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MADRAS RECORD OFFICE

Government of Madras

Public works

DEPARTMENT

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Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
28th March 1873.*

Read the following papers:—

No. 665. From the Officiating Superintending Engineer, 6th Division, to the Secretary to Government, Public Works Department, dated Tanjore, 16th November 1872, No. 665.

WITH reference to G. O., No. 535, dated 28th February 1872, I have the honour to report that I have had all tanks in which breaches might affect the Railway in this division examined thoroughly.

2. East of Tanjore, that is in the delta, there are no tanks which could cause damage to the railway. To the west of Tanjore, between that place and the Trichinopoly boundary, there are several small tanks, but the Executive Engineer reports that the waterway allowed in the railway is very ample, and he does not consider the embankment is in any danger of injury from the breaching of the tanks. Estimates for the repair of such tanks as require it will be submitted from time to time.

3. In the Trichinopoly Taluq the tanks which lie above and command the railway are only those which lie, in what may be termed, the Tovagoody and Deva-
rajanery valleys. These have all been examined by the Executive Engineer, and estimates for their thorough repair submitted for sanction. The work will be carried out as early as possible.

4. In Kulitaly Taluq the Range Officer reports that there are only two tanks the breaching of which would affect the railway, the Poodocottah tank and the Veeragian tank; the first of these has never been known to be full, but the second has lately attracted attention, and has been repaired. A scheme for improving and extending this tank is now under consideration, and it is probable will be carried out shortly. The tank is fed by a jungle stream and also by surplus water from the Ooppademanagalum tank in the Coimbatore District; this tank is said to be in good order, but there may be tanks higher up the valley which require attention. These have probably been noticed by the Superintending Engineer of the 7th Division, if not they should be specially examined.

No. 666. From the Consulting Engineer for Railways, to the Secretary to Government, Public Works Department, dated Madras, 7th January 1873, No. 6.

At the request of the Agent of the Madras Railway Company, I have the honour to forward, for the consideration of Government, the accompanying letter* regarding the insecure state of certain tanks in the vicinity of the line of railway. Mr. Elwin also begs that attention may be drawn to the Order of Government, dated the 28th February 1872, No. 535.

2. Upon receipt of the letter in question, those portions of it which referred to the Camalapoor and Charapully tanks were sent to the District Engineer of Cuddapah, with a request that the dangerous condition in which they were represented to be might receive early and careful consideration.

3. The Coyempett tank is within the Carvaitnugger Zemindary, and I have asked the Collector of North Arcot to exert his influence with the Zemindar in

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order to insure that, if the tank is repaired, the work may be executed in a thoroughly efficient manner, and that a suitable calingulah may in future be provided.

From the Agent and Manager of the Madras Railway Company, to the Consulting Engineer for Railways, dated Madras, 18th December 1872, No. 935.

ADVERTING to the previous communications which I have addressed to your department on the subject of the danger to which the works on this railway are exposed by reason of the insecure state of the tanks in the vicinity of the line, I have the honour to request that you will be so good as to submit to Government the enclosed copies of further communications* which I have received from the Chief Engineer upon the same subject.

* No. 592, dated 12th December 1872.
" 599, " 13th " "

2. In forwarding these documents I beg that you will be so kind as to direct the particular attention of His Excellency the Governor in Council to Order of Government No. 535, dated the 28th of February 1872.

From the Chief Engineer, to the Agent and Manager of the Madras Railway Company, dated Madras, 12th December 1872, No. 592.

THE Resident Engineer, 1st Division, North-West Line, reports that, on the 23rd ultimo, a breach 52 feet in length was made on the north-west side of the bund of the Coyempett tank, near the 78th and 80th miles, North-West Line, causing a large quantity of water to be suddenly discharged through the double 20 feet pile bridge at $\frac{1}{4}$ th mile. Later on, the same day, the ryots cut a gap 45 feet in length on the south-east side of the bund, causing a considerable rush of water through the trouble 15 feet girder bridge at $\frac{1}{4}$ th, and the single 15 feet girder bridge at $\frac{1}{2}$ th. The Coyempett tank was breached so long ago as December 1865, on which occasion Mr. Smart reported to you as follows (*vide* his letter No. 528, dated 8th December 1865):—"The second interruption took place near the 80th mile, some little distance south of the Soornamookey river, and was caused by the bursting of the Coyempett tank bund. The escape waters from this tank flooded a large area of country to a considerable depth, and carried away a 12 feet and a 6 feet arch, situated at a distance of about 10 chains apart, leaving gaps in the embankment of 140 and 120 feet respectively. Several bridges in this locality were more or less damaged by scour, and also a 2 feet culvert, the south abutment of which will have to be partially renewed;" the bund appears to have been then patched up in an insecure manner, and was again breached on 10th October 1866, has been ever since left unprovided with a calingulah.

2. The Charapully tank at $\frac{1}{4}$ th, North-West Line, breached at 11 A.M. on Sunday, the 24th, and the water rose to within 3 feet of rail level at $\frac{1}{4}$ th.

3. I have already on more than one occasion pointed out the danger to which our line is exposed from the bursting of tank bunds, and the exceptional risk under which night traffic is conducted in the present state of the law as regards the responsibility of tank-owners to maintain their tank bunds and calingulahs in an efficient state.

4. The protective works with which, at great cost, most of our bridges have already been provided, will no doubt prove effective so far as the safety of the bridges is concerned, but it is quite certain that, in cases when the breach in a tank bund is of such an extent as to discharge a volume of water against our railway greater than the capacity of the bridge to carry away, although the bridge itself may be saved, it must be at the expense of the neighbouring embankment, as has been exemplified in the cases of the breaches at the 29th mile, South-West Line, on 15th November 1871, and at 60th mile, South-West Line, on 22nd November 1872. The latter case is a striking proof that the safety of trains may be as much endangered by the washing away of a few chains of embankment as by the destruction of a bridge.

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From the Chief Engineer, to the Agent and Manager of the Madras Railway Company, dated Madras, 13th December 1872, No. 599.

WITH further reference to the subject of my letter, No. 592, of yesterday, I beg herewith to forward copy of letter from the Resident Engineer, 2nd Division, North-West Line, and to beg that the attention of Government may be invited to the present unsafe condition of Camalapoor tank bund. In the event of a serious breach occurring in this bund, not only would the safety of the bridges within the tank be endangered, but the heavy embankment between Paupugnee river and the tank would be liable to damage.

2. Mr. Burge states that the bund is being now strengthened by additions to its width, but besides this it is clear that the revetment is insufficient, and it appears probable that the calingulah has not capacity enough.

From the Resident Engineer, to the Deputy Chief Engineer of the Madras Railway Company, dated 2nd Division, North-West Line, 12th December 1872, No. 759.

I wish to bring to notice the condition of Camalapoor tank, which the line passes through at the 177th mile.

2. The water in this tank was rising so rapidly before I left on leave that I found it necessary to examine if the calingulah was fully acting, and Mr. Robinson while here wrote to the Collector about the condition of the bund. On my return I strengthened the force of watchmen through and below the tank. It breached almost simultaneously, but at a point where the bund is only 2 or 3 feet high, and this only affected our works by the scour caused through the bridges inside the tank. These are protected, two of them by low floors nearly at foundation level, and all the earth above them has been scoured away. In the case of a larger breach it is probable that these floors would not be enough to prevent the destruction of the bridges, and if it occurred near the intersection of bund with embankment the works between the former and Paupugnee river would certainly suffer. The breach has been roughly made up again, however there is no immediate danger as the principal supply-channel from Paupugnee river is now cut off; and the Collector, on whom I called on Tuesday, is fully alive to the necessity of keeping it diverted, and he visited the place yesterday. He had already been in correspondence with Department Public Works, and the bund is now being strengthened by additions to its width.

3. It appears to me, however, that the capacity of the calingulah (144 feet $\times$ 2 feet 10 inches) is insufficient, as is proved by the occurrence of the breach, and that also the stone revetment should be raised. In many places this is not higher than the crest of the calingulah, and in a tank being such a large surface extent as this has, I believe that, when full, a strong wind coupled with a fresh in river would probably cause injury by wash to the bund on the leeward side above the stone-work and consequent breach.

4. The material of the bund is very loose, and when the tank is full it is quite saturated with water.

No. 667. From the Consulting Engineer for Railways, to the Secretary to Government, Public Works Department, dated Madras, 30th January 1873, No. 70.

