
Cask	Carried over				Cft 5,803	

23

2,2896 116355-93
116449-53

Thermæ Caracallianæ Tank Bund — Brought forward — 108,489 93
108583-53

16 Raising and extending the present waste weir Sht. 172.

Excavation.

Removing the present Bund between Nº 1 and 2 Caligulahs	1	92	40	14	51520			
Excavating foundation for wing of Nº 1 Caligulah	1	80	6	7-6	3600			
Do Do front Retaining wall Do	1	58	3	7-6	1305			
Do for proposed Caligulah	1	92	15	7-6	10350			
Do for Apron of Do	1	92	14	2	2576			
				Cft.	69351			
Total Earthwork in the Excavation				Cyd.	2569	Cyd.	16	240136

Concrete work

under front retaining wall below the Cest of Nº 1 Calig.s	1	58	3	1-6	261			
Do Do of Nº 2 Do	1	130	3	1-6	585			
Do between Nº 1 & 2 Do	1	92	3	1-6	414			
with masonry below rear Apron of the proposed Extn between Nº 1 & 2 Caligulah	1	92	11	1-6	1518			
under foundation between Retaining wall and masonry below Apron	1	92	6-6	1-6	621			
under foundation of front wing of Nº 1 Caligulah	1	31	5	1-6	232-6			
under the foundation of rear wing of Nº 1 Caligulah	1	47	4	1-6	317-3			
under masonry cross wall in Nº 1 Caligulah	1	29	4	1-6	174			
under front wing of Nº 2 Do	1	26	5	1-6	195			
Do rear wing of Do	1	38	4-6	1-6	256-6			
				Cft.	4574-3			
Total Concrete work				Cyd.	169-1/2	Cyd.	3 8	5934

Brick in Chunam work

Front Retg wall below Cest	1	58	2	6	696			
Foundation of front wing	1	30	6-4	6-6	823-6			
Do of Rear wing	1	46	6-4	6	1116			
Do wall across Apron	1	22	2	9-6	453-9			
Retaining wall in the front of the Cest of the extension	1	92	2	6	1104			
Retaining wall in the front of the existing Caligulah	1	130	2	6	1560			
Foundation of front wing Do	1	25	6-4	6-6	688-6			
Rear wing Do	1	37	6-4	6	900			
Below rear Apron of the proposed addition between the existing Nos 1 & 2 Caligulahs	1	92	8	6-4	3178			
				Cft.	10469-9			
Total Brickwork in Chunam				Cyd.	388	Cyd.	4 8	1746

Dressed Laterite Stone in Chunam work.

Raising the Body of Caligulah	1	280	6	6	10080			
Step below the Body	1	280	2	10 3	2380			
Below the Body of the proposed addition	1	92	4	6 4	1656			
Raising front wing of Caligulah Nº 1 also	1	24	2	8 10	640			
Do Do Rear wing Do Do	1	43	2	6 8	869			
Corbiring both sides of the Step of Nº 1 Caligulah above	3	17	1	9 4-6	267-9			
	1	15	5	1	375			
Carried over				Cft.	15908-9			

2580 16 — 108,489 93
108583-53

Chowbeenbackum Tank Bund — Brought forward

A 14 — Alteration of No 5 or Manapakum Sluice

Breaking & removing the Old Masonry											
Removing the portion of Side wall for Shutter and Casing	2	4	6	3	0	9	3	249	3		
do for Casing back side of Shutter	2	8	0	2	0	8	3	364	0		
do do 3d Step	2	8	0	2	0	5	6	176	0		
do Portion of Old Pier wall	1	11	0	2	3	11	0	272	3		
do of Wing walls	2	19	0	1	11	10	0	728	4		
							Cubfeet	1689	10		
Total Old Masonry							Cubyds	62 ¾	Cubyds	6	2386
Excavation for the Termination of the Sluice Head	1	100	0	9	0	16	0	14400			
Opening the Bund for passing along the Sides of Sluice Head	1	78	0	7	0	25	0	Cubfs 13650	0		
								Cft 28050			
Total Excavation							Cubyds	1039	Cubyds	3	19413
Brick in Chunam work											
Additional Brick work to inside of Grooved Stones for Sluice Shutters	2	4	6	2	0	9	3	166	6		
Walls to 2d Step	2	10	0	2	0	7	0	280	0		
do 3d do	2	7	3	2	0	6	6	188	6		
Steps to bottom platform	2	3	3	2	0	5	6	71	6		
do 2d Step	2	3	3	2	0	5	6	71	6		
do 3d do	2	3	0	2	0	5	6	66	0		
Wing walls above	2	19	0	2	3	15	6	1325	3		
Retaining wall to Sluice Head	1	11	0	3	2	15	6	539	11		
Closet walls to face of Steps	2	3	0	0	6	6	10	20	6		
Supporting walls to the new Arch on front of Culvert	2	16	0	2	8	4	0	302	0		
Paving over Arch	1	22	0	9	9	0	6	197	3		
							Cubfeet	3037	0		
Total Brick Work							Cubyds	112 ½	Cubyds	4 8	5064
Arch work with Brick in Chunam											
Arch at the front of Culvert	1	2	0	7	0	2	0	112	0		
Total Arch work							Cubyds	4 ¼	Cubyds	6	258
Centering to the Arch & allow for the cost of the Arch work											66
Dressed Granite Caming in Chunam work											
do to front side of Sluice	2	1	6	1	0	8	9	26	3		
do to back side of do	2	10	0	1	0	8	3	165	0		
do to inside of 2d Step	2	8	0	1	0	6	0	96	8		
do do do 3d do	2	5	9	1	2	6	9	77	7		
do to face of Retaining wall	1	4	0	1	3	6	9	33	9		
do inside of last Step											
do Flooring to Sluice Head	1	73	0	8	5	0	0	50	0		
do Sides for retaining water	3	5	0	1	0	1	0	15	0		
Caming to Closet walls in both sides	2	5	0	1	0	9	6	27	9		
do do do	2	5	0	0	9	5	9	23	10		
							Cubfeet	518	Cubfeet	1 4	6478
Dressed Granite Grooved Coping Stone											
Granite Caming & Coping Stone	1	26	3	5	6	0	11	132	4½		
do Grooved Stones for Shutters	2	1	6	1	0	9	3	Cubfeet	27	9½	
							Cubfeet	160	1½	Cubfeet	2	3204
Carried Over											172436	105821

