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MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

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Read the following papers —

No 152 From Major J BEATTY, R E Officiating Superintending Engineer, Godavery, to Lieutenant-Colonel J MULLINS, R E, Chief Engineer for Irrigation, dated Camp at Dowlaishweram, 26th October 1876, No 2,086

With reference to your memorandum, No 55 GD, of 1st June 1876, I have

- 1 Longitudinal Section
- 1 Book of Cross Section
- 1 Classified Abstract
- 1 Abstract Estimate

1 Central Delta Divisional Officer's Report, No 183, dated 31st August 1876

the honor to resubmit the revised estimate for the Central Delta Eastern embankment, and to explain, as I regret to find was not clearly enough done in the original report, that this estimate is for embanking the right bank of the Gowtami Godavery to

the head of the Polaram island, and the right bank of the Vindi Gowtami to Mokaltippa Below Mokaltippa there is little cultivation and a sparse population, and the greatest freshes rise but little above the level of high water of spring tides, consequently embankments are not provided

2 The embankments of the Polaram island have been provided for in a separate estimate submitted with this office No 1,440 of 25th August 1876.

3 Mr Ellis explains in his report that his maximum flood levels start from the anicut by assuming that the height there in the great fresh of 1853 was 53 feet above mean sea level or 15 feet on anicut, and he makes maximum flood level at Yeddur-lunka in the Polaram island near Yanam to be 10 14 above mean sea level, which is within 4 inches of what it was ascertained to be at Yanam by the Eastern Delta Range Officer, who made maximum flood level there 9 84, and Yanam is somewhat below Yeddur-lunka, so that the level should be less

4 Mr Ellis estimates roughly that about 23 per cent, or 30,000 acres of the area protected by the embankment now estimated for, is zemindary He assumes that the total area to be protected in the Central Delta is 357 square miles or 228,480 acres, of which about 130,000, lying to the east of the Amlapore canal, are protected by the embankment now estimated for, the remainder, viz, 98,480 acres to the west of that canal being protected by the left banks of the Vasista and Vamatayam The above areas are approximate only, but have been arrived at by an examination of the revenue survey map

5 An abstract of the estimate mile by mile is herewith sent, also a classified abstract The acreage for which land compensation will be required has been shown in the estimate as nearly as practicable As regards tufting, Mr Ellis has not provided specially for it, where it becomes necessary he would meet the cost from the item of contingencies In paragraph 1 of this letter I have explained the reasons for not providing an embankment below Mokaltippa

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6 In the estimates of the completion project of the Central Delta, a sum of Rupees 59,700 was provided for earthworks of the East Bank canal. That canal approaches the left embankment of the Gowtami at about 17 miles from Bobberlunka, or 9 miles from its head, i.e., the head of the East Bank canal. Consequently 26 miles only of the portion to be improved run alongside the river embankment, and we may

* Rupees 22,174.

roughly calculate that a moiety of $\frac{26}{35}$ of Rupees 59,700,* the sum provided for earthworks on that canal, would have been available for deduction from the embankment estimate had the completion project of the Central Delta been already sanctioned.

7 The estimate previously submitted amounted to Rupees 68,000. The revised estimate comes to Rupees 90,000. The difference is made up of the following items —

	Original Estimate			Revised Estimate		
	RS	A	P	RS	A	P
Earthwork	56,192	5	4	59,760	9	11
Ramming	3,512	0	4	..	..	..
Cattle crossings ..	..	..	..	2,750	0	0
Compensation, &c ..	5,000	0	0	7,900	0	0
Establishment	..	..	..	16,250	0	0
Contingencies	3,295	10	4	3,339	6	1
Total	68,000	0	0	90,000	0	0

8. I take this opportunity to remind you that the estimate for raising the left bank of Vasista from the ancient to the aqueduct was submitted with my letter, No. 419, of 15th May 1876, and has not yet been sanctioned or returned for revision. The remaining embankment estimates will be delayed until it is understood what additional information they should contain.