WITH reference to the Order of Government, dated the 8th instant, No. 48, I have the honour to submit a letter* from

* No. 25, 22nd January 1873, with enclosures. the Agent of the Carnatic Railway

Company, giving cover to further reports as to the cause of the injury which the open line sustained upon the 23rd November 1872.

2. It will be seen that, with regard to the river Cortilliar and the amount of waterway allowed by the Railway bridge, the Chief Engineer says that additional information must be obtained before a definite report can be made. I have applied to the District Engineers of North Arcot and Chingleput for all available records

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regarding the drainage area of the Cortilliar, and they shall be placed at Mr. Dibblee's disposal.

3. With the exception of the flood in the Cortilliar river, the damage sustained by the line of railway can be directly traced to the bursting of tanks and to the overflowing of irrigation channels. So far as reliance can be placed upon the statements of the villagers, the tanks which lie above the railway seem to have been in an inefficient state upon the date in question. The overflowing of the channels seems to have been due to the absence of any proper means of regulating the discharge through them from the river.

4. With regard to the second paragraph of the order of Government under acknowledgment, the Agent states that "in presence of the more urgent duties with which the Chief Engineer was engaged, I did not deem it necessary to call on him Beyond the usual Half-yearly Certificate.

to make fixed periodical inspections and reports upon the condition of the small length of line open for traffic, the more especially as from my constant communication with the Superintendent, both verbally and in writing, I was satisfied that all requisite attention was promptly paid to the maintenance of the way and works." I learn from Mr. Fisher that during the year 1872 the Chief Engineer made three special inspections and reports upon the condition of the line before November, in addition to various occasional visits. Now that the special work upon which the Chief Engineer has been hitherto employed is finished, or nearly so, I have suggested to the Agent that these inspections should be made regularly once a quarter as on the other lines of Railway in the Presidency.

From the Agent and Manager of the Carnatic Railway Company (Limited), to the Consulting Engineer for Railways, dated Madras, 22nd January 1873, No. 25.

WITH reference to your letter No. 30, dated the 16th instant, I regret that my having omitted to call attention to the request contained in the Chief Engineer's letter, No. 623, forwarded with mine of the 26th November 1872, No. 640, should have caused it to have been overlooked, and have the honour to state that in future the request contained in the 2nd paragraph of your letter under reply shall have attention.

I have now to submit a copy of the Chief Engineer's further report, No. 56, dated the 21st instant, together with extracts from a report by Mr. Jenkinson, and translations of statements made by villagers respecting the bursting of tanks adjacent to the line, by which the damage done to the line on the occasion of the recent floods was so greatly influenced.

The information therein supplied you may probably consider all that is necessary to be supplied by the Companies' officers as to the causes which led to the damage, and that any further information respecting the supply-channels from the Palar which may be required will be obtained from the officers of the Public Works Department. I shall nevertheless be happy to answer any further inquiries you may desire to make as far as it may be in my power to do so.

From the Chief Engineer, to the Agent and Manager of the Carnatic Railway Company, dated Madras, 21st January 1873, No. 56.

ADVERTING to the Consulting Engineer's letter, No. 30, 16th January 1873, and in continuation of my No. 623, of the 25th November 1872, I have the pleasure to enclose extracts from a report by Mr. Jenkinson on the causes which produced the excessive damage to our works during the floods in November last, accompanied also by translations of statements made by villagers where the various tanks referred to are situated.

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With regard to the river Cortilliar, Mr. Jenkinson speaks of very numerous tanks having burst along its banks on either side; it will be necessary, however, to await further information as to supply channels from the river Palar and the larger tanks at the sources before any definite report can be made.

In other respects the inquiries have been full, and I think explain what occurred as satisfactorily as can be expected. At the third mile north of the Cortilliar river, at Paloor, and in the 7th, 11th, and 14th miles the breaches in our works and embankments were due to the bursting of tanks against which no reasonable allowance of waterway could provide, for the remaining part the country was flooded by the irrigation channels which overflowed from the unprecedented freshes on the Cortilliar river.

The downpour of rain on this occasion was doubtless very much greater than usual, and some damage to irrigation works was to have been expected; it would appear however from the statements of the villagers that the tank bunds and channels were not in a condition to withstand any emergency, and I beg leave to suggest that it should be submitted, for the consideration of Government, whether tanks situated so as to command a line of communication such as our railway, the repairs to which are so costly, should not receive a greater amount of attention in their up-keep, and more expenditure for the requisite repairs, than seems to have been bestowed upon the works now under reference. I think this recommends itself on the score of economy, as the maintenance of the tanks would be very much less expensive than restoring our works, either of which Government have directly or indirectly to pay for, in addition to which is the question of convenience to the public, which cannot fail to be seriously affected by the sudden interruption of communication at a time when, from the flooded state of the country, the common roads are also impassable.

You will observe that in some of their statements the villagers volunteer the information that a large revenue is derived from some of the tanks; this, and that of the safety to the crops and property of the ryots, are not questions in which it is my province to interfere, and I would merely point out that in attaining the object I have in view, the security of our line and works, other benefits would be derived from endeavours to prevent the bursting of tank bunds.

In restoring the bridges and culverts permanently, which is now being undertaken, I shall propose a certain amount of increase to the waterway which was provided previously. I would wish it to be understood, however, that it should not be inferred from such action that I am of opinion that the casualties which have occurred were due to a want of foresight in constructing the line originally. Such floods had never been known previously, and it was not only impossible to foresee their occurrence after a lapse of more than six years, but, in my opinion, it is impossible to calculate what waterway would be required to pass the drainage of an extent of countries when it is being stored and is suddenly let loose as by the bursting of tank bunds.

*Report on the causes of injuries done to the Carnatic Railway between Arconum and
Conjeeveram by the Floods in November and December 1872.*

3RD MILE.—The damage between the 2nd and 3rd miles of the railway was caused by the bursting of the tanks belonging to Perumparcherry village and of Poyapakum. Other

tanks at Keelanthurum, Theyvathanum, Ambanoor, Meypaucum, Malanthorai, contributed to the flood. The villagers' reports show sufficiently the bad state of repair into which these tanks had fallen.

4TH, 5TH, AND 6TH MILES.—To the south of the river Cortilliar are many irrigation channels led from the river, which are crossed by the railway and fill tanks at a distance from the river. These channels of course served to spread over the country the high level of the water in the river, is that dips in the country quite inland were inundated from the river. The damage done to the railway in the 4th, 5th, and 6th miles may be attributed to this. At 5th mile 11th telegraph post and at 6th mile 11th telegraph post, culverts over these channels were destroyed.

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SIXTH MILE, 11TH AND 20TH, 21ST, 22ND TELEGRAPH POST.—The water in the channel at 6th miles 11th telegraph post was swelled by the bursting of Attapaukum and Poonaveram tanks, and the breach in the bank at 6th mile 20th, 21st, 22nd telegraph post is due to the same cause.

7TH MILE.—Nearly a quarter of a mile of railway in the 7th mile was destroyed by the bursting of Attapaukum tanks, which are fed by the Nemely and Cullar channels from the river Cortilliar, Sayanapuram tank and Pulloor Chittary tank with the floods from the tanks west of them.

7TH MILE 20TH TELEGRAPH POST.—At 7th mile 20th telegraph post a culvert was destroyed by the bursting of the Pulloor tanks, Periar, Poonari, and Chittari. I understand that the paddy land under these tanks is in cultivation all the year round, and that water is supplied by natural springs.

11TH MILE.—In the 11th mile the railway passes at the toe of the Periar or big tank of Govindavaddy or Agram village. This is a very large tank with a thick and high bund, which in the main portion seems in good repair and properly revetted. There is a slight leak appearing to the east of the railway in the public road, but not of a nature to cause anxiety; it seems more of a spring than a leak through the bund. At the end, the bund does not appear in so good a condition, and a breach was made between its calingulahs, adding to their violent discharge; some bank was carried away at the abutments of the three 10 feet bridge, which provides for the waste water of the tank. The small tank of the village was also breached.

14TH MILE.—About three miles west of the railway at the 14th mile are two tanks belonging to Sembarambaucum village; they receive their supply from the Kumbakal channel, which leads water from the river Palar. These tanks have no calingulahs, and the royts were obliged to cut the bunds. The water struck the railway at the 14th mile and caused great damage. The inundation was increased by the bursting of the following tanks:—Avooloor, Thandellum, Benyar, Thypaucum, Govindavady, and Gony Coopum.

I am sorry not to be able to procure a Map to illustrate this report, and very few of the tanks mentioned are to be found on the Ordnance. But it will be understood that the railway traverses a highly irrigated country and meets the line of drainage at right angles. Great numbers of tanks burst (in the Wallajah taluq, I am told, that 52 tanks burst) and the floods let loose met the railway embankment and carried away large portions of the line. No reasonable amount of water could provide for such a contingency.

It will be noticed, in reading the above, that irrigation channels are frequently mentioned. These are canals cut from the river, some of great importance, as the Kumbakal, which requires a bridge of four 20 feet spans where the railway crosses it, which supply water to tanks at a distance from the rivers. There is no control over the supply to these channels, and the consequence is that tanks are liable to be surcharged whenever there is a fresh in the river, and this is not an unfrequent occurrence in the Palar in the rainy season, coming as it does from the high lands of Mysore. At the 14th mile on the railway, where there is a dip in the surface of the country, floods are not rare, the water being no doubt supplied by the Kumbakal channel as was the case this last monsoon. On the 7th December, when I had nearly finished the new bank at the 14th mile, fresh floods came down and carried away a portion of new work; the reason being, I believe, that a fresh came down the Palar, the water being brought on by the Kumbakal channel and through the tanks of Sembarambaucum to the railway.

Many of the tanks, though supplied by special channels from the rivers, are without calingulahs or waste weirs, nor have they proper outlet sluices, and their bunds have been allowed to fall into disrepair.

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Much damage was occasioned to the railway by the second floods on the 28th November, not so much on account of fresh tanks bursting as from the anxiety of the villagers to save some water for the hot season having led them to temporarily repair the breaches in the tanks with straw and mud as soon as the first rain had stopped, but while it was sufficiently evident that more rain was imminent. Of course the tanks, which were now full again from the surface drainage, burst anew, and the water rushing down enlarged the old breaches in the line, deepening the holes and washing away new work. This is particularly the case in the 3rd mile, where a high and costly bank for a deviation was rendered necessary by the depth of the hole; and at 7th mile 20th telegraph post, where the Chittary tank of Pulloor village burst no less than three times in one week, each time inflicting damage on the line and causing much inconvenience and delay.

I have no hesitation in saying that much money was lost to the Company by this pernicious practice, both from the greater work it gave to the repairing parties and from the delay caused in re-opening the line.

(Signed) C. H. G. JENKINSON,
Assistant Engineer.

Reports from Villagers.

THERE are three large tanks attached to the Wallajah Taluq, No. 212, namely, Banakolum, Moongily and Thangul; of these none has a calingulah; Banakolum was repaired about fifteen years ago, and the others were never repaired. They are now in a very bad state, requiring immediate repair. Several applications have been made to the Tahsildar, Collector, and Superintending Engineer with that object, but in vain. In consequence of the recent bursting of these tanks the railway has sustained serious damages, and a good supply of water has been lost.

There is a large tank attached to the Wallajah Taluq, No. 210, called Keelanthoorum. It was repaired by Government about ten years ago. Since the last three years the banks have been gradually falling down, and its calingulah is in a very bad state of repair. We are frequently reporting this to the Collector and subordinates of the Public Works Department, but in vain. In consequence of the late heavy rains the neighbouring Theyvathanum and Malanthoorum tanks have been burst; the calingulah on the western side of Nagavetloo tank was opened, and extensive floods followed, which took their course into the main canal that feeds our tank, damaging it very seriously, and thence into our tank itself; and notwithstanding all our efforts to prevent its bursting, which was of course impossible, the tank gave way in two or three places and discharged itself into Banakolum tank, whose embankments were also strengthened to prevent* water running into it (*sic.*) but to no purpose. We are afraid that even the temporary constructions abovementioned will soon be washed away if the necessary repairs are not executed in time, and a good deal of water supply would thus be lost. The railway has sustained serious damage by the bursting of this tank, and the water taking its course into the Banakolum tank.

(Signed) CHINNATHUMBY REDDY.

THERE are two large tanks attached to the Wallajah Taluq, No. 211, called Malanthoorai and Thangul. These tanks were repaired by Government about twenty or twenty-five years ago. Since the last two or three years their embankments have been in a very decayed state, and I am frequently reporting it to the Sheristadar, Collector, and subordinates of the Public Works Department, but nothing has as yet been done regarding them. In consequence of the late heavy rains,

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the opening of the calingulah of the Nagavetloo tank, and the decayed state of the bunds, these tanks have burst and the floods took its course to the Keelanthoorum tank and caused great damage to the railway. The temporary constructions to prevent the bursting were all washed away, and substantial repairs are therefore necessary to secure the supply of water.

(Signed) SASHADRY SASTRY.

THERE is a tank attached to the Wallajah Taluq, No. 209, called Theyvathanum. It was repaired by Government about fifteen years ago.

No. IV.
Theyvathanum Tank.

Since the last three or four years its bunds have almost fallen, and its calingulah has been destroyed and swept away. I have reported the circumstances to the Collector and Public Works Department subordinates, but in vain. I took the Tahsildar to the spot and showed them to him, and he requested the Public Works Department subordinates to inspect them and undertake the repairs at once and prepare the usual estimates, etc., but nothing has as yet been done towards them. During the last monsoon the Pennair river was in full flood and partly emptied itself into the Navegetloo tank, whose

Two, Palar, Nagavetloo.

two calingulahs had in consequence to be opened, besides other temporary openings of the lake, to prevent overflowing; extensive floods ensued, directing their course into the Ummanoor tank, where the people had opened the calingulah and other outlets. This took place about midnight, and the flood washed into our tank and escaped from it by destroying its bund in five different places, and took its course to the Banakolum tank which was already overflowed. In this manner the flood emptied itself into Banakolum tank and damaged the railway works to the extent of half a mile.

Report of the Villagers of Perumparcherry.

VILLAGE No. 224, attached to the Wallajah Taluq, in the Zillah of Chittoor, has three tanks, named Pullee, Valail Ari and Bana Ari lying about equi-distance between the villages of Perumparcherry and Poyapakum.

No. V.
Perumparcherry village.
Pulle Ari.
Valail Ari.
Bana Ari.

Pulle Ari has breached in one place and Valail Ari in two places.

There are eleven breaches in Bana Ari tank, particularly caused by the high floods in the Payralee channel of Bana Ari into Parumcunjee tank, and subsequently damaged thirty tanks of their calingulahs with several breaches. This Bana Ari tank, by having no calingulah or sluices, was breached, and thereby caused damage to the railway line as well as to the ryots, who tried their best to close them but to no effect. But now the site of these breaches being very expensive for repairs ryots are unable to do them.

These three tanks may now require about 300 or 400 Rupees worth of earthwork repairs, and unless two calingulahs with stone revetment to the tank bund be executed, to the Bana Ari tank in particular, much difficulty will be experienced.

The above proposed works will nearly amount to 3,000 Rupees, and the villagers earnestly pray for their execution.

(Signed) RAMASAWMY REDDY.

N. B.—The Pullee Ari has no calingulah.

Maniem.

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REPORT of the village of Ambanoor, No. 214, of the Wallajah Taluq of the Zillah of Chittoor, lying within one mile on the south-west of Arconum village and about two miles off the tramway and civil road lines.

No. VI.—Ambanoor village.

The tank situated on the south side of this village was repaired by Government some fifteen years ago, but since the last five years the calingulah of this tank has been in a ruinous state, by which the high rush of the late floods through Nagavetlee calingulah washed away the temporary earth bund thrown up at the site of the ruined calingulah as well as making two other breaches; there is also cut breach.

There is also another tank on the north side of the village, the bund of which is in bad order, being repaired some fifteen years ago. The high overflow of the Malpaukum Vallul tank surplus into this tank effected four breaches. This tank has no calingulah, but its surplus finds its way to Panavetty tank, the bund of which is also in bad order.

In consequence of the Engineers not estimating and repairing these tanks at times necessary, we consider that both the tramway and civil road met with the late accidents, and so we pray for the repairs of the above tanks.

(Signed) VENCATAKIRSTNAMA CHARRY,
(..) SOONDRUM, Canakoo.

REPORT of the villagers of Altoopaucum, No. 109, and Poonnaverum, No. 117, of the Wallajah Taluq in the Zillah of Chittoor, lying within 6 miles south of Arconum village. The railway line from Arconum to Conjeeveram and the

No. VII.
Altoopaucum.
Poonnaverum.

civil road are within the limits of the last named village.

In the village of Altoopaucum there are two tanks, and one in the village of Poonnaverum. There are no stone revetments or calingulahs provided for the two tanks of Altoopaucum. The big or first tank was repaired some five or six years ago and the small or second tank about twenty years ago.

The tank of Poonnaverum was repaired some 25 years ago, and the bund is therefore in a ruinous condition. There is no calingulah or stone revetment provided for this tank. There are two breaches in the bund of the big tank at Altoopaucum. The surplus overflow of Altoopaucum small tank, as well as of the big tank at Altoopaucum is the surplus overflow of Altoopaucum small tank and that of Poonnaverum tank from the large tank of Sayanapuram, which breached at two places by having no stone revetments or calingulah provided. The heavy overflows which caused these breaches is chiefly owing to the high flood of the river and its channels. High floods of this nature have not been seen since the last fifty years.

(Signed) MOONESAWMY REDDY,
Maniem.

REPORT of the villagers of Pulloor, No. 80, attached to the taluq of Wallajah in the Zillah of Chittoor, bounded on the north by Arconum, 9 miles off, and within the boundary limits of which village both the railway and civil road are

No. VIII.—Pulloor.

in existence. A tank of this village, called Chithari, which is close to the above mentioned roads on their western side, was only repaired some eight years ago, and the bund is therefore in a ruinous condition. Besides this tank there are two other tanks, named Perriari, or big tank, and Poothari, the bunds of which being repaired some eight years ago are now in a ruinous condition; there is no revetment or calingulah to these two tanks. The late heavy rains from the 20th to the 22nd November 1872, caused the overflow of Nelvoy Sayanapuram, Coopum Colathoor, Agavalum, Thermal, and Reddy Vellum tanks, etc., (all of which are on the west of these two tanks) to run through Perriari and Poothari tanks. This excessive supply of water into tanks whose bunds are

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in a ruinous condition caused three breaches in the Perriari tank, five in Poothari, and three in Chithari. The excessive water of these breaches as well as the high floods in the Vellakal and spring channels damaged the bridges on the railway line; no good earthwork repairs as well as a revetment and calingulah have been carried out of late. The irrigable area under this village yields a revenue of 6,000 Rupees to Government annually, and if the aforementioned works be executed it will be no loss to Government, but at the same time it will be well to the protection of the railway and to the good of the ryots.

REPORTS of the villagers of Govindapaddy village, No. 125, of the Conjeeveram taluq, in the No. IX.—Govindapady or Agaram.

* West.

roads are two tanks, the first called Perriari, or big tank of Govindapaddy, which was repaired some twenty years ago; the second, called Chithari or small tank of Govindapaddy, about 1½ miles off the above roads, was repaired some ten years ago.

By the heavy rains from the 20th to 22nd November last the Vellakal or river channel of the Palar river flowing full caused the overflow of Thermal Puthupaucum, Malvenbankum, Keelvenbankum, Thandelum, Vallenellari, Poyganellari, Kolathoor, etc., tanks on the west of these two tanks which collected into Perriari and Chithari and caused breaches in them. There are two calingulahs in Perriari and two in Chithari tanks of Govindapaddy, the irrigable land under these tanks yields to Government a revenue of Rupees 6,000 annually.

If the necessary annual repairs had been executed both the railway and public road embankments would never have been washed away. We often report to the Tahsildar about the required repairs.

We the undersigned, Subbroya Moodelly, Village Munsif, and Veerabuthra Naick, the Maniem

No. X.—Sembrambankum.

of the village of Shembrambakum of the Conjeeveram taluq in the Zillah of Chingleput, beg to state that the limits of our village boundry is between the 13th and 14th miles of the railway from Arconum to Conjeeveram. In our village there are two tanks called Perriari or big tank and Chithari or small tank lying on the west of the railway. There will be no fear of danger to the railway embankment if earthwork, masonry sluices, and calingulah works be executed to the Perriari tank, which has a full supply through the Kambakal channel from the Palar river anicut and through the Korathur tank. It is usual to let off the excess water of this tank through cuts made purposely into Kotharikal channel. There were no breaches in these two tanks this year except the cut that was purposely opened for safety. Both the railway and civil road will never meet with any accident if the above mentioned two tanks be repaired.

(Signed) SUBBROYA MOODELLY,
Village Munsif.

() VEERABUTHRA NAICK,
Maniem.

(True Copy) (Signed) F. L. DIBBLEE,
Chief Engineer.

(True Copy) (Signed) J. T. FISHER,
Agent and Manager.

No. 668. From Colonel F. J. MOBERLY, R. E., for District Engineer, North Arcot, to the Secretary to Government, Public Works Department, dated Guindy, 21st January 1873, No. 344.

As called for in G. O., No. 2,783, dated 27th November last, I have the honour to enclose a statement showing all tanks, breaches in which might affect the railway running in the North Arcot District.

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Statement showing Names of Tanks and their conditions lying on the sides of the Railway Line in the North Arcot District.

Name of Tanks.	Remarks as to state of Tanks, etc.
SOUTH-WEST LINE.	
No. 1 or Wallajah Range.	
Thalangay thangal	Tank was in very good order and well supplied with calingulah. There is ground for suspicion that they were blocked up by the villagers.
Seekarajapooram tank	In fair order.
Katpak Malary do	Do.
Sclimonthey do	Do.
Ursambali thangal	Do.
Usmandoor tank	In great need of repair.
Mootavades do. (Jaheer)	Do. do.
Mardalum do. do	
NORTH-WEST LINE.	
Pawkalah tank	Not in the least danger of breaching.
Mallalcherovoo tank	In a most efficient condition.
Collappareddy do	Do. do. do.
Damalcherovoo do	Do. do. do.
Megarallah do	Small and estimated for.
Dosalcherovoo do	In good order.
Ummacherovoo do	Now abandoned, and if restored would be a large tank.
Samalacoonah do	Has a fine basin and a bund equal to any pressure.
Nagapattah do	Small tank.
Chunam do	Estimated for, its bund being weak and irregular.
Cotramangalam do	Estimated for.
Tookeyvakam large tank	In good order.
Do. small do.	Could only affect the railway between Poondy and Karikamboddy station, where generally the embankment is high and the masonry works ample in capacity. The danger lies to the south or to that portion of the line running through the Zemindari of Karvetnaggaram, where the tanks are large and the means for surplus water is of far less capacity than to the north.
SOUTH-WEST LINE.	
No. 3 or Vellore Range.	
Two Tanks to the south of the Railway road as far as Vanyambady.	There are two tanks, one is thangal and the other is a proper tank of Peryankoopam village, situated a little more than a half mile from the 115th mile on the railway. These are the only tanks that might affect. The bund of the thangal is very uneven at top and weak in many parts. The stone revetment is greatly displaced, and there is no calingulah of any kind. The tank is situated much higher up to the west. The bund is very uneven and washed down much in front slopes, and the revetment slipped down and displaced. This tank was breached in 1865 and 1867. The breach of 1865 washed away a masonry bridge in the 118th mile on Trunk Road No. 1. A masonry calingulah of 200 feet long is required.
No. 2 or Chittoor Range.	
Coombarajapooram tank	In tolerable good order.
Chembaroyanalloor do	In good order.
Karnampett large do	Do.
Savor Alanthangal do	Very small tank and under repair.

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Statement showing Names of Tanks, etc.—(Concluded.)

Name of Tanks.	Remarks as to state of Tanks, etc.
No. 2 or Chittoor Range.—(Concluded.)	
Savor large tank	In tolerable order but a regulating calingulah wanting.
Karigary Sooltanary do.	Wants repair.
Brammapooram Chedathangal tank	Small tank and under repairs.
Kotpody large tank	The middle portion of the bund wants strengthening and requires repairs generally.
Vandranthangal Elavathettary tank	In good order.
Vandranthangal large tank	In bad order, constantly breaching and Estimate for its repair already submitted.
Karasamangalam do.	Under repair.
Suthary Chittary do.	In good order and calingulah wanting.
Do. large do.	Breached and under repair.
Panamadanghy large do.	In good order.
Bommanaikenpolayam do.	Do.
Soorancooppam do.	Do.
Vickramachy do.	Breached and under repair
Vadoovanthangal do.	In good order.
Vapoonganary do.	Wants slight repairs.
Umnangooppam do.	In tolerable order.
Cheroovankey large do.	In good order.
Ottary tank	Wants repairs.

NORTH ARCOT,
21st January 1873.

(Signed) F. J. MOBERLY, Colonel, R.E.,
for District Engineer, North Arcot.

No. 669. From the District Engineer, Cuddapah, to the Secretary to Government, Public Works Department, dated Camp at Mydukur, 5th February 1873, No. 331.

With reference to Government Order, No. 2,783, of 27th November 1872, I have the honour to inform you that I have inspected all the tanks along line of railway except those in Jammalamadugoo Taluq, which have already been reported on in letter from late Superintending Engineer, 3rd Division, No. 2,015, of 30th November 1872. The enclosed list shows their state, and if they are to be got into good order before next rains I shall require two good active Overseers as a temporary measure to do the work, as the Range Establishment cannot do it in the time.

Statement showing the state of Tanks in the District of Cuddapah, which are situated along the line of Railway from Shettigoonta to Sadipiralla.

District.	Taluq.	Name of Tank.	Present state or condition.
Cuddapah...	Pullempett ...	Shettigoonta Tank ...	Bank wants strengthening, and calingulah a little repair. Estimate is being prepared.
Do. ...	Do. ...	Korlacoonta do. ...	This is a large tank or rather two tanks, one Circar and one shrotriem, joined together; the Circar one is in good order except in at site of an old breach, ordered to be strengthened; both sluices want repair, and west calingulah to be lengthened. Estimate is preparing. The shrotriem tank wants repair badly. Calingulah was destroyed this year, the Collector has been informed about it.
Do. ...	Do. ...	Reddypully do. ...	In good order except the 300 yards near railway, the west calingulah requires an apron. Estimate preparing.

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Statement showing the state of Tanks in the District of Cuddapah, etc.—(Continued.)

District.	Taluq.	Name of Tank.	Present state or condition.
Cuddapah ..	Pullempett ...	Pullempett Tank ...	In good order except where banks join railway. Ordered to prepare estimate. A calingulah also is wanting. Estimate preparing.
Do. ...	Do. ...	Ootookoor do. ...	In good order, one sluice requires repair; directed to be looked to.
Do. ...	Do. ...	Kitchemma do. ...	Bund wants strengthening and west calingulah requires repair. Estimate preparing.
Do. ...	Do. ...	Munnoor do. ...	Bund wants strengthening and calingulah requires lengthening. Estimate preparing.
Do. ...	Do. ...	Hastaveram do. ...	Bund and calingulahs require repair. Estimate preparing.
Do. ...	Do. ...	Patoor do. ...	Bund and calingulah require repair. Estimate preparing.
Do. ...	Do. ...	Nagireddypully do. ...	Bank wants repair and a calingulah required. Estimate preparing.
Do. ...	Do. ...	Nundaloor do. ...	Bank wants repair and calingulah lengthening and lowering. Estimate preparing.
Do. ...	Sidhout ...	Chellamareddy do. ...	Bank good except in one place, and calingulah wants repair; being done.
Do. ...	Do. ...	Kootalammah do. ...	Sluice wants repair, and a small calingulah required. Estimate preparing.
Do. ...	Do. ...	Mungempett do. ...	Very small; wants a little earthwork; ordered to be done.
Do. ...	Do. ...	Ontimitta Tank ...	A large tank; only a short artificial bund which appears to be slightly leaky; will look at it again later in season, tail race of each calingulah wants opening out.
Do. ...	Cuddapah ...	Ootookoor do. ...	Lately repaired; in good order. East calingulah requires to be lengthened. Estimate preparing.
Do. ...	Do. ...	Chintakommadinna do. ...	Bank wants raising and strengthening; small calingulah wants lowering; the large rough stone calingulah is partly destroyed. A new masonry one required, supply channel wants repair. Estimates ordered.
Do. ...	Do. ...	Goorramgumpalapully Tank.	Bank is slipping in two places from springs, and wants strengthening generally; ordered slips to be attended to at once, and estimate for general repair to be sent in.
Do. ...	Do. ...	Gunganapully Tank...	Tank lately reconstructed, bank wants looking to in two or three places. Large calingulah appears to be built in wrong place. Water cannot escape if it gets over, ordered sections, etc., to be taken, and will see again. Estimate preparing.
Do. ...	Do. ...	Coppartee do. ...	Calingulah requires repair, and bank raising and strengthening. Estimate preparing.
Do. ...	Do. ...	Thadigotla Gumpai Cheruvoo ...	Calingulah requires repair and lengthening and bund raising and strengthening. Estimate preparing.
Do. ...	Do. ...	Apeecoontah...	Calingulah required and bank strengthening. Estimate preparing.
Do. ...	Do. ...	At 165½ miles on rail.	A shrotriem tank; wants repair.

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Statement showing the state of Tanks in the District of Cuddapah, etc.—(Concluded.)

District.	Taluq.	Name of Tank.	Present state or condition.
Cuddapah...	Cuddapah	Maguda Coontah ...	Bund wants strengthening and a new calingulah. Estimate ordered.
Do. ...	Do. ...		A shrotriem tank adjoining above requires repair, etc.
Do. ...	Do. ...	Boganarny Coontah ...	Revetment wants repair and a calingulah required. This tank is private property.
Do. ...	Do. ...	Woolavalawance Coonta	Dussavandum tank requires repair, as also two coontahs near Ambaram belonging to Caze of Cuddapah.
Do. ...	Do. ...	Ambaram Tank ...	Bank requires raising and strengthening, rough stone calingulah requires alteration, and sluices want repair.
Do. ...	Do. ...	Camelapoor do. ...	Bank requires strengthening very badly; is being done; revetment also wants looking after, and calingulah to be lowered. Estimate preparing.
Do. ...	Do. ...	Suddipiralla Tank ...	Bank badly in want of repair, also calingulah. Estimate ordered.

CAMP AT MYDUR,
5th February 1873.

(Signed) G. S. SAGE,
District Engineer, Cuddapah.

No. 76.

No. 670. *Note by the Chief Engineer for Irrigation.*

IN G. O. of the 28th February 1872, No. 535, certain Superintending Engineers were directed to depute competent officers to examine all tanks the breaching of which might cause injury to the lines of railway passing through their divisions, and, in G. O., No. 2,783, of the 27th November 1872, some Superintending Engineers not having reported on this subject the District Engineers who had succeeded to the charge of the districts concerned were informed that Government expected an early report.

2. From a perusal of the reports which have come in it appears to be tolerably clear that no sufficient examination of the tanks has been generally made. It is very easy to indicate what ought to be done and the requisite instructions will be given in detail further on, together with a form for the exhibition of the information on which alone any really effective measures for the security of the tanks, and therefore of the railways threatened by them, can be planned; but I am afraid that with the small amount of information available regarding the circumstances of the tanks, the progress likely to be made in dealing with them will be but slow.

3. In order that it may be clearly shown that the tanks are or are not in a secure and efficient condition, the particulars which must be obtained to enable them to be dealt with, should be exhibited in a statement in the subjoined form, and their circumstances should be further explained by a map* on a scale of 1 mile to the inch, showing the connection of the tanks which are not isolated. Where a number of tanks form a chain or a series

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of chains, it is of course practically useless to deal with them without reference to each other, or to put the lower ones in repair, leaving those above them to burst and breach the lower tanks of the series. The requirements of every tank of a chain must be considered at once, and the security of each one in succession from the top to the bottom of the chain provided for. It should not however be overlooked that it is not always necessary to furnish minor tanks with masonry escapes, or to provide larger tanks with such escapes of the full length requisite to pass extraordinary floods, but in every case there must be due provision of either masonry or other escapes. Usually either masonry, or very hard ground, is needed to pass the ordinary flood discharges; beyond this, the quantity up to the maximum may, in the interests of economy, be allowed to flow over hard ground if available, the escape of water at such points being, as a rule, prevented by a low bund, which can readily be removed by the villagers. These expedients in the way of supplemental escapes are confessedly imperfect, but they may, if due judgment be exercised, be made fairly efficient, and they would be a very great improvement upon the existing condition of many of the tanks.

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APPROXIMATE ESTIMATE OF WORK REQUIRED.	Remarks and explanations.	
	Total.	29
Escapes.	24	
Sluices.	25	
Earthwork.	26	
Revetment.	27	
Total.	28	
Highest revenue.	23	
Average revenue.	22	
Extra sluices required.	21	
Whether irrigation cuts necessary.	20	
Number of sluices.	19	
Area irrigated.	18	
Additional height of bund required.	17	
Description of additional escape proposed.	16	
Additional length of waste weir required.	15	
Depth on crest required to pass maximum flood discharge.	14	
HEIGHT TO BUND.	Above crest of escape.	12
	Above top of dms stones.	13
Estimated maximum flood discharge from catchment basin.	11	
CALCULATED OR WASTE WEIR LENGTH.	Effective.	10
	Total.	9
Capacity of tanks surplusing into.	8	
Number (in series or chain) of tanks surplusing into.	7	
Other sources of supply, if any.	6	
Area of catchment basin in square miles.	5	
Approximate capacity of tank when full.	4	
Approximate area of tanks.	3	
Names of Tanks.	2	
Number in series.	1	

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28th March 1873.*

4. The details of information required may appear numerous, but there is not one detail which can be omitted from the calculation with safety. The collection of the information as to facts will take time, and then some knowledge will be needed for a right use of it, in connection with maximum recorded rainfall, and other local circumstances. I am of opinion that the staff of the districts is not adequate to the task of dealing with this matter promptly and effectively, and it may be noticed that what is now pressingly wanted for the comparatively few tanks affecting the railway is required for the good management and efficiency of all the tanks all over the country, and is one of the objects intended to be secured in the grouping of such works, which has been lately decided upon.

5. I think it will be of some use to call for a short return showing the tanks which were repaired with reference to the instructions contained in G. O., No. 535, of the 28th February 1872, and the amount and nature of the outlay upon them; secondly, the tanks not considered in need of repairs; and, thirdly, noting which of them breached during the last rainy season. Unless Government are prepared to abandon many tanks altogether as irrigation works, accidents must be expected to happen in such a season as that which has recently been experienced, but still there are plenty of preventable accidents, that is accidents which may be averted by a timely and perfectly reasonable outlay on works the efficiency of which is worth ensuring.

6. In connection with the unusual floods in the Cortiliar this year, the special attention of the District Engineers of North Arcot and Chingleput has been called to the probability that much of the water was received from the Palar either through the Cauverypauk tank or by inundation; and they have been requested to devise measures in concert for preventing the Palar freshes from doing injury. The north main channel from the Palar has a head sluice, but it seems probable that this was turned, and that further the flood waters passed from the Palar, below the anicut, across the country towards the Cortiliar.

FORT ST. GEORGE,
11th February 1873.

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

No. 671.

ORDER THEREON, 28th March 1873, No. 963.

IRRIGATION, No. 31.

The Chief Engineer for Irrigation appears not to have rightly apprehended the intention of Government Order No. 184, of 20th January 1873, commending to his attention the adoption of effectual measures for maintaining all tanks above lines of railway in a state of security. In their Order No. 535, of 28th February 1872, the Government had called for reports on the state of tanks affecting railways in the districts of Bellary,

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28th March 1873.*

Cuddapah, North Arcot, Chingleput, Salem, Tanjore, Trichinopoly, and Coimbatore. They had occasion to take notice of neglect of these instructions in their Order No. 2,783, of 27th November 1872. From Tanjore, Trichinopoly, and Coimbatore only have reports been received that give any assurance that proper attention has been paid to the subject, and that funds have been fully allotted for carrying out the necessary repairs. It only remained to be ascertained that a certain drainage, alluded to in the 4th paragraph of Major Hasted's letter as affecting the railway in Trichinopoly limits, but chiefly lying within Coimbatore, had not been lost sight of by the Engineer in charge of the latter district. The reports from Bellary, Cuddapah, and North Arcot, coupled with those of the officials of the Madras and Carnatic Railways were not of a nature to show that the requisite attention had been paid to the subject; and from Chingleput and Salem no reports had been received.

2. The railway lines were laid out with full knowledge on the part of their projectors of the dangers to which the position of certain tanks exposed them. The Government cannot, therefore, undertake to place all tanks affecting them in a state of absolute security, or to treat them exceptionally from other tanks which may be of more general importance. But *ceteris paribus*, the existence of railways under tanks is another inducement, were any wanting, to maintain the latter in a state of efficiency. And the Government accordingly desired that the attention of the Chief Engineer for Irrigation, which had already been called to more systematic supervision of outlay on Irrigation Repairs generally, should be specially directed towards securing prompt and thorough attention to their previous orders regarding railway tanks. The Government believe that under Colonel Mullins' personal direction in exceptional cases, and by his constant direct communication with District Engineers, a considerable improvement in the protection of railways from the breaching of tanks may be secured at a moderate cost and within a reasonable time, and they desire that this should not be delayed by the preparation of the elaborate statements which Colonel Mullins proposes to obtain before any action is taken.

3. The circumstances of the Department Public Works consequent on its very recent re-organization appears to His Excellency in Council to prevent for the present any steps being taken towards a more scientific treatment of chains of tanks, beyond supplying each Taluq Oversoer, Range Officer, and District Engineer, with copies of the Revenue Survey Taluq Maps on the scale of a mile to the inch, so far as published, to aid those officers in grouping them and dealing with them more systematically than hitherto.

4. It is presumed that the Cuddapah District Engineer has been authorized to employ the two temporary Overseers he requires. The tanks affecting the Carnatic Railway do not appear to be noticed in the North Arcot statement, which omission should be accounted for with reference to Mr. Jenkinson's Report and its accompaniments. It is observed that the Chief Engineer for Irrigation has already

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28th March 1873.*

called on the District Engineers of North Arcot and Chingleput to devise measures for dealing more effectually with the flood waters of the Palar.

(True Extract.)

Colonel, R.E.,
Secretary to Government.

To the Chief Engineer for Irrigation.
„ Consulting Engineer for Railways.
„ District Engineer, Bellary.
„ „ Cuddapah.
„ „ North Arcot.
„ „ Chingleput.
„ „ Salem.
„ „ Tanjore.
„ „ Trichinopoly.
„ „ Coimbatore.

Ed. S. T. Austin.

10
3
No. 10
Railway Department.

CONSULTING ENGINEER'S OFFICE,

No. 6

From

LIEUT.-COLONEL J. H. M. SHAW STEWART, R.E.,

Consulting Engineer for Railways,

To

COLONEL G. W. WALKER, R.E.,

Secretary to Government,

Public Works Department,

Fort Saint George.

SIR,

At the request of the Agent
of the Madras Railway Company, I have
the honour to forward, for the consideration
of Government, the accompanying letter re-
garding the insecure state of certain tanks
in the vicinity of the line of railway. Mr.
Elwin also begs that attention may be drawn
to the order of Government dated the 28th
February 1872, No. 535.

2. Upon receipt of the letter in
question, those portions of it which referred

No. 935
18th Dec^r 1872
with enclosures

to the Lamlapoor and Charapully tanks
were sent to the District Engineer of
Cooldapah, with a request that the dangerous
condition in which they were represented to be
might receive early and careful consideration.

3. The Royempett tank is within
the Carwarthugger zemindary. I have asked
the Collector of North Arcot to exert his in-
fluence with the Zemindar in order to insure
that, if the tank is repaired, the work may
be executed in a thoroughly efficient manner,
and that a suitable Calingular may in
future be provided.

I have the honour to be,
Sir,

Your most obedient servant

Madras
7 January
1873

W. Maitland
Lieut. Col. R.E.
Cons. Engr. for Railways

Railway Department.

CONSULTING ENGINEER'S OFFICE.

From

LIEUT. COLONEL J. H. M. SHAW STEWART, R.E.

Consulting Engineer for Railways,

To

COLONEL G. W. WALKER, R.E.,

Secretary to Government,

Public Works Department,

Fort Saint George.

SIR,

With reference to the order of Government dated the 8th instant, No. 25, I have the honour to submit a letter from the Agent of the Carnatic Railway Company giving cover to further reports as to the cause of the injury which the open line sustained upon the 23rd November 1872.

It will be seen that, with regard to the river collision and the amount of waterway allowed by the Railway bridge, the Chief Engineer says that additional information must be obtained before a definite report.

No 25

22 Jan'y 73.

with enclosures

No 28 - February 73

P. M. 1873

RAILWAY DEPARTMENT.

From

The Consulting Engineer for Railways,

To

The Secretary to Government,
P. W. Department,
Fort Saint George.

Date Recd. 23rd Jan'y 1873

No. 6

Step 63-28th March 73

Letter received from the Agent of the Carnatic Railway Company stating that the insurance of certain tanks in the vicinity of the line of

No. 25.

From

J. J. Fisher Esq^r

Agent & Manager

Carnatic Ry. Co. Ltd.

To

Genl Col. J. H. M. Shaw Stewart R. E.
Consulting Engineer for Ry.
Madras.

Sir

With reference to your letter
No 20 dated the 16th Inst I regret that
my having omitted to call attention
to the request contained in the Chief
Engineer's letter No 623, forwarded with
mine of the 26th Inst. 1872 No 640
should have caused it to have been
overlooked and have the honor to
state that in future the request
contained in the second paragraph
of your letter under reply shall
have attention.

I have now to submit a
copy of the Chief Engineer's further
report No 56 dated the 21st instant
together with extracts from a
report by Mr. Jackson and trans-
lations of statements made by
Villagers respecting the burning of
banks adjacent to the line, by

line before November, in addition to various
occasional visits. Now that the special
work upon which the Chief Engineer has
been hitherto employed is finished, or
nearly so, I have suggested to the Agent
that these inspections should be made
regularly once a quarter, as on the other
lines of railway in the Presidency.

I have the honor to be

Sir

Your most obedient servant

W. Stewart Esq. R. E.

Consulting Engineer for Railways

Madras
30 January 1873

W. J.

Observations on the
reports as to the cause
of the fire on the line of the
Carnatic Railway Co.
23rd Nov 1872
Chgo 63-28^a 11/13

Dated 30th Jan'y
1873

No. 70

21

To
The Secretary to Government,
P. W. Department,
Fort Saint George.

From
The Consulting Engineer
for Railways.

1873

RAILWAY DEPARTMENT.

W. J. Fisher Esq. R. E.
Jan'y 22nd 1873

which the damage done to the
line on the occasion of the recent
floods was so greatly influenced.

The information therein supplied
you may probably consider all
that is necessary to be supplied by
the Co's Officers as to the causes
which led to the damage, and
that any further information
respecting the supply channels from
the Palar which may be required,
will be obtained from the Officers
of the D. P. W. I shall nevertheless
be happy to answer any further
enquiries you may desire to make
as far as ^{being in my} power to do so.

I have the honour to be
Sir

Yours most obedt Serv^t

J. T. Fisher

Agent & Manager

Letter Aug 22. 1873.
23

20
died Oct. 1. H. W. Stuart
Cousing's for App
Wardens

John
J. J. Fisher
Agent & Insurance

Statement showing how ~~many~~ ^{many} ~~kind~~ ^{kind} ~~of~~ ^{of} ~~and~~ ^{and} ~~again~~ ^{again}, which are 20
Actual ~~and~~ ^{and} ~~the~~ ^{the} ~~line~~ ^{line} ~~of~~ ^{of} ~~railway~~ ^{railway} ~~from~~ ^{from} ~~Shanghai~~ ^{Shanghai} ~~to~~ ^{to} ~~Harbin~~ ^{Harbin} ~~cella~~ ^{cella}

District
 Telling
 Name of bank

Pullenpott — Hettigorota Tuck.

Co. ————— Karlaevosta Tank

Bank wants strengthening and being such a little repair.
Estimate is being prepared.

This is a large tank or rather 2 tanks one lined and
the other in iron joined together, the interior is in good
order excepting the water of an old beach, ordered to
be strong & covered both sides want repair, and were

The Throhm tank wants repair badly. Calingalar was destroyed this year, the collector has been informed about it.

In good order except the 300 yards near railway.
 West Calingulak requires an Apron. Estimate prepared.
 In good order except where bank to join Railway.
 ordered to prepare Estimate - A Calingulak also in
 wanting. Estimate preparing.

Respectfully,
 Yours,
 Frank

Excellent. Thank-

Present state of the fortification

Name of tank

District

Name of tank

Present state of the fortification

Pullemipott	Ortattor Tank	The good sides, and since requires repair, presented to be looked to.
Do.	Kitchener Tank	Drum wants strengthening and west Calingulach requires repair. Estimate preparing.
Do.	Munoor Tank	Drum wants strengthening and Calingulach requires strengthening. Estimate preparing.
Do.	Nantavaram Tank	Drum and Calingulach requires repair. Estimate preparing.
Do.	Paloor Tank	Drum and Calingulach requires repair. Estimate preparing.
Do.	Nagerreddy pully Tank	Drum wants repair and Calingulach requires. Estimate preparing.
Do.	Kundaloor Tank	Drum wants repair, and Calingulach strengthening and lowering. Estimate preparing.
Do.	Chellamareddy Tank	Drum good except in one place and Calingulach wants repair, being done.
Do.	Arattalavaram Tank	Drum wants repair, and a small Calingulach requires. Estimate preparing.
Do.	Mungampott Tank	Very small, wants a little earthwork, ordered to be done.
Do.	Chattinotta Tank	Drum tank, good, but the bottom of the tank which appears to be slightly better will be at it again. Lateral in ground tank and one of each Calingulach wants strengthening.
Do.	Chidlapah Tank	Drum repaired in good order. East Calingulach requires to be strengthened. Estimate preparing.
Do.	Chittakottam Tank	Drum wants strengthening and strengthening small Calingulach wants lowering, the large rough stone Calingulach is partly destroyed, a new having been required, supply obtained wants repair. Estimate preparing.
Do.	Gooramgumpal Tank	Drum is slightly in places from opening and wants strengthening generally ordered to be attended to, and one small estimate for general repair to be sent in.

Present state of condition

Kind of tank

Water

Chudalapada Gungampully Tank - Tank lately purchased but water looking to
 be two or three feet deep, large kalungulak of iron
 to be built in wrong place, water cannot escape
 if it gets ordered sections are to be taken &
 will require. Estimate preparing.
 Chudalapada requires repair, and strengthening
 and strengthening. Estimate preparing.

Chudalapada requires repair, and strengthening
 and strengthening. Estimate preparing.

Chudalapada requires repair, and strengthening
 and strengthening. Estimate preparing.

Chudalapada requires repair, and strengthening
 and strengthening. Estimate preparing.

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Chudalapada requires repair, and strengthening
 and strengthening. Estimate preparing.

Chudalapada requires repair, and strengthening
 and strengthening. Estimate preparing.

5th February 1893

Chudalapada requires repair, and strengthening
 and strengthening. Estimate preparing.

No 331

Cuddapah District Engineer's Office
Camp: Hospitaller
5 February 1873.

From
The District Engineer
of Cuddapah
To The Secretary to Government
D. O. W.

Fort Saint George

Sir, With reference to Government Order
No 2703 of 27th November 1872, I have the honor
to inform you that I have inspected all the
tanks along line of railway except those
in Tammalamadugoo Taluq which have
already been reported on in letter from
late Superintending Engineer 1st Division
No 2015 of 30th November 1872. The annex
list shows their state and if they are
to be got into good order before next
rain, I shall require 2 good active
Overseers as a temporary measure to do
the work, as the Range Establishment
cannot do it in the time.

I have the honor to be
Sir,
Your most obed^t Servant

[Signature]
District Engineer of
Cuddapah.

I enclose in a letter
from the District Engineer
of Cuddapah dated
5th February 1873
No 331
No 25 Nov 73 Bk: 569.
Enclosed along the
state of tanks in the District
of Cuddapah, which
are situated along the
line of Railway from
Chingenta to Hospitaller.

Area irrigated.	Number of sluices	Whether irrigation cuts necessary	Extra sluices required	Average Revenue	Highest Revenue	Approximate estimate of work required.				
						Escapes	Sluices	Earth work	Canal work	Total.
18	19	20	21	22	23	24	25	26	27	28

Remarks & explanations.

29.

4. The details of information required may appear numerous, but there is not one detail which can be omitted from the calculation with safety. The collection of the information as to facts will take time, and then some knowledge will be needed for a right use of it, in connection with maximum recorded rainfall, and other local circumstances. I am of opinion that the staff of the District is not adequate to the task of dealing with this matter promptly & effectively, & it may be noticed that what is now pressing is wanted for the comparatively few Tanks affecting the Railway is required for the good management & efficiency of all the Tanks all over the country, and is one of the objects intended to be secured in the grouping of such works, which has been lately decided upon.

