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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

P.W.D. DEPARTMENT

G.O. No. 2973(W)

dt-2-12-1884

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2973

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Civil Works.
Irrigation.

READ—the following papers :—

From Colonel H. L. PRENDERGAST, R.E., Superintending Engineer, V Circle, to the Chief Engineer for Irrigation, dated Chepâk, 24th November 1884, No. 3265.

I have the honor to report that the bund of the Red Hills tank has been swept away, from the wing wall of the 10-vent surplus sluice, along the short north face, and round the bend along the eastern side, to a distance of fully 700 yards. Only a few broken mounds are left, the bank being generally levelled to its base, but the north sluice is standing in the middle of the breach apparently uninjured. The water is now running out in a small channel some 50 feet wide, where there was a deeper scour, but principally through the gap at the southern extremity of the breach, about 200 feet in width, where there is still a deep scour. The water must have rushed through this gap with great violence, for many of the large revetment stones have been carried down two hundred yards from the bund. A little way further south there is a partial breach, the revetment being left standing at about full tank level, though the earth behind is a good deal washed away. For several hundred yards further the parapet wall has been thrown over, and at the south end of the bund, where it takes a turn to the east, the highest row of revetment stones has been disturbed, the water having washed slightly over the bank in rear.

2. The wind was blowing from the north-west on the evening of the 20th ; it backed to west during the night, to south-west about four in the morning of the 21st, and to south later on, culminating in gusts of hurricane force after 6 A.M.

Along the deeper parts of the tank the waves were thrown up with force sufficient to upset the parapet stones, and cast a good deal of spray over them, the west wind blowing at right angles with the general direction of the bank. The parapet extends southwards as far as the Polal sluice; for a couple of hundred yards to the north of the sluice there are only a few of the parapet stones displaced, but just at the sluice itself there is a narrow but deep gully down the outer slope of the bank. The sluice projecting into the tank acted as a groyne, and when the wind blew furiously from the south the water was dashed up and fell over the top of the bund. It was when the wind was in this direction, south-west to south, that sweeping over the long stretch of the tank surface, it piled up the water against the north-east corner of the bund.

3. The Tank Superintendent, who was driven away by the preliminary sheets of spray, describes the scene as that of a succession of waves that rose 10 feet above the bank, washed away the earthwork and consequently burst through, carrying down the weakened embankment. I was informed that the lesser partial breach was the first to take place, but if this was the case the interval could not have been long

before the northern part of the bund was destroyed, because the revetment is left standing at about the course of stone at full tank level, and a good deal of the earth behind is at the same high level. There is no very clear narration of the circumstances of the bank giving way, and this is not to be wondered at, considering that the early morning hours were dark with heavy clouds and a tempest of rain and wind, while the people at Tuluken chattram, a small village just beyond the north end of the tank bund, had, in some cases, to fly from the torrent, leaving their houses and goods to be washed away. The Tank Superintendent, Ponnusawmy Pillai, thus lost all he possessed there.

The wing wall of the surplus sluice does not seem to be damaged, and the masonry weir beyond is standing firm.

4. On the night of the storm the water level was some 3 inches below weir crest. On the 9th instant, after the heavy rains, the weir had been discharging with a head of 13 inches, but the water fell below the weir crest on the 12th instant.

I had inspected the tank on the 19th, when the heavy rains had ceased, and found the embankment and masonry works all in good order; I then wrote some notes of inspection, which I put on one side when the catastrophe occurred; but I will have them copied and sent to you as evidence that no danger was in the least foreseen, and that there was no indication of any measures being required to provide for the safety of the tank.

5. In fact I was perfectly satisfied with the condition of the reservoir, and felt quite relieved that a very secure accession of water had been passed off, hoping that the violence of the monsoon might be over, and that there would be no reason to have any anxious thoughts about these works.

6. The parapet wall was built on the tank bund, to give further protection from the force of waves. The parapet wall was in thoroughly good order when the storm came on. It is impossible to say what the pressure of the wind amounted to last Friday morning, but its destructive effects were much greater in Madras than when the last cyclonic storm took place in November 1881.

Our experience of storms of late years has been that they came in the hot weather, in May, when tanks are dry or very low, and in November before the monsoon rains have filled the tanks. Thus in the beginning of November 1881 the Red Hills tank was $6\frac{3}{4}$ feet below the weir crest, at its then reduced level, or $9\frac{3}{4}$ feet below the present weir crest, and on the 1st December 1881 the tank was not full.

On the 21st instant the water was about four inches below the full tank level, and the time was most unfavorable for a storm of wind. The direction of the wind was also the worst, as it caused the full force of the waves to be expended against the revetment of the bund. Had the strong wind blown from the east, as in 1881, there would have been no such pressure on the bund.

In short a storm occasionally attacks engineering works in all countries and causes damage that the skill of the most experienced man could not anticipate. We have had a lamentable storm of this nature, and can only deplore the results.

No. 186 I.

Note by the Chief Engineer for Irrigation.

The report submitted by the Superintending Engineer, on the bursting of the Red Hills tank, enables the cause of the breaches to be thoroughly investigated.

2. On 19th instant the tank bund was inspected by the Superintending Engineer and was found, after the exceptionally heavy rains that had previously taken place, to be in excellent order. The surplus weir of the tank had passed 13 inches of water on 9th instant, and the tank bund had safely borne the pressure of so great a head of water ($1\frac{1}{3}$ feet more than when the breaches occurred on 21st instant), without having given the smallest indication of weakness in any part.

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3. Between the hours of 3 A.M. and noon of 21st instant a cyclone swept over Madras. At about 5 A.M. the wind was from the west, and the greatest force of the cyclone was reached between the hours of 7 and 8 A.M., when, according to the official report of the Government Astronomer, the wind was blowing from the south-west, and had attained its maximum velocity of 49 miles per hour.

4. About 7 A.M. the tank is reported to have breached, when the water in it was 3 inches below F.T.L. The general direction of the wind at this hour, being from the south-west, would have tended to generate a succession of waves, diagonally across the tank, toward the north-east portion of the bund, over the greatest possible expanse of water (as will be apparent from the sketch map), and this to cause waves, of the greatest possible force and height, to dash against this portion of the embankment. The water at this part of the tank being driven before the wind doubtless heaped up against the stone revetment of the bank to a very considerable extent, and, dashing against it with great violence, would naturally fall on the top and over the back of the bund in showers of spray.

5. As explained in the note by the Chief Engineer for Irrigation, printed with G.O., No. 1051 I., of 24th November 1884, the stone revetment of the bank, together with the top of the bund, is 6 feet above F.T.L., and a stone parapet wall, 2 feet to 3 feet high, is built on the top of the bund. The combined force of the wind and waves dashing against the parapet wall overturned it. Deprived of this protection the top and back of the bund would be more and more cut away by each succeeding wave passing over them until the embankment, thus weakened, was no longer able to withstand the pressure against it, and breaches accordingly took place along the north-east part of the bund, *i.e.*, at the part against which the greatest violence of the waves was directed.

6. Nothing was wanted to add to the destructive force of the cyclone on the tank embankment. The tank was within 3 inches of being full when the storm occurred, and the direction of the wind, throughout the cyclone, was of the most unfavorable description. The two causes combined dered it impossible that the bank, as designed, could stand, as both the top and back of it were at the mercy of the waves.

7. The hour at which the cyclone raged rendered it impossible for any effective measures to be taken for the security of the bund, but it is highly unlikely that the making up of the bund could have been carried out fast enough to avert the disaster, even in the improbable event of a sufficient amount of labor being induced to turn out in the middle of a violent storm of wind and rain.

(Signed) A. S. RUSSELL,
for Chief Engineer for Irrigation.

MADRAS,
25th November 1884.

From Colonel H. L. PRENDERGAST, R.E., Superintending Engineer, V Circle, to the Chief Engineer for Irrigation, dated Chepâk, 26th November 1884, No. 3297.

With reference to paragraph 1 of G.O., No. 1051 I., dated the 24th November 1884, I have the honor to report that the steps taken in the last three months to ensure the safety of the Red Hills tank consisted in placing the screw gear shutters in working order at the 10-vent surplus sluice and opening a paved escape at full tank level at the south end of the bund.

2. After the surplus weir was reduced by 3 feet in height in November 1877 a ground escape was prepared to relieve the tank when full at the south end of the main bund, but after the masonry weir was raised again the ground escape was on too low a level, and the Chief Engineer considered it should be removed to higher ground, so as to pass off water at the permanent full level 47·31.

These discharging works came into play when the tank was filled and the water raised 13 inches above weir crest level by the heavy rains that fell before the storm of the 21st instant.

V

Colonel Smalley, the Executive Engineer, and Mr. Ellis, the Assistant Engineer, had been both of them carefully watching the tank during this month. I had gone over the works on the 19th instant, and saw that all was in good order; the water was 4 inches below the crest of the weir, and the general condition was entirely satisfactory after a severe strain from the greatest supply of water that the tank had hitherto received.

3. There remained no fresh precaution to be taken, but the terrific force of the wind dashed the water in great waves over the bank and destroyed it. I have thus recapitulated the points on which I am called upon to report; but in my letter No. 3265, of the 24th instant, I have already narrated the circumstances of the disaster, and I now send you also my notes of inspection of the 19th instant.

4. On the 22nd instant a commencement was made of the preparation of materials for a ring bund, and work was begun on the 23rd. The level of the water on the 23rd was 3 feet lower than it ever was in 1877, when the supply for irrigation was stopped.

If the rains continue it might be advantageous to let out water to the fields, when the ring bund is constructed, so that there would be less difficulty to contend with in the work of restoration. But looking to the completion of this work, and the possibility of there being a limited supply of water in next year, I would say that the delivery of water for the sake of irrigation should be stopped.

5. Colonel Pennycuick visited the Cholaveram tank on the 23rd instant, wading through the country, to arrive at the breached portion. The bund of this tank is carried away to a length of some 500 feet, at the north sluice, which remains standing. There too, as at the Red Hills tank, destruction was caused by the violence of the wind from the southern quarter.

Colonel Smalley reported that the head sluice at the anicut was shut off on the morning of the 6th November. But from the land drainage the tank rose to the greatest height on the evening of the 8th, when water was flowing over the weir, to a depth of 15 inches. The bund had stood well. The water in the tank had fallen to about 4 inches below weir crest on the 15th of the month, and was probably a little lower on the 21st.

ENCLOSURE.

No. 3293.

Notes of Inspection.

19th November.—Red Hills tank. I was glad to find that the tank has stood very well the effects of 24·9 inches of rain falling in eight days, 3rd to 10th November. After three days' interval 1¼ inch of rain fell again, bringing up the total fall to 26·4 inches in twelve days. The greatest fall in 24 hours was 4·95 inches, and in four consecutive days, 5th to 8th, 16·6 inches were registered, being equivalent to 4·15 inches per day.

2. The works show no signs of disturbance, except in the concrete laid over the laterite flooring here and there, below the surplus weir. I examined the bund carefully and could not detect any alteration in the appearance of the bund, or the revetment. I did not find any cracks or subsidence in any part of the earthwork or revetment.

3. On the 29th ultimo I had visited the tank and found that the platform of the 10-vent under sluice was not restored to working order after the lengthening of the rods holding down the longitudinal beams, while also the pavement of the ne wescape at full tank level at the south end of the bund was not completed. The water stood then at 42·7, but fresh water had come into Cholaveram tank, and the head sluice there was opened to let water into the Red Hills tank.

As we were on that day not ready to deal with surplus water I directed that the supply from Cholaveram should be shut off when the Red Hills tank had risen to three feet below weir crest.

4. Rain fell on the 2nd and again on the 3rd to the amount of 2¼ inches and the head sluice was shut on the 4th, the tank water standing at 43·81. I also gave instructions that as soon as the tank began to overflow the water level was to be recorded three times in the day—at 6 A.M., at noon, and at 6 P.M.

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The following table shows the fall of rain and level of water in the tank:—

November.	Rain.	Total.	Water level.	Difference.	Water level taken three times a day.
	INCHES.				
	0·95	...	43·61	...	...
3rd	1·30	2·25	43·81	+ 0·20	...
4th	4·50	6·75	44·76	+ 0·95	...
5th	2·65	9·40	45·36	+ 0·60	...
6th	4·50	13·90	46·51	+ 1·15	At 6 A.M.
	...	...	46·91	...	Noon.
	...	...	47·11	...	At 6 P.M.
7th	...	...	48·11	+ 1·60	At 6 A.M.
	4·95	18·85	48·15	+ 0·04	At noon and 6 P.M.
	...	...	48·19	...	At 6 A.M.
8th	2·60	21·45	48·31	...	At noon.
	...	...	48·45	+ 0·30	At 6 P.M.
9th	...	...	48·21	...	At 6 A.M.
	3·45	24·90	47·96	...	Noon.
	...	...	47·81	— 0·64	6 P.M.
10th	...	...	47·61	...	6 A.M.
	0·0	...	47·48	...	Noon.
	...	...	47·41	— 0·40	6 P.M.
11th	...	...	47·29	...	...
	0·0	...	47·13	...	...
12th	0·0	...	47·19	...	...
13th	1·50	26·40	47·11	...	...
14th	...	...			
15th					

5. The Executive Engineer, Colonel Smalley, was at the tank on the morning of the 5th, in anticipation of the tank being filled, and directed pins to be put to the screw spears, pushing on the work at the escape, and getting the under-sluice platform ready.

Between the morning of the 4th and 5th the tank rose very nearly a foot; by that time 6¾ inches of rain had fallen. But it was not till the close of the fifth day of rain, when 13·9 inches had fallen up to the morning of that day, the 7th, that the weir began to discharge, full tank level being 47·31.

The overflow lasted for four days until the night of the 11th, and the water then gradually sunk, standing on the 19th at 47·05.

6. It was reported on the 8th that the Kovilpadagai tank had breached. This tank lies within three miles to the west of the Red Hills, and surpluses direct into it. The greatest fall of rain in 24 hours occurred the same day, 4·95 inches, and on the following day, the 9th, the water in the Red Hills tank was at its highest level, 48·45, or about 13½ inches above weir crest.

7. The southern escape was not completed when the tank rose to the pavement level on the 7th evening, a portion in the middle being unfinished, but Mr. Ellis had been pushing on the work; retaining walls of large rough stone had been put in, stone was packed as a wing against the earthen bund, and more stone was held in reserve in case of any scour. But the escape acted well, and discharged easily throughout, without giving any trouble.

8. The water having reached its highest point on the evening of the 9th had fallen 0·24 foot the next morning. But on the morning of the 9th the sluice shutters were all raised half a foot, and during the day some water was passing over a road dam, on the trunk road, to the north of the village of Tuluken chattram. On the morning of the 10th Colonel Smalley had the shutters raised to one foot above sill, as the water level was only ·02 foot lower than it had been the morning before. He was also preparing to relieve the tank, by lowering the trunk road, near the road dam, in the event of the tank rising again; but this was not necessary, as the water fell ·4 foot during the day.

9. The greatest rise in the tank water in twenty-four hours was 1·6 foot, from the 7th morning to the 8th morning. There had then been 9·45 inches of rain in the preceding forty-eight hours and 18·85 inches in six days; but water was running over the weir probably for the greater part of the night of the 7th.

The powerful discharging capacity of the tank is exemplified further by the fact that in the next twenty-four hours, in which 2·6 inches of rain fell, making an aggregate fall of 21·45 inches in seven days, the water level rose only ·08 foot. After this, on the morning of the 9th, the under sluices came into play, and though there was heavy rain in the day—very likely as much as the half of the fall registered the next morning, viz., 3·45 inches—the water rose only ·26 foot by the evening, and then began to fall.

10. In December 1883 there was a fall of 12·3 inches of rain in six days. In November 1884 there has been a fall of 22·65 inches, as a part only of the eight days, continuous fall, in the six days registered, from the morning of the 5th to the morning of the 10th. But in 1883 the tank was only 0·25 foot below weir crest level, and in this year the water was 3·7 feet below full level, after the first day's rain.

If we assume, in the absence of more frequent observations, that the rise of water in the tank was uniform through the twenty-four hours, and that the rainfall was likewise uniform, it is found that in 1883, after the tank was full, there was a fall of 4·1 inch of rain in thirty-eight hours, that raised the water to its greatest height of 47·91 or ·6 foot above crest level.

In 1884, after the tank was filled, a rainfall of 6·39 inches brought the water level to its maximum height, 48·45, in forty-six hours, that is to 1·14 feet above weir crest. Thus in 1883 the rise above weir crest was at the average rate of ·1 foot in 6·3 hours; in this year the average rate of rise is ·1 foot in four hours. In 1883 the average time in which an inch of rain fell was 9·2 hours, in 1884 the average time was 7·2 hours.

In this year there was the more rain and the quicker rise of the water level during the time that the weir was discharging up to the highest level.

11. In 1883 there had been 7·6 inches of rain in three to four days immediately preceding the time when the tank was filled. In this year, before the tank was, full, there had been 14·53 inches of rain in the corresponding period of three to four days.

That the tank did not rise to a higher level is due to there being three additional outlets that were effective this year, viz., the discharge, though to a small extent only, to the north over the trunk road; the 10-vent under sluices, and the escape 200 feet long, at the south end of the bund at the full tank level.

CHEPÂK,
26th November 1884.

(Signed) H. L. PRENDERGAST, Col., R.E.,
Superintending Engineer, V Circle.

Note by the Secretary to Government, Public Works Department.

The destruction of the Red Hills reservoir was without doubt caused by the waves, generated during the cyclonic storm on the morning of the 21st November, washing in enormous masses over the embankment at its north end. The evidence that this was the immediate cause of the disaster is irresistible.

It is, however, doubtful whether the force of the waves would have caused the destruction of the reservoir had it not been for certain errors in the original design. In my opinion those errors were—

(1) The top of the bank above full tank level is only six feet—a height that seems insufficient in the case of so large a waterspread.

(2) The laterite wall (wave-breaker) on the top of the bank appears to me to have been too weak in section to withstand the force exerted by the waves. Its dimensions were 3 feet in height by 1½ feet in thickness, and it was formed of loose blocks of laterite laid without cement or mortar.

These are points on which the Chief Engineer for Irrigation will of course report.