From Mr. J. ELLIS, Sub-Engineer in charge of Central Delta Division, Godavery, to Major J. BEATTY, R.E., Officiating Superintending Engineer, Godavery, dated Gannanum, 31st August 1876, No 193

With reference to your memorandum, No 786, dated 24th June 1876, I beg to submit

2 Abstract Estimates
1 Longitudinal Section.
1 Cross Sections Book
1 Old Abstract Estimate.

* Statement "A"

Number		Number of Villages	Area
1	Government Villages	69	109,600
2	Zamindary do	24	30,000
	Total	93	139,600

the accompanying papers with the following information — Statement "A" approximately gives the area of Zamindary and Government lands protected by the embankment. I cannot ascertain the exact quantity of each, but for this purpose take into account all land situated between the embankment and the Ambspore canal. To be more accurate I should say that the whole of the Ambspore island of the Central Delta is really covered by protection from inundation as much to the embankment as it does to the Vasista bank on its western side.

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With reference to the Chief Engineer's memorandum No 55 G D on this subject, I have to observe as follows —

His para 1 — 1st — The estimate has been abstracted mile by mile as ordered

2nd — And has been classified according to items of work

3rd — The land compensation cannot be definitely fixed at any exact acreage, the area now given in estimate is as near as I can determine

4th — Turfing is a heavy item and can only be performed after the new earthwork has consolidated and settled. This will probably take two wet seasons, and by then the bank will have turfed itself as in the case of the Polaram embankments and other earthworks in the Central Delta

5th — The country below Mokaltippa is not so well populated or so carefully cultivated as to need protection from the floods, and, moreover, the freshes do not rise much above tide high water at those parts, and therefore further embanking is not needed. In fact, the old embankment ceases at the 51st mile, and proposed raising is only needed to that point. The "eastern river embankment," as the longitudinal section shows, means the embankment from Bobberlunka or Central Delta head along right bank of the Gowtami to the 38th milestone, or opposite to Polaram island head, and then along the right bank of the Vridi Gowtami branch to Mokaltippa limits and tide waters there

The right embankment to the Gowtami main branch below the 38th milestone and that for the left bank of the Vridi Gowtami have been otherwise disposed of in the Polaram island project

His para 2 — From the 17th milestone the river embankment forms the left bank to the East Bank canal and therefore all earth required for proposed raising can be taken out of the canal to improve it. In some few spots the river embankment runs some little distance from the canal, still forming its bank, in such spots outer excavations will be needed or extra rates should be given. These are not many, and the contingency item or general saving can cover the excess

General Remarks

The great flood of 1853 stood 15 feet on the ancient, or + 53 on mean sea level, the observed fresh of July 1875 gave at Wuddipurru 5 miles + 46.47 on mean sea, and at Kottapetta bridge 19 miles + 34.50 on mean sea, and at Yeddurlunka gave + 10.14 on mean sea. These when reduced gave an average surface fall of 1 foot per mile. Reducing therefore the fall as particularized in the note under "reference," see longitudinal section, the surface fall has been brought to 12.8 (+ 4 for mean sea) at the 38th milestone, and reducing at the rate of 1 foot per mile for Vridi Gowtami branch we come to 0 or + 4 mean sea at the 51st mile point, where the villagers tell me no flood rises above high tide level. The old embankment ends here

The flood marks of 1853 in the Vridi Gowtami branch cannot be ascertained. Villagers state that the fresh of 1875 was as high as any they had ever seen

I give in purple the flood levels of 1875 as obtained for the Polaram project. These are found to agree very nearly with those deduced for that of 1853, from the 38th mile to the end

I have not altered the estimate in any way. But the embankment as now sectioned to 9 feet width at top with side slopes $1\frac{1}{2}$ to 1 will in the future admit of raising to the required height for any margin that may be needed to provide for the difference if any between the two freshes of 1875 and 1853 in the Vridi Gowtami branch. The top then can be diminished to 6 feet in the raising without otherwise diminishing its strength.

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CLASSIFICATION

- I.—Head of Service—Irrigation
II.—Funds—Ordinary Agricultural
III.—Class—Original Works
IV.—Main-head—River Embankment.
V.—Name of Work—Raising embankment of Gowtami Godavery and Vridi Gowtami

DESCRIPTION
Abstract Estimate No—of 1876-77.
Godavery District, Central Delta Division.

- VI.—Amount of Estimate—Rupees 90,000.
VII.—To be carried out by the Public Works Department.