5. I think it will be of some use to call.

Copy

1873-28th Dec 1873.

Atto in connection
with the subject of
examination of tanks
near Railway lines

Date 11th
Recd 12th February 73.

1876.

From 1873 to 1876
No. of papers for March
from 1874 to 1875
The following for Mr.
to Mr. Secretary to Govt.
P.M. D.

P. N. Dept.

Proceedings of the Madras Government.

Read the following papers.

From the Consulting Eng^r for Railways.

Transmitting a letter from the
Agent and Manager, Madras Railway,
on the insecure state of certain Tanks
in the vicinity of the Railway - (H.E. No. 6 dated 7th Jan/73)

No.

No.

No.

Forwarding further reports on
the cause of injury sustained by the open
line of the Carnatic Railway. (No. 70 of 31st Dec)

Read also the following note by the Chief Eng^r for Irrigⁿ.

Ordered that the
note by the Chief Engineer
for Irrigation be communi-
cated to all District Engineers
and that the papers received
from the Consulting Engineer
for Railways be sent to
the District Engineers, (then
Sephur and North Arcot, in
order that the tanks

which burst during the last monsoon, or which are reported to be insecure may receive special and early attention. It will be understood that all banks which directly or indirectly affect the security of any line of railway are to be examined, and the repairs required ascertained with as little delay as possible; and, unless the District Engineers have Range Officers fully competent to deal with this subject, the Government will expect them to inspect the banks themselves and to give detailed instructions

regarding every bank the size of which is sufficient to be of any consequence; as regards the effect of the volume it will hold upon the Railway or other banks lower down in the chain.

2. The subject of the inadequacy of the Engineer Establishment will be taken into consideration at an early date. In the meantime District Engineers should themselves do as much as may be in their power to compensate for the want of a sufficient number of fully qualified Assistants, by taking care to furnish full written instructions

in respect of all works
visited by them.

3. The return referred to
in para 5 of the Chief
Engineer's Note should be
prepared at once by the
SE Engineers concerned, and
sent to that Officer for
submission to Government,
and the instructions in
that Note should be care-
fully attended to by all
District Engineers.

13/4/73

...

...

...

In the first of
these letters Major Hasted
reports that he has had
all the Tanks in the
late 6th Division, in
which breaches might
affect the Great Southern
of India Railway, -
thoroughly examined,
and arrangements for
the

the repairs found necessary
have been made. The Dis-
trict Engineer Trichinopoly
will ascertain from the
District Engineer Coimbatore
whether the Oppadamm-
gallum Tank in the latter
District and the tanks, if
any, above it are in such
order, and so sufficiently
provided with escapes, as
not to endanger the Veera-
giam tank in Trichinopoly.

2 The District
Engineer North Arcot
has transmitted a list of
the tanks in that District
which are so situated as
to be liable to affect the
South West and North
West

West lines of the Madras
Railway. The open line
of the Carnatic Railway
appears to have been
overlooked. The particulars
given are not sufficiently
full to admit of any
opinion being formed
as to their real condition,
but further orders will
shortly be issued on the
subject of the systematic
treatment of all such
Tanks.

3 The District
Engineer Cuddalore
has inspected all the
Tanks affecting the
Railway in his District,
except those in the
Sammalamaruppo

Trucks along Railroad

44-1312/73

Read all following.

The Inspectors of R.R. (H.E. Mebbis - 7 Nov / 72)
The General Engineer } (H.E. Dec 6 / 94 Jan / 73)
for Railways
" " " " " 40-30"
District Engineer } (" " " 344 . 21 "
" Route Agent } (" " " 531 " 5 "
" " " " " " " 46 " 11 "
Chief Engineer for Oregon }

The Chief Engineer for Irrigation appears not to have rightly apprehended the intention of Government Order No 184 of 20th January 1873, commending to his attention the adoption of effectual measures for maintaining all Tanks above lines of Railway in a state of security

security. In their Order
No. 535 of 28th February
1872 the Government had
called for Reports on the
state of Tanks affecting
Railways in the Districts
of Bellary, Cuddapah,
North Arcot, Chingleput,
Salem, Tanjore, Trichinopoly,
and Coimbatore. They had
occasion to take notice of
neglect of these instructions
in their Order No 2783 of
27th November 1872. From
Tanjore, Trichinopoly,
and Coimbatore only have
reports been received that
give any assurance that
proper attention has been
paid to the subject, and
that

35
that funds have been
fully allotted for carrying
out the necessary repairs.
It only ~~remained~~ ^{remained} to be
~~ascertained~~ ^{ascertained} that a certain
drainage alluded to
in the 11th para of Major
Hasted's letter as affect-
ing the Railway in
Trichinopoly limits, but
chiefly lying within
Coimbatore, had not
been lost sight of by
the Engineer in charge
of the latter District.
The Reports from
Bellary Cuddapah
and North Arcot, coupled
with those of the Officials
of the Madras and
Carnatic

Carnatic Railway were not of a nature to show that the requisite attention had been paid to the subject. And from Chingleput, and Salem no reports had been received. The Railway lines were laid out with full knowledge on the part of their projectors of the dangers to which the position of certain tanks exposed them. The Government cannot therefore undertake to place all Tanks affecting them in a state of absolute security, or to treat them exceptionally from other

other tanks which may be of more general importance. But ceteris paribus, the existence of Railways under Tanks is another inducement, were any wanting, to maintain the latter in a state of efficiency - and the Government accordingly desired that the attention of the Chief Engineer for Irrigation, which had already been called to more systematic supervision of outlay on Irrigation Repairs generally, should be specially directed towards

towards securing prompt
and thorough attention
to their previous orders
regarding Railway Tanks. ^{Int. say.}

Such action, as
is desired is not to be
secured by mere reitera-
tion of Government Orders
or by calling for the
supply of information
in such detail as that
proposed by the Chief
Engineer for Irrigation
and in the present cir-
cumstances of the Public
Works Department so
recently reorganized
it is out of the question
that any steps can yet
be taken towards a
more

We must believe that under
Colon Mullins' personal direction
^{in exceptional cases}
~~where necessary~~, & by his
constant direct communication
with District Engineers, a
considerable improvement
in the protection of Railways
from the breaching of Tanks
maybe ^{secured} ~~obtained~~ at a
moderate cost & within a
reasonable time, and the
Govt desire that this shd
not be delayed by the
preparation of the elaborate
statements which Col. Mullins
proposes to ^{obtain} ~~have prepared~~ before
any action is taken.
The circumstances of the D.P.W.
consequent on its very recent
reorganization appears to
H.E. in Council to prevent
for the present any steps
being taken

35
more scientific treat-
ment of chains of
Tanks, beyond supply-
ing each Talook
Overseer, Range Officer
and District Engineer,
with copies of the Re-
venue Survey Talook
Maps on the scale
of a Mile to the Inch,
so far as published,
to aid those Officers in
grouping them and
dealing with them
more systematically
than hitherto.

It is presumed
that the Cuddalore
District Engineer has
been authorized to em-
ploy the two temporary
Overseers

Overlooked he required.
 The tanks affecting
 the Carnatic Railway
 do not appear to be
 noticed in the North
 Arcot Statement;
 which omission should
 be accounted for with
 reference to Mr.
 Jenkinson's Report
 and its accompani-
 ments. It is observed
 that the Chief Engi-
 neer for Irrigation
 has already called
 on the District En-
 gineers of North
 Arcot and Chingleput
 to devise measures
 for dealing more
 effectually.

30 36
 effectually with the
 flood waters of the
 Paluv.
 G.M.W.

Log
 Messrs. Eng. for L. ✓
 Cons. Eng. for R. ✓
 Dist. Eng. Bellary ✓
 Chingleput ✓
 North Arcot ✓
 Chingleput ✓
 Salem ✓
 Tanjore ✓
 Trichinopoly ✓
 Coimbatore ✓
 + Controller of Forests ✓

90
 12

Dec. 14/73.
 1/4/73.

945 A, 80, 450, 872,

5714, 2659 *

Sept. of 1873 Madras.

PUBLIC WORKS.

To the Chief Engr for
Irrigation

Date

Recd.

Encl. 6

G. 028th March 1873.

No. 665 Cb/1

Thanks. Present orders
papers on the subject
of maintaining
banks above
level of carrying in
state of security.

No. 665. 71