105 9 14-12

Thimbumbackum Tank Bund — Brought forward. 106,692.47 / 104,513.37 / 104,000.15

A 13 Alteration of No 4 or Maungadoo Sluice

Removal of Old Masonry

Removing the old Retaining walls out sides of Sluice Head	2	30	02	022	9	2640		
Retaining wall in front of Culvert	1	18	32	65	0	228-12		
The Rough Stone Side walls of Sluice	1	26	03	04	0	312		
Total Removal of Old Masonry					Cubft	3180 1/2		
					Cubyds	118	Cubyd	6	444
Excavation Excavated and filled the trench that was dug for the examination of sluice	1	93	10	18		16740		
Excavating the Bund for puddling along the sides of Sluice Head	1	134	07	024	6	22981		
Total Excavation					Cubft	39721		
					Cubyds	1471 cft	Cubyd	3	2513
Brick in Chunam Work								
Additional walls to 2nd Step	2	3	12	66	10	106-9		
do 6 tops of 2nd do	2	10	02	61	9	87-6		
Step to 1st Platform	1	3	02	06	10	41		
do do 2nd or Step do	2	5	02	39	6	313-9		
Retaining wall to Sluice Head	1	18	32	99	10	493-3		
					Cubfeet	942 3		
Total Brick in Chunam Work					Cubyds	35		4 8	1578
Dressed Granite Casing in Chunam	1	9	2	9	1	81		3	243
do Granite Casing to additional walls to 2nd Step	2	4	7/12	1	06	3	57-1/2			
to Sides of additional walls in top of 2nd Step	2	3	61	01	0	37-0				
					Cubyds	74-1/2 cft		1 4	92 10
Add the difference of casing with Granite & the Steps or side walls in lieu of constructing them wholly with Brickwork									216
Dressed Granite Grooved & Plug holes Stones									
Curved Stones for Sluice Mouths	2	1	61	06	0	18	0			
Covering or Plug Stones	1	10	04	60	9	33	9			
Total Dressed Granite Stones					Cubfeet	51	9 cft	2	103 8
Wrought Iron work for the lifting Apparatus of the Sluice Gates &c						447 lb		3	83 13
Pointing with Chunam to Granite Casing									
do to Additional walls to 2nd Step	2	5	7/12	6	10	77-4			
do to Steps from 2nd to 1st Platform	1	3	0	6	10	20-7			
do do on face	1	13	0	2	0	26			
do to Steps on top of Platform	2	5	0	9	6	95			
do do on face	1	20		2	0	40			
to face of Head Wall	1	18	3	10		182-6			
to top of Retaining Walls	1	11	3	2	0	36-6			
Total Pointing					Sqfeet	478 05	Sqre	1	5
					Squares	5			
Jarrah wood wrought and put up									
Sluice Boards	1	2	60	67	0	Cft 83 1/2	Cft	3	26 4
Country wood wrought & put up									
Country wood Plugs	3						Each	10 8	31 8
Puddle work									
At the sides of Sluice Head	2	63	66	024		18288			
In Culvert at the back of Retg work	1	6	03	025		1200			
					Cubfeet	19488			
Total Puddling					Cubyds	722	Cubyd	6	270 12
Add sundries									126
Total for Clearing the Maungadoo or Sluice No 4									1397 13

Carried over 105,821.07 / 105,914.21

Chombrumbackum Tank Bund — Brought forward — ~~106664-27~~ 103,084-77

12 Alteration of No I. or Rantham.

Calais Sluice

Breaking and Removing old Masonry									
Removing the portion of old Re-									
taining wall of Sluice	1	10	0	3	6	8	0		
Excavation									
Excavating the trench for Puddling									
along the sides of Sluice Head	1	170	0	7	0	24	0		
Brick or Chunam work									
Additional walls to 2d Step	2	3	1/2	2	6	6	3		
do do to top of 2d Step	2	10	0	2	2	1	0		
Steps from 2d to 1st Platforms	1	3	0	2	0	3	0		
do to Sides from 1st Platforms	1	2	0	3	0	2	6		
Retaining wall to Sluice Head	1	18	0	2	9	13	3		
Total Brick or Chunam							Cubyds	30 1/2	Cubyds
Dressed Granite or Chunam Casing work									
Casing to Additional wall of 2d Step	2	4	0	6 1/2	1	0	6	3	
Dressed Granite Grooved & Plug holes Stones									
Grooved Stones for Sluice Shutters	2	1	0	1	0	6	3		
Covering or Plug holes Stones	1	10	0	9	4	6	1	0	
Total Dressed Granite Stones							Cubfeet	60 10 1/2	Cubfeet
Pointing with Chunam to Stone Casing									
Pointing to Additional walls to 2d Step	2	3	0	6 1/2	0	6	3		
do to Steps from 2d to 1st Platforms	1	3	0	3	0	6	3		
do to Steps from 1st Platforms	1	12	0	2	0	0	6		
do do do on face	1	3	0	7	0				
do to face of Iron Retg wall	1	14	0	9	0				
do on top of do	1	18	0	2	0				
Total Pointing							Cubfeet	327 6 1/2	
							Cubyds	3 1/4	Squares
Teakwood Wrought & put up									
Sluice Boards	1	2	6	0	6	6	6	Cubfeet	97 6 Cubfeet
Country wood wrought & put up									
Plugs	3								Each

Puddle work									
At the sides of Sluice Head	2	60	0	6	0	24	0		
On Culvert at the back of Retg wall	1	6	0	6	0	24	0		
Total Puddlework							Cubfeet	1152	
							Cubyds	606	Cubyds
Excavated and filled									
the trench dug out for Exa-									
mining the foundation of									
the Sluice Head	1	78	0	9	4	18	0	Cf 12636 or 468	Cy

Wrought Iron work for the Apparatus for lifting the Sluice Plugs — 1128 15 — 913-11-4

2d 2d

Add difference of Casing the step or side wall with Granite in lieu of building the whole with brick in Chunam — 3 — 8313 — 216 ..

Total for altering the head of Palamthandalam Sluice — 1213 8 — 1,42812 — 1213 8 — 1,42812 ..

Carried over — ~~106092-11-4~~ 104513-3-7 105 0 11 105 9 14-12

Chumbrumbakum Tank Bund — Brought forward — 102822 27 / 101245 77 ✓

No 3. or

A 11 Thiroomoodiakum Old Sluice — 101339 37

Blocking up and securing the Old Sluice

Brick in Chunam work

Foundation Front Retaining wall 1 24 — 5 — 0 3 — 360

Superstructure

Front Retaining wall 1 24 — 3 — 10 — 1220 26 — 312 —

Closet walls inside the Culvert 2 2 — 2 — 3 3 — 19 — 6

Cubical 1999½

Total Brick work Cubyds 41 Cubyds 40 1040 ✓

Puddle work

At the back of front Retg wall 1 24 — 6 — 13 — 1872 —

Inside the Culvert 1 2 — 2 — 3 3 — 13 —

Cubical 1885

Total Puddling Cubyds 70 Cubyds 6 264 ✓

Concrete work 1 6 — 2 — 3 3 Cubical 39 — 30

Do Cubic Yards 1½ Cubyds 30 54 ✓

Removing the Head work

Brick Work in Chunam

Walls of front platform 2 14 — 9 2 — 9 12 — 473 — 6 — 1703 6

Outside of front platform 2 7 — 2 — 8 12 — 462 —

Top of front do 2 12 — 7 — 1 — 168 —

Front wall of 2d do 2 10 — 6 2 — 9 4 — 407 —

Outside walls of 2d do 2 16 — 2 — 9 16 — 1408 —

Top of 2 do 2 16 — 2 — 4 2 — 448 —

Front Retaining wall 1 45 — 3 — 26 — 6 4770 —

2 23 — 2 — 9 15 — 1050 —

Do Do 2 16 — 2 — 9 4 — 330 —

Side walls of Culverts 2 9 — 2 — 9 5 6 — 134 9 —

10773 — 3

Deduction for Retaining wall thro the Vault 1 4 — 6 — 6 — 170 — 3 — 1110

Cubical 10663 ½

Total Concrete work Cubyds 395 Cubyds

Add that at foundation 141

Total Cubic Yards of Removing old work 536 Cubyds 16 307 ✓

Removing Granite Casing Stone Cubyds 37 Cubyds 8 188 ✓

Earthwork

Excavated and filled in the trench that was dug on Command the Sluice Head for the Examination of the Sluice Head 1 89 — 0 9 — 0 15 — 0 12105 —