Quantity	Description of Work	Rate	Per	Amount	Total
10,039½	2nd Mile Cubic yards of earthwork ... Compensation for land ... Contingencies ...	RS. A. P. 0 1 5	C. yd.	RS. A. P. 688 14 7 150 0 0 51 1 5	1,090
15,082½	3rd Mile Cubic yards of earthwork ... Cattle crossing ... Compensation for land ... Contingencies ...	0 1 5	C. yd.	1,335 6 6 100 0 0 175 0 0 79 9 6	1,690
7,214½	4th Mile Cubic yards of earthwork ... Compensation for land ... Contingencies ...	0 1 5	C. yd.	638 12 5 100 0 0 36 3 7	775
12,181½	5th Mile Cubic yards of earthwork ... Compensation for land ... Contingencies ...	0 1 5	C. yd.	1,079 9 8 150 0 0 61 6 4	1,290
10,645½	6th Mile Cubic yards of earthwork ... Compensation for land ... Contingencies ...	0 1 5	C. yd.	942 9 2 155 0 0 62 6 10	1,150
12,133½	7th Mile Cubic yards of earthwork ... Cattle crossing ... Compensation for land ... Contingencies ...	0 1 5	C. yd.	1,074 9 7 125 0 0 250 0 0 70 6 5	1,490
14,757½	8th Mile Cubic yards of earthwork ... Cattle crossing ... Compensation for land ... Contingencies ...	0 1 5	C. yd.	1,376 9 10 125 0 0 200 0 0 83 6 2	1,715
12,821½	9th Mile Cubic yards of earthwork ... Cattle crossing ... Compensation for land ... Contingencies ...	0 1 5	C. yd.	1,115 3 3 125 0 0 195 0 0 49 12 9	1,525

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Quantity	Description of Work	Rate	Per	Amount	Total
11,892½	10th Mile Cubic yards of earthwork ... Compensation for land ... Contingencies ...	RS. A. P. 0 1 5	C. yd.	RS. A. P. 1,052 15 4 220 0 0 67 0 8	1,340
13,566½	11th Mile Cubic yards of earthwork ... Cattle crossing ... Compensation for land ... Contingencies ...	0 1 5	C. yd.	1,201 3 5 125 0 0 300 0 0 78 12 7	1,705
11,195½	12th Mile Cubic yards of earthwork ... Cattle crossing ... Compensation for land ... Contingencies ...	0 1 5	C. yd.	991 4 4 125 0 0 205 0 0 58 11 8	1,380
14,813½	13th Mile Cubic yards of earthwork ... Cattle crossing ... Compensation for land ... Contingencies ...	0 1 5	C. yd.	1,311 9 6 125 0 0 250 0 0 78 6 6	1,765
18,797½	14th Mile Cubic yards of earthwork ... Compensation for land ... Contingencies ...	0 1 5	C. yd.	1,664 6 2 300 0 0 95 9 10	2,060
13,371½	15th Mile Cubic yards of earthwork ... Cattle crossing ... Compensation for land ... Contingencies ...	0 1 5	C. yd.	1,183 14 5 125 0 0 175 0 0 71 1 7	1,555
12,656½	16th Mile Cubic yards of earthwork ... Cattle crossing ... Compensation for land ... Contingencies ...	0 1 5	C. yd.	1,120 9 6 125 0 0 175 0 0 64 6 6	1,485
3,261½	17th Mile Cubic yards of earthwork ... Compensation for land ... Contingencies ...	0 1 5	C. yd.	288 12 10 60 0 0 11 3 2	360
13,200	18th Mile Cubic yards of earthwork ... Cattle crossing ... Compensation for land ... Contingencies ...	0 1 5	C. yd.	1,168 12 0 100 0 0 150 0 0 61 4 0	1,480
17,477½	19th Mile Cubic yards of earthwork ... Compensation for land ... Contingencies ...	0 1 5	C. yd.	1,547 8 2 225 0 0 77 7 10	1,850