Whether, looking to these apparently weak points in the construction of the reservoir, it was prudent to allow the water level to rise to the height at which it appears to have stood during the greater part of November is also a point which will doubtless receive attention from the Chief Engineer for Irrigation.

1st December 1884.

(Signed) J. SHAW-STEWART, Colonel, R.E.,
Secretary to Govt., P.W.D.

ORDER—dated 2nd December 1884, No. 2973 W., Public Works.

His Excellency the Governor in Council desires that the Chief Engineer for Irrigation will, as soon as practicable, submit a complete report to Government on the recent disaster to the Red Hills reservoir, noticing particularly the points indicated in the Secretary's note, recorded at the head of these proceedings.

Colonel Hasted will also report upon the duties of all officers who were connected with the charge of the reservoir and upon the share of blame, if any, due to each officer.

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Pending receipt of the report now called for the Government will withhold expression of their opinion in the matter.

The Chief Engineer for Irrigation will also submit, with the least possible delay, proposals for restoring the reservoir. Such proposals should be drawn up in communication with the President of the Madras Municipal Commission, and with reference to the scheme for a low-level water-supply to the town of Madras.

(True Extract.)

Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
" Superintending Engineer, V Circle.
To" Lieut.-Col. J. Pennycuick, R.E.
To the Financial Department.

Exd. C. Howarth.
Spare Copies

IX

B. III

CIVIL WORKS.
IRRIGATION.

Govt. of 1884 Madras.

PUBLIC WORKS.

Dated December, 2nd.

Recd. *Encl.*

G.O., 2nd Dec. 1884, No. 2973 W.

DECEMBER.

Red Hills Reservoir

Orders calling for complete report on the recent disaster to the —.

24th June 1884, No. 1581 W., Public Works.

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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

General.
Account.

Read—the following papers:—

From the Superintending Engineer,		I	Circle,	dated	22nd May 1884,	No. 59 G.L.
,,	,,	I	,,	,,	6th June ,,	,, 86 ,,
,,	,,	II	,,	,,	3rd May ,,	,, 41 ,,
,,	,,	II	,,	,,	16th ,,	,, ,, 458 K.S.
,,	,,	III	,,	,,	2nd ,,	,, eight statements.
,,	,,	III	,,	,,	16th ,,	,, No. 318.
,,	,,	IV	,,	,,	16th ,,	,, ,, 231 E.W.
,,	,,	IV	,,	,,	20th ,,	,, ,, 233 ,,
,,	,,	IV	,,	,,	29th ,,	,, ,, 246 ,,
,,	,,	V	,,	,,	16th ,,	,, ,, 593.
,,	,,	V	,,	,,	16th ,,	,, ,, 594.
,,	,,	V	,,	,,	16th ,,	,, ,, 595.
,,	,,	V	,,	,,	16th ,,	,, ,, 596.
,,	,,	V	,,	,,	3rd June ,,	,, ,, 849.
,,	,,	V	,,	,,	5th ,,	,, ,, 896.
,,	,,	VI	,,	,,	8th May ,,	statement.
,,	Consulting Architect to Government,			,,	17th June ,,	No. 249.
,,	Quartermaster-General,			,,	21st ,,	,, ,, 165-A.
,,						

Order—dated 24th June 1884, No. 1581 W., Public Works.

With the papers read above, Superintending Engineers and the Consulting Architect submit statements of the estimated requirements for the current official year, in lump sums for minor works and tools and plant for each division; and in detail for the incomplete works of the past year, and for new works recommended to be taken up in 1884-85.

2. Under "Imperial other services," the demands against "Original works" amount to—

	Rs.
Postal	5,151
Telegraph	1,000
Salt	553

of which only Rs. 1,404 under Postal have been allotted for the completion of two incomplete works. The balance of the minor works grant, after the above allotment for unfinished works, under Postal, Rs. 10,596, and the whole of the minor works grant under Telegraph, Rs. 6,000, are placed at the disposal of the Director-General of the Post Office, and of the Director-General of Telegraphs, as shown in Statement A. Those officers will allot the requisite funds for work to be undertaken during the year.

3. The sum of Rs. 553 is required under Salt, to permit of the early completion of the head sluice across Mercanam brine supply channel. On receipt of a reply to a

reference made to the Revenue Department, the requisite reappropriation statement, reallotting the sum required from the budget provision under Item No. 10, opening and maintaining the Covelong bar, will be submitted for the early sanction of the Government of India.

4. The allotments under Repairs will be found in Statement A.

5. The demands of Superintending Engineers under Imperial Military amount, as shown below, to Rs. 1,31,411 :—

	Rs.
For minor works anticipated to be placed at the disposal of Superintending Engineer in lump sum	28,006
For incomplete minor works	4,875
„ incomplete major works	34,677
„ new minor works	22,080
„ new major works	41,773
Total ...	1,31,411

6. As the minor works grant, Item No. 5, Class B, amounts to only Rs. 22,320, the demands of Superintending Engineer have been greatly reduced, as shown below; and (provision to meet the same having been made) the balance of the minor works grant, Rs. 10,961, has been placed in lump sum at the disposal of officers commanding divisions and districts, to be distributed individually in such proportion as His Excellency the Commander-in-Chief may deem proper :—

	Rs.
For incomplete minor works	1,961
„ incomplete major works	5,103
„ new minor works	1,500
„ new major works	2,795
Total ...	11,359

7. There are several new minor works for which funds have been applied for by Superintending Engineers; but as the balance of the minor works grant, after providing for works now on hand, has been placed at the disposal of the military officers commanding divisions and districts, application should be made to them by Superintending Engineers to meet outlay on such works as are to be carried out during 1884-85.

8. A reference has been made to the Military Department respecting suggestions of the Superintending Engineer, V Circle, to resume the budget grant for "Alterations and additions to wash-house for the British Infantry at Bangalore," and to reduce the budget grant for "Armaments of Fort St. George." On receipt of a reply, the necessary order will issue.

9. The allotment under Repairs will be found in Statement A. The grant to the Coimbatore Division includes the allotment required for special repairs to the European barracks at Cannanore. The demands of Superintending Engineers under this head amount to Rs. 2,95,000, but have been reduced to Rs. 2,75,000 to bring the sum within the provision in the budget.

10. The demands of Superintending Engineers under Provincial, for anticipated outlay on minor works, amount to Rs. 53,180, but have been reduced to Rs. 34,750 as shown in Statement C.

11. On account of incomplete works of last year, exclusive of Police and Registration, the demands amount to—

	Rs.
Major works	2,34,099
Minor works	12,063
Total ...	2,46,162

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but have been reduced to Rs. 1,33,367 as below :—

	Rs.
For major works	1,23,512
„ minor works	9,855
Total ...	1,33,367

Allotments have been made to the extent of the funds available.

12. Under New Works the demands amount to—

	Rs.
Major works	79,879
Minor works	14,192
Total ...	94,071

but have been reduced, as shown below, to Rs. 18,205 :—

	Rs.
Major works	14,750
Minor works	3,455
Total ...	18,205

Funds have been allotted for two minor works, viz., the temporary buildings for the establishment of the Head Assistant Collector at Naduvatam, and the improvements to the Tiruvadamarudúr palace, as also for the following major works :—

(1) Iron-safe for Taluk Cutcherries in the Vizagapatam District.
(2) Quarters for Police Inspector and an Apothecary at Anantapur.
(3) Bungalow for the Sub-divisional officer at Anantapur.

13. The demands under Registration amount to Rs. 61,178, of which the sum of Rs. 46,460 is on account of new works. Funds have been allotted for the completion of all the incomplete works to the extent of Rs. 13,921; and of the new works, for which grants have been applied for, provision has been made in the budget for four works to the amount of Rs. 7,705.

14. Under Police, the demands amount to Rs. 21,930. Provision has been made in the budget for these works, aggregating Rs. 2,690; and Rs. 5,894 have been allotted from the reserve.

15. The total allotments made from the Provincial reserve amount to Rs. 2,06,137.

16. The demands under Repairs and Tools and Plant, and the allotments passed, are shown in Statement C. To meet the demands under Communications and Miscellaneous Public Improvement, Rs. 3,600 have been transferred from the budget provision under Civil Buildings, viz., Rs. 1,600 to the grant under Communications and Rs. 2,000 to Miscellaneous Public Improvement. The provision under these heads will now stand as below :—

	Rs.
Civil Buildings	1,38,800
Communications	49,600
Miscellaneous Public Improvement	6,600
Total ...	1,95,000

17. The following sums, aggregating to Rs. 9,741, have been resumed and added to the Provincial reserve :—

	Rs.
Improvements to the Collector's house at Masulipatam	1,155
Cemetery at Pudipatnam	111
Improvements to the Deputy Collector's Cutcherry at Tanjore ...	219
District Munsif's Court at Sivaganga	1,200
Additions and improvements to the Public Works offices at Chepâk ...	4,962
Sub-Registrar's office at Yellamanchili	893
Do. at Narisipatam	500
Police station-house at Jayanadharajapuram	701
Total ...	9,741

6

18. The distribution of the lump sum grants under Police and Registration, Items Nos. 71 and 110 in the Provincial budget, is shown in Statement E.

(True Extract.)

(Signed) J. SHAW-STEWART, Colonel, R.E.,
Secretary to Govt., P.W.D.

To Superintending Engineers.
To the Consulting Architect to Government.
" General Superintendent, Public Works Stores and Workshops.
" Chief Engineer for Irrigation.
" Examiner, Public Works Accounts.
" Financial Department.
" Revenue "
" Judicial "
" Educational "
" ~~Medical~~ Military "
" Ecclesiastical "
" Director-General of Post Offices.
" " of Telegraphs.

Exd. J. Henricus.
Spare Copies

2973

7

GENERAL.
ACCOUNT.

Govt. of {1884} Madras.

PUBLIC WORKS.

Dated June, 24th.

Recd. *Encl.*

G.O., 24th June 1884, No. 1581 W.

JUNE.

254/46.

Reserve

Distribution of the amount of the — with Government for 1884-85.

2973

Accompaniment to Proceedings No. 1581 W., dated 24th June 1884.

STATEMENT A.

Statement showing amounts applied for and those granted under Imperial Military and Other Services.

	AMOUNTS APPLIED FOR.						AMOUNTS GRANTED.						Remarks.
	Minor Works.			Repairs.			Minor Works.			Repairs.			
	Civil Buildings.			Civil Buildings.			Civil Buildings.			Civil Buildings.			
	Military.	Postal.	Telegraph.	Military.	Postal.	Salt.	Military.	Postal.	Telegraph.	Military.	Postal.	Salt.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Ganjam ..	1,000	..	..	..	..	..	..	..	..	2,000	..	..	
Vizagapatam ..	256	..	..	..	..	..	..	..	..	3,500	..	..	
Eastern Godávari	60	..	..	..	..	..	..	..	..	500	..	..	
Central do.	..	..	..	..	..	..	..	..	..	..	..	..	
Western do.	..	..	..	..	..	..	..	..	..	..	..	..	
Kushikulya ..	..	..	..	..	..	..	..	..	..	..	..	..	
Eastern Kistna ..	..	..	..	..	..	..	..	..	..	..	..	..	
Gudivada ..	..	..	..	..	..	..	..	..	..	..	..	..	
Western Kistna ..	..	..	..	..	..	..	..	..	..	..	..	..	
Nellore ..	..	..	..	..	..	..	..	..	..	26,000	200	..	
Sangam Project ..	..	..	..	..	..	..	..	..	..	..	100	..	
Bellary ..	2,000	..	..	..	..	..	..	..	..	..	200	..	
Cuddapah ..	..	..	..	..	..	..	..	..	..	15,000	1,000	..	
Kurnool ..	..	..	..	..	..	..	..	..	..	38,000	800	..	
Do. Canal ..	..	..	..	..	..	..	..	..	..	..	100	..	
Nilgiri ..	1,000	..	900	..	..	..	..	..	..	3,000	300	..	
Coimbatore ..	..	..	300	..	..	..	..	..	..	3,000	..	..	
Salem ..	..	..	100	..	..	..	..	..	..	..	100	..	
North Arcot ..	200	..	300	..	..	..	..	..	..	..	200	..	
Barur Project ..	3,000	..	..	..	..	..	..	..	..	30,000	..	..	
South Arcot ..	..	..	400	..	..	..	..	..	..	..	200	..	
Chingleput ..	4,000	..	400	..	..	..	..	..	..	1,50,000	500	1,000	
Buckingham Canal	..	..	..	..	..	..	..	..	..	6,000	..	..	
Presidency ..	16,000	..	500	1,000	..	..	..	..	..	..	..	..	
Trichinopoly ..	500	..	..	..	..	..	..	..	..	..	300	..	
Tanjore ..	..	..	..	..	..	..	..	..	..	..	..	..	
Cauvery, &c. ..	..	..	..	..	..	..	..	..	..	..	..	..	
Negapatam ..	..	..	..	..	..	..	..	..	..	..	..	..	
Madura ..	..	..	..	..	..	..	*10,961	..	..	..	..	..	
Tinnevelly ..	..	..	..	..	..	..	..	†10,596	†6,000	..	..	..	
Consulting Architect ..	..	..	..	..	..	..	..	..	..	..	..	..	
Officers Commanding Divisions and Districts.	..	..	..	..	..	..	..	..	..	..	600	700	
Director-General of Telegraphs.	..	..	..	..	..	..	..	..	..	..	..	..	
Do. of Post Offices.	..	..	..	..	..	..	..	..	..	..	..	..	
Reserve with Government ..													
Total ..	28,006	2,900	1,000	..	2,95,000	5,350	3,300	..	10,961	10,596	6,000	..	2,75,000	5,000	3,000	..	

*The officers commanding divisions and districts will allot funds for such minor military works as are required to be carried out during the year.

†The Director-General of Post Offices and the Director-General of Telegraphs will allot funds for such postal and telegraph minor works as may be carried out during the year.

8

GENERAL.
ACCOUNT.

Govt. of {1884} Madras.

PUBLIC WORKS.

Dated June, 24th.

Recd. *Encl.*

G.O., 24th June 1884, No. 1581 W.

JUNE.

254/46.

Reserve

Distribution of the amount of the — with Government for 1884-85.

Accompaniment to Proceedings No. 1581 W., dated 24th June 1884.

STATEMENT A.

Statement showing amounts applied for and those granted under Imperial Military and Other Services.

—	AMOUNTS APPLIED FOR.								AMOUNTS GRANTED.							
	Minor Works.				Repairs.				Minor Works.				Repairs.			
	Military.	Civil Buildings. Postal.	Civil Buildings. Tele-graph.	Civil Buildings. Salt.	Military.	Civil Buildings. Postal.	Civil Buildings. Tele-graph.	Civil Buildings. Salt.	Military	Civil Buildings. Postal.	Civil Buildings. Tele-graph.	Civil Buildings. Salt.	Military.	Civil Buildings. Postal.	Civil Buildings. Tele-graph.	Civil Buildings. Salt.
	RS.	RS.	RS.		RS.	RS.	RS.		RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Ganjam	1,000	..	..	..	2,000	..	..	..	..	..	..	..	2,000	..	..	..
Vizagapatam	256	..	..	..	4,000	200	300	..	..	..	..	..	3,500	200	300	..
Eastern Godávari	50	..	..	..	1,000	500	500	..	..	..	..	..	500	300	500	..
Central do.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Western do.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rushikulya	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Eastern Kistna	..	..	..	..	..	200	300	..	..	..	..	..	..	200	300	..
Gudiváda	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Western Kistna	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nellore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sangam Project	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bellary	2,000	..	..	..	28,000	200	200	..	..	..	..	..	25,000	200	200	..
Cuddapah	..	..	..	..	..	150	..	..	..	..	..	..	..	100	..	..
Kurnool	..	..	..	..	..	200	..	..	..	..	..	..	..	200	..	..
Do. Canal	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nilgiri	1,000	900	..	..	18,000	1,400	..	..	..	..	..	..	15,000	1,000	..	..
Coimbatore	..	300	..	..	40,000	1,000	..	..	..	..	..	..	38,000	800	..	..
Salem	..	100	..	..	..	100	..	..	..	..	..	..	..	100	..	..
North Arcot	200	300	..	..	3,000	300	..	..	..	..	..	..	3,000	300	..	..
Barur Project	3,000	..	..	..	4,000	..	..	..	..	..	..	..	3,000	..	..	..
South Arcot	..	400	..	..	..	100	..	..	..	..	..	..	..	100	..	..
Chingleput	4,000	400	..	..	40,000	200	..	..	..	..	..	..	30,000	200	..	..
Buckingham Canal	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Presidency	16,000	500	1,000	..	1,50,000	500	2,000	..	..	..	..	..	1,50,000	500	1,000	..
Trichinopoly	500	..	..	..	5,000	..	..	..	..	..	..	..	5,000	..	..	..
Tanjore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cauvery, &c.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Negapatam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Madura	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tinnevelly	..	..	..	..	..	300	..	..	..	..	..	..	..	300	..	..
Consulting Architect	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Officers Commanding Divisions and Districts.	..	..	..	..	..	..	..	..	*10,961	..	..	..	..	..	..	..
Director-General of Telegraphs.	..	..	..	..	..	..	..	..	..	..	† 6,000	..	..	..	..	..
Do. of Post Offices.	..	..	..	..	..	..	..	..	..	†10,596	..	..	..	..	..	..
Reserve with Government ..	..	..	..	..	..	..	..	..	..	..	..	..	..	500	700	..
Total ..	28,006	2,900	1,000	..	2,95,000	5,350	3,300	..	10,961	10,596	6,000	..	2,75,000	5,000	3,000	..

Remarks.

* The officers commanding divisions and districts will allot funds for such minor military works as are required to be carried out during the year.

† The Director-General of Post Offices and the Director-General of Telegraphs will allot funds for such postal and telegraph minor works as may be carried out during the year.

2973

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Statement B.

Statement of requirements on account of Imperial Incomplete Works for 1883-84 and of New Works sanctioned but not yet commenced.

