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Local & Munl. (1897) Department.

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[Despatch Abstract.]

Water Supply

Sanctioning, