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MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Revenue.
5773 DEPARTMENT

G.O. No.	573.	Press
B.P. No.		Mis.
Dated	23-3-1875 196	

Not to be folded or roughly handled

No. 376. Read the following endorsement of the Chief Engineer for Irrigation, dated Camp at Tripatty, 12th February 1875, No. 178 :—

From Colonel A. S. MOBERLY, R.E., District Engineer, Cuddapah, to Lieutenant-Colonel J. MULLINS, R.E., Chief Engineer for Irrigation, dated Cuddapah, 7th December 1874, No. 1,740.

I HAVE the honor to submit, for the information of Government, the accompanying report from Mr. Supervisor Pimm regarding the breaching of the Chintacoonta tank in the Jummalmadoogoo taluq in this district.

2. The Chintacoonta tank is situated in latitude 14° 42' N. and longitude 78° 23' E., at a distance of about 5½ miles west of the Railway station at Moodanoor. The length of the bank was about 300 yards ; on the north side it runs into the hill, but on the south side it abutted against a small hillock (which was detached from the south hill by a narrow opening, through which passed, what Mr. Pimm styles, the ghaut road, but along which, I think, only cattle could have passed), the greater part of which is now washed away. The tank had no surplus escape, but there were two sluices, one of which, however, it appears had been useless for years, and is now destroyed. The bank is about 50 feet above the fields. The area of the tank was about 1 square mile, and that of its catchment basin 9 square miles. The main feeder is from the south, and enters with a fall of about 25 feet per mile.

3. The tank was called a two and a half or three year tank, and had never before been known to be so full, the highest water-mark before being only got up to 66·62 ; and for this reason, I fancy, no provision had been made for a surplus escape. The cause of the damage may, however, be attributed rather to the bad material of which the upper part of the bank was formed.

4. On the 29th October the Chief Engineer of the Madras Railway informed me that he had heard that the Chintacoonta tank was in a very dangerous state, and begged me to have it cut so as to save it from breaching down upon the railway line ; and on the same evening the Cuddapah Range Officer showed me a telegram from Mr. Pimm saying that the tank was in great danger. On the next morning I went to the tank accompanied by Mr. Haworth, the Railway Resident Engineer, and on examining the bank I learnt that during the night previous the heavy slip shown in the accompanying section had occurred, and I found the water pouring through in three jets. I also found deep vertical fissures, some of which the villagers had been trying to fill up with stones. The jets were issuing out at about 8 feet from the top of the bank, and as the water level was about 3 feet below the top of the bank this would be giving a head of 5 feet. As I found that the top of the bank was formed of stones and gravelly soil, I came to the conclusion that the only chance of saving the tank was to make a cut near the small hillock, where I thought there was probability of coming upon rock, and so gradually lower the water in the tank until we should get below the leak. At first, however, I tried to deepen the channel cut by Mr. Pimm through the ghaut road on the 26th October, but I found the ground so stony and hard, and the work progress so slowly from want of space for the people to work in, that I had a cut made on the north side of the hillock.

5. Having seen the work fairly started and good progress making, I at 2 P.M. left Mr. Pimm with instructions to take out one course of the revetment at a time, and then to lower the water gradually by allowing only 3 inches in depth to pass until such time as he had got well below the level of the leak, when he might stop the discharge. I had ordered all the people off the bank near the slip as I thought it might break through at any moment. For the after account of the breach I must refer you to Mr. Pimm's report. Mr. Pimm informs me that if 3 inches of water only had been allowed to run off at a time it would have had no effect as the drainage water from the hill streams was supplying a larger quantity. This might be, but I think the sluice was taking all this off. He further states that between 3 P.M. and 7 P.M. the tank was only lowered about $\frac{3}{8}$ths of an inch.

6. I am of opinion that if the channel through the ghaut road had been cut on the 26th, and if the Reddies, &c., had given assistance to Mr. Pimm instead of being obstructive, the tank would have been saved with merely the loss of a few fields of paddy which would have been destroyed by the water passing over them. On an after visit that I made to the tank on the 11th November, in company with the Acting Head Assistant, the Reddies and Curnums admitted to that officer that they had obstructed Mr. Pimm in cutting the channel because some of their fields would be damaged.