Division.	Item No.	Name of Work.	Amount of Estimate.	Number and Date of Sanction.	Past Expenditure.	Balance of Estimate.	Amount applied for 1884-85.		Amount allotted		Item No.	Head of Reserve from which the Appropriation is made.
							For incomplete Works.	For new Works.	For incomplete Works.	For new Works.		
1	2	3	4	5	6	7	8	9	10	11	12	13
		IMPERIAL.	Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		
		OTHER SERVICES.										
		Minor Works.										
Kistna Western.	1	Post office at Duggirala	900	G.O., No. 1918 W., of the 9th July 1883.	..	900	..	900	..	900	1	From minor works grant.
Madura ..	2	Seventh-class post office at Peermad ..	1,384	G.O., No. 508 W., of the 15th February 1883.	1,412	..	28	..	..	..	2	Rs. 28 said to have been spent by the Chief Engineer, Travancore. Appropriation not necessary under code paragraph 2293, III.
Godávari, Eastern.	3	Post office at Kunavaram	600	G.O., No. 1360 W., of the 9th May 1883.	561	39	819	..	..	..	3	Revised estimate for Rs. 1,380 said to have been submitted for sanction. The question of funds can be considered after the revised estimate has been sanctioned.
				Total ..	..	..	847	900	..	900		
		Major Works.										
South Arcot ..	2	Head-sluice across Mercanum brine supply channel.	3,000	G.O., No. 3003 W., of the 14th December 1882.	2,447	553	553	..	..	..	2	Application made to the Government of India for the requisite funds.
Architect ..	3	Constructing post office at Madras ..	3,16,720	G.O., No. 3192 W., of the 12th November 1883.	2,84,924	31,796	31,796	..	..	..	3	Rs. 38,206 provided in the budget. The balance to remain at credit of work, pending the sanction of estimates for stables.
Nílgiri ..	1	Post office at Devála	3,730	G.O., No. 3135 W., of the 29th November 1882.	3,226	504	504	..	504	..	1	From the minor works grant.
				Total ..	..	..	32,853	..	504	..		
		MILITARY.										
		Minor Works.										
Vizagapatam ..	1	Additions to regimental hospital at Vizianagrum.	515	G.O., No. 179 W., of the 21st January 1884.	..	515	..	515	..	..	1	No funds available.
Do. ..	2	Three latrines for 16th Madras native infantry at Vizianagrum.	..	....	..	..	..	2,130	..	..	2	Do. do.
Do. ..	3	Powder magazine with surrounding walls.	..	....	..	..	..	2,069	..	..	3	Do. do.
Do. ..	4	Improvements to hospital of 16th Madras native infantry at Vizianagrum.	..	....	..	..	..	545	..	..	4	Do. do.
Do. ..	5	Improvements to tent godown of 16th Madras native infantry at Vizianagrum.	..	....	..	..	..	400	..	..	5	Do. do.
Godávari Eastern.	6	Two latrines for the detachment of the native infantry at Sámalkót.	..	....	..	..	..	150	..	..	6	Do. do.
Do. do. ..	7	Providing lightning conductor for the powder magazine at Sámalkót.	..	....	..	..	..	300	..	..	7	Do. do.
Bellary ..	8	Compound-wall and latrine for the quarters of the army hospitals corps at Bellary.	1,335	G.O., No. 490 W., of the 22nd February 1884.	..	1,335	..	1,335	..	..	8	Do. do.
Do. ..	9	Compound-wall with two gates to enclose the female hospital attached to the station hospital.	1,300	G.O., No. 3662 W., of the 20th December 1883.	..	1,300	..	1,300	..	..	9	Do. do.
Do. ..	10	Three cisterns to receive the waste water from the wash-houses of the European infantry barracks at Bellary.	1,500	G.O., No. 1125 W., of the 6th May 1884.	..	1,500	..	1,500	..	1,500	10	From minor works grant.
Presidency ..	11	Constructing 18 married quarters in the parade barracks at Bangalore into quarters for nine staff sergeants ..	1,035	G.O., No. 1161 W., of the 18th April 1883.	62	973	973	..	973	..	11	Do. do.
Do. ..	12	Latrine for the native infantry at Ráyapuram.	1,100	G.O., No. 3328 W., of the 22nd November 1883.	502	598	598	..	598	..	12	Do. do.
Chingleput ..	13	Dead-house for the depôt hospital at Pallávaram.	812	G.O., No. 1271 W., of the 21st May 1884.	..	812	..	812	..	..	13	No funds available.
Coimbatore ..	14	Improvements to the canteen at Malapuram.	1,455	G.O., No. 248 W., of the 10th January 1884.	1,020	435	435	..	..	..	14	Appropriation not necessary under code paragraph 2293, III.
Do. ..	15	Building a shed in front of the Commissariat stores at Malapuram for watchmen.	294	Superintending Engineer's Register No. 49 of 1883-84.	89	205	205	..	..	..	15	Do. do.
Do. ..	16	New rifle range at Malapuram ..	219	Superintending Engineer's Register No. 83 of 1883-84.	108	111	111	..	..	..	16	Do. do.
Do. ..	17	Asphalting the floor of the Commissariat godowns at Cannanore.	460	Superintending Engineer's Register No. 54 of 1883-84.	169	291	291	..	..	..	17	Do. do.
Do. ..	18	Fixing lightning conductors to the new station magazine at Cannanore.	500	Superintending Engineer's Register No. 67 of 1883-84.	92	408	408	..	..	..	18	Do. do.
Do. ..	19	Fixing lightning conductors to the old station magazine at Cannanore.	500	Superintending Engineer's Register No. 68 of 1883-84.	82	418	418	..	..	..	19	Do. do.
Do. ..	20	Fixing lightning conductors for the native infantry magazine at Cannanore.	400	Superintending Engineer's Register No. 69 of 1883-84.	52	348	348	..	..	..	20	Do. do.
Do. ..	21	Fixing lightning conductors to the European infantry magazine at Cannanore.	355	Superintending Engineer's Register No. 70 of 1883-84.	267	88	88	..	..	..	21	Do. do.

Statement B.

Statement of requirements on account of Imperial Incomplete Works for 1883-84 and of New Works sanctioned but not yet commenced.

Division.	Item No.	Name of Work.	Amount of Estimate.	Number and Date of Sanction.	Past Expenditure.	Balance of Estimate.	Amount applied for 1884-85.		Amount allotted		Item No.	Head of Reserve from which the Appropriation is made.
							For incomplete Works.	For new Works.	For incomplete Works.	For new Works.		
1	2	3	4	5	6	7	8	9	10	11	12	13
		IMPERIAL.	Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		
		Other Services.										
		Minor Works.										
Kistna Western.	1	Post office at Duggirala	900	G.O., No. 1918 W., of the 9th July 1883.	..	900	..	900	..	900	1	From minor works grant.
Madura ..	2	Seventh-class post office at Peermad ..	1,384	G.O., No. 508 W., of the 15th February 1883.	1,412	..	28	..	..	..	2	Rs. 28 said to have been spent by the Chief Engineer, Travancore. Appropriation not necessary under code paragraph 2293, III.
Godávari, Eastern.	3	Post office at Kunavaram	600	G.O., No. 1360 W., of the 9th May 1883.	561	39	819	..	..	..	3	Revised estimate for Rs. 1,380 said to have been submitted for sanction. The question of funds can be considered after the revised estimate has been sanctioned.
				Total ..	..	..	847	900	..	900		
		Major Works.										
South Arcot ..	2	Head-sluice across Mercanum brine supply channel.	3,000	G.O., No. 3003 W., of the 14th December 1882.	2,447	553	553	..	..	..	2	Application made to the Government of India for the requisite funds.
Architect ..	3	Constructing post office at Madras ..	3,16,720	G.O., No. 3192 W., of the 12th November 1883.	2,84,924	31,796	31,796	..	..	..	3	Rs. 38,206 provided in the budget. The balance to remain at credit of work, pending the sanction of estimates for stables.
Nílgiri ..	1	Post office at Devála	3,730	G.O., No. 3135 W., of the 29th November 1882.	3,226	504	504	..	504	..	1	From the minor works grant.
				Total ..	..	..	32,853	..	504	..		
		MILITARY.										
		Minor Works.										
Vizagapatam ..	1	Additions to regimental hospital at Vizianagrum.	515	G.O., No. 179 W., of the 21st January 1884.	..	515	..	515	..	..	1	No funds available.
Do. ..	2	Three latrines for 16th Madras native infantry at Vizianagrum.	..	....	..	..	..	2,130	..	..	2	Do. do.
Do. ..	3	Powder magazine with surrounding walls.	..	....	..	..	..	2,069	..	..	3	Do. do.
Do. ..	4	Improvements to hospital of 16th Madras native infantry at Vizianagrum.	..	....	..	..	..	545	..	..	4	Do. do.
Do. ..	5	Improvements to tent godown of 16th Madras native infantry at Vizianagrum.	..	....	..	..	..	400	..	..	5	Do. do.
Godávari Eastern.	6	Two latrines for the detachment of the native infantry at Sámalkót.	..	....	..	..	..	160	..	..	6	Do. do.
Do. do. ..	7	Providing lightning conductor for the powder magazine at Sámalkót.	..	....	..	..	..	300	..	..	7	Do. do.
Bellary ..	8	Compound-wall and latrine for the quarters of the army hospitals corps at Bellary.	1,335	G.O., No. 490 W., of the 22nd February 1884.	..	1,335	..	1,335	..	..	8	Do. do.
Do. ..	9	Compound-wall with two gates to enclose the female hospital attached to the station hospital.	1,300	G.O., No. 3662 W., of the 20th December 1883.	..	1,300	..	1,300	..	..	9	Do. do.
Do. ..	10	Three cisterns to receive the waste water from the wash-houses of the European infantry barracks at Bellary.	1,500	G.O., No. 1125 W., of the 6th May 1884.	..	1,500	..	1,500	..	1,500	10	From minor works grant.
Presidency ..	11	Constructing 18 married quarters in the parade barracks at Bangalore into quarters for nine staff sergeants ..	1,035	G.O., No. 1161 W., of the 18th April 1883.	62	973	973	..	973	..	11	Do. do.
Do. ..	12	Latrine for the native infantry at Ráyapuram.	1,100	G.O., No. 3328 W., of the 22nd November 1883.	502	598	598	..	598	..	12	Do. do.
Chingleput ..	13	Dead-house for the depôt hospital at Pallávaram.	812	G.O., No. 1271 W., of the 21st May 1884.	..	812	..	812	..	..	13	No funds available.
Coimbatore ..	14	Improvements to the canteen at Malapuram.	1,455	G.O., No. 248 W., of the 10th January 1884.	1,020	435	435	..	..	..	14	Appropriation not necessary under code paragraph 2293, III.
Do. ..	15	Building a shed in front of the Commissariat stores at Malapuram for watchmen.	294	Superintending Engineer's Register No. 49 of 1883-84.	89	205	205	..	..	..	15	Do. do.
Do. ..	16	New rifle range at Malapuram ..	219	Superintending Engineer's Register No. 83 of 1883-84.	108	111	111	..	..	..	16	Do. do.
Do. ..	17	Asphalting the floor of the Commissariat godowns at Cannanore.	460	Superintending Engineer's Register No. 54 of 1883-84.	169	291	291	..	..	..	17	Do. do.
Do. ..	18	Fixing lightning conductors to the new station magazine at Cannanore.	500	Superintending Engineer's Register No. 67 of 1883-84.	92	408	408	..	..	..	18	Do. do.
Do. ..	19	Fixing lightning conductors to the old station magazine at Cannanore.	500	Superintending Engineer's Register No. 68 of 1883-84.	82	418	418	..	..	..	19	Do. do.
Do. ..	20	Fixing lightning conductors for the native infantry magazine at Cannanore.	400	Superintending Engineer's Register No. 69 of 1883-84.	52	348	348	..	..	..	20	Do. do.
Do. ..	21	Fixing lightning conductors to the European infantry magazine at Cannanore.	355	Superintending Engineer's Register No. 70 of 1883-84.	267	88	88	..	..	..	21	Do. do.

Statement of requirements on account of Imperial Incomplete Works for 1883-84 and of New Works sanctioned but not yet commenced—*cont.*

Division.	Item No.	Name of Work.	Amount of Estimate.	Number and Date of Sanction.	Past Expenditure.	Balance of Estimate.	Amount applied for 1884-85.		Amount allotted.		Item No.	Head of Reserve from which the Appropriation is made.
							For incomplete Works.	For new Works.	For incomplete Works.	For new Works.		
1	2	3	4	5	6	7	8	9	10	11	12	13
		IMPERIAL—*cont.*			Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		
		MILITARY—*cont.*										
		Minor Works—cont.										
Coimbatore ..	22	Fixing lightning conductors to the fort magazine at Cannanore.	350	Superintending Engineer's Register No. 71 of 1883-84.	69	281	281	..	..	..	22	Appropriation not necessary under code paragraph 2293, III.
North Arcot ..	23	Fixing lightning conductors to the powder magazine in the Vellore fort.	1,140	G.O., No. 44 W., of the 10th Jan. 1884.	1,000	140	140	..	..	..	23	Do. do.
Nilgiri ..	24	Guard-shed at His Excellency the Commander-in-Chief's house at Ootacamund.	422	....	338	84	84	..	..	..	24	Do. do.
Do. ..	25	Providing 25 dry-earth boxes for latrine of hospital at Wellington.	100	....	36	64	64	..	..	..	25	Do. do.
Barur Project ..	26	Altering and improving the centre lines, Remount depôt, for the stabling of farm horses.	361	Superintending Engineer's Register No. 26 of 1883-84.	320	41	41	..	..	..	26	Do. do.
Do. ..	27	Providing sky lights to stud lines, Remount depôt.	390	....	..	390	390	..	390	..	27	Work almost completed on emergency last year in anticipation of allotments. Appropriation made from minor works grant.
Do. ..	28	Providing skylights to 40 horse stables at Remount depôt.	426	....	..	426	..	426	..	..	28	No funds available.
Coimbatore ..	29	Constructing a shed for 5 elephants at Cannanore.	850	G.O., No. 694 W., of the 14th March 1884.	..	850	..	850	..	..	29	Do. do.
Do. ..	30	Converting a part of gun-shed at Mangalore into a drying and forge room for the armourers of the native infantry regiment.	..	....	..	..	..	790	..	..	30	Do. do.
Do. ..	31	Building a urinary for the plunge bath of the Royal Artillery barracks at Cannanore.	30	Superintending Engineer's Register No. 24 of 1883-84.	..	30	..	30	..	..	31	Do. do.
Do. ..	32	Building a urinary for the station hospital at Cannanore.	68	Superintending Engineer's Register No. 25 of 1883-84.	..	68	..	68	..	..	32	Do. do.
North Arcot ..	33	Staff sergeant's quarters at Vellore ..	1,260	G.O., No. 2705 W., of the 2nd November 1881.	..	1,260	..	1,260	..	..	33	Do. do.
Do. ..	34	Sinking a well in the lines of the native infantry at Vellore.	85	Superintending Engineer's Register No. 3 of 1882-83.	..	85	..	85	..	..	34	Do. do.
Do. ..	35	Pension pay office at Vellore, providing new doors and granite flooring, &c.	230	Superintending Engineer's Register No. 21 of 1881-82.	..	230	..	230	..	..	35	Do. do.
Do. ..	36	Native regimental school at Vellore ..	2,150	G.O., No. 44 W., of the 10th Jan. 1884.	..	2,150	..	2,150	..	..	36	Do. do.
Nilgiri ..	37	Providing bath-rooms, sergeant's quarters, Wellington.	..	....	..	..	..	865	..	..	37	Do. do.
Do. ..	38	Flooring the passage leading from the family quarters to the latrines at Wellington.	640	G.O., No. 415 W., of the 15th February 1884.	..	640	..	640	..	..	38	Do. do.
Do. ..	39	Drinking water to be laid on to hospital at Wellington.	..	....	..	..	..	2,220	..	..	39	Do. do.
Do. ..	40	Adding a room to the hospital purveyor's godown at Wellington.	..	....	..	..	..	1,410	..	..	40	Do. do.
				Total ..	..	..	4,875	22,080	1,961	1,500		
		Major Works.										
Bellary ..	1	Constructing stables for one field battery.	10,000	G.O., No. 2099 W., of the 1st August 1883.	8,540	1,460	1,460	..	1,460	..	1	From minor works grants.
Do.	2	Constructing a double slaughter-house for use of the Commissariat department.	7,210	G.O., 136 W., of the 13th January 1883.	3,567	3,643	3,643	..	3,643	..	2	Do. do. ..
Do.	3	Constructing an infectious disease ward and cook-house for the station hospital at Bellary.	6,140	G.O., No. 320 W., of the 7th February 1884.	..	6,140	..	6,140	..	..	3	Item No. 5, Appendix B. No funds available.
Do.	4	Constructing collar maker's and wheeler's shop for the Royal Artillery at Bellary.	5,663	G.O., No. 914 W., of the 3rd April 1884.	..	5,663	..	5,663	..	..	4	Item No. 13, Appendix B. No funds available.
Do.	5	Constructing school-house for a native infantry regiment at Bellary.	3,030	G.O., No. 149 W., of the 17th January 1884.	..	3,030	..	3,030	..	..	5	No funds available.
Coimbatore ..	6	Converting the old artillery stables at Cannanore into a bakery and sinking a well.	11,380	G.O., No. 181 W., of the 21st January 1884.	5,000	6,380	3,880	..	..	..	6	Rs. 3,880 required in addition to the grant of Rs. 2,500 provided in the budget. Item No. 8, Class A. No funds available.
Barur Project ..	7	Purchase of Honorary Surgeon Wells' bungalow and that of the farrier sergeant at the Remount depôt (2,500+1,510).	4,010	G.O., No. 2903 W., of the 15th October 1883.	..	4,010	..	4,010	..	..	7	Item No. 46, Appendix B. No funds available.
Nilgiri	8	Bakery at Wellington	..	....	..	..	..	10,000	..	..	8	Estimate under revision. Item No. 45, Appendix B. No funds available. Rs. 5,000 provided in preliminary issue of budget withheld by G.O. I. pending sanction to estimate.
Nilgiri	9	Barracks for a detachment of native infantry at Ootacamund.	12,930	G.O., No. 612 W., of the 6th March 1884.	..	12,930	..	12,930	..	..	9	No funds available. Estimate since cancelled. *Vide* G.O., No. $\frac{1376 \text{ W.}}{A}$, dated 2nd June 1884.