Earthwork to fill in the Space formerly occupied by the Head of Sluice 1 45 — 0 30 — 15 — 20250

2 45 — 9 — 15 — 6075 — 170

Cubical 38430

Total Cubic Yards of Earthwork Cubyds 1423 Cubyds 12 1714 ✓

Total for Blocking up and securing Thiroomoodiakum Old Sluice 613 6 ✓

Deduct uneven Item 6 —

613 — ✓

Total for Three Sluices viz Thiroomoodiakum, Mayoor and Malyambakum. 1839 — —

Carried over. 104664 27

10308 7 ✓

10311

Chembrembackum Tank Bund — Brought forward 536 156 9664126 ✓ 9534146

Continued

A 10 Reconstruction of Abt 2m Masonry for Sluice

Brick on Chunam work

Foundation to the front of Sluice

Do	Do	1	22	6	13	4	0	1170			
Do	Returning wall	1	5	6	20	4	0	450			
Do	Culvert	1	30	9	6	4	9	1260			
	Cistern	1	16	16	4			2824			
Side walls of the Sluice Head above		2	22	6	3	9	11	1856	3		
Returns of the Side walls		2	24	6	7	6	5	2160			
Returning wall above the floor		1	29	3	6	10		1097			
Side walls of the Culvert		2	34	2	6	5		850			
Extra backing to the Arch		2	30	6	3	1		218			
Cloak in front of Culvert		1	3	2	2			12			
Cistern walls above		1	40	2	6	9		900			
							Cubft	36688			
Deduct for casing Stone							Cubft	1720			
							Cubft	34968			
Total Brickwork							Cubyds	357 1/3	Cubyds	41	1158 ✓
Archwork with brick on Chunam		10									
Arch		1	37	9	8	2		Cubft 6664			
Total Archwork							Cubyds	22 27	Cubyds	6	343 ✓
Centering 1/4 Cost of Archwork											339 ✓
Teakwood Shutters		1	41	6	6	0		5 3			
do do do for Cistern		1	13	6	2	9		6 6½			
Sluice Boards		1	3	4	2	3	15	0	1 5		
Total Teakwood arnaghts and shutters							Cubft	13 2½	Cft	3	391 ✓

Add the difference of Cubic contents of the side or step walls with Coursed stone in Mortar from the side walls with bricks = 216 - -

Dressed Granite Stone on Chunam work

To the Sluice floor		1	22	5	1	9		220 9			
do Cistern do		1	9	6	7	6		67 9			
Side walls of Sluice Head		2	18	1	3	2		540			
do do of Sluice		2	64	6	1	3	5	806 3			
Face of Returning Wall		1	5	3	9	6		59 4½			
Vent in Cistern wall		2	1	0	1	0	9	18 0			
Total dressed Granite Stones								1720 1½	Cubfeet	14	2150 26 ✓
Beam Stones at the Back of the Sluice Shutters		10	5	1	0	1	0	50			
Beam Stones on top of side walls		2	7	1	1			14			
Flat Stone to bear the blunt wall of Sluice		1	5	2	6	1	0	12 6		2	2 ✓
Total Rough dressed Stone work								76 6	Cubfeet	1	766 ✓
Grooved Stones for the Shutters of Sluice Head and Cistern		2	42	1	3	1		52 6	Cft	2	105 ✓
Pointing to the side walls of Sluice		8	27			11		594			
do Front face of Ret. wall		1	3			14		42			
do Intrados of Arch		1	38			29		116			
To the inside of Cistern		1	36	4		9		324			
do outside of do		1	54			9		486			
do top of Cistern walls		1	41			1	6	61 6			
Total Dressed Stone work								1693 6	Cft	3	30 15 ✓
Wrought Iron work for the apparatus of Sluice Gates								165			
Forming Head Bund earthwork							Squares	17	Squares	1	17 ✓
Plastering with 2 Coats of Chunam:											
To the front of Retaining wall		1	19		8			152			
do sides of the Sluice Head		2	6		5			60			
Intrados of the Arch		1	36	4	9			171			
Cistern walls John inside		1	40		3			120			
Cistern walls John outside		4	9	6	9	0		342			
		3	16		9	0		432			
Total Plastering							Sqft	1277 13	Squares	2 8	32 8 ✓
Add inseven Item											4560 11 1
Total for Reconstructing the Mayfoor Sluice											4604 51
										4604 51	102822 21
									Carried over	4560 11 1	101351 3 ✓

Chumbrembackum Tank Bund.

								77656	87731 15
			Brought forwards						
A 9	Reconstruction of Sluice No 2 or Cavanore Sluice								
	Ground Gneiss Stones	1	1 — 01 — 31 — 0		30	0			
		2	1 — 01 — 31 — 0		17	6			
	Dressed Gneiss Plug Stones	3	10 — 0 5 — 6	1/2	264	2			
	Fo 1st step	1	12 — 3 5 — 6	0	287	5			
	2 do	1	12 — 3 5 — 6	9	150	7			
	3 do	1			250	0	Cubfeet	2 ..	500 .. ✓
	Total Ground and Plug holes Stones				130	3	Cubfeet	1 ..	30 .. ✓
	Cross Stones for breaking water	6	5 — 01 — 01 — 0				Each	10 8 .	126 .. ✓
	Wooden Plugs	12		Each	13	1/2			
	Iron Rivets & Staples	1	3 — 80 — 67 — 2						
		2	3 — 60 — 21 — 10		14	7/2			
				Cubfeet	27	9	Cubfeet	3 ..	83 4 .. ✓
				Sqft	20		Sqft	1 ..	20 .. ✓
	Pointing with Chunam to the Granite Casing wrought to receive Apparatus for Lifting the Sluice Gates to 894						sft	8 3 ..	167 10 ✓
	Add for Increase of Casing the side or Step walls with dressed Granite stones instead of building the whole with brick in Chunam								216 ..
	Total for rebuilding Cavanore Sluice No 2							89036 ✓	87442 89036 ✓

A 10 Reconstructing No 8. or Mayyoor Sluice

	Opening the Tank Bund	1	37 — 42 — 6	15	23587	1/2			
	Excavating Foundation				873	1/2	Cubyds	16	11 136 ✓
	Sluice Head	1	23 — 23 — 8	9	3570	75			
	Retaining Wall	1	12 — 31 — 6	6	2418				
	Culvert	1	19 — 12 — 5	6	1254				1128
	Back of Cistern	1	9 — 28 — 5	6	1386				
	Cistern	1	15 — 20 — 5	6	1650				
					Cubfeet	10276	75		
	Total Excavation				Cubyds	380	1/2		
	Deduct for Old Sluice Masonry					60			
					Cubyds	320	1/2	Cubyds	24 80 .. ✓
	Concrete Work					130			
	Under foundation of Sluice Head	1	23 — 14 — 2	6	895				
	do Retaining Wall	1	9 — 21 — 2	6	301	1/2			
	Culvert	1	29 — 12 — 2	6	435				
	Cistern	1	17 — 17 — 2	6	435	6			
					Cubfeet	1975	12		
	Total Concrete				Cubyds	73		Cubyds	30 2558 ✓
	Puddling								
	To the Side of the Sluice Head	2	38 — 6 — 13	6	6156				
	Over the Culvert at the back of Ret. Wall	1	9 — 6 — 10	6	567				
	To the Sides of Cistern Walls	2	12 — 6 6 — 12	6	1875				
					Cubfeet	8598			
	Total Puddle Work				Cubyds	319		Cubyds	6 1910 ✓ 96641 26
									53615 6
									12 82
									703

Carried over

Chumbrambakum Tank.

A J. Reconstruction of Cumbrambakum Sluice Weir — Brought forward — 16 — 1696 — 11 — 87825 11

Concrete Work

Under the returns of the Sluice Head	1	19	5	1-6	142-6			
Do the Retaining wall	1	17	8	1-6	204			
Do the Sluice Head	1	27-6	14-9	5-6	608-5			
Do the Culvert	1	50-6	11	4-6	833-3			
Do the Cistern	1	19	19	1-6	541-6			
					Cft 2329-8			
Total Concrete work					Cyds 86¼	Cyd	3-8	301 14 ✓

Brick in Chunam work:

At Foundation								
Do Returns of side walls in the front of Sluice Head	1	18-6	4-6	5	416-3			
Centre Retaining wall	1	16	3-8	5	650			
Sluice Head	1	28	14	3-5	1995			
Culvert	1	37	10	6-5	2677-6			
Cistern	1	18	6	18-6	5 1711-3			
Superstructure.								
Front returns of side walls	2	4	3	7-12	172			
side walls of the Sluice Head at Talek	2	63	6	3-7½	2 701-4½			
Do do	2	78	6	4-6	2 1331-1			
Coards for 2nd & 3rd Steps	2	3	0	2-5	37-3			
1st Step	2	5	6	2-3	1 141-6			
2nd do	2	8	1	0-3	96			
3rd do	2	6	6	2-6	1 265-9			
Retaining wall	1	14	9	1-3	2-6 1099-10½			
Do Top	1	14	9	0-3	3 66-2½			
Side walls of Culvert	2	55	6	3-3	2 1720-6			
Top of back Retaining wall	1	9	0	2-3	0-9 15-2¼			
Cistern Walls	1	50	2	1-8	2-8 1369-5½			
Backing to Arch	2	5½	2	2-6	126-3			
					Cubft 5944-0			
Deduction for Openings					Cubft 350			
Do for Granite Stone Casing					Cubft 2549			
					3089-0			
					Cubft 12855-3			
Total brick in Chunam work					Cubyds 476-9	Cubyd	45	21428 ✓

Arch Work with brick in Chunam

Culvert	1	63	6	3-7½-6	1358-5¼			
Do over Retaining wall	1	5	3-10	6-2-6	216-6¼			
					Cubft 1575-0			
Total Archwork					Cubyds 58-9	Cubyd	6	350 ✓
Centering to the Arches								80 ✓

Granite Stone Facing in Chunam work

To the face of Retaining wall	1	5	2	2-6	25-2		10-8	150
To the sides of Culvert	2	31	2	0-9-6	2		1	30
To the returns of sides of Sluice Head	2	5	2	0-9	2		1	20
do Sides of the 1st Step do	2	10	2	0-3	2			
do do do do	2	10-9	1	0-3½-11	2			
do do 3rd do	2	10	0	1-3	6			
do of the Culvert wall	2	63	3	1-3	5-2			
do floor of Culvert	1	95	0	5-0	1-0			
do do of Cistern	1	12	6	11-6	1-0			
					143-9			
Total dressed Stone work					2549-0 9¾	Cubfet	14	3187½
					2500-3½			77665

Carried Over

87825-11

Chenab ambakanna Tank.
Rebuilding the sluice No 3 — Brought forward — 1275132 — 79665 44
Continued — 79759 44

Turfing to the ring Bund	1	300	9		Sq ft 2700 or Sq yds 300	Sq yd	0 8	96 ✓
Revetment to the do	1	335	1	6 14	7035 cft.			
Total Revetment to the Bund (Ring)					Cy 260½	Cy	0 8	1304 ✓
Removing the ring bund & preforming the Tank Bund after the Completion of the Sluice work	1	300	21	20	Cft 126000			
		Total Rem & Earth			Cy 4666⅔	Cy	0 2	583356 ✓
Breaking and removing the old masonry work					Cy 768	Cy	0 6	285 12 ✓
Concrete work as per details entered for Chetty or rr 6 sluice					Cy 81¼	Cy	3 0	243 12 ✓
Puddle work do do do					Cy 1405 468	Cy	0 6	151 14 ✓
Brick in Chunam work do do do					Cy 346½			
& Deduction for the less work @ foundations of Pillathunnan sluice					Cy 103¼			
Total Brick work for Pillathunnan sluice					Cy 243 2/4	Cy	4 8	1036 2 1085 10 ✓
Arch work with brick in Chunam as per particulars entered in the 2 & 6 sluices Estimate					Cy 57½	Cy	6 0	345 ✓
Centering to the arch work @ ¼ Cost of the Brick work					230	Cft		86 4 ✓
Dressed Granite Casing in Chunam work					2131	Sq ft	1 4	2662 14 8 2664 28 ✓
Rough do Stone for breaking the force of water					Cft 40	Cft	1 0	40 0 ✓
Dressed granite grooved & plug holes stones					161¼	Cft	2 0	322 8 ✓
Pointing with Chunam to the Granite Casing					Square 18 12	Sq ft	1 0	72 ✓
Country wooden Plugs wrought and put up					No 18	Each	10 8	180 ✓
Teakwood wrought & put up in Cistern Shutters					Cft 20 19-6/12	Cft	3 0	58 10 61 3 ✓
Add Granite Casing in Chunam to the Closet walls of the sluice steps	4	3	0	9 1½	15 10 2/4 Cft 37⅛	Cft	1 4	47 11 46 6 ✓
Wrought Iron Lifting Apparatus for the sluice Gates					lbs 1333	lbs	3 0	25014 ✓
Add the difference of the cost of Casting with the Granite Casing the side or step walls instead of building the whole with Bricks								216 0
								8066 108
								7934 28
Total for reconstructing the Pillathunnan sluice								7934 28 8066 108