7. The widest part of the breach is 270 feet at top and 212 feet at the bottom, and the narrowest is 130 feet. The bottom of the breach is about 25 feet below the present bed of the tank, and 55 feet below top of bank.

8. Considering the extent of ayacut under this tank, *viz.*, 264 acres, I do not think it worth the while of Government to restore it in its entirety, and think it would suffice to provide for a tank with only one-third the former capacity, and this can only be done by constructing an escape in the breach. This, however, I am afraid would be found to be very expensive, and so before anything further is done I would suggest that a careful survey, &c., be made, and I therefore request the services of a good Surveyor for a period of two months for preparing the survey, levels, and plans.

From Mr. H. PIMM, Supervisor, Department Public Works, Sub-divisional Officer in charge of Cuddapah Range, to Colonel A. S. MOBERLY, R.E., District Engineer, Cuddapah, dated Camp at Moodanoor, 15th November 1874, No. 263.—Through the Officer in charge of Cuddapah Range.

I RESPECTFULLY beg to submit the following report on the Chintacoonta tank and the causes of it breaching. Friday, 23rd ultimo, I wrote to the Reddy for a report on the tank, received an answer that not much water was then being received in the tank.

Saturday, 24th ultimo.—Received a letter from the Reddy that the tank had received a great supply of water last night. I at once went and inspected the tank bund (which seemed quite safe then, no crack could be seen); I then went to the supply channel intending to breach the channel bund and cut off the supply, but could not do it for want of tools.

Sunday, 25th ultimo.—I sent for tools as early as I could; went to the Chintacoonta supply channel, and made a breach in the channel bund and built a bund of stone boulders across the supply channel. This turned off about three-fourths of the supply. I would have completed this work, but the Reddy and Curnum would not get or give me a relief of coolies to work during this night. I was forced to leave it to be finished next morning. As the Road Maistry and myself were left alone on the channel bund at about 6-30 P.M. I again inspected the tank bund, which still seemed quite safe, no cracks in the bund.

Monday, 26th.—A bund of earth, backing the stone boulders, was completed this morning across the supply channel; at about 12-30 noon I pointed out and requested the Reddies and Curnums to cut through the ghaut road. I could not attempt to cut a surplus channel below the breach I had made in the supply channel for these reasons:—*First*, I had not time, owing to the length and depth, which would be about half a mile in length and from 6 to 12 feet in depth. (This was what the heads of the village wanted.)

Second, I had no one to assist me, and the supply would have been again turned into the tank before this channel could have been completed, as I would have to cut into the hill stream which I had turned the supply into. I tried all I could to get my orders carried out to have a surplus channel cut that night to present water level. (I gave the Reddy a written Telugu order that I held him responsible that he got this work done that night.) If this was done I intended to have deepened it, as required afterwards, to about one yard in depth. As I could not get orders obeyed, I went to the Railway Station and tried to telegraph to the Range Officer, but could not, but the Station Master sent one to the Railway Authorities at Camalapoor. The Deputy Collector came up that night, and at his request I went again with a few Railway gang coolies at 12-30 midnight to the channel, but very little work was done that morning and the next day. A few cracks, but very slight, appeared on the top of the bund today, longitudinally and diagonally, and the water was within 3 feet of the lowest portion of the top of the bund.

Tuesday, 27th.—Remained on the work all day. The coolies the Deputy Collector ordered to be sent to me did not come. I had in the afternoon about 100 coolies, but worked very unsatisfactorily, nor would the heads of the village use any exertion to get the work done, though I requested them often. I asked for another set of coolies for the night, could not get them same as yesterday. The Reddy stated that he would tom-tom and ask them to work, but would not force them.

Wednesday, 28th.—Mr. Millet (Railway Engineer) accompanied me to the tank bund. He stated he considered the tank in a dangerous state, and it was only a matter of time for it to give way from the cracks in the bund. The cracks had opened from 6 to 9 inches during the last 24 hours. The villagers did no work today except tried to fill in the cracks in the bund. I told them it was of no use, but all the labor should be put on in cutting the channel through the ghaut road, this they did not attend to.

In the evening I inspected the tank bund again, and though the cracks had been filled in, the cracks appeared again and the water in some of the cracks seemed to be at about the same level as the water in the tank. Sent a telegram to the Deputy Collector at Camalapoor, reporting the dangerous state of the tank bund, but received no answer.

Thursday, 29th.—A report was spread that the bund had breached. I went and found that the bund near the centre had slipped in rear. I did not stop as I could not now save the bund, but could assist to save human life. I had on Tuesday last given warning for the villagers under the bund and in the valley to leave their houses; this afternoon I sent lascars and the police from village to village to drive the villagers out. (Telegraphed to Range Officer and received a reply from the District Engineer.)

Friday, 30th.—Cut the tank bund at the south end, which appeared to be rocky ground, by personal orders of the District Engineer (who was on the bund); at 3 P.M. 3 inches of water was let through the cutting which was about a yard in breadth, this water assisted the cutting and removing the boulders on the south side; all boulders that could be removed were placed on the side and toe of the rear revetment to protect it from being scoured; at about 3-30 or 3-45 P.M. about 9 inches of water was let through the cutting; at about 4-45 or 5 P.M. I left off working at the cutting, and nearly 18 inches of water in depth at the mouth was then let through the cutting; all the labor for above another hour was in throwing stones and placing boulders on the side and toe of rear revetment to prevent it from being scoured. I would not have

Proceedings of the Madras Government, Public Works Department,
16th March 1875.

let more than 12 inches of water in depth at the mouth if the revetment stones had been smaller, but one course of revetment stones had to be removed to carry out the District Engineer's orders, which were to keep letting off the water gradually by removing one course of revetment stones at a time at the mouth of the cutting when necessary, until the large jets of water ceased to run in the slip in the rear part of the bund. I ordered twenty Wuddar coolies to come on the rock, and to remain all night with me to carry out the District Engineer's orders if required, and they were present; at 10-55 I was awakened by the bund giving way; I went at once on the hillock south of the cutting and saw that the north side had given way, and the hillock on which I was standing was scouring away very fast, and it was dangerous to remain on it; I ordered every one away at once. The high flood only lasted about one hour. A little before 7 and again about 8-30 P.M. I inspected the cutting. The bund and revetment was all right, but the water was scouring the side of the hill on the south side and had cut its way about 4½ feet in depth from the toe of the bund into the paddy fields. I arrived at Moodanoor about 1-30 A.M. to give any assistance I could to the villagers and Railway Company. The high flood had gone down, and the water was draining off by the river very fast. No report has been received nor have I heard that any human life or cattle have been lost.

The greatest damage was about 4 miles of the permanent-way of the railway being washed away, and in four places the embankment was breached.

About half of the crops under the tank bund are destroyed. One road culvert of 7 arches, the wing and parapet walls are washed away; likewise three of the largest road dams are more or less damaged, and one road dam washed away entirely. The old Bellary road is breached in many places, and the road surface for about 2½ miles more or less damaged. (Another report on the roads will give full details of these damages.) A number of dry-stone built houses in the village of Moodanoor were washed down during the flood. I would have reported more fully on these damages, but you have inspected them all during your stay at Moodanoor this week.

The breach in the tank bund is about 300 feet in length and about 70 feet in depth from the top of the bund, and about 25 feet below the general level of the tank bed. I enclose a survey of the bund showing the breach (scale 100 feet to an inch). To repair this breach and restore the tank and to build a calingulah it will cost from Rupees 70,000 to Rupees 1,00,000. A contour survey of the tank with survey of bund and all necessary sections and plans of proposed calingulah will be sent in as soon as possible. The Poolivendalah Taluq Overseer will be placed on this work. I will take up the other duties of the sub-division until another Overseer is appointed.

In continuation of my diary of the 26th ultimo, and statements abovementioned, I respectfully beg to state the following:—The Deputy Collector (Mr. Sharkey) asked what I required after I had explained and he had read my report to the Range Officer. I stated as I could not get my orders carried out, I required some Revenue official who could force labor; he stated he would assist me by ordering coolies, and that he would send to me the next day a Tahsildar. He left Moodanoor, and I received no assistance from him or through his orders.

If I had the Deputy Collector's assistance or any Revenue official as promised by him, I could have had the cutting through the ghaut road made to at least 1 or 1½ yards in depth below the water level, and in all probability it would have saved the tank.

SUBMITTED for the information of Government.

In G. O., of the 9th January 1875, No. 60, paragraph 3, attention was specially called to the Chintacoonta tank among others, the line of railway north of Moodanoor having been greatly injured by its breaching. On referring to G. O., No. 184, of the 20th January 1873, it will be seen that this tank was examined, and the report on it is as follows:—"The bund of the Chintacoonta tank requires no repair; it is very strong and revetted both front and rear. The present estimate provides for the repair of its supply channel."

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16th March 1875.

2. The tank had no means whatever of disposing of surplus, and none had ever been discharged. It is stated that on no former occasion had the water risen above a certain projecting stone on the interior face of the bund, which is at 5·33 feet below the level reached in October 1874. Although, therefore, the fact that no surplus weir or other means of discharging flood waters ought to have been stated when the tank was inspected with special reference to its situation above the railway, its past history was such as might reasonably induce the then Superintending Engineer to believe in its perfect safety. The tank has just been inspected, and it may be added that, without such a knowledge of the composition of the bund as could not have been expected, the only way in which its safety could have been ensured was necessarily unknown. Mr. Pimm adopted the best possible means of averting the danger in cutting the southern supply channel and diverting the water coming from the hills in that direction, but this course was taken too late, and it is at most possible rather than probable that an earlier closure of this source of supply would have saved the tank.

3. The section of the bund at the breach, and the pits dug in the top of the bund at and near the slip, show that the lower part of the bund is of good red soil, but that the top for a depth of 3 to probably 8 feet at some places is of shale, stone, and gravel. So long as the water was below or but a little above the top of the good soil no leaks showed themselves, but when the water had risen to a little over 70 or to 3 feet below the lowest part of the bund (73·36), slight cracks appeared, *vide* Mr. Pimm's letter, diary account for the 26th October. Had it then been understood exactly what the circumstances were, and had the village officers exerted themselves and supplied labor, possibly by cutting a trench along the centre of the top of the bund to below the level of the considerable leaks, and filling in with good soil from the paddy fields, the danger might have been averted. This work would have been a difficult one, and in the absence of information as to the depth of gravelly soil and the exact position of the leak, together with the rapid rising of the tank, the task would have seemed well nigh hopeless, and it must be remembered that the villagers omitted to second effectually Mr. Pimm's efforts to save the tank. The lowering of the pathway along the hill side at the south end of the bund may easily have seemed to be the only chance left, but the revelation of the character of the soil made by the breach indicates that, had Mr. Pimm succeeded in cutting a channel here, a breach would have resulted.

4. The cut in the embankment of the supply channel did some good, but it could help the tank only by diverting water, and it was on too high a level to draw off any of the water which had already entered the tank. Mr. Pimm showed much energy, and under less adverse circumstances his exertions might have been successful.

5. The District Engineer has been requested to ascertain what work, if any, has been done to the tank bund within the last twenty years or so. If the raising of the bund was carried out before 1856-57, it will probably be useless to inquire into the circumstances.

6. With regard to the restoration of the tank it may be taken for granted that this should not be allowed unless it can be made perfectly safe, with adequate arrangements for disposing of surplus. The latter essential cannot be provided at

either end of the bund; neither can it be secured at the old full tank level of 66·62; but were the water raised to 72 an outfall could be got from the southern supply channel. The restoration of the tank would, therefore, involve the following works:—

1*st.*—The removal of all the stony soil from the top of the bund.

2*nd.*—The raising of the bund to 84·00, which could be done without any addition to the width of the lower part of the bund.

3*rd.*—The selection of a position for a surplus weir in the right bank of the southern supply channel, and the choice will fall on one of two places, *viz.*, that where the cut was made by Mr. Pimm, and another a few hundred yards lower down where this bank was recently revetted—the selection will depend only upon economical considerations, and for its determination levels on both lines will be needed. A surplus weir 120 feet long will be required, the maximum flood discharge being from 2,000 to 2,250 cubic feet a second, and the maximum depth to be allowed to pass over being 3 feet. The supply channel between the surplus weir and the tank must not be less than 60 feet wide, with its bed 5 feet below full tank level or 2 feet below weir crest level. It will be better to make it 3 feet below crest level. The outfall channel where cutting may be needed should be 60 feet wide, and 1 foot below weir crest level at the commencement. Here also it will start with a width of 120 feet, which may be reduced to the normal width at a distance of 150 yards. The spoil banks to be placed 20 yards from the edges of the 60 feet channel. The bed fall of this channel may be anything moderate which the levels may show to be convenient. The fall of the country is great, and the channel will soon adjust its own bed fall.

4*th.*—The closing of the breach will require some special precautions. The best material available is certainly the silt in the tank bed, and this, if well consolidated, will be water-tight. The junction with the bund on the north side should be made as noticed in this Office Circular, No. 48, dated 21st December 1872.

On the south side the shale rock must be benched out for a width of 8 feet, and a depth of not less than 1 foot from the surface in horizontal steps, and on this a wall, also in steps, and projecting not less than 4 feet from the surface of the rock, should be built. This wall to be 7½ feet thick at the lower part, with face batters of 1 in 8 on either side. Above the rock a trench 9 feet wide must be carried 12 feet into the hill from its face. The bed or floor of the breach is almost horizontal, and consists of silt in which a trench 12 feet wide should be cut down to the solid ground below and 3 feet into the latter. The front and rear slopes of the bund at the breach to be made to correspond with the old bund; the former to be carefully revetted upon a stone and gravel backing; a lighter revetment will do for the rear slope. The bund at the breach will be 64 feet high, and it will suffice if for a width of 70 feet at base and 6 feet at top the central part be formed of silt. The gravelly soil will be better for the outsides of the bund on either side and will probably be equally cheap.

7. The Collector's opinion on the question of the restoration of the tank should be obtained. A rough estimate of the cost amounts to Rupees 25,000. The revenue statement submitted by the District Engineer for the years 1861-65 to 1873-74 gives the following particulars:—

	Ayacut	Cultivation.
Government lands	Acres 143, Rs. 1,893.	Acres 135, Rs. 1,996
Inam do.	„ 136 „ 2,051	„ 117 „ 122

consequently the Government interests at stake may be taken at Rupees 2,120 yearly; but the interests of the Inamdars are of somewhat greater extent. It would appear that the tank having been kept in good order, and having been destroyed by natural causes which have operated for the first time since its construction, if it be considered that the measures taken to prevent the breaching of the tank were, though unsuccessful, the best which the circumstances admitted, and that it would have breached had it been left alone, the Government are not under an obligation to restore the tank in order to re-establish the value of the inams, and if so it would seem that the Inamdars may properly be asked to contribute towards the expense of making the tank again capable of irrigating the lands under it. Moreover, the tank is said to have been a three years' tank, and probably it may be deemed to have been capable of irrigating 400 acres on the average, and if restored in the manner suggested it may be assumed that this area can be irrigated. The average area for the period named has been 252 acres, and consequently 148 acres additional could be brought under the tank. The average revenue derived from the Government lands has approximated to 15 Rupees an acre. There is, so far as can be judged from an inspection of the country, plenty of land available for irrigation, but for many years to come this would not be capable of paying a very high rate of assessment, and probably the additional land to be brought under the tank would not do more than compensate for the loss of revenue on highly assessed lands rendered unfit for cultivation.

8. The District Engineer has been requested to obtain the information necessary to enable the details of the restoration to be determined, and he has been informed that the survey establishment required for the purpose will be sanctioned. It will be necessary to ascertain what cultivated lands, if any, on the margin of the tank, will be submerged by raising the water level as proposed, and in the meantime it is suggested that the question of restoration should be settled in the Revenue Department.

9. In the same Order of Government reference is made to the damage sustained by the railway between Rajampett and the Cheyaur by the bursting of two tanks. The only tank, however, which gave way was the Munnoor Kitchemma tank.* The repairs supposed to be necessary were carried out, and the bund was in good order except that it appeared possible that leakage may have led to the breach in the southern part of the bund. The surplus weirs, two in number and giving a water-way of 101 feet, were certainly inadequate. The area of the catchment basin is not determinable from the Atlas sheet, and the District Engineer has applied for the Revenue Survey sheets; but, should these not give the required information, the position of the water-shed must be ascertained by a reconnoissance or survey. It is believed at present that the drainage of some 8 square miles is received, and if so the water-way required will be 120 to 140 more than the

No. 60, 9th January 1875.

* *Vide* statement in Proceedings, Madras Government, No. 963, of the 28th March 1873.

the tank now possesses, and this or more can without difficulty be afforded in the south bund. The rainfall at the nearest station, Pullempett,* where a register was kept, was 10·45 inches in 24 hours. The tanks in this part of the district, as seen from the railway, show that attention has during the past two or three years been paid to their repair, and the bunds are generally in very good order. Most of them appear to have suffered but slight injuries from the severe trial which they under-went last October, and they have been able to retain a full supply. With the instructions which have been issued regarding the proper treatment of tanks, there should be no difficulty in making each one affecting the railway perfectly safe before the next monsoon, and the rest should be similarly dealt with as quickly as possible.

* A few miles south.

(Signed) JOHN MULLINS, Lieut.-Colonel, R.E.,
Chief Engineer for Irrigation.

No. 377. ORDER THEREON, 16th March 1875, No. 729.

IRRIGATION, No. 25.

WITH the foregoing endorsement the Chief Engineer for Irrigation submits the reports received by him from the District Engineer, Cuddapah, of the circumstances attending the breaching of the Chintacoonta tank in October last, whereby much of the embankment of the railway over a length of about 4 miles to the north of Moodanoor was washed away.

2. It appears that the tank had no means of disposing of surplus, and that without material modification of its full supply level the provision of an escape would have been hardly practicable; that the want of a surplus weir has never before been experienced, and that in the floods of October last the water rose some 5½ feet above the highest level before known. The bund was apparently in good order, but the upper part of it turns out to have been composed of porous soil, and when the water had risen to 3 feet below the lowest part of the bund dangerous leaks appeared, a heavy slip occurred, and, the breaching of the tank at this point being imminent, the District Engineer tried to save it by making a cut at the south end, and there being no rock at a high level in the hill side but only gravel, control over the water was soon lost, and a breach occurred. Previous to this, however, the southern supply channel of the tank had been breached, and the supply from that source diverted, but so much water came down from the hills to the west and north that the tank level continued to rise.

3. His Excellency the Governor in Council considers that, although the exact circumstances of this tank ought to have been more accurately ascertained and reported in 1872, these were not such as to make an accident at all probable. The tank is an old work, and until recently it would have been deemed perfectly safe. Every exertion was made also by the Public Works Department to avert disaster when the danger became imminent.m

4. The question of the restoration of the tank will be referred to the Revenue Department for early determination.

5. The Chief Engineer for Irrigation has also reported on the breaching of the Kitchemmah tank near Rajampett, and it is shown that the apparent requirements of this tank were provided for, but that its drainage basin was not, and remains to be, ascertained; and that, although it has escapes upwards of 100 feet in length, the means of disposing of surplus need probably to be more than doubled. What is necessary should be at once ascertained and carried out before the next monsoon.

(True Extract.)

Colonel, R.E.,
Secretary to Government.

To the District Engineer, Cuddapah.
" Consulting Engineer for Railways.
" Chief Engineer for Irrigation.
" Revenue Department.

Ext. S. T. Austin.
Spare Copies

No 1054
Revenue Department
Govt. of India Branch.

PUBLIC WORKS.

To

THE SECRETARY TO THE GOVERNMENT

No. 451, dated

Subject

No. 23

Dated

Vide Ltr No 451 / 75

14 Sales Offices Duties

No 573
Referred to the Board of Rev for early report on the subject of para 4 of the Ordr abstd records.
23rd March 75