Statement of requirements on account of Imperial Incomplete Works for 1883-84 and of new Works sanctioned but not yet commenced—*cont.*

Divison.	Item No.	Name of Work.	Amount of Estimate.	Number and Date of Sanction.	Past Expenditure.	Balance of Estimate.	Amount applied for 1884-85.		Amount allotted		Item No.	Head of Reserve from which the Appropriation is made.
							For incomplete Works.	For new Works.	For incomplete Works.	For new Works.		
1	2	3	4	5	6	7	8	9	10	11	12	13
		IMPERIAL—*cont.*			Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		
		MILITARY—*cont.*										
		Major Works—cont.										
Presidency ..	10	Completing the emplacements and improving the store rooms, &c., of the coast batteries, Madras.	48,800	G.Os., No. 20 W., of 8th Jan. 1884, and No. 1661 W., of the 13th June 1883.	30,510	18,290	8,290	..	..	..	10	In addition to Rs. 10,000 provided in the budget Item No. 5 Class A. No funds available.
Do. ..	11	Fortified post at Agram, Bangalore ..	34,280	G.O., No. 3060 W., dated 30th October 1883.	3,453	30,827	10,827	..	..	..	11	In addition to Rs. 20,000 provided in the budget. Item No. 4, Class B. No funds available.
Do. ..	12	Alterations and additions to wash-houses for the British infantry at Bangalore.	12,500	G.O., No. 1102 W., of the 7th May 1880.	7,636	4,864	..	..	..	..	12	The grant of Rs. 4,000 provided in the budget (Item No. 3, Class A) may be resumed if the Military Department does not require the full number of bath-rooms being constructed. Under reference with the Military Department
Do. ..	13	Armaments of Fort St. George.	42,035	G.O., No. 2970 W., dated 19th October 1883.	..	42,035	..	..	..	..	13	Superintending Engineer, V Circle, recommends the grant of Rs. 30,000 provided in the budget being reduced by Rs. 15,000, Item No. 6, Class A. Referred to Quartermaster-General.
Do. ..	14	Re-roofing and re-flooring the barrel machine shop at the gun carriage factory, Madras.	4,030	G.O., No. 2413 W., of the 16th September 1883.	..	4,030	..	..	..	2,795	14	Item No. 40, Appendix B. Allotment made for re-roofing the barrel machine shops only.
Trichinopoly ..	15	Constructing public buildings in connection with the lines of the 30th regiment native infantry at Trichinopoly.	14,215	G.O., No. 3128 W., of the 5th November 1883, and G.O., No. 1187 W., of the 10th May 1884.	3,138	11,077	6,577	..	..	..	15	In addition to Rs. 4,500 provided in the budget. Item No. 2, Class B works. No funds available.
			..	Total ..	..	..	34,677	41,773	5,103	2,795		

STATEMENT C.

Statement showing Funds applied for and those granted under Provincial.

Divisions.	Amounts applied for							Amounts granted.						
	Minor Works.			Repairs.			Tools and Plant.	Minor Works.			Repairs.			Tools and Plant.
	Civil Buildings.	Communications.	Miscellaneous Public Improvements.	Civil Buildings.	Communications.	Miscellaneous Public Improvements.		Civil Buildings.	Communications.	Miscellaneous Public Improvements.	Civil Buildings.	Communications.	Miscellaneous Public Improvements.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Ganjam	2,000	..	..	9,000	2,100	..	500	2,000	..	..	9,000	2,100	..	500
Vizagapatam	3,500	..	..	1,000	12,500	..	2,000	2,000	..	..	1,000	12,500	..	2,000
Eastern Godávari	1,200	..	..	500	15,000	..	8,000	1,000	..	..	500	15,000	..	8,000
Central do.	200	..	..	500	..	..	500	200	..	..	500	..	..	500
Western do.	..	..	..	800	..	..	1,200	..	..	..	800	..	..	1,200
A Project	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rushikulya	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Eastern Kistna	1,530	..	..	2,300	..	600	3,940	1,000	..	..	2,000	..	600	3,900
Gudiváda	..	..	..	..	..	..	300	..	..	..	..	..	..	300
Western Kistna	200	..	..	100	..	..	100	200	..	..	100	..	..	100
Nellore	500	..	..	5,000	..	..	2,300	500	..	..	5,000	..	..	2,300
Sangam	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bellary	1,500	..	..	2,000	..	..	700	1,000	..	..	2,000	..	..	700
Cuddapah	700	..	..	1,500	..	..	900	500	..	..	1,500	..	..	900
Kurnool	300	..	..	1,000	..	..	(a)2,500	300	..	..	1,000	..	..	2,500
Do. Canal	..	..	..	..	..	..	..	..	..	..	..	..	..	..
C Project	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nílgiri	2,000	..	..	12,000	..	3,000	3,000	2,000	..	..	8,000	..	3,000	3,000
Coimbatore	2,000	..	..	4,500	..	..	2,630	2,000	..	..	4,500	..	..	2,500
Salem	1,500	..	..	5,000	..	..	300	1,000	..	..	5,000	..	..	300
North Arcot	500	..	..	1,000	..	..	800	500	..	..	1,000	..	..	800
B Project	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Barur Project	500	..	..	500	..	..	150	500	..	..	500	..	..	150
South Arcot	12,000	..	..	1,500	..	..	1,430	4,000	..	..	1,500	..	..	1,400
Chingleput	4,000	..	..	9,000	..	..	500	3,000	..	..	8,000	..	..	500
Buckingham Canal	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Presidency	15,000	..	..	65,000	20,000	4,000	4,526	10,000	..	..	65,000	18,400	3,000	4,526
Trichinopoly	500	..	..	200	..	..	1,000	500	..	..	200	..	..	1,000
Tanjore	..	..	..	1,440	..	..	1,000	..	..	..	12,000	..	..	1,000
				(b)10,774										
Cauvery, &c.	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Negapatam	..	..	..	200	..	..	500	..	..	..	200	..	..	500
Madura	250	..	..	4,500	(c)1,635	..	300	250	..	..	4,500	1,600	..	300
Tinnevelly	300	..	..	500	..	..	1,000	300	..	..	500	..	..	1,000
Consulting Architect	3,000	..	..	2,000	..	..	..	2,000	..	..	2,000	..	..	500
Reserve with Government	..	..	..	..	..	..	..	..	..	..	2,500	..	..	30,461
Total ..	53,180	..	..	1,41,814	51,235	7,600	40,070	34,750	..	..	1,38,800	49,600	6,600	70,837

(a) For conveying famine tools, and cleaning and tarring all serviceable tools.
(b) For repairing Tanjore Palace.
(c) For Gudalúr Peermad Ghât.

STATEMENT D.

Statement of requirements on account of Provincial and Local Incomplete Works for 1883-84 and of New Works sanctioned but not yet commenced.

Division.	Item No.	Name of Work.	Amount of Estimate.	Number and Date of Sanction.	Past Expenditure.	Balance of Estimate.	Amount applied for		Amount allotted		Item No.	Head of Reserve from which the Appropriation is made.
							For incomplete Works.	For new Works.	For incomplete Works.	For new Works.		
1	2	3	4	5	6	7	8	9	10	11	12	13
			Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		
		PROVINCIAL.										
		Minor Works.										
Ganjam ..	1	Additions to divisional office at Berhampore.	2,468	G.O., No. 107 W., of the 14th January 1884.	1,719	749	749	..	749	..	1	From Provincial Reserve.
Do. ..	2	Quarters for the jailor at Berhampore.	2,300	G.O., No. 417 W., of the 16th February 1884.	..	2,300	..	2,300	..	..	2	No funds available.
Do. ..	3	Providing accommodation for female prisoners in the district jail at Berhampore.	1,460	G.O., No. 588 W., of the 4th March 1884.	..	1,460	..	1,460	..	..	3	Do. do.
Do. ..	4	Reconstructing school-house at Russellkonda.	1,680	G.O., No. 2029 W., of the 25th July 1883.	1,025	655	655	..	655	..	4	From Provincial Reserve.
Godávari, Eastern.	5	Enlarging the Superintending Engineer's office at Dowlaishweram.	2,450	G.O., No. 1448 W., of the 19th May 1883.	1,676	774	774	..	774	..	5	Do. do.
Do. do. ..	6	Out-offices for the jail superintendent's quarters at Rajahmundry.	2,250	G.O., No. 492 W., of the 22nd February 1884.	1,000	1,250	1,250	..	1,250	..	6	Do. do.
Gudiváda ..	7	Treasury room in the compound of the taluk cutcherry at Gudiváda.	1,460	G.O., No. 2231 W., of the 11th August 1883.	545	915	915	..	915	..	7	Do. do.
Cuddapah ..	8	Improving the Cuddapah divisional office.	2,100	G.O., No. 3231 W., of the 14th November 1883.	1,145	955	955	..	955	..	8	Revised estimate promised. From Provincial Reserve.
Bellary ..	9	An additional store-room and office-room to the district munsif's court at Narayandevirkeri.	1,180	G.O., No. 180 W., of the 21st January 1884.	..	1,180	..	1,180	..	..	9	No funds available.
Do. ..	10	Ryots' shed at Hospet	747	G.O., No. 384 W., of the 13th February 1884.	..	747	..	747	..	..	10	Do. do.
Coimbatore ..	11	Sinking a well in the civil debtors' wards in the Calicut jail.	900	G.O., No. 421 W., of the 16th February 1884.	..	900	..	900	..	..	11	Do. do.
Do. ..	12	Purchasing ground adjacent to the central jail at Cannanore.	1,194	G.O., No. 1162 W., of the 8th May 1884.	..	1,194	..	1,194	..	..	12	No funds available.
Nilgiri ..	13	Monegars' chavady at Kótagiri ..	865	G.O., No. 2186 W., of the 8th August 1883.	563	302	302	..	..	..	13	Appropriation not necessary under code paragraph 2293, III.
Do. ..	14	Additions and alterations to Sub-Judge's court at Ootacamund.	405	Superintending Engineer's register No. 45 of 1883-84.	164	241	241	..	..	..	14	Do. do.
Do. ..	15	Temporary buildings for the establishment of the Head Assistant Collector at Naduvattam.	1,360	G.O., No. 290 W., of the 4th February 1884.	..	1,360	..	1,360	..	1,360	15	From Provincial Reserve.
Do. ..	16	Improvements to monegars' chavady at Kótagiri.	45	....	..	45	..	45	..	..	16	Funds can be allotted from the grant at the Superintending Engineer's disposal.
Do. ..	17	Boundary wall to form a cemetery at Pookote, South Wynaad.	..	....	..	..	..	1,500	..	..	17	The question of funds can be considered after the estimate has been sanctioned.
Do. ..	18	Survey establishment employed in connection with Ootacamund water-supply.	2,400	G.O., No. 1536 W., of the 2nd June 1883.	1,745	655	655	..	655	..	18	From Provincial Reserve.
North Arcot ..	19	Sub-jail in the Wandiwash taluk cutcherry.	175	Superintending Engineer's register No. 5 of 1883-84.	92	83	83	..	..	..	19	Appropriation not necessary under code paragraph 2293, III.
Salem	20	Additions to Tirupatúr munsif's court.	1,343	G.O., No. 424 W., of the 16th February 1884.	..	1,343	..	1,343	..	..	20	No funds available.
Do.	21	Providing masonry wells for eight sub-treasuries in Salem district.	128	Superintending Engineer's register No. 15 of 1883-84.	..	128	..	128	..	..	21	Funds can be allotted from the grant at the Superintending Engineer's disposal.
South Arcot ..	22	Improving the sub-divisional officer's bungalow at Vriddháchalam.	1,690	G.Os., No. 2980 W., of the 29th October 1883, and No. 139 W., of the 8th March 1884.	625	1,065	1,065	..	1,065	..	22	From Provincial Reserve.
Do. ..	23	Compensation for land taken up for sub-divisional officer's bungalow and office at Tindivanam.	514	G.O., No. 703 W., of the 14th March 1884.	..	514	514	..	..	..	23	The Superintending Engineer, V Circle, should apply for the grant later in the year after ascertaining that the amount was not disbursed by the Collector before the close of 1883-84.
Presidency ..	24	Terraced shed in connection with Small Cause Court at Madras.	2,260	G.O., No. 31 W., of the 8th January 1 84.	984	1,276	1,276	..	1,276	..	24	From Provincial Reserve.
Tinnevelly ..	25	Constructing a coach-house to the Sub-Collector's bungalow at Tuticorin.	378	Sanctioned by Superintending Engineer.	350	28	28	..	..	..	25	Appropriation not necessary under code paragraph 2293, III.
Madura	26	Deputy tahsildar's cutcherry at Tirupatúr.	280	Sanctioned by the Superintending Engineer.	190	90	90	..	..	..	26	Grant not necessary under code paragraph 2293, III.
Tanjore ..	27	Improving the sub-jail at Nannilam ..	11,100	G.O., No. 663 W., of the 1st March 1883.	951	149	149	..	..	..	27	Do. do.

Statement of requirements on account of Provincial and Local Incomplete Works for 1883-84 and of New Works sanctioned but not yet commenced—*cont.*

Division.	Item No.	Name of Work.	Amount of Estimate.	Number and Date of Sanction.	Past Expenditure.	Balance of Estimate.	Amount applied for		Amount allotted		Item No.	Head of Reserve from which the Appropriation is made.
							For incomplete Works.	For new Works.	For incomplete Works.	For new Works.		
1	2	3	4	5	6	7	8	9	10	11	12	13
		PROVINCIAL—*cont.*	RS.		RS.	RS.	RS.	RS.	RS.	RS.		
		Minor Works—cont.										
Tanjore ..	28	Altering the old taluk cutcherry at Shiyáli to suit the requirements of the district munsif's court.	2,360	G.O., No. 3478 W., of the 4th December 1883.	799	1,561	1,561	..	1,561	..	28	From Provincial Reserve.
Negapatam ..	29	Altering and improving the accommodation afforded to the district munsif's court at Tiruturaipúndi.	2,000	G.O., No. 1673 W., of the 16th November 1877.	2,009	..	500	..	..	..	29	A revised estimate promised, when the question of funds can be considered.
Tanjore ..	30	Improvements to the Thiruvadamarudúr palace.	2,095	G.O., No. 946 W., of the 7th April 1884.	..	2,095	..	2,095	..	2,095	30	From Provincial Reserve.
Architect ..	31	Special repairs to Presidency College (Repairs).	374	....	300	74	74	..	..	..	31	Funds to be provided from the repair grant at the disposal of Consulting Architect.
Do. ..	32	Converting the gallery into a museum, Presidency College (Repairs).	371	....	368	3	3	..	..	..	32	Do. do.
Do. ..	33	Trimming and turfing slopes and other repairs at the Presidency College (Repairs).	367	....	336	31	31	..	..	..	33	Do. do.
Do. ..	34	Replastering the passage at end of stairs and repairing punkahs at Presidency College (Repairs).	300	....	107	193	193	..	..	..	34	Do. do.
		Total ..	..	....	..	..	12,063	14,192	9,855	3,455		
		Major Works.										
Vizagapatam ..	1	Third-class taluk cutcherry at Párvatipur.	8,460	G.O., No. 66 W., of the 12th January 1881.	6,644	1,816	924	..	924	..	1	Rs. 924 required in addition to Rs. 892 provided in the budget. Item No. 2, Class A.
Do. ..	2	Travellers' bungalow at Sálúr	4,520	G.O., No. 65 W., of the 9th Jan. 1883.	2,933	1,587	1,587	..	1,587	..	2	From Provincial Reserve.
Do. ..	3	Iron safes for taluk cutcherries in the Vizagapatam district.	6,000	G.O., No. 2680 W., of the 24th September 1883.	..	6,000	..	6,000	..	6,000	3	Do. do.
Godávari Eastern.	4	Improvements to the sea custom house buildings at Cocanada.	4,310	G.O., No. 1254 W., of the 30th April 1883.	2,470	1,840	1,840	..	1,840	..	4	Do. do.
Do. do. ..	5	Office buildings for Eastern and Head works sub-divisions.	..	....	..	..	..	5,725	..	..	5	The question of funds can be considered after sanction to estimate.
Do. do. ..	6	New church at Cocanada	14,039	G.O., No. 2510 W., of the 7th September 1883.	3,375	10,664	2,625	..	2,625	..	6	Balance of Rs. 6,000 to be allotted by Government. From Provincial Reserve.
Do. do. ..	7	Deputy tahsildar's cutcherry at Gokavaram.	..	....	..	..	..	5,000	..	..	7	The question of funds can be considered after sanction to estimate.
Do. do. ..	8	Additions to the Rajahmundry College.	6,900	G.O., No. 1271 W., of the 1st May 1883.	5,455	1,445	1,445	..	1,445	..	8	From Provincial Reserve.
Godávari, Western.	9	Third-class taluk cutcherry at Pentapad.	7,200	G.O., No. 1311 W., of the 8th May 1875.	6,594	606	606	..	606	..	9	Do. do.
Kistna, Western.	10	District munsif's court at Bápatla ..	12,620	G.O., No. 1492 W., of the 15th June 1882.	10,035	2,585	2,585	..	2,585	..	10	Do. do.
Nellore ..	11	Improvements to the district jail at Nellore.	6,372	G.Os., No. 472 W., dated 13th February 1883, and No. 489 W., dated 22nd February 1884.	4,640	1,732	1,732	..	1,732	..	11	Do. do.
Do. ..	12	Sub-jail at Darsi	4,550	G.O., No. 1994 W. A., dated 18th July 1883.	3,055	1,495	800	..	800	..	12	Do. do.
Kistna, Eastern.	13	Improvements to the Collector's cutcherry at Masulipatam.	34,845	G.O., No. 493 W., dated 15th February 1883.	9,235	25,610	9,291	..	..	..	13	In addition to the sum of Rs. 16,319 provided in the budget. Item No. 7, Class A. No funds at present available.
Do. do. ..	14	Improvements to the Collector's house at Masulipatam.	5,744	G.O., No. 2265 W., dated 14th August 1883.	3,899	1,845	..	..	..	..	14	Rs. 1,155 surrendered from the grant of Rs. 3,000 provided in the budget. Item No. 8, Class A. Rs. 1,155 resumed.
Bellary ..	15	Quarters for a police inspector and an apothecary at Anantapur.	7,500	G.O., No. 3496 W., of the 6th December 1883.	..	7,500	..	7,500	..	5,000	15	From Provincial Reserve.
Do. ..	16	Head Assistant Collector's cutcherry at Hospet.	3,515	G.O., No. 52 W., of the 10th January 1884.	354	3,161	3,161	..	3,161	..	16	Do. do.
Cuddapah ..	17	Additions and alterations to the district court-house at Cuddapah.	7,780	G.O., No. 1398 W., of the 10th May 1879.	7,343	437	230	..	..	..	17	Appropriation not necessary under code paragraph 2293, III.
Kurnool ..	18	Sub-divisional officer's bungalow at Cumbum.	3,000	G.O., No. 1549 W., of the 4th June 1883.	1,067	1,933	1,933	..	1,933	..	18	From Provincial Reserve.
Bellary ..	19	Bungalow for the sub-divisional officer at Anantapur.	3,750	G.O., No. 355 W., of the 9th February 1884.	..	3,750	..	3,750	..	3,750	19	Work commenced. Item No. 42, Class B. From Provincial Reserve.
Do. ..	20	Combined office for the Superintending Engineer and Executive Engineer in the fort at Bellary.	18,494	G.O., No. 1129 W., of the 6th May 1884.	..	18,494	..	18,494	..	..	20	No funds available.