Reconstructing the Cavasure or sluice No 2

Opening the Tank Bund for reconstructing the sluice	1	55	24	15	Cft 34650 or 1283⅓	Cy	0 16	1206 6 ✓
Forming Ring Bund	1	215	26	14	Cft 78260 or 2898	Cy	0 16	271 11 ✓
Revetment to do	1	295	1	6 13	do 5752½ or 230	Cy	0 8	115 0 ✓
Removing the Ring Bund and reforming the Tank Bund	1	215	26	14	do 78260 or 2898	Cy	0 2	405 6 ✓
Add Extra Earthwork for					Cy 345			
Breaking and Removing the Old masonry of the Old sluice					Cy 629⅔	Cy	0 6	232 12 ✓
Excavating foundations	1	740	28	15	58800			
Deduct for the Quantity of masonry broken and removed of the old sluice					5880			
					Cft 52920			
Total Earthwork in Excavation including Bailing					Cy 1960	Cy	0 4	490 0
Casing with Dressed Granite stone to the Closet	4	3	0	9 5-6	Cft 49-6	Cft	1 4	6110 ✓
						Carried over		1696 11-6 87731 15

A 7

Chumbrem Lackum Tank Bund

Reconstruction of Pomamallee Sluice No 7. Continued

Brought forward 1604 .. 68325 15 4

Cistern walls	1	50	2	10	0	1369 5½			
Arching to Arch	2	257	9	9	6	124 3			
Brought from work of the Lifting Apparatus of sluice Gates						Cubfeet 21315 894	tt	3	1671 0
Deduction for Vents in the Retaining walls work for Cut Granite Stone Casing						3092 5			
						Cubfeet 10315			
						Cubyds 670 3	Cubyds	40	30528 0
Total Brick in Chumam work									2192 0
Cistern & the arches @ ½ Cut of the Arch work									
Arch work with Brick in Chumam									
& foundation under the flooring of the Culvert	1	96	16	6½	6	10023 6			
Arching at Superstructure over Retaining wall	1	63	2	7½	6	1358 5½			
Do over Retaining wall	1	3	3	16	6	216 6¾			
						Cubfeet 9951 Cyds 144	Cyds	6	873 0
Puddle work Inside the foundation of Cistern	1	12	12	12		1728			
Do Culvert	1	31	9	8	7	17788			
Do Do	1	3	11	8	7	1723½			
Do Do	1	49	6	8	7	27772			
On the sides of the Sluice Head above	2	49	6	8	16	33312			
Do the back of Retaining wall Do	2	49	6	8	14	29148			
Do the sides of Cistern walls Do	1	14	6	8	14	2744			
Inside the arch under floor of Sluice	1	42.5	21.8 area			Cft 20610 ½ 7635	Cyds	6	2864 0
Total Puddle work									
Cut Granite to the front Returns	2	5	1	3	2	27 1			
Do to the sides of 1st Slope	2	10	7	3	6	150			
Do Do 2d Do	2	10	9	7	3 12 11	605 6			
Do Do 3d Do	2	10	7	3	6 3	136 3			
Do the sides of the Culvert	2	62	3	3	2	803½ 0¾			
Do the sides of Retd Wall	1	5	6	3	12 6	78 2			
Do Do of Sloping Culvert	1	95	5	3	4	474			
Do Do of Cistern	1	12	6	10	6	143 9			
Total dressed Stone work						2500 3¾	Cubfeet	1 4	3725 6 8
Add the difference of Labour the sidewalls with dressed Granite with 1/3 of building the whole with brick									218 0
Grooved and Plug holes Stones									
Grooved Stones 1st Slope	4	1	1	3	10	30			
Do 2d Do	2	1	1	3	7	17 6			40 0
Plug holes Stones 1st Slope		10	5	6	1 2	64 2			
Do Do 2d Do	1	12	3	5	6	67 5		1	1911 8
Do Do 3d Do	1	12	3	5	6 9	59 7			1711 0
Total Dressed Plug holes and Grooved Stones						249 8	Cubfeet	2	3409 5 4
Country wooden Plugs	12						Each	10 8	126 0
Granite Rough dressed Stones for placing across the Sluice for breaking the Vertical force of water at the Sluice Heads	3	3	1	0	1	45	Cubfeet	1	45 0
Teakwood Shutters for Sluices	1	3	6	0	6 7	123			1232 10
Do for Culvert	2	3	6	0	6 10	0 35			
Total Teakwood wrought Iron						47 3	Cubfeet	3	1411 2
Removing the Puddle Bund and performing the Sauk Bund						Cft 126000 or 4666⅔	Cyds	2	5832 5 4
Pointing with Chunam to the Granite Casing &c			Squares 20				Squares	1	20 0
Breaking and removing the Old Masonry						7000	Cubyds	6	375
Add sundry Items									11339 5 4
Total Cost of Constructing Pomamallee Sluice									11339 5 4

Rebuilding the sluice

No 3 or Pillathumam Sluice						502		8	3016
Opening the Sauk Bund for rebuilding the sluice	1	73	52	32		Cft 121672 or 4499	Cyds	36	9842 6
Forming new Bund	1	300	21	20		Cft 126000 or Cyds 4666⅔	Cyds	1	291 10
									1275 13 2
									79665 4 4

Carried Over

19750 04

A 7

Chumbrembackum South Bund
Relief Drift No 7 or

Toonamalla Sluice

Brought forward 6819 11 0
6832515

Excavating Foundation including Boiling Water	1	116	28	22	Cubfat 71456 / Cubyds 2646	½ Cubyds	4	6610		
Opening the old Bund over the Sluice	1	47	41	15	Cubfat 28905 / Cubyds 1070	½ Cubyds	2	1333		
Forming Ring Bund	1	300	21	20	Cubfat 126000 / Cubyds 4666	⅔ Cubyds	1	2910		
Total Earthwork										
Turfing to do	1	300	9		Sqyds 2700 / Square 300	Sqyds	6	96		
Total Turfing										
Revetment to the Ring Bund	1	335	1	6 14	Cubfat 7035 / Cubyds 260	⅔ Cubyds	8	1304		
Concrete Work Under Foundation	1	122								
Inside the Cistern	1	122	12	2 6				4360		
Concrete raised on party walls under floor which had to be removed to give flat to Arch work shown in Section	1 On Grant Returns	4	17	32				136		
	1	37	8	12 2				760		
	1 Sluice Mids	92	24	17 32				317		
	1 Ret. Wall	57	6	12 2				1336		
on Plan	On Culvert				Cubfat 3811 / Cubyds 704 19	Cubyds	3	3125		
Total Concrete work										
Dressed Granite Casing to the Court walls in the front of sluice	4	3	0	9 5	Cft			5115/16	Cft	1 4 6415
Brick in Chunam work										
Foundation Side wall up to the Springing of the Arch in foundation	2	96	2	1				2688		
Cistern wall up to the Springing of the Arch in foundation	1	60	3	14 6				2640		
Cross walls do	2	8	2	7				224		
do do	1	8	2	14 6				232 2		
do do	2	8	3	7				336 2		
Projections for Retaining wall	2	9	2½ 3	17 14 6				9032 7½		
do for front Returns	2	6	2	6 14 6				1290		
	1	3	2	3				1072		
Side walls	2	96	8		2352					
Brickwork Cordt and removed to admit Arch work in foundation	3	8	2	3	144					
	2	6	2	3	144					
	2	9	2½ 2	1½	172					
	2	4	2	6	60					
Backing to the Arch including the Hooking Course above the Crown of the Arch and below the Floor of the Sluice	1									
	2	96	12	7 6	9360					
Deduct for Arch from the above	1	96	36 5 area		5424			3936		
Total Brickwork at foundation						Cubfat		12230		
Front Returns of side walls	2	4	3	7 2				192		
Side walls of the Sluice 1st Step	2	13 6	3 7½	7 2				701 4½		
do 2d Step	2	18 6	4	6 14				2331		
Court for the 2d and 3 Steps	2	3	1	8 6 9				277 6		
Step from the top of Bund	2	5½ 6	2	3 3				371 4		
do do	2	8	2	3				96		
do do	2	6 6	2	2 6				66		
Retaining do	1	14 9	2	2 3				66 4½		
do do	1	14 9	5	1½ 22 6				1700 10½		
Side walls of Culvert	2	55 6	3	5 2				1720 6		
Total Brickwork in Cistern	1	9	2	30 9				15 2½		
				Carried over		Cft		19818		1604 6832515