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Quantity	Description of Work	Rate	Per	Amount	Total
	20th Mile	RS A P		RS A P	RS
11,770	Cubic yards of earthwork	0 1 5	C yd	1,042 2 2	
	Cattle crossing	...	..	100 0 0	
	Compensation for land	...	..	100 0 0	
	Contingencies	...	..	57 13 10	
					1,300
5,667½	21st Mile				
	Cubic yards of earthwork	0 1 5	C yd	501 12 10	
	Cattle crossing	...	..	100 0 0	
	Compensation for land	...	..	100 0 0	
	Contingencies	...	..	28 3 2	
					730
18,443½	22nd Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,633 0 0	
	Cattle crossing	...	..	100 0 0	
	Compensation for land	...	..	200 0 0	
	Contingencies	...	..	97 0 0	
					2,030
20,753½	23rd Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,837 8 6	
	Cattle crossing	...	..	100 0 0	
	Compensation for land	...	..	250 0 0	
	Contingencies	...	..	112 7 6	
					2,300
22,503½	24th Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,992 7 8	
	Cattle crossing	...	..	100 0 0	
	Compensation for land	...	..	225 0 0	
	Contingencies	...	..	112 8 4	
					2,430
11,495	25th Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,017 12 7	
	Cattle crossing	...	..	80 0 0	
	Compensation for land	...	..	125 0 0	
	Contingencies	...	..	57 3 5	
					1,250
12,570½	26th Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,113 0 4	
	Cattle crossing	...	..	100 0 0	
	Compensation for land	...	..	100 0 0	
	Contingencies	...	..	60 15 8	
					1,380
17,208½	27th Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,523 11 3	
	Cattle crossing	...	..	80 0 0	
	Compensation for land	...	..	100 0 0	
	Contingencies	...	..	86 4 9	
					1,840
15,387½	28th Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,362 7 4	
	Cattle crossing	...	..	90 0 0	
	Compensation for land	...	..	125 0 0	
	Contingencies	...	..	62 8 8	
					1,640
14,422½	29th Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,276 15 6	
	Cattle crossing	...	..	100 0 0	
	Compensation for land	...	..	150 0 0	
	Contingencies	...	..	73 0 6	
					1,600

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Quantity	Description of Work	Rate	Per	Amount	Total
	30th Mile	RS A P		RS A P	RS
6,257½	Cubic yards of earthwork	0 1 5	C yd	554 1 2	
	Compensation for land	...	..	75 0 0	
	Contingencies	...	..	20 14 10	
					650
11,525½	31st Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,020 7 10	
	Compensation for land	...	..	125 0 0	
	Contingencies	...	..	54 8 2	
					1,200
21,474½	32nd Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,901 6 1	
	Cattle crossing	...	..	100 0 0	
	Compensation for land	...	..	225 0 9	
	Contingencies	...	..	103 9 11	
					2,330
21,755½	33rd Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,926 4 4	
	Cattle crossing	...	..	125 0 0	
	Compensation for land	...	..	225 0 0	
	Contingencies	...	..	98 11 8	
					2,375
19,347½	34th Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,713 1 4	
	Cattle crossing	...	..	125 0 0	
	Compensation for land	...	..	200 0 0	
	Contingencies	...	..	86 14 8	
					2,125
18,333½	35th Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,623 4 2	
	Cattle crossing	...	..	125 0 0	
	Compensation for land	...	..	200 0 0	
	Contingencies	...	..	96 11 10	
					2,045
12,637½	36th Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,118 15 6	
	Compensation for land	...	..	125 0 0	
	Contingencies	...	..	56 0 6	
					1,300
21,230	37th Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,879 11 10	
	Cattle crossing	...	..	125 0 0	
	Compensation for land	...	..	200 0 0	
	Contingencies	...	..	90 4 2	
					2,295
20,680	38th Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,831 0 8	
	Compensation for land	...	..	200 0 0	
	Contingencies	...	..	98 15 4	
					2,130
13,615½	39th Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,205 8 9	
	Compensation for land	...	..	100 0 0	
	Contingencies	...	..	64 7 3	
					1,370
15,007½	40th Mile				
	Cubic yards of earthwork	0 1 5	C yd	1,328 13 1	
	Compensation for land	...	..	125 0 0	
	Contingencies	...	..	76 2 11	
					1,530

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Quantity	Description of Work	Rate	Per	Amount	Total
	41st Mile	RS A P		RS A P	RS
21,486	Cubic yards of earthwork ..	0 1 5	C yd	1,962 7 6	
	Compensation for land ..			200 0 0	
	Contingencies ..			97 8 6	2,260
	42nd Mile				
16,390	Cubic yards of earthwork ...	0 1 5	C yd	1,151 3 3	
	Compensation for land ..			150 0 0	
	Contingencies ..			88 12 9	1,690
	43rd Mile				
10,951	Cubic yards of earthwork ..	0 1 5	C yd	969 10 2	
	Compensation for land ..			100 0 0	
	Contingencies ..			50 5 10	1,120
	44th Mile				
10,340	Cubic yards of earthwork ..	0 1 5	C yd	915 8 5	
	Compensation for land ..			100 0 0	
	Contingencies ..			44 7 7	1,066
	45th Mile				
12,344	Cubic yards of earthwork ..	0 1 5	C yd	1,062 15 11	
	Compensation for land ..			100 0 0	
	Contingencies ..			57 0 1	1,220
	46th Mile				
6,453	Cubic yards of earthwork ..	0 1 5	C yd	571 6 3	
	Compensation for land ..			50 0 0	
	Contingencies ..			24 3 9	645
	47th Mile				
5,548	Cubic yards of earthwork ..	0 1 5	C yd	441 4 11	
	Compensation for land ..			75 0 0	
	Contingencies ..			23 11 1	530
	48th Mile				
7,467	Cubic yards of earthwork ..	0 1 5	C yd	661 3 5	
	Compensation for land ..			75 0 0	
	Contingencies ..			33 12 7	770
	49th Mile				
6,160	Cubic yards of earthwork ..	0 1 5	C yd	515 6 9	
	Compensation for land ..			75 0 0	
	Contingencies ..			20 9 3	610
	50th Mile				
8,506	Cubic yards of earthwork ..	0 1 5	C yd	753 3 2	
	Compensation for land ..			100 0 0	
	Contingencies ..			46 12 10	900
	51st Mile				
11,244	Cubic yards of earthwork ..	0 1 5	C yd	975 9 8	
	Compensation for land ..			100 0 0	
	Contingencies ..			34 6 4	1,110

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Quantity	Description of Work	Rate	Per	Amount	Total
	52nd Mile	RS A P		RS A P	RS
851	Cubic yards of earthwork ..	0 1 5	C yd	75 6 11	
	Compensation for land ..			25 0 0	
	Contingencies ..			4 9 1	105
	Total Estimate				*73,750

* Exclusive of establishment

GODAVERY,
23rd September 1876

(Signed) J ELLIS, Sub-Engineer,
In charge Central Delta Division, Godavery
(Signed) J. BEATTY, Major, R E,
Offg Superintending Engineer, Godavery

No 271 W.

Note by the Chief Engineer for Irrigation
In G O, No 2,575, of the 27th September 1876, an estimate was sanctioned for improving the left embankment of the Godavery and Gowtami Godavery from Rajahmundry to Yanam, and an estimate for the right embankment of the Gowtami Godavery, 33 miles, and for the Vridi Gowtami, 13 miles, has since been revised and forwarded by the Superintending Engineer, and is submitted for the consideration of Government

26th October 1876, No 2,086

2 This embankment forms the protection of the Central Delta on its eastern side from the head of the Delta to Mokaltippa There is at present, as the longitudinal section shows, an embankment throughout, but its level with reference to that of the river flood water is extremely irregular, and in many places dangerously low

3 The following abstract gives a general view of the estimate mile by mile —

Rivers	Miles	Land Compensation	Cattle Crossings	Earthwork	Total	Remarks.
						No work required
Gowtami	1			940	1,090	
Godavery right bank	2	150		1,415	1,690	Top to be 4 feet above M F L
	3	175	100	675	775	Top width 9 feet
	4	100		1,140	1,290	Slopes 1½ to 1.
	5	150		1,005	1,180	
	6	175	125	1,145	1,490	
	7	220	125	1,390	1,715	
	8	200	125	1,205	1,525	
	9	195	125	1,120	1,340	
	10	220		1,280	1,705	
	11	300	125	1,050	1,380	
	12	205	125	1,390	1,765	
	13	250	125	1,760	2,060	
	14	303	125	1,255	1,555	
	15	175	125	1,185	1,485	
	16	175		300	360	From 16 miles on bank to 17 miles on canal
	17	60				

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Rivers	Miles.	Land Com- pensation.	Cattle Cross- ings	Earthwork	Total.	Remarks.
Vridi Gowtami Godavery right bank	18	150	100	1,230	1,480	Length 38 miles Per mile 1,545 Rs.
	19	225	100	1,625	1,850	
	20	100	100	1,100	1,300	
	21	100	100	530	730	
	22	200	100	1,730	2,030	
	23	250	100	1,950	2,300	
	24	225	100	2,105	2,430	
	25	125	80	1,075	1,280	
	26	100	100	1,180	1,380	
	27	150	80	1,610	1,840	
	28	125	90	1,400	1,640	
	29	150	100	1,350	1,600	
	30	75	...	575	650	
	31	125	...	1,075	1,200	
	32	225	100	2,005	2,330	
	33	225	125	2,025	2,375	
	34	200	125	1,800	2,125	
	35	200	125	1,720	2,045	
	36	125	125	1,175	1,300	
	37	200	125	1,970	2,235	
	38	200	...	1,930	2,130	
	39	6,525	...	...	68,715	
	40	100	...	1,270	1,370	
	41	125	...	1,405	1,530	
	42	200	...	2,000	2,200	
	43	150	...	1,540	1,690	
	44	100	...	1,020	1,120	
	45	100	...	960	1,060	
	46	50	...	1,150	1,250	
	47	75	...	600	650	
	48	75	...	515	590	
	49	75	...	695	770	
	50	100	...	575	650	
	51	100	...	800	900	
	52	25	...	1,050	1,150	
	...	1,375	...	80	105	
	...	...	...	...	15,035	
	...	...	...	...	73,750	
	...	...	...	...	18,450	
	...	...	...	...	...	
	...	...	...	...	92,200	
Establishment Tools and Plant	...	...	...	...	...	Per mile 1,146 Rs.

It is to be noticed that on the longitudinal section it is shown, and in the Range Officer's letter it is mentioned, that maximum flood level does not exceed high water level at the 51st mile, and, though this may not be exactly in accordance with the fact, it is probable that high freshes in the main river affect but little the water level 13 miles below the head of the Vridi Gowtami branch. In that case it is not necessary to provide a margin of 4 feet all the way down this branch, and it is certainly not desirable to run an embankment at that level with an abrupt termination at the end. All requisite protection will be afforded by the existing embankments in the 50th and 51st miles, and from the 38th mile the surface slope of the bank should be increased to 1 15 feet a mile, which will reduce the margin gradually to a little under 2 feet.

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at the 51st mile This re-arrangement will effect a considerable reduction of cost in the lower miles

4 Inquiry has been made as to the extent of earthwork required for these embankments which would be obtainable from the contemplated improvements to the East Bank canal, and the Superintending Engineer has reported that roughly it may be assumed that Rupees 22,174 may be taken to represent the value of work common to both the embankment and the canal. The canal left bank it appears, from the 17th to the 42nd mile, is also the river embankment, and Major Beatty calculates that half the earthwork of this part of the canal would be available for the flood banks. This calculation is too rough to be taken into account, and the estimate should have been prepared, as was that for the left bank of the Gowtami Godavery, so as to show the deduction to be made in each mile.

5 So far as may be practicable the soil for the flood bank should be obtained by cutting the canal to its intended section, and an account should be kept of the value of the work so done in order that the amount may hereafter be charged to the canal. No further charge to the Delta system on account of the flood banks seems to be necessary, because the existing banks have been charged thereto, and irrigation has thus already borne more than its share of the cost of the protection afforded by the embanking of the river.

6. The country protected by the flood banks is that lying between them and the Amlapore canal, and its area is stated to be as follows —

	NO	Acres	100,000
Government villages	59	..	30,000
Zemindary do	25	..	130,000
Total	84	..	...

It has already been decided in similar cases that Zemindars cannot be compelled to contribute, and, as the Government interests necessitate the maintenance of the flood banks in a state of efficiency, the estimate is recommended for sanction, subject to the revision noted in paragraph 3 above

The following is a classified abstract —

	RS
B Compensation for land	7,900
L Earthwork	65,850
Establishment, 25 per cent	73,750
Tools and Plant	18,450
Total	92,200

(Signed) JOHN MULLINS, Lt.-Col., R.E.,
Chief Engineer for Irrigation
FORT ST. GEORGE,
28th November 1876
To the Secretary to Government, Public Works Department.

Proceedings of the Madras Government, Public Works Department,
7th December 1876. No. 3,311-A.

No 153. ORDER THEREON, 7th December 1876, No. 3,311.

IRRIGATION, No 16-C
Account

THE estimate of Rupees 73,750 for improving the flood embankments on the right bank of the Gowtami Godavery and Vridi Gowtami Godavery, from the head of the Central Delta to Mokaltippa, a distance of 51½ miles, is sanctioned for entry in the Budget of 1877-78. This estimate will be considered approximate until the arrangements below the 38th mile have been revised, in accordance with the recommendation made in paragraph 3 of the Note by the Chief Engineer for Irrigation, and until it has been ascertained mile by mile what part of the work is common to the East Bank canal and to the embankments.

2 This sanction has been registered as No 203 I of 1876-77, as follows:—

Irrigation
Ordinary Agricultural
Original Works
River Embankments

Name of Work.—Embankment, right bank of Gowtami Godavery and Vridi Gowtami, Godavery, Head of Central Delta to Mokaltippa.

Amount of Estimate — Rupees (73,750) seventy-three thousand seven hundred and fifty.

3 These Proceedings will be forwarded for the consideration of the Government of India in continuation of those of the 27th September 1876, No. 2,575, with reference to paragraphs 8 and 11 of letter, No 2,448, dated 13th September 1876.

(True Extract)

(Signed) G. W. WALKER, Major-General, R.E.,
Secretary to Government.

No 153-A (DOCKET No 3,311-A, dated 7th December 1876)

COPY of the above forwarded to the Government of India.

(True Extract)

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

Exd. E C Shunker

50 Spare Copies

15
No 3311
Public Works Department
PROCEEDINGS of the MADRAS GOVERNMENT.
Under date the 7th Decr 76
Read the following —

From the Chief Engineer (H.E. No 271 W 3/28 Nov 76) for the
sand, fifty mgs for the a case

The estimate of Rs 73,750 for improving the flood embankments on the right bank of the Gowtami Godavery and Vridi Gowtami Godavery, from the head of the Central Delta to Mokaltippa, a distance of 51½ miles, is sanctioned for entry in the Budget of 1877-78. This estimate will be considered approximate until the arrangements below the 38th mile

have been revised in accordance with the recommendation made in para 3 of the Note by the Chief Engineer for irrigation, and until it has been ascertained, mile by mile, what part of the work is common to the East Bank Canal and to the embankments.

2. This sanction has been registered as No. 203.I of 1866. by as follows -
Irrigation

Ordinary Agricultural
Original Works.
River Embankments.

Name of Work. Embankment, right bank of Goutami Godavery and Verde Goutami, Godavery, Head of Central Delta to Mahalippha.

Amount:

Amount of Estimate Rs (73,750)
Seventy three thousand, seven hundred and fifty.

3 These Proceedings will be forwarded for the consideration of the Government of India in continuation of those of the 27th September 1896, No 2575, with reference to paras 8 and 11 of letter No 2448, dated 13th September 1896

By. 4/12
Mm.

A.R. No ^{3311A} ~~2575~~ a / 7 Sept 1897
Copy of the above forwarded to the Govt. of India.

H. Sadanary ✓
Collector of Godavery ✓
Ch. S. for Bridge with 6 Endos
En. R. N. Acc to ✓
Revenue Dept ✓
Dated 2-1-97

520

11-2-13 BL IV

Ch. 5792
Govt. of 1870 Madras.

PUBLIC WORKS.

To the P. & S. Secretary

Dated

Issued

Recd.

Encl

G. O. 7th Dec 1870, No. 33/11
33/14

Nos. 52

Flood embankments on the
right bank of the Govt. and
and Vidi Govt. in
the Central Delta, G. & S.
Scheme for improving
the ———— sanctioned —

Forwarding copy of
No. sanctioning the scheme
for improving the flood embank-
ments on the right bank of
the Govt. & Vidi Govt.
in the Central Delta,
G. & S.

Ch. 5792