Statement of requirements on account of Provincial and Local Incomplete Works for 1883-84 and of New Works sanctioned but not yet commenced—cont.

Division.	Item No.	Name of Work.	Amount of Estimate.	Number and Date of Sanction.	Past Expenditure.	Balance of Estimate.	Amount applied for		Amount allotted		Item No.	Head of Reserve from which the Appropriation is made.
							For incomplete Works.	For new Works.	For incomplete Works.	For new Works.		
1	2	3	4	5	6	7	8	9	10	11	12	13
		PROVINCIAL—*cont.*	Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		
		Major Works—cont.										
Coimbatore ..	21	Improving the taluk cutcherry at Cherikal.	8,164	G.O., No. 423 W., of the 16th February 1883.	7,320	844	844	..	844	..	21	From Provincial Reserve.
Do. ..	22	Do. do. at Udipi ..	4,500	G.O., No. 3187 W., of the 5th December 1882.	2,914	1,586	1,586	..	1,586	..	22	Do. do.
Do. ..	23	Do. Huzur treasury at Coimbatore.	3,910	G.O., No. 3066 W., of the 24th October 1883.	2,897	1,013	1,013	..	1,013	..	23	Do. do.
Do. ..	24	Sea custom house at Malpi	6,560	G.O., No. 109 W., of the 14th January 1884.	..	6,560	..	6,560	..	..	24	Item No. 15, Class B. No funds available.
Do. ..	25	Do. do. at Tandr	2,960	G.O., No. 386 W., of the 13th February 1884.	..	2,960	..	2,960	..	..	25	Item No. 16, Class B. No funds available.
Nilgiris ..	26	Quarters for six single or three married clerks on Stonehouse Hill, Ootacamund.	21,914	G.O., No. 1936 W., of the 1st August 1882.	9,073	12,841	12,841	..	10,000	..	26	From Provincial Reserve.
Do. ..	27	Cinchona buildings at Naduvattam ..	38,220	G.O., No. 749 W., of the 8th March 1883.	36,334	1,886	1,886	..	1,886	..	27	Do. do.
Do. ..	28	Converting cattle-shed into latrine at Lawrence Asylum, Ootacamund.	2,650	G.O., No. 191 W., of the 27th January 1884.	1,247	1,403	1,403	..	1,403	..	28	Do. do.
Do. ..	29	Purchasing, improving and furnishing Ottley Hall property.	25,820	G.O., No. 758 W., of the 20th March 1884.	23,356	2,464	2,464	..	2,464	..	29	Do. do.
Do. ..	30	Bazar drainage scheme	2,09,935	G.Os., No. 682 W., of the 13th March 1884, and 1112 W., of the 5th May 1884.	77,819	1,33,116	41,981	..	..	..	30	In addition to Rs. 14,200 provided in the budget. Item No. 157, Class A. No funds now available.
Do ..	31	Security of the road through Elk Hill cutting.	10,400	G.O., No. 263 W., of the 30th January 1884.	1,838	8,562	8,562	..	8,562	..	31	From Provincial Reserve.
Do. ..	32	Lines and quarters for 38 sappers and 2 native officers.	14,330	..	..	..	14,330	..	..	..	32	In addition to Rs. 5,600 provided in the budget. Item No. 94, Class A. The question of funds can be considered on the estimate being sanctioned.
North Arcot ..	33	Taluk cutcherry at Wállájapet ..	35,270	G.O., No. 2726 W., of the 20th September 1883.	32,783	2,487	2,487	..	2,487	..	33	From Provincial Reserve.
Do. ..	34	Jail superintendent's quarters at Vellore.	26,080	G.O., No. 279 W., of the 25th January 1883.	20,451	5,629	5,629	..	5,629	..	34	Do. do.
South Arcot ..	35	Additions to the Collector's cutcherry at Manjakuppam.	8,528	G.O., No. 294 W., of the 26th January 1883.	2,834	5,694	2,200	..	2,200	..	35	In addition to Rs. 3,494 provided in the budget. Item No. 32. From Provincial Reserve.
Presidency ..	36	Improvements to the Government House at Madras.	19,253	G.O., No. 1632 W., of the 11th June 1883.	18,316	937	937	..	937	..	36	From Provincial Reserve.
Do. ..	37	Improvements to the laboratory of the Chemical Examiner's room, Medical College.	22,900	G.O., No. 89 W., of the 10th January 1883.	20,847	2,053	1,000	..	1,000	..	37	Do. do.
Do. ..	38	Adding a chancel to St. Mary's church at Fort St. George.	5,370	G.O., No. 3448 W., of the 1st December 1883.	2,275	3,095	3,095	..	3,095	..	38	Do. do.
Do. ..	39	Improvements to the apothecary's quarters, leper hospital, Madras.	4,980	G.O., No. 3416 W., of the 29th November 1883.	2,015	2,965	1,315	..	1,315	..	39	In addition to Rs. 1,650 provided in the budget. Item No. 90. From Provincial Reserve.
Chingleput ..	40	Constructing a strong-room and for additions and alterations, &c., to the taluk cutcherry, Ponnéri.	3,665	G.O., No. 2686 W., of the 24th September 1883.	3,444	221	593	..	593	..	40	Substitution of teak-wood for palmyrahs has caused an excess of Rs. 372. From Provincial Reserve.
Trichinopoly ..	41	District munsif's court-house at Kulitalai.	16,100	G.O., No. 2848 W., of the 20th October 1882.	14,110	1,990	490	..	..	..	41	In addition to Rs. 1,500 provided in the budget. Item No. 49. The question of further funds can be considered later in the year.
Do. ..	42	First-class taluk cutcherry at Perambalúr.	27,000	G.O., No. 2769 W., of the 6th July 1878.	18,136	8,864	4,344	..	4,000	..	42	In addition to Rs. 3,000 provided in the budget. Item No. 26. From Provincial Reserve.
Do. ..	43	District munsif's court at Ariyalúr ..	13,800	G.O., No. 2121 W., of the 21st August 1881.	11,186	2,614	614	..	614	..	43	In addition to Rs. 2,000 provided in the budget. Item No. 48. From Provincial Reserve.
Tanjore ..	44	Divisional office at Tanjore ..	11,920	G.O., No. 944 W., of the 7th April 1884.	5,568	6,352	6,352	..	6,352	..	44	From Provincial Reserve.
Do. ..	45	District munsif's court at Tiruvádi ..	11,900	G.O., No. 3165 W., of the 16th November 1875.	10,831	1,069	1,069	..	1,069	..	45	Do. do.
Do ..	46	Cemetery at Pudupatnam	3,170	G.O., No. 2679 W., of the 24th September 1883.	1,111	2,059	..	..	..	..	46	Rs. 111 surrendered from the grant of Rs. 2,170 provided in the budget. Item No. 51. Rs. 111 resumed.

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Statement of requirements on account of Provincial and Local Incomplete Works for 1883-84 and of New Works sanctioned but not yet commenced—*cont.*

Division.	Item No.	Name of Work.	Amount of Estimate.	Number and Date of Sanction.	Past Expenditure.	Balance of Estimate.	Amount applied for		Amount allotted		Item No.	Head of Reserve from which the Appropriation is made.
							For incomplete Works.	For new Works.	For incomplete Works.	For new Works.		
1	2	3	4	5	6	7	8	9	10	11	12	13
			Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		
		PROVINCIAL—*cont.*										
		Major Works—cont.										
Do. ..	47	Improvements to Deputy Collector's office at Tanjore.	2,855	G.O., No. 1453 W., of the 19th May 1883.	2,219	636	..	..	..	..	47	Rs. 219 surrendered from the grant of Rs. 855 provided in the budget. Item No 33. Rs. 219 resumed.
Tinnevelly ..	48	Third-class taluk cutcherry with out-houses at Virudupati.	9,395	G.O., No. 1355 W., of the 9th May 1883.	8,744	651	651	..	651	..	48	From Provincial Reserve.
Madura ..	49	Preservation of Tirumul Naik's palace and adoption for public offices.	1,64,723	G.O., No.	2,31,962	..	22,502	..	..	..	49	In addition to Rs. 17,498 provided in the budget. Item No. 96, Class A. No funds now available.
Do. ..	50	Deputy tahsildar's cutcherry with out-houses at Kodaikánal.	11,160	G.O., No. 2916 W., of the 16th October 1883.	4,778	6,382	2,222	..	2,222	..	50	In addition to Rs. 4,160 provided in the budget. Item No. . From Provincial Reserve.
Do. ..	51	District munsif's court at Sivaganga ..	14,900	G.O., No. 2266 W., of the 14th August 1883.	6,100	8,800	..	..	..	..	51	Rs. 1,200 surrendered from the grant of Rs. 10,000 provided in the budget. Item No. 50. Rs. 1,200 resumed.
Negapatam ..	52	Sub-magistrate's cutcherry and police station at Arantángi.	10,300	G.O., No. 3010 W., of the 14th November 1882.	10,827	..	2,113	..	..	..	52	Revised estimate promised. The question of funds can be considered later in the year.
Do. ..	53	Deputy Collector's cutcherry at Mannárgudi.	7,895	G.O., No. 1293 W., of the 2nd May 1883.	4,881	3,014	3,014	..	3,014	..	53	From Provincial Reserve.
Do. ..	54	Town sub-magistrate's cutcherry and police station at Negapatam.	6,420	G.O., No. 1395 W., of the 12th May 1883.	5,024	1,396	..	..	..	..	54	Rs. 24 surrendered from the grant of Rs. 1,420 provided in the budget. Item No. 47.
Do. ..	55	Improvements to the taluk cutcherry at Mannárgudi.	3,890	G.O., No. 314 W., of the 6th February 1884.	..	3,890	..	3,890	..	..	55	Item No. 17, Class B. No funds available.
Architect ..	56	Additions to Zenana, Amir Mahal ..	74,881	G.O., No. 1779 W., of the 25th June 1883.	61,490	13,391	13,391	..	10,000	..	56	From Provincial Reserve
Do. ..	57	Additions and improvements to Public Works offices at Chepâk.	97,044	G.Os., Nos. 49 W. and 50 W., of the 10th January 1884, and G.O., No. 1338 W., dated 28th May 1884.	77,006	20,038	..	..	..	..	57	Rs. 4,962 surrendered from the grant of Rs. 25,000 provided in the budget. Item No. 92 Class A. Rs. 4,962 resumed.
Do. ..	58	Adding a record-room and verandah to Examiner's office at Chepâk.	6,446	G.O., No. 2494 W., of the 8th November 1882.	6,099	347	347	..	..	..	58	Appropriation not necessary under code paragraph 2293, III.
Do. ..	59	Erecting a memorial to the late Right Honorable W. P. Adam.	10,248	G.O., No. 1150 W., of the 7th May 1884.	9,830	418	418	..	..	..	59	Do. do.
Do. ..	60	Providing additional accommodation for Government central museum.	11,615	G.O., No.	10,827	788	788	..	788	..	60	From Provincial Reserve.
Architect ..	61	Improving the roads in the Chepâk park and maintaining trees.	17,987	....	7,437	10,550	5,550	..	5,550	..	61	Rs. 5,550 in addition to the modified grant in budget. Item No. 158, Class A. From Provincial Reserve.
Do. ..	62	Widening the promenade between the Napier bridge and Triplicane creek, and other improvements at Chepâk.	78,225	....	47,050	31,175	22,343	..	20,000	..	62	In addition to Rs. 8,832 provided in the budget. Item No. 159, Class A. From Provincial Reserve.
Do. ..	63	New opthalmic hospital at Madras ..	97,663	G.O., No. 693 W., of the 14th March 1884.	..	97,663	..	20,000	..	..	63	In addition to Rs. 20,000 provided in the budget. Item No. 91, Class A. No funds at present available.
Vizagapatam ..	64	New Potinghy Ghât	4,25,391	G.O., No. 3255 W., of the 16th November 1883.	4,10,225	15,166	15,166	..	10,000	..	64	
		Total ..	..	....	..	..	2,34,099	79,879	1,23,512	14,750		
		Registration.										
Vizagapatam ..	1	Sub-registrar's office at Ellamanchili ..	1,680	G.O., No. 248 W., of the 22nd January 1883.	893	787	..	..	..	..	1	Rs. 1,680 provided in the budget. *Vide* Item No. 124, Class A. Rs. 893 resumed.
Do. ..	2	Do. do. at Narisipatam ..	1,690	G.O., No. 382 W., of the 3rd February 1883.	500	1,190	..	..	..	..	2	Rs. 1,690 provided in the budget. Item No. 125, Class A. Rs. 500 resumed.
Godávari, Eastern.	3	Do. do. at Pithápuram ..	2,300	G.O., No. 352 W., of the 1st February 1883.	..	2,300	..	2,300	..	..	3	No funds available.
Do. do.	4	Do. do. at Rámachendrapuram.	2,350	G.O., No. 840 W., of the 14th March 1883.	1,669	681	681	..	681	..	4	From Provincial Reserve.
Godávari, Western.	5	Do. do. at Pentapad ..	2,710	G.O., No. 556 W., of the 20th February 1883.	939	1,771	61	..		..	5	In addition to Rs. 1,710 provided in the budget. No. 99, Class A. The question of funds can be considered later in the year.
Kistna, Eastern.	6	Do. do. at Gunnavaram..	2,170	G.O., No. 2514 W., of the 7th September 1884.	..	2,170	..	2,170	..	..	6	Item No. 43, Class B. No funds available.
Gudiváda ..	7	Do. do. at Gudiváda ..	2,800	G.O., No. 509 W., of the 15th Feb. 1883.	1,905	895	895		895	..	7	From Provincial Reserve.

Statement of requirements on account of Provincial and Local Incomplete Works for 1883-84 and of New Works sanctioned but not yet commenced—*cont.*