68419 11

Chambrambakum Tank Bund

A 6 Brought forward 425 5 5 4 5989136

Clearing Casting &c Chetty or No 6 Sluice Continued.

Side walls of Culvert	2	62	1	35	8	878	4			
Face of Centre Ret. wall	1	5	1	10		50				
Total Dressed Granite Stone Casing work						2130	4	Cubic ft	1 4	266428
Rough Granite Beam Stone for fitting the side walls of Sluice	8	5	1	1		40		Cubic feet	1	40
Granite Grooved Stones	1	4	0	3	9	23	9			
do Plug hole Stones	1	27	6	2		137	6			
Total Plug and Grooved Stones						161	3	Cubic feet	2	3228
Pointing with Chunam										
To the face of front return	2	5		7		70				
Side walls of Sluice	2	31		4		248				
Front face to Centre Ret. wall	1	2	9	10	6	28	10½			
Intrados of Arch	1	61	6	4	9	292	1½			
Inside of Cistern	1	39		9	6	370	6			
Outside of do	1	52		9	6	494	0			
Top of do wall	1	25	6	1	6	60	3			
						Sq ft 1571	9			
Total Pointing work						346		Sq ft	1	16
Country wooden Plugs	18							Each	10 8	189
Teakwood wrought & put up										
Sluice shutters	1	3	6	6	9	113	7/16			
	1	3	6	0	2½	10	7/8			
						Total Teakwood	20	8	Cft	3
Breaking & removing the old Sluice structure	4	3		0	9	4½	78	Cft	1 4	46662
Piers Rd	1	46		10	11		5060			
Sluice Head 2 Do	1	48		7	15		5040			
Retaining wall Bottom portion	1	33		8	6	18	5049			
Do Top portion	1	41		2	3	6	287			
Side walls of Culvert	2	125		2	5		1250			
Back Retaining wall	1	20		3	5		300			
Do Top	1	25		2	8		400			
Side walls of discharging Ch	2	75		2	6		270			
Foundation Sluice	1	146		8	6		7008			
Projections of front Ret. wall	1	33		9	6		1782			
back Do	1	17		3	6		306			
						Cft	26752			30
Total Clearing Grubbing the Masonry						Cft	991	Cft	6	3716
Wrought Iron work for the lifting apparatus of the Sluices							1338	lbs	3	250-14
Add the difference of the cost of Cutting the side or abt walls of the sluice with dressed Granite stones instead of Brick work & the bricks									1	216
Total for Reconstructing the Chetty or No 6 Sluice										8433 26

Carried over 6832515

6841948

A 6

Chembumbackum Tank Bund

No 6 Chetty Sluice Continued

Brought forward 59,892136

Opening the Tank Bund for rebuild-ing the Sluice	1	114	60	20	Cft 136800					2312 10
					Cubyds 5066 2/3	Cyds	2	633 5 4		
Total Excavation										
Forming Ring Bund to the front of the Sluice	1	300	21	20	Cft 126000					
					Cubic yd 4666 2/3	Cyds	1	291 10 8		
Earthwork for forming Ring Bund					Cft 7035 2260	Cyds	8	130 4 6		
Revetment to the Ring Bund		330	1	6	Cft 2700	Sq yds	6	96		
Turfing to the do do		300	9							
Removing the Ring Bund and re-forming the Tank Bund over the Sluice		300	21	20	Cft 126000					
					Additional Earthwork Cft 10800					
					Cft 136800					
Total of Earthwork					Cyds 5066 2/3	Cyds	2	633 5 4		
Excavating Foundation										
Puddle Trench		114	6	4	6					
Sluice Head		54	23	4	6					
Culvert		50	6 12	4	6					
Cistern		20	20	4	6					
					Cubfeet 72550 6					
Total Excavating Cubic yards					465	Cubyds	4	116 4		
Concrete at Foundation										
Front Retaining wall	1	18	9 5	1	6					
12 of Sluice	1	20	6 15	1	6					
Centre Retaining wall	1	20	3 9	1	6					
Culvert of Sluice	1	51	6 11	1	6					
Cistern of do	1	17	18	1	6					
					Cubfeet 2191					
Total Concrete					Cubyds 81 1/2	Cubyds	38	2846		
Puddle Work										
1st On the sides of Sluice Head	2	40	6 6	1	9					
2d On Culvert behind retaining wall	1	9	6	1	20					
3d On sides of Cistern walls	1	27	6	1	14					
					Cubfeet 12634					
Total Puddle Work					Cubyds 468	Cubyds	6	1750		
Foundation, Front Retaining wall	1	18	3 4	9						
do Front of Sluice	1	21	14	63						
do Centre Retaining wall	1	19	9 8	63						
do Culvert	1	52	10	63						
do Cistern	1	16	6 7	63						
Superstructure										
Front Returns of Sluice	2	6	3	37						
Side walls of front do	2	23	6 3	18 6						
Centre Retaining wall	1	45	6 4	18 6						
Side walls of Culverts	2	62	3	5 8						
Retaining wall at the Entrance of Culvert	1	8	6 1	9 3						
Cistern walls	1	40	2	6 9 6						
					11353 1					
Deduct for Granite Casing Stones					2053 4	Cubfeet				
Total Brickwork in Chunam					Cubyds 9299 9	Cubyds	48	1550		
					344 23/27					
Archwork with Brick in Chunam										
Arch	1	61	9 8	9 2 6	1543					
	1	16	6 5	2 2 6	206 3					
					Cubfeet 1554 3					
Total Arch work					Cubyds 57 1/2	Cubyds	6	345		
Centering to the Arch @ 1/4 the Cost of Archwork								864		
Granite Casing in Chunam										
Floor of the Sluice	1	88	4	6 9	297					
do Cistern	1	12	12	9 9	100					
Side walls of Sluice Head	2	29	1	3 11	797					
Carried Over								4255 5 4		59892136
										59980 96

Estimated by Lieut. Ibbetson 1st January 1823

See what this Item of Work was at this period and what the quantity executed was - the remainder

5477.2 14 0
54,792

A 5 **Turfing to the Slopes of the Bund** — Brought forward —

Begun from the South West end

	2	1250		12		5400		
	2	3	600		30	0	10000	
	3	4	600		42	3	25600	
	4	5	1235		42	0	51702	
	25	26	900		33	0	29700	
	26	27	900		32	0	28800	
	27	28	255		40	0	10200	
No 1. Vettoomaday Calingulah	28	29	81		2		324	
	29	30	98		66	0	5940	
No 2. Roshumby — do —	30	31	140		16		1680	
	31	32	1780		57		86120	
No 3. Thattan — do —	32	33	222		81		13314	
	33	34	200		66		13200	
	34	35	636		67	2	22602	2
	35	36	972		68		26496	
	36	37	1176		57		16632	
	37	38	1430		56		23930	
No 4. or Nalliemmen do	38	39	170		81		13770	
	39	40	150		60		9000	
No 2. or Cavanore Sluice	40	41	823		33		27159	
	41	42	425		66		28050	
No 5. or Poonniemmen Calingulah	42	43	121		66		7986	
	43	44	170		72		12240	
	44	45	450		73		32850	
	45	46	1001		76		76076	
	46	47	1053		60		63180	
	47	48	591		64		37824	
	48	49	436		71		30956	
	49	50	1342		73		97966	
	50	51	465		73		33945	
	51	52	850		64		54400	
	52	53	1730		59		102070	
No 6. or Pernamalla Sluice	53	53A						
	53A	54	525		70	0	36750	
	54	55	599		74		44326	
	55	56	762		63		48006	
	56	57	914		56		51184	
	57	58	975		49		47775	
	58	59	734		53		38902	
	59	60	1027		50		51350	
	60	61	1060		39		41340	
	61	62	530		40		21200	
	62	63	960		42		40320	
	63	64	460		31		14260	
	64	65	840		21		17640	
Total Turfing Square Feet							1501552	Sq Feet
							166839	Yards

	6	5213 116

5213 116

A 6 **Rebuilding No 6 or Chetty Sluice** 5

Removing the Old Brickwork & Granitework

Carried over 59892 136

59986 96

57950 90

43525 5½
434319 ·

Puddling to the Bund — Brought forward

	1	2	450	2 — 0	4 — 11½	3712 — 6
	2	3	600	2 — 3	10 — 9	14852 — 6
	3	4	680	2 — 4	18 — 6	26223 — 4
	4	5	1239	2 — 3	8 — 10½	47427 — 8
	5	6	900	2 — 3	11 — 7½	23520 — 7½
	6	7	990	2 — 3	11 — 9	23793 — 9
	7	8	255	2 — 0	13 — 10½	10120 — 4½
	9	10	990	2 — 9	25 — 6	61497 — 6
	10	11	1160	2 — 6	22 — 3	64522 — ·
No. 3. or Thattan Calingalah	11	12	232			8721
	12	13	200	2 — 9	22 — 6	12375 — ·
	13	14	1856	2 — 10½	22 — 6	48142 — 12
	14	15	911	2 — 9	26 — 4½	68073 — 6
	15	16	1116	2 — 3	23 — 7½	64344 — 3½
	16	17	1450	2 — 3	15 — 9	48937 — 6
	17	18	220			11880 — 3
No. 4. or Nalliammen — do —	18	19	220			11880 — 3
	18	19	1450	2 — 3	16 — 6	55564 — 9½
	19	20	1425	2 — 3	15 — 3	54572 — 10½
No. 5. or Ponniammen — do —	20	21	220			11880 — 3
	21	22	1170	2 — 3	8 — 7½	32394 — 10½
	22	23	450	2 — 0	6 — 6	5050 — ·
	23	24	1084	2 — 0	3 — 6	7567 — ·
	24	25	1053	2 — 0	2 — 6	5265 — ·
	25	26	591	2 — 0	6 — 10½	8126 — 3
	26	27	436	2 — 2	11 — 4½	10730 — 9
	27	28	1974	2 — 1	10 — 9	34037 — ·
	28	29	1965	2 — 1	12 — 6	42335 — 7½
	29	30	850	2 — 3	30 — ·	38250 — ·
	30	31	1730	2 — 3	20 — 6	79796 — 3
No. 9. or Poonamallee Sluice	31	31A	200			11200 — ·
	31	32	525	2 — 6	21 — 6	28219 — ·
	32	33	1519	2 — 6	19 — 10½	29081 — 1
	33	34	762	2 — 0	10 — 7½	16192 — 6
	34	35	972	2 — 0	15 — 3	25697 — ·
	35	36	975	2 — 0	5 — ·	9750 — ·
	36	37	734	2 — 2	23 — 9	27155 — 5
	37	38	1027	2 — 0	16 — 6	13350 — ·
	38	39	1060	2 — 3	24 — 9	19428 — 9
	39	40	1520	2 — 0	5 — 9	8995 — ·
			Total Cubic feet			809827 — 6
						1000
			Total Puddling Cubic Yards		2999½	Cubic · 6 · 112479 · 112479 ·

Carried over — 54,6792 ·
54772 14

3 Travelling between the Revetment and Puddle

Brought forward 38448 9 ✓
38512 6

No 1 or Vettiomaday Calingulah					
No 2 or Rasquimby do					
No 3 or Thattan do					
No 4 Nalliemmen do					
No 5 Pranamallee					

A 2

Revetment (new) with Rough Laterite Stones

Brought forward 9010.5

9104 1

Commencing from the South West end

	1	2	450	1 - 10½	4 - 3
	2	3	600	10 - 9	
	3	4	600	10 - 3	20005 -
	4	5	1231	17 - 6	40391 - 3
	5	6	900	11 - 9	
	6	7	900	11 - 6	
	7	8	235	16 - 3	7769 - 6
No 1. Calingulah (Vittoomaday)	8	9	90	26 -	4387 - 6
No 2. or Roshumby Calingulah	9	10			
	10	11	1180	23 - 3	58561 - 9
No 3. or Thattan ——do——	11	12			
	12	13	200	23 - 9	
	13	14	836	32 - 4½	27674 - 4
	14	15	971	26 - 7½	23299 - 9
	15	16		26 - 10½	36238 - 7
	16	17		17 - 3	44492 - 4
No 4. or Nallieummun ——do——	17	18			
	18		150	19 -	5343 - 9
No 2. or Cavanore Sluice	18	19			
	19	20	125	17 - 6	13945 - 5
No 5. Poopiemmun Caungulah	20	21			
	21	22	170	18 - 3	3247 - 4½
	22	23	450	8 - 6	7127 - 10½
	23	24	1081	5 - 6	11147 - 9
	24	25	1053	7 - 6	8283 - 9
	25	26	591	9 - 9½	5626 - 4½
	26	27	436	4 - 2½	1123 - 9
	27	28	934	14 - 6	2644 - 7½
	28	29	1155	9 - 6	1364 - 2
No 2.	29	30	850	21 - 6	3426 - 7½
	30	31	1730	21 - 9	7095 - 7½
No 6. or Poonamallee Sluice	31	32			
	32		525	24 -	2387 -
	32	33	519	22 - 3	2457 - 4½
	33	34	763	12 - 4½	1760 - 9
	34	35	914	6 - 7½	1153 - 7½
	35	36	975	6 - 6	1262 - 10
	36	37	732	7 - 6	1933 - 10½
	37	38	1027	6 - 6	1637 - 10½
	38	39	1060	9 - 1½	1855 - 10½
	39	40	530	6 - 1½	608 - 9

Total Line Rough Laterite Stone Revetment Cubical 718892 - 9 Cubfeet

Deduct for the Stock of Laterite at work 189000 - 9

Do which is Labour is charged at the Cattle Ends of the Items of this Estimate Do Cubic Yds 529892 Cubic Yds 19625½

1 8 . 29438 4 . 29438 4 .

Carried over — 38,448 9 . 3857.2-5

Detailed Estimate for the Project for the Enlargement of the Chembrembaukum Tank.

Nos of Items	Description of Works	Nos of Cross Sections & Plans	Length	Breadth or Thickness	Depth or Height	Quantity	Per	Rate	Amount	Total of each Work	Grand Total	Remarks
			Feet	Inches		Cubic feet						
1	Earthwork to the Bund											
	Commencing from the South West end	1 & 2	450		20	5	12707	6				
		2 & 3	600		86	3	51750					
		3 & 4	608		170	6	100520					
		4 & 5	1231		140	6	172955	6				
		5 & 6	900		35	8	32100					
		6 & 7	900		40	5	36375					
		7 & 8	255		212		54060					
	No 1 Coliyolah Vettomady	8 & 9	90		522		46980					
	No 2 do Reshumly	9 & 10	Caliyalah									
		10 & 11	1160		273	6	317260					
	No 3 do Thatton	11 & 12	Caliyalah									
		12 & 13	200		160	3	32050					
		13 & 14	636		98	6	62646					
		14 & 15	911		78	2	71209	10				
		15 & 16	1116		65	8	73284					
		16 & 17	1450		49		71050					
	No 4 do Nalliammen	17 & 18	Caliyalah									
		18	150		63	3	9407	6				
	Sluice No 2 (Cavanore)	18 & 19										
		19 & 20	425		106	3	83246					
	No 5 Caliyalah (Nalliammen)	20 & 21	Caliyalah									
		21 & 22	170		196	2	33341	4				
		22 & 23	450		71	9	35437	6				
		23 & 24	1081		59	3	64282					
		24 & 25	1033		69	8	72339					
		25 & 26	591		93		55503					
		26 & 27	2236		147	5	329473	2				
		27 & 28	3774		164	3	619779	8				
		28 & 29	465		110	3	51266	3				
		29 & 30	830		80	2	66411	8				
		30 & 31	1730		80	9	139697	6				
	No 9 Sluice (Ponamallee)	31 & 31A										
		31A & 32	575		169	3	88656	3				
		32 & 33	589		119	5	70336	5				
		33 & 34	761		60	6	45997	2	29000			
		34 & 35	914		97	6	89115					
		35 & 36	975		104	9	102131	3				
		36 & 37	734		105	11	77742	10				
		37 & 38	1027		81	6	84720	6				
		38 & 39	1060		36	11	39131	8				
		39 & 40	530		20	4	10776	8				
	Total Cubic Yards of Earthwork						2594974	7				
							96170	Cubic Yards	1.6	90105	90105	

when added to the cost of the scheme, will raise the total outlay on the project to over five lakhs of rupees, and on this the enhanced revenue due thereto would only yield a profit to about $3\frac{1}{2}$ per cent. This item, I am to state, should have been brought into the calculations when discussing the remunerative character of the project, and I am to request, in submitting projects of this nature for approval, in future the cost of establishment may invariably be added and taken into consideration in calculating the returns due thereto.

9. The enclosures to your letter under reply are herewith returned.

No. 208. ORDER THEREON, 13th June 1872, No. 1,461.

IRRIGATION, No. 7.

COMMUNICATED to the Chief Engineer for Irrigation, and to the Superintending Engineer of the 4th Division.

(True Extract.)

Captain, R.E.,
Acting Joint-Secretary to Government.

To the Acting Chief Engineer for Irrigation.
" Superintending Engineer, 4th Division.
" Revenue Department.
" Controller of Public Works Accounts.

Exd. E. C. Shunker.

Total Cultivated Lands of Carimere

Proceedings of the Madras Government, Public Works Department,
13th June 1872.

No. 207. Read the following letter from the Secretary to the Government of India, Public Works Department (Irrigation), to the Secretary to the Government of Madras, Public Works Department (Irrigation Branch), dated Fort William, 11th May 1872, No. 06-I. :—

I AM directed to acknowledge the receipt of your letter No. 881, dated the 3rd ultimo, submitting proposals for the Chembrambaukum Tank Project in the Chingleput District of the Madras Presidency.

2. The project sanctioned in Public Works Department No. 162-I. of 25th October 1867, it appears contained two serious errors. One a positive error of design affecting the contour of the basin, the other an over-estimate of the water-supply from local rainfall. This project has necessarily been abandoned.

3. Of the two schemes now submitted the smaller or more restricted project (designated the 6-feet scheme), involving an expenditure of Rupees 4,14,000, is recommended for adoption in preference to the larger scheme estimated to cost Rupees 8,38,000. Some obscurity still hangs over the amount of water-supply, which is variously estimated by the authorities conversant with the locality.

4. The Government of India, on a mature consideration of the papers, deem it prudent to adopt the views of Major Mullins and the Director of Revenue Settlement, and would calculate the returns on a basis of a water-supply of 88½ millions of cubic yards, rather than on one of 100 millions, as proposed by the Superintending Engineer and the Acting Chief Engineer for Irrigation.

On this basis we have a gross projected outlay of Rupees 4,14,000, and a *net* return of Rupees 17,442, giving an interest on the capital expended of Rupees 4·21 per cent. Of this amount of expenditure Rupees 2,70,392 have been already disbursed (Rupees 1,94,964 from Loan Funds, and the balance from Ordinary), and it is proposed to expend from Loan Funds the further sum of Rupees 1,43,608, and to repay out of Ordinary Funds to the Government of India the sum of Rupees 1,11,141. The amount wasted in prosecuting the first scheme on erroneous data, making the whole sum chargeable to Loan Funds Rupees 3,02,859, which represents the estimated cost of the present 6-feet scheme.

5. The Government of India cannot concur in this recommendation, and is of opinion that no more Loan Funds should be expended on the project. The amount, Rupees 1,94,964, already expended from Loan Funds may, however, as a special case, continue at the debit of that account.

6. The excess necessary to complete the project, namely, Rupees 1,43,608, should be provided by an appropriation from the Ordinary grant of the Presidency.

7. It is understood that a sum of Rupees 50,000 has been assigned for this work by the Government of Madras out of the Ordinary grant of the current year. The Government of India approve of this appropriation, and as the work is already far advanced, and as a cessation of labour would involve a loss on materials and establishment, they trust that the Government of Madras will make such allotments to this project as will ensure its completion at an early date.

8. It is noticed that no provision appears to have been made in the estimate for establishment. The per-centage of such charges to outlay on works in the Madras Presidency has for the last three years been on an average 21·17, and this,