Division.	Item No.	Name of Work.	Amount of Estimate.	Number and Date of Sanction.	Past Expenditure.	Balance of Estimate.	Amount applied for		Amount allotted		Item No.	Head of Reserve from which the Appropriation is made.
							For incomplete Works.	For new Works.	For incomplete Works.	For new Works.		
1	2	3	4	5	6	7	8	9	10	11	12	13
		Provincial—*cont.*	Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		
		Registration—cont.										
Nellore ..	8	Sub-Register's Office at Kandukúr ..	2,455	G.O., No. 2738 W., of the 20th October 1882.	..	2,455	..	2,455	..	..	8	No funds available.
Cuddapah ..	9	Do. do. at Pulivendla ..	2,320	G.O., No. 1450 W., of the 19th May 1883.	1,902	418	418	..	..	..	9	Appropriation not necessary under code paragraph 2293, III.
Do. ..	10	Do. do. at Proddutur ..	2,240	G.O., No. 1497 W., of the 28th May 1883.	263	1,977	1,977	..	1,977	..	10	From Provincial Reserve.
Do. ..	11	Do. do. at Pullampet ..	2,073	Do. do. ..	1,077	996	996	..	996	..	11	Do. do.
Bellary ..	12	Do. do. at Adóni ..	2,542	G.O., No. 2757 W., of the 2nd October 1883.	1,082	1,460	1,460	..	1,460	..	12	Do. do.
Do. ..	13	Do. do. at Humply ..	2,660	G.O., No. 21 W., of the 8th January 1884.	..	2,660	..	2,660	..	..	13	Item No. 37, Class B. No fund available.
Coimbatore ..	14	Do. do. at Bellangudi ..	2,970	G.O., No. 2292 W., of the 6th September 1882.	2,070	900	900	..	900	..	14	From Provincial Reserve.
Do. ..	15	Do. do. at Coondapoor ..	3,357	G.O., No. 1238 W., of the 25th April 1883.	2,357	1,000	1,000	..	1,000	..	15	Do. do.
Do. ..	16	Do. do. at Cherpalcheri.	2,530	G.O., No. 2652 W., of the 12th October 1882.	570	1,960	1,960	..	1,960	..	16	Do. do.
Do. ..	17	Do. do. at Putúr ..	3,120	G.O., No. 3330 W., of the 22nd November 1883.	..	3,120	..	3,120	..	..	17	Item No. 31, Class B. No funds available.
Do. ..	18	Do. do. at Chaviyoor ..	3,020	G.O., No. 3331 W., of the 22nd November 1883.	..	3,020	..	3,020	..	..	18	Item No. 33, Class B. No funds available.
Do. ..	19	Do. do. at Kuthuperamba.	3,060	Do. do. ..	..	3,060	..	3,060	..	..	19	Item No. 35, Class B. No funds available.
Do. ..	20	Do. do. at Sirinangudi ..	2,650	Do. do. ..	..	2,650	..	2,650	..	..	20	Item No. 36, Class B. No funds available.
Do. ..	21	Do. do. at Udipi ..	3,370	G.O., No. 856 W., of the 28th March 1884.	..	3,370	..	3,370	..	..	21	Item No. 38, Class B. No funds available.
Do. ..	22	Adding a room for the sub-registrar's office at Erode.	1,870	G.O., No. 1837 W., of the 2nd July 1883.	1,270	600	600	..	600	..	22	From Provincial Reserve.
Do. ..	23	Do. do. at Polláchi ..	1,800	Do. do. ..	1,066	734	734	..	734	..	23	Do. do.
Nílgiri ..	24	Sub-registrar's quarters at Vayitiri ..	2,200	G.O., No. 2316 W., of the 17th August 1883.	..	2,200	..	2,200	..	..	24	Item No. 46, Class B. No funds available.
Do. ..	25	Do. do. at Gúdalúr ..	2,200	Do. do. ..	..	2,200	..	2,200	..	..	25	Item No. 47, Class B. No funds available.
North Arcot ..	26	Sub-registrar's office at Tirutani ..	2,230	G.O., No. 3046 W., of the 26th October 1883.	..	2,230	..	2,230	..	..	26	Item No. 45, Class B. No funds available.
Do. ..	27	Do. do. at Tirupati ..	2,320	G.O., No. 3047 W., of the 26th October 1883.	..	2,320	..	2,320	..	..	27	Item No. 44, Class B. No funds available.
South Arcot ..	28	Do. do. at Vriddháchalam.	2,060	G.O., No. 865 W., of the 16th March 1883.	..	2,060	..	2,060	..	..	28	Rs. 2,060 provided in the budget. Item No. 118, Class A.
Do. ..	29	Do. do. at Ullunderpett ..	2,175	G.O., No. 2295 W., of the 2nd May 1883.	..	2,175	..	2,175	..	..	29	Rs. 2,175 provided in the budget. Item No. 121, Class A.
Chingleput ..	30	Do. do. at Madurantakam.	1,920	G.O., No. 3147 W., of the 30th November 1882.	..	1,920	..	1,920	..	..	30	Rs. 1,920 provided in the budget. Item No. 137, Class A.
Do. ..	31	Adding a room for sub-registrar's office to the taluk cutcherry at Trivellúr.	1,550	G.O., No. 1963 W., of the 13th July 1883.	..	1,550	..	1,550	..	..	31	Rs. 1,550 provided in the budget. Item No. 151, Class A.
Madura ..	32	Sub-registrar's office at Sivaganga ..	2,278	G.O., No. 726 W., of the 6th March 1883.	1,425	853	853	..	853	..	32	From Provincial Reserve.
Trichinopoly ..	33	Addi[illegible]al room to the taluk cutcherry [illegible]alitalai to serve as a sub-registrar's office.	1,775	G.O., No. 2681 W., of the 24th September 1883.	710	1,065	1,065	..	1,065	..	33	Do. do.
Tinnevelly ..	34	[illegible]istrar's office at Kocharakulam ..	4,380	G.O., No. 3189 W., of the 12th November 1883.	..	4,380	..	3,000	..	..	34	No funds available.
Do. ..	35	Sub-registrar's office at Srivilliputur ..	2,705	G.O., No. 3424 W., of the 30th November 1883.	..	2,705	..	2,000	..	..	35	Item No. 39, Class B. No funds available.
Trichinopoly ..	36	Do. do. at Turayur ..	2,675	G.O., No. 2466 W., of the 22nd September 1882.	2,357	318	318	..	..	..	36	Appropriation not necessary under code paragraph 2293, III.
Do. ..	37	Do. do. at Jaynkondasholapuram.	2,650	G.O., No. 2466 W., of the 22nd September 1882.	1,850	800	800	..	800	..	37	From Provincial Reserve.
		Total ..	..	....	..	..	14,718	46,460	13,921	..		

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Statement of requirements on account of Provincial and Local Incomplete Works for 1883-84 and of New Works sanctioned but not yet commenced—*cont.*

Division.	Item No.	Name of Work.	Amount of Estimate.	Number and Date of Sanction.	Past Expenditure.	Balance of Estimate.	Amount applied for		Amount allotted		Item No.	Head of Reserve from which the Appropriation is made.
							For incomplete Works.	For new Works.	For incomplete Works.	For new Works.		
1	2	3	4	5	6	7	8	9	10	11	12	13
			Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		
		PROVINCIAL—*cont.*										
		Police Works.										
Ganjam ..	1	Th[illegible] police station-house at Judduputti.	618	G.O., No. 551 W., of the 29th February 1884.	..	618	..	618	..	..	1	No funds available.
Do. ..	2	Do. do. at Kottabomalli ..	618	Do. do. ..	..	618	..	618	..	..	2	Do. do.
Do. ..	3	Do. do. at Kukkadakandy ..	620	Do. do. ..	..	620	..	620	..	..	3	Do. do.
Vizagapatam ..	4	Police station-house at Jaganadharajapuram.	1,520	G.O., No. 2339 W., of the 20th August 1883.	701	819	..	..	..	..	4	Rs. 1,520 provided in the budget. Item No. 80, Class A. Rs. 701 resumed.
Nellore ..	5	Police hospital at Ongole	5,589	G.O., No. 2981 W., of the 20th October 1883.	..	5,589	..	2,000	..	..	5	In addition to Rs. 2,500 provided in the budget. Item No. 62, Class A. No funds available at present.
Bellary ..	6	Eight police huts at Humply ..	2,590	G.O., No. 2490 W., of the 25th September 1882.	2,455	135	135	..	..	..	6	Appropriation not necessary under code paragraph 2293, III.
Nellore ..	7	Police huts at Kandukúr	1,890	G.O., No. 1746 W., of the 15th July 1881.	..	1,890	..	1,890	..	..	7	No funds available.
Kurnool ..	8	Nine constables' huts at Pattikonda ..	2,300	G.O., No. 453 W., of the 19th February 1884.	..	2,300	..	2,300	..	..	8	Do. do.
Cuddapah ..	9	Police huts at Balapanoor	1,900	G.O., No. 4648 W., of the 7th December 1878.	1,068	832	832	..	832	..	9	From Provincial Reserve.
Bellary ..	10	Police hospital at Hospet	640	G.O., No. 533 W., of the 28th February 1884.	..	640	..	640	..	640	10	Do. do.
Coimbatore ..	11	Second-class police station at Uppinangadi.	2,775	G.O., No. 18 W., of the 7th January 1884.	..	2,775	..	2,775	..	..	11	Item No. 27, Class B. No funds available.
Do. ..	12	Third-class police station at Shoranur.	2,077	G.O., No. 1972 W., of the 4th August 1882.	1,205	872	872	..	872	..	12	From Provincial Reserve.
South Arcot ..	13	Hospital ward for use of the police force at Tirukoilúr.	2,120	G.O., No. 19 W., of the 7th January 1881.	522	1,598	478	..	..	..	13	In addition to Rs. 1,120 provided in the budget. Item No. 83, Class A. Additional funds can be applied for, if necessary, later in the year.
Do. ..	14	Office for the Assistant Superintendent of police at Tirukoilúr.	2,355	G.O., No. 3189 W., of the 5th December 1882.	1,470	885	885	..	885	..	14	From Provincial Reserve.
South Arcot ..	15	Police station-house at Oothangal Mangalam.	1,240	G.O., No. 2918 W., of the 16th October 1883.	375	865	466	..	..	..	15	In addition to Rs 399 provided in the budget. Item No. 76, Class A. Additional funds can be applied for, if necessary, later in the year.
Tinnevelly ..	16	Police station-house at Vachakaraputty.	1,300	G.O., No. 2881 W., of the 3rd November 1882.	853	447	266	..	..	..	16	Appropriation not necessary under code paragraph 2293, III.
Do. ..	17	Police huts at Vachakaraputty ..	1,188	G.O., No. 2881 W., of the 3rd November 1882.	960	228	178	..	..	..	17	Appropriation not necessary under code paragraph 2293, Rule III.
Do. ..	18	Police huts at Pavúr	1,017	G.O., No. 3119 W., of the 16th December 1881.	655	362	362	..	..	..	18	Appropriation not necessary under code paragraph 2293, III.
Do. ..	19	Do. at Sivaghiri	1,100	G.O., No. 3023 W., of the 5th December 1881.	408	692	692	..	692	..	19	From Provincial Reserve.
Do. ..	20	Do. at Vajaikulam	1,200	G.O., No. 2542 W., of the 28th September 1882.	585	615	615	..	615	..	20	Do. do.
Madura ..	21	Do. at Yelumalai	1,150	G.O., No. 3009 W., of the 14th November 1882.	700	450	450	..	..	..	21	Appropriation not necessary under code paragraph 2293, III.
Trichinopoly ..	22	Second-class police station-house at Kovarankurchi.	1,655	G.O., No. 2817 W., of the 26th October 1882.	1,048	607	607	..	607	..	22	From Provincial Reserve.
Do. ..	23	Five police huts at Andimadam ..	1,125	G.O., No. 883 W., of the 3rd April 1882.	374	751	751	..	751	..	23	Do. do.
Tanjore ..	24	First-class police station-house at Tanjore.	1,971	G.O., No. 2899 W., of the 6th September 1882.	1,964	7	58	..	..	..	24	Appropriation not necessary under code paragraph 2293, III.
Do. ..	25	Second-class police station-house at Kornad.	2,040	G.O., No. 1449 W., of the 19th May 1883.	999	1,041	1,041	..	..	..	25	Rs. 1,000 provided in budget. Item No. 84, Class A.
Do. ..	26	Police station-house at Oratnad ..	1,690	G.O.. No. 2106 W., of the 1st August 1883.	53	1,637	1,637	..	..	..	26	Rs. 1,690 provided in budget. Item No. 77, Class A.
Do. ..	27	Do. do. at Kumbakónam.	3,200	G.O., No. 4589 W., of the 6th June 1883.	2,207	993	144	..	..	..	27	In addition to Rs. 849 provided in the budget. Item No. 70, Class A. Funds may be applied for, if necessary, later in the year.
		Total ..	..		..	..	10,469	11,461	5,254	640		

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Statement E.

Statement showing Distribution of Budget Grants under Police and Registration.

Executive Division.	Locality.	Budget Item.	Name of Work.	Amount of Estimate.	Amount of Grant.
				Rs.	Rs.
		71	*Grant for Police Works costing above Rs.* 1,000 *and below Rs.* 2,500 *each, as detailed below.*	...	...
Nílgiri ...	Cherambádi.	72	Third-class police station-house ...	...	2,000
Do. ...	Nadgany ...	73	Do. do. ...	...	2,000
Do. ...	Nellakóta ...	74	Do. do. ...	...	2,000
Do. ...	Nadgany ...	75	Three police huts	...	1,800
South Arcot.	Mangalam.	76	Third-class police station-house ...	1,240	399
Tanjore ...	Oratnad ...	77	Do. do. ...	1,690	1,690
Vizagapatam.	Kurapam ...	78	Second-class police station-house ...	1,520	1,520
Do. ...	Kumaradu.	79	Do. do ...	1,520	1,520
Do. ...	Jagannádha-rajapuram.	80	Do. do. ...	1,520	1,520
Ganjam ...	Chicacole ...	81	Seven Police huts	1,176	622
North Arcot.	Maderpauk.	82	Do. do.	1,520	945
South Arcot.	Tirukoilúr...	83	Hospital ward and latrine for the police force at	2,120	1,120
Tanjore ...	Kornad ...	84	Police station-house	2,040	1,000
			Total ...	.	18,134
			REGISTRATION.		
		110	Minor works as detailed below ...	...	...
Kurnool ...	Chagulmarry	111	Sub-registrar's office	2,093	2,093
Coimbatore.	Karúr ...	112	Do.	2,120	2,120
Do. ...	Perandorai.	113	Do.	2,310	2,310
Do. ...	Konghiem.	114	Do.	2,130	2,130
Do. ...	Bhaváni ...	115	Do.	2,040	2,040
Do. ...	Mannárghat.	116	Do.	2,450	2,450
North Arcot.	Puttúr ...	117	Do.	2,240	1,240
South Arcot.	Vriddhá-chalam.	118	Do.	2,060	2,060
Vizagapatam.	Sálúr ...	119	Do.	1,880	1,880
Godávari, Western.	Tanuku ...	120	Do.	2,415	2,415
South Arcot.	Ulundurpet.	121	Do.	2,175	2,175
Eastern Godávari.	Alamúr ...	122	Do.	2,450	2,450
Ganjam ...	Narsannapet.	123	Do.	1,650	1,650
Vizagapatam.	Ellaman-chilly.	124	Do, ...	1,680	1,680
Do. ...	Narsapatam.	125	Do.	1,690	1,690
Madura ...	Tirushuli ...	126	Do.	2,125	2,125
Do. ...	Dindigul ...	127	Do.	2,125	2,125
Do. ...	Ootamapoli-um.	128	Do.	2,095	2,095
Tinnevelly.	Nángunéri.	129	Do.	1,960	1,960
Do. ...	Tuticorin ...	130	Do.	2,290	2,290
Do. ..	Sátúr ...	131	Do.	2,070	2,070
Do. ...	Virudupati.	132	Do.	2,215	2,215
Do. ...	Sankaranai-nárkoil.	133	Do.	1,950	1,950
Do. ...	Otapidáram.	134	Do.	2,090	2,090
Do. ...	Tenkási ...	135	Do.	1,960	1,960
Vizagapatam.	Pálkonda ...	136	Do.	1,820	1,750
Chingleput.	Maduránta-kam.	137	Do.	1,920	1,920

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Statement showing Distribution of Budget Grants under Police and Registration.—*cont.*

Executive Division.	Locality.	Budget Item.	Name of Work.	Amount of Estimate.	Amount of Grant.
				Rs.	Rs.
Salem ...	Námakal ...	138	Sub-registrar's office	1,870	1,870
Do. ...	Razipur ...	139	Do.	2,037	2,037
Tanjore ...	Tiruviár ...	140	Do.	2,235	2,235
Do. ...	Máyavaram.	141	Do.	2,060	2,060
Do. ...	Velangaman.	142	Do.	2,140	2,140
Do. ...	Vallam ...	143	Do.	2,240	2,060
Negapatam.	Mannárgudi.	144	Do.	2,000	2,000
Madura ...	Tirupatúr ...	145	Do.	2,425	2,425
Do. ...	Ramnad ...	146	Do.	2,225	2,225
Coimbatore.	Udamálpet.	147	Adding a room for sub-registrar's office to the taluk cutcherry.	1,800	1,800
Do. ...	Dhárapuram.	148	Do. do.	1,800	1,800
Godávari, Eastern.	Rajahmun-dry.	149	Do. do.	1,940	1,940
Do. ...		150	Do. do.	1,760	1,760
Chingleput.	Tiruvallúr...	151	Do. do.	1,550	1,550
			Total ...	...	82,835

No. 3265

SUPERINTENDING ENGINEER'S OFFICE,
5TH CIRCLE, MADRAS,
Chepauk, 24th November 1884.

From

THE SUPERINTENDING ENGINEER,
5TH CIRCLE,

To

THE Chief Engineer
for Irrigation.

SIR,

Enclosures.

I have the honor to report that the bund of the Red Hills Tank has been swept away from the waste weir wall of the 10 Vents Surplus Sluice along the short North face and round the bund along the Eastern side to a distance of fully 700 yards only a few brick mounds are left: the bank being generally levelled to its base, but the North abutment is standing, with the middle of the breach apparently uninjured. The water is now running out in a small channel some 50 feet wide, where there was a deeper scour, but principally thro' the gap at the Southern extremity

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extremity of the breach, about 200 feet in width, where there is still a deep scour. The water must have rushed thro' this gap with great violence; for many of the large revetment Stones have been carried a distance two Hundred yards, from the bund. A little way further South, there is a partial breach: the revetment being left standing at about full bank level: tho' the earth behind is a good deal washed away. For Several Hundred yards further, the parapet wall has been thrown over, and at the South end of the bund where it takes a turn to the East, the highest row of revetment Stones has been disturbed; the water having washed slightly over the bank in rear.

2. The wind was blowing from the N.W. on the evening of the 20: it backed to West during the night, to S.W. about 4 in the morning

morning of the 21, and to South, later on; culminating in gusts of hurricane force, after 6 A.M.

Along the deeper parts of the bank, the waves were thrown with force sufficient to upset the parapet Stones, and cast a good deal of Spray over them: the West wind blowing right angles with the general direction of the bank. The parapet extends South wards, as far as the Pilot Sluice; for a couple of Hundred yards to the North of the Sluice, there are only a few of the parapet Stones displaced: but just at the Sluice itself there is a narrow but deep gully down the outer slope of the bank. The Sluice projecting into the Sea acted as a groyne: and when the wind blew furiously from the South, the water was dashed up and fell over the top of the bund. It was when the

wind

wind — was in this direction N. to South: that sweeping over the long stretch of the Bank surface, it piled up the water against the N. E. corner of the Bund

3. The Bank Superintendent who was driven away by the preliminary sheets of spray: describes the scene, as that of a succession of waves that rose 10 feet above the bank, washed away the earth work and consequently burst thro', carrying down the weakened embankment. I was informed that the lesser partial breach was the first to take place: but if this was the case, the interval could not have been long, before the Northern part of the Bund was destroyed: because the revetment is left standing at about the course of stone at full tank level, and a good deal of the earth behind it at the same high level.

There

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There is no very clear narration of the circumstances of the bank giving way: and this is not to be wondered at, considering that the early morning hours were dark, with heavy clouds, and a tempest of rain and wind: while the people at Tukekere Khutkram, a small village just beyond the North end of the Tank Bund, had, in some cases, to fly from the torrent leaving their houses and goods to be washed away. The Tank Superintendent Ponnusawmy Pillai, does not all be possessed there.

The wing wall of the Surplus Sluice does not seem to be damaged, and the masonry weir beyond is standing firm.

4. On the night of the Storm, the water level was some 3 inches below weir crest. On the 9th Inst. after the heavy rains, the weir had been discharging with a head of

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Inches: but the water fell
below the mean present on the 12th Instt.

I had inspected the tank
on the 19th; when the heavy rains
had ceased; and found the
embankment and masonry
works all in good order; I
then wrote some Notes of Inspect-
ion; which I put on one side when
the Catastrophe occurred: but
I will have them copied and sent
to you; as evidence that no danger
was in the least forseen: and
that there was no indication of any
measures being required to pro-
vide for the safety of the tank.

5. In fact, I was perfect-
ly satisfied with the condition
of the Reservoir; and felt quite
relieved that a very large quan-
tity of water had been passed
off; hoping that the Violence of the
Monsoon might be over, and
that there would be no reason
to have any anxious thoughts
about these works.

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6. The parapet wall was
built on the tank bund, to
give further protection from the
force of waves. The parapet wall
was in thoroughly good order
when the Storm came on. It is
impossible to say, what the pres-
sure of the wind amounted to,
last Friday morning; but its
destructive effects were much
greater in Madras, than where
the last Cyclonic Storm took
place in November 1881.

Our experience of Storms of late
years has been, that they came in
the hot weather, in May when
tanks are dry or very low: and in
November before the Monsoon
rains have filled the tanks.
Thus in the beginning of Novemb.
1881, the Red Hills Tank
was $6\frac{3}{4}$ ft. below the mean present
& its then reduced level, or $9\frac{3}{4}$
feet below the present mean crest:
and on the 1st December 1881, the
tank was not full.

On the 21st Instant, the weather
was

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was about 4 inches below the full tank level, and the time was most unfavorable for a storm of wind. The direction of the wind was also the worst as it caused the full force of the waves to be expended against the revetment of the bund. Had the strong wind blown from the East, as in 1881, there would have been no such pressure on the bund.

In short a storm occasionally attacks Engineering works in all countries & causes damage that the skill of the most experienced man could not anticipate. We have had a lamentable storm of this nature, and can only deplore the results.

I have the honor to be

Sir

Your Most Obedt Servt

Lieut Saunders Asst Coll PWD,

Superintending Engr

Circle

CHIEF ENGINEER
24 NOV
1884
FOR IRRIGATION

From.

The Supty. Engineer
5th Circle.

To

The Chief Engineer
for Irrigation.

Dated 24th } November/84
Received }

No. 3265

Red Hills Tank—

Report regarding the
breaching of the—

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Public Works Department.

No. 186. J. 2973

Note by the Chief Engr for Irrign—

Letter from the S.E. V Circle No. 3265 dt
November 11th 1884.

The report submitted by the Supty. Engineer, on the breaching of the Red Hills Tank, enables the cause of the breaches to be thoroughly investigated.

2. On 19th instant the tank bund was inspected by the Supty Engr, and was found, after the exceptionally heavy rains that had previously taken place to be in excellent order. The surplus weir of the tank had passed 13" of water on 9th instant, and the tank bund had safely borne the pressure of so great a head of water (1½ feet more than when the breaches occurred

on 21st instant) without having given
the smallest indication of weakness in
any part.

3. Between the hours of 3 A.M and
noon of 21st instant a cyclone swept over
Madras. At about 5 A.M the wind
was from the West, and the greatest
force of the cyclone was reached
between the hours of 7 and 8 A.M, when,
according to the official report of the
Government Astronomer, the wind
was blowing from the South-West,
and had attained its maximum
velocity of 49 miles per hour.

4. About 7 A.M the tank is reported
to have breached, when the water in it
was 3 inches below F.T.L. The
general direction of the wind at
this hour, being from the South West,
would have tended to generate
a succession of waves, diagonally
across the tank, toward the

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North East portion of the bund, over
the greatest possible Expanse of water
(as will be apparent from the sketch
map), and thus to cause waves of the
greatest possible force and height,
to dash against this portion of the
embankment. The water at this
part of the tank being driven before
the wind doubtless heaped up against the
stone revetment of the bank to a
very considerable extent, and, dashing
against it with great violence, would
naturally fall on the top and over
the back of the bund in
showers of spray.

As explained in the Note by
the Chief Engr for Irrigation printed
with G.O. No. 1057 I of 24 Nov. 1884,
the stone revetment of the bank,
together with the top of the bund,
is 6 feet above F.T.L., and a
stone parapet wall, 2' to 3' high

is built on the top of the bund. The combined force of the wind and waves dashing against the parapet wall, overturned it. Deprived of this protection, the top and back of the bund would be more and more cut away by each succeeding wave passing over them, until the embankment, thus weakened, was no longer able to withstand the pressure against it, and breaches accordingly took place along the north east part of the bund, i.e. at the part against which the greatest violence of the waves was directed.

4. Nothing was wanted to add to the destructive force of the cyclone on the tank embankment. The tank was within 3" inches of being full when the storm occurred, and the direction of the wind, throughout the cyclone, was of the most

unfavourable description. The two causes combined rendered it impossible that the bank, as designed could stand, as both the top and back of it were at the mercy of the waves.

2973.

5. The hour at which the cyclone ~~ranged~~ raged rendered it impossible for any effective measures to be taken for the security of the bund, but it is highly unlikely that the making up of the bund could have been carried out fast enough to avert the disaster, even in the improbable event of a sufficient ~~number~~ amount of labour being induced to turn out in the middle of a violent storm of wind and rain.

A. S. Russell. 26

Madras
November 25. 1884.

for Chief Engr for Irrign

is built on the top of the bund. The combined force of the wind and waves dashing against the parapet wall, overturned it. Deprived of this protection, the top and back of the bund would be more and more cut away by each succeeding wave passing over them, until the embankment, thus weakened, was no longer able to withstand the pressure against it, and breaches accordingly took place along the north east part of the bund, i.e. at the part against which the greatest violence of the waves was directed.

4. Nothing was wanted to add to the destructive force of the cyclone on the tank embankment. The tank was within 3" inches of being full when the storm occurred, and the direction of the wind, throughout the cyclone, was of the most unfavourable description. The two causes combined rendered it impossible that the bank, as designed could stand, as both the top and back of it were at the mercy of the waves.

2973.

5. The hour at which the cyclone ~~ranged~~ raged rendered it impossible for any effective measures to be taken for the security of the bund, but it is highly unlikely that the making up of the bund could have been carried out fast enough to avert the disaster, even in the improbable event of a sufficient ~~number~~ amount of labour being induced to turn out in the middle of a violent storm of wind and rain.

A. S. Russell. 26

Madras.
November 25. 1884.

for Chief Engineer Irrign

G.O. 1051. Dy 24-11-84
" 603. Dy 2-8-82

Kondapalle No. 8293 9/10
Notes of Inspection.

19th November. Red-Hills Tank: I was glad to find, that the tank has stood very well the effects of 24.9 inches of rain, falling in 8 days, 5th to 12th November - After 3 days interval, 1½ inche of rain fell again, bringing up the total fall to 26.4 inches in 12 days - The greatest fall in 24 hours, was 4.95 inches: and in four consecutive days, 5th to 8th 16.6 inches were registered, being equivalent to 4.15 inches per day.

2. The works shew no signs of disturbance, except in the concrete laid over the laterite flooring here and there, below

Cir: 25/11/84

below the Surplus weir.
I examined the bund carefully, and could not detect any alteration in the appearance of the bund, or the revetment. I did not find any cracks or subsidence in any part of the earthwork or Revetment.

3. On the 29th Ultimo, I had visited the tank and found that the flat form of the 10 Vent under Sluice was not restored to working order, after the lengthening of the rods holding down the longitudinal beams: while also the pavement of the new escape path full tank level at the South end of the bund, was not completed. The water stood then at 42.7. but fresh water had come into Pholawram Tank, and the Head Sluice there

9/11

there was opened to let water into the Red Hills Tank.

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As we were, on that day, not ready to deal with Surplus water, I directed that the supply from Pholawram, should be shut off, when the Red Hills Tank had risen to three feet below weir crest.

4 Rain fell on the 2nd and again on the 3rd to the amount of 2 7/10 inches and the Head Sluice was shut on the 4th, the tank water standing at 43.81. I also gave instructions, that as soon as the tank began to overflow, the water level was to be recorded, three times in the day, at 6 A.M. at noon, and at 6 P.M.

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The following table shews the fall of Rain and level of water in the Tank.

Nov. numb.	Rain inches.	Total.	Water level.	Differ-ence.	water level taken 3 times a day.
3rd	0.95		43.61		
4th	1.30	2.25	43.81	+ 0.20	
5th	4.50	6.75	44.76	+ 0.95	
6th	2.65	9.40	45.36	+ 0.60	
7th	4.50	13.90	46.51	+ 1.15	at 6 A.M.
			46.91		Noon
			47.11		at 6 P.M.
8th	4.95	18.85	48.11	+ 1.60	at 6 A.M.
			48.15	+ 0.04	at noon & 6 P.M.
9th	2.60	21.45	48.19		at 6 A.M.
			48.31		at noon
			48.45	+ 0.30	at 6 P.M.
10th	3.45	24.90	48.21		at 6 A.M.
			47.96		Noon
11th	0.0		47.81	- 0.64	6 P.M.
			47.64		6 A.M.
			47.48		Noon
12th	0.0		47.41	- 0.40	6 P.M.
13th	0.0		47.29		
14	1.50	26.40	47.13		
15			47.19		
			47.11		

5. The Executive Engineer Colonel Smeaton was at the Tank on the morning of the 5th in anticipation of the tank being filled, and pointed pins to be put to the Screwspears: pushing on the work at the Sluice escape, and getting the under-Sluice sheet form ready.

Between

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6

4/12

Between the morning of the 4th & 5th the tank rose very nearly a foot: by that time, 6¾ inches of Rain had fallen. But it was not till the close of the 5th day of rain, when 13.9 inches had fallen, up to the morning of that day, the 7th, that the weir began to discharge.

Full tank level being 47.31.

The overflow lasted for 4½ days until the night of the 11th and the water then gradually sunk, standing on the 19th at 47.05.

6. Steward reported on the 8th that the Kovilpada gan tank had breached: This tank lies within 3 miles to the West of the Red Hills, and surplus direct into it. The greatest fall of Rain in 24 hours occurred the same day: 4.95 inches and on the following

25 50 day

day the 9th the water in the Red Hills Tank, was at its highest level, 48.45 or about 13½ inches above weir crest.

7. The Southern Escape was not completed, when the tank rose to the pavement level, on the 9th evening; a portion in the middle being unfinished; but Mr. Ellis had been pushing on the work & retaining walls of large rough Stone had been put in & Stone was packed as a wing, against the earthen bund & pond more Stone was held in reserve, in case of any scour. But the escape acted well, and discharged easily throughout, without giving any trouble.

8. The waters having

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having reached its highest point, on the evening of the 9th, had fallen 0.24 ft the next morning. But on the morning of the 9th the Sluice Shutters were all raised half a foot; and during the day, some water was passing over a Road dam, on the Trunk Road, to the North of the Village of Tuticorin. On the morning of the 10th Coll. Smalley had the Shutters raised to one foot above Sill, as the water level was only .02 ft lower than it had been the morning before. He was also preparing to relieve the tank, by lowering the Trunk Road, near the Road dam, in the event of the Tank rising again; but this was not ne

2 (31) cessary

necessary; as the water fell 1 ft 6 during the day.

9. The greatest rise in the tank water in 24 hours was 1.6 foot, from the 7th morning to the 8th morning. There had then been 0.45 inches of rain in the preceding 48 hours, and 18.85 inches in 6 days: but water was running over the weir probably for the greater part of the night of the 7th

The powerful discharging capacity of the tank is exemplified further, by the fact that in the next 24 hours, in which 2.6 inches of rain fell, making an aggregate fall of 21.45 inches in 7 days, the water level rose only .08 foot

2973

foot. After this, on the morning of the 9th, the undersluices came into play; and though there was heavy rain in the day — very likely as much as the half of the fall registered the next morning viz 3.45 inches — the water rose only .26 foot by the evening, and then began to fall.

10. In December 1883, there was a fall of 12.3 inches of rain in 6 days. In November 1884, there has been a fall of 22.65 inches, as a part only of the 8 days continuous fall, in the 6 days registered from the morning of the 5th to the morning of the 10th.

But in 1883, the tank was only 0.25 foot below weir crest level; and in this year the water was 3.7 feet

37 below

below full level, after the first days rain.

If we assume, in the absence of more frequent observations, that the rise of water in the tank was uniform through the 24 hours, and that the rainfall was likewise uniform; it is found that in 1883, after the tank was full there was a fall of 4·1 inch of rain in 38 hours, that raised the water to its greatest height of 47·91, or 1·6 foot above crest level.

In 1884, after the tank was filled, a rainfall of 6·39 inches brought the water level to its maximum height 48·45 in 46 hours: that is, to 1·14 feet above weir crest.

Thus in 1883, the rise above weir crest was at the average rate of 1 foot in 63 hours; in

8/15

2973

in this year, the average rate of rise is 1 foot in 4 hours. In 1883 the average time in which an inch of rain fell was 9·2 hours in 1884, the average time was 7·2 hours.

In this year, there was the more rain and the quicker rise of the water level during the time that the weir was discharging up to the highest level.

11. In 1883, there had been 7·6 inches of rain in 3 to 4 days immediately preceding the time when the tank was filled. In this year, before the tank was full, there had been 14·53 inches of rain in the corresponding period of 3 to 4 days.

That the tank did not rise to a higher level is due to

33 there

there being three additional
outlets, that were effective
this year; viz, the discharge
though to a small extent
only — to the North, over the
Trunk Road; the 10 vent
under Sluices, and the
escape 200 feet long, at the
south end of the bund at
the full tank level.

Hon'ble Sender and Coll R.E.
Superintending Engineer
5th Circle.

Chepauk.
26 November 1884.

CHIEF ENGINEER
26 NOV
1884
FOR IRRIGATION

No. 3297

SUPERINTENDING ENGINEER'S OFFICE,
5TH CIRCLE, MADRAS,
Chepauk, 26th November 1884.

From

THE SUPERINTENDING ENGINEER,
5TH CIRCLE,

To

THE Chief Engineer
for Irrigation

SIR,

Enclosures.

With reference to para 1 of G.O. No. 1057 dated the 24th November 1884, I have the honor to report that the steps taken in the last 3 months to ensure the safety of the Red Hills Tank, consisted, in placing the Screw gear shutters in working order at the 10 Vent Surplus sluice, and opening a paved escape at full tank level, at the South end of the bund

2. After the surplus Weir was re-duced, by 3 feet, in height in November 1877, a ground escape was prepared, to relieve the tank when full at the south end of the main bund; but after the masonry

weir was raised again, the ground escape was on too low a level, and the Chief Engineer considered it should be removed to higher ground, so as to pass off water at the permanent full level 47·31-

These discharging works came into play when the tank was filled, and the water raised 13 inches above weir crest level, by the heavy rains that fell before the storm of the 21st instant.

Colonel Swalley the Executive Engineer and Mr Ellis the Assistant Engineer, had been both of them carefully watching the tank during this month. I had gone over the works on the 19th instant, and saw that all was in good order; the water was 11 inches below the crest of the Weir; and the general condition was entirely satisfactory, after a severe strain from the greatest supply of water that the tank had hitherto received

3. There remained no fresh precaution to be taken, but the terrific force of the wind dashed the water in great waves,

over

over the bank and destroyed it- I have thus recapitulated the points on which I am called upon to report; but in my letter No. 3265 of the 24th instant, I have already narrated the circumstances of the disaster, and I now send you also my notes of inspection of the 19th instant.

4- On the 22nd instant, a commencement was made, of the preparation of materials for a ring-bund, and work was begun on the 23rd. The level of the water on the 23rd was 3 feet lower than it ever was in 1877, when the supply for irrigation was stopped.

If the rains continue, it might be advantageous to let out water to the fields, when the ring-bund is constructed, so that there would be less difficulty to contend with in the work of restoration. But looking to the completion of this work, and the possibility of there being a limited supply of water in next year, I would say that the delivery of water for the sake of irrigation should be stopped.

5- Colonel Penny-cuick ~~visited~~ the

Cholaveram Tank on the 23 inst. wading through the Country, to arrive at the breached portion. The bund of this Tank is carried away to a length of some 500 feet, at the both sluice, which remains standing. There too, as at the Red Hills Tank, destruction was caused by the violence of the wind from the Southern quarter.

Colonel Smalley reported that the Head sluice at the Anicut was shut off on the morning of the 6th November. But from the land drainage, the Tank rose to the greatest height on the evening of the 8th, when water was flowing over the weir, to a depth of 15 inches. The bund had stood well. The water in the Tank had fallen to about 4 inches below weir crest, on the 15th of the month, and was probably a little lower on the 21st.

I have the honor to be
Sir
Your most obt Servant
Newt Sandeman Lt. Coll R.E.
Superintending Engineer
5 Circle

From

CHIEF ENGINEER
26 NOV
1884
FOR IRRIGATION

THE SUPERINTENDING ENGINEER,

5TH CIRCLE,

To

THE Chief Engineer
for Irrigation

Dated 26 November 1886.
Recd.

ENCLOSURES. /

No. 3297.

Red Hills Tank-

Reporting the steps taken during the last 3 months to ensure the safety of

2973

Note

The destruction of the Red Hills reservoir was without doubt caused by the waves, generated during the Cyclonic storm on the morning of the 21st November, washing in enormous masses over the embankment at its north end. The evidence that this was the immediate cause of the disaster is irresistible.

It is however doubtful whether the force of the ~~cyclonic~~ waves would have caused the destruction of the reservoir had it not been for certain errors in the original design. In my opinion those errors were :—

(1). The top of the bank above full tank level is only 6 feet, a height that seems insufficient in the case of so large a water spread.

(2). The laterite wall (wave-breaker) on the top of the bank appears to me to

2973

have been too weak in section to withstand the force exerted by the waves. Its dimensions were 3 feet in height, by 1½ feet in thickness, — and it was formed of loose blocks of laterite, laid without cement or mortar.

These are points on which the Chief Engineer for Irrigation will of course report.

Whether, looking to these apparently weak points in the construction of the reservoir, it was prudent to allow the water level to rise to the height at which it appears to have stood during the greater part of November, is also a point which will doubtless receive attention from the Chief Engineer for Irrigation.

W. MacDermott

1-12-84.

374.
38

circ/

P. W. Department

Read the following. — 2973

Letter from the S.E. Circle No. 3297 d/ Nov 26. 1884

For Orders.

This letter adds really nothing to the information given by the Supdg. Engr. in his former letter No. 3265 d/ 24th Nov 1884, which, it was considered when the note and draft order circulated therewith was drawn up, was full and complete for the purpose of answering the queries asked by Govt in para 1 of G.O. No. 1057 d/ 24th Nov 1884.

28/29

2. It has already been shewn that on the 9th instant when 13" of water was passing over the waste weir, the tank bund sustained the maximum water pressure* brought against it this season - a water pressure far greater than that to which it was subjected shewing when the breach took place. It was also shewn that having after undergone this severe test, and after the heavy rains of the monsoon, the bund shewed no signs of weakness whatever when inspected by the Supty Engineer

* on an average about 835 lbs per square foot where the breach took place.

& water pressure 793 lbs per square foot

2973

within 48 hours of the time it breached.

That neither the great pressure which the bank had sustained nor its saturation by heavy rain, had produced any visible subsidence or percolation whatever is a sufficient proof that the bank was in Excellent order, and was of ample strength. The Supty. Engineer satisfied himself on this point, and it is submitted that in seeing that the embankment was maintained upto full section, and was in thorough order, he did all that could

394
40

be expected to "insure the safety of the tank."

3. The other point on which Government apparently desires fuller information is whether the disaster could have been averted by wise foresight. This query can be met with a most emphatic negative, as will be apparent from the following:—

1st. At the time the tank breached the water pressure against the land was less than had been the case for many days previous. As the tank had not suffered

2973

in any way from this pressure (which had for many days been steadily moderating) the causes of the breach must be sought for elsewhere. The only additional forces, brought against the land at the time it breached, were the wind pressure plus the force of the waves. No possible measure, that could have been taken could in any way have diminished the destructive violence of these prime agents of the disaster.

3a/ 4/1

2nd. The danger to which

large tanks are liable during cyclones, from storm waves being driven over their embank-ment, is well known and was provided for in the case of the Red Hills tank by a 'wave-breaker' or stone wall of about 3' high placed on the top of the revetment of the bund, which itself is 6 feet above F.T.L. That this 'wave-breaker' was demolished by the combined violence of the wind and waves is certain, as it has gone on portions of the bund which are otherwise intact. This possible danger was therefore foreseen and

provided for, but, as the result has proved, the provision thus made was inadequate. For this, the District officers cannot be made held responsible.

3rd. The 'Wave-breaker' once demolished, it is certain that the waves must have swept over the Earthern ~~bank~~ bund (it need hardly be added) when this occurred the destruction that followed was inevitable. That the waves did sweep over the bund is proved.

(1) from the evidence of a competent observer

(Vide para 3 of Supty Engineers letter No. 3265 of 24th instant.)

(2) from the fact of the demolition of the 'Wave-breaker' which the force of the wind* alone was most certainly insufficient to overturn

(3) from the plain Evidences they have left of having done so, as proved by the long grass, at the rear of portions of the bund still in tact, being beaten down by the rush of water down the slope; by the

* 12 lbs per square foot when blowing at its maximum rate of 49 miles per hour.

the length and peculiar character of the breach; and by other unmistakable signs. 2973

It is submitted that there is not an iota of reason for supposing that the Waves did not sweep over the bund. In the note sent with the Supty Engineer's letter the fact was assumed as from the report, being ~~self~~ evident, and it was shown that, under the peculiar conditions under which the

Cyclone

Cyclone occurred,
it was only to be
expected. The tank
was nearly full, and
the wind was blowing
at the time the
breach occured, from
the S. W. quarter, over
about 4 miles of
water - the greatest
length of water in the
tank. As the
height of waves
increases in a
direct ratio with

the

length of the expanse
of water over which
they are generated, the
greatest height of the
waves would necessarily
be at the north eastern
end of the bund where
the breach occurred.
and the danger of a
breach there by waves
dashing over the bund
would be imminent.
Had either of the con=
-ditions under which
the cyclone occurred
been absent, it is
possible that the
waves would not have
washed over the top of
the bund. Combined,

184

it all experience goes to show that it is almost certain they would do so after the fall of the 'wave-breaker'.

It is submitted that the fact of the waves passing over the bund has now been proved. Granted that this is so, human energy could not have averted the catastrophe that followed. It is exceedingly improbable that men would have turned out to work in such a storm. Even had they been induced to do so, it is almost certain that they could not have worked

2973

in so exposed a situation in the teeth of a violent gale of wind. The early hour of the morning, at which the breach occurred, prevented men being collected, and finally, admitting that they could have been collected and could have worked, it is impossible that they could have repaired over a length of 3 miles of bund, the breaches, caused by a succession of breaking waves, as fast as they were made.

48

To sum up what has been adduced in

considering this point of
the waves being driven
over the bund, it is
submitted that it
is a fact, which does
not admit of question
that
the breaches were due
to the storm waves
breaking over the em=
=bankment, and
that the destruction
which followed could
not have been averted.

4. If the Government
are still not satisfied
at the explanation
now given, it is sug=
=gested that a special
reference be made to
Col: Pennycuick specifying distinctly any
points on which

29973

doubt is still en=
=tertained. The papers
can then lie over until
Col: Hasted is able
to report direct to
Government on the
matter.

A.S. Russell.

26.11.84

For. Joint Secy: to Govt:
P.W. Dept.
Irrigation Branch

considering this point of the waves being driven over the bund, it is submitted that it is a fact, which does not admit of question, that the breaches were due to the storm waves breaking over the em= =bankment, and that the destruction which followed could not have been averted.

4. If the Government are still not satisfied at the explanation now given, it is sug= =gested that a special reference be made to Col: Pennycuick specifying distinctly any points on which

29973

doubt is still en= =tertained. The papers can then lie over until Col: Hasted is able to report direct to Government on the matter.

A.S. Russell.

26.11.84

For. Joint Secy: to Govt:
P.W. Dept.
Irrigation Branch

The Hon C. G. Macleo
The Rt Hon the Governo

For Orders

2973 W

Saidapett 2973
22nd November 1884

My dear Webster

Herewith Talisildars report sent last night which I found awaiting me on my return from seeing you

The smash is a very complete one - I cannot imagine where Smalley can be - Arundel wrote to me last night that he heard that he was at the Red Hills but he is evidently not there.

The Local Fund Engineer went out early this morning -

I still adhere to the view that a special Engineer officer and some one with his head about him should go out at once - I do not think that the District Staff can cope efficiently and speedily with all that is on hand.

Nothing from Chembrambakum which means I conclude that all is safe there.

Yours Very Sincerely
(Sd) Frederick Price.

Ex R.P.

2973

Letter from the Acting Tahsildar of Saidapet Taluq No. B dt November 21st 1884, Camp Polal to the Collr of Chingleput

I beg to report that I arrived with great difficulty at Polal, about 8 P.M., the road on the way, especially between the 6th & 8th mile stone being impassible on account of some of the avenue trees having been blown down by the late storm, and lying across the road. I have just written to the L.F. Engineer to have these removed.

I have ascertained from inquiries made, that the marginally noted villages have been inundated by the floods from the breaches, of which, there are two on both sides of No 2 sluice - one lying between the escape on the sluice and the other to the south of the sluice. The breaches are very large, both measuring about 4 furlongs in length.

All traffic is interrupted on account of the breaches and it is not at present exactly

1. Tandalkalam.
2. Vadakarai.
3. Attiyakam.
4. Alinjivakam.
5. Vadapurambakam.
6. Grant Lyon.
7. Lyon.
8. Sethumedu.
9. Sayasambakam.
10. Kesapur.
11. Sheyambakam.
12. Mathoor.
13. Manjambakkam.
14. Vaj Kadu.
15. Arumbakkam.
16. Kadapankam.
17. Sadayankuppam.
18. Maravari Kuppam.

exactly known, what amount of damage has resulted to life and property in the villages referred to, or what has been the consequences that ensued by reason of the floods on the other side of the Northern Trunk Road. It is rumoured that the Sholaveram Tank, has also breached, but there is no reason to believe that this report might be true as it is doubtful how this information could have been brought on this side of the breach.

I have just seen Supervisor Mr. Mariappa Mudly, the only officer of P.W. here and have written to him that I am ready to give him any help that he may require to stop the breaches or to avert any further damage that may be rendered to the Tank. The water in the tank has been drained away to a depth of about 10 feet. The capacity of it was somewhat less than 25 feet, when the breaches took place.

I shall report further on the subject tomorrow for your honour's information.

2973

Exd. K.P.

2973

My dear Audry

Will you please show to His Excellency the enclosed note from Price and report from his Tahsildar on the damage to the Red Hills tank. The P.W. Department are aware of all that has happened and there is, for the moment, nothing to be said.

Yours very sincerely

22nd November/84 Sgd/ Forster Webster.

4/89

2973

My dear Audrey

Will you please show to His Excellency the enclosed note from Price and report from his Inhalder on the damage to the Red Hills tank. The P.W. department are aware of all that has happened and there is, for the moment, nothing to be said.

Yours very sincerely

22nd November/84 Sgd/ Forster Webster.

Sgd/ P

I have told Major Bowen to direct Colonel Pennycuick (who seems to be the most important and experienced of our officers who is available) to go directly to the Red Hills Tank and look after things himself.

Major Bowen reports that the only person now on the spot is Mr. Ellis. He supposes Colonel Pendergast and Colonel Smalley to be together at the Chembrambakkum Tank which he has not seen and with the locality of which he seemed imperfectly acquainted.

I have further directed him to consider that the Red Hills and Chembrambakkum Tanks should for the present take precedence of all other matters not very exceptionally urgent.

I have further directed him fully to inform by Telegraph Colonel Hasted-

of what has occurred but I have not directed that officer's return which it is hoped may not be necessary.

The calamity at the Red Hills is evidently very serious and the conduct of the officers who were in charge of it must be very carefully inquired into.

(Sd) M. G. D.
Nov. 22d, 1884

Forwarded to the Secry. to Govt. P. W. D. for perusal of note by H. E. the Governor and favor of return.

(Sd) E. F. W
25/11/84

Originals returned to the Chief Secretary 25-11-84.

Ed P. S.

C No 9881

No 2973

In the letter accompanying the Sec 1st circle applies for an additional appropriation for the new Petitiyagoda Ghat. The sanctioned Estimate for this work is Rs 625-391 of which Rs 410-22 were suspended up to 1883-84 & the 215 have been allotted for the current official year. The balance now intended is therefore Rs 5166 only - But the Sec authorizes an expenditure of Rs 8795 over the sanctioned estimate being within 5 per cent of the estimated amount & he orders to cover the total expenditure now applies for an additional of Rs 1300 - The balance of the Provincial revenue is Rs 7980 only - It is therefore impossible to appropriate the sum applied for by the Sec - Hence the Surveyor

~~draft order is sent~~
~~for submission for~~
~~approval~~

I o b w

For orders as there
the balance - Rs 7980.
at the credit of the
Reuse is to be
appropriated in part
payment of the
demand - Rs 13000 -
made by the S E. ?

A S
1-12-84

C.a.w.

To stop work on the Pittapuli
Hospital & as items required to
complete the plan would be highly
injurious. I think Rs 5000 may
be allotted at once & a further
allotment granted when funds
(then on the surrender) become
available.

C.S
1-12-84

1-12

No 1358

Vizagapatam Division Office
Waltair 5th November 1884.

From

The Executive Engineer
Vizagapatam Division

To

The Superintending Engineer
1st Circle
Dowlaiswaram.

Sir,

The Sum of Rs 10000 allotted in G.O No 1581 W dt 24th June 1884 for the new Patenghi Ghat having been almost expended as shewn below I have the honor to request You to be so good as to obtain an additional allotment of Rs 13000 for Expenditure during the Current official Year

Amount of Estimate	Expenditure upto end of October 1884.	Current years Grant	Current years Expenditure	Additional allotment required for the Current official Year
4,25,391-4				
Excess Sanctioned by the Supg Engineer 8795	4,19,568-1-6	10000	9306-2-11	13000
4,34,186				

2 The Patenghi Bungalow, Serai Choultry and other items of the Estimate are in vigorous progress and it would be a pity to stop the Work for want

of funds.

I have the honor to be
Sir
Your most obedient Servt

(Signed). J. D. Harris
Executive Engineer
Vizagapatam Dn

(True copy).

Asst Engr
For Supg Engineer

No. 2685

FROM,

THE SUPERINTENDING ENGINEER
FIRST CIRCLE. 2973

TO,

THE Chief Engineer
P.W. Dept

Dowlaishweram, 18th November 1884.

SIR,

Dept 19th

I have the honor to forward herewith Copy of a letter No. 1358 dated the 5th November 1884 received from the Vizagapatam Division Officer and to request that the additional sum therein applied for for the Patinghi Ghât road may be allotted as soon as possible. I hope soon to make a Special inspection of the Work.

I have the honor to be
Sir
Your most obedient Servt

Asst Engr
For Superintending Engineer
1st Circle

JK

25

From

The Supg Engineer
1st Circle

To

The Chief Engineer
D.P.W.
Madras

Dated 18th
Decd 19th } November 1884
Recd

No 268 V/2
Circle-1

New Potinghy ghat road.

Requests that the additional sum applid for for the — may be allotted as soon as possible.

With Order

By

No 971. W

PUBLIC WORKS DEPARTMENT.

2973

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 2nd December 84

READ the following

Letter from the S.E. I Circle (No. 268 V/2 dt Nov. 18th 1884)

The state of the Provincial reserve does not admit of a larger additional appropriation than Rs 5000 being at present made for the Potinghi Ghat; but should ~~however~~ funds become available later in the year that appropriation which is hereby sanctioned will be supplemented to the required extent.

S.E. I Circle ✓
Exd P.W. Accts ✓

Despd 3-12-84

CL. 1.12.84

M. 1.12.84

RC.
157 c. 27-1-85.

PUBLIC WORKS DEPARTMENT.

2973

PROCEEDINGS OF THE MADRAS GOVERNMENT.

~~UNDER date the~~

READ the following

Letter from the S.E.N. Circle No. 3265 d/ Novr 24. 1884.
Note by the Chief Engr for Irrign. d/ " 25. "
Letter from the S.E.N. Circle No. 3297 d/ " 26 "
Note by the Secy. to Govt. P.W.D. d/ Decr 1. 1884.

Order thereon.

H.E. the Governor in Council desires that the Chief Engr for Irrigation will, as soon as practicable, submit a complete report to Govt on the recent disaster to the Red Hills reservoir noticing particularly the points indicated in the Secretary's note, recorded at the head of these Proceedings.

Col: Hasted will also report upon the duties of all officers who were connected with the charge of the reservoir and upon the share of blame, if any, due to each officer.

Pending receipt of the report now called for, the Government will withhold Expression

of their opinion in the matter.

The Chief Engr for Irrigation will also submit, with the least possible delay, proposals for restoring the reservoir - such proposals should be drawn up in communication with the President of the Madras Municipal Commission, and with reference to the scheme for a low-level water supply to the town of Madras.

(True Extract)

Col R.E.
Secretary to Govt. P.W. Dept

Recd 21/12

To,
The Chief Engr for Irrigation.
Supt Engr V Circle
Lt. Col. Pennycuick R.E.
Financial dept
Ex. 9/11

Public Works Department

973

Note

The destruction of the Red Hills reservoir was without doubt caused by the waves, generated during the cyclonic storm on the morning of the 21st November, washing in enormous masses over the embankment at its North end - The evidence that this was the immediate cause of the disaster is irresistable.

It is however doubtful whether the force of the waves would have caused the destruction of the reservoir, had it not been for certain errors in the original design. In my opinion these errors were:-

(1) The top of the bank above full tank level is only 6 feet, a height that seems insufficient in the case of so large a water spread -

The

2. The latinite wall (wave-breaker) on the top of the bank appears to me to have been too weak in section to withstand the force exerted by the waves. Its dimensions were 3 feet in height, by 1½ feet in thickness — and it was formed of loose blocks of latinite, laid without cement or mortar.

These are points on which the Chief Engineer for Irrigation will of course report.

Whether, looking to these apparently weak points in the construction of the reservoir, it was prudent to allow the water level to rise to the height at which it appears to have stood during the greater part of November, is also a point which will doubtless receive attention from the Chief Engineer for Irrigation.

(Sd) J. Shaw Stewart.

4th Dec. 1-12-84.

2973

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60

Civil wor[illegible]
Irrigation

PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 2[illegible] Dec. 1884

No. 2973 W

READ the following

Letter from the Supdg Engineer, V Circle. } H. E. No. 3265 dy 24th Nov. 1884.

Note by the Chief Engineer for Irrigation. } " " dy 25th Nov. 1884.

Letter from the S.E. V Circle } " - 3297 dy 26th

Note by the Secretary to Govt. P. W. Dept. } " " dy 1st Dec. 1884.

His Excellency the Governor in Council desires that the Chief Engineer for Irrigation will, as soon as practicable, submit a complete report to Government on the recent disaster to the Red Hills reservoir - noticing particularly the

the points indicated in
the Secretary's Note, ~~by the Secretary~~
~~in the P. W. Dept.~~, recorded
at the head of these Proceedings

Col: Hasted will also
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with the charge of the reservoir
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if any, due to each officer.

Pending receipt of
the report now called
for, the Government
will withhold ex-
-pression of their
opinion in the
matter.

The Chief
Engineer for Irrigation

11/9/4
3/1
15

Will

2973

will also submit, with
the least possible delay,
proposals for restoring
the reservoir. Such pro-
-posals should be
drawn up in communication
with the President of
the Madras Municipal
Commission, and with
reference to the scheme
for a low-level water
supply to the town
of Madras.

1.12.84

6/12

Chief Engineer for Irrigation
Supdg. Engineer V Circle
Lt. Col: J. Pennycuick R.E.
Irrib: Deptt.

Red Hills.

Concord

23

2973

Lake Asquam in Red Hills of New Hampshire

63

15.2.27 III

9929

Govt. of [1884] Madras.

PUBLIC WORKS.

61

Dated 10 Dec 3/12

Rcvd. Encl.

G.O., 2d Dec 1884, No. 2073

Red Hills Reservoir

Orders calling for
~~Contractor~~ completion
report on the works
mistaken by the —

65
6

Dec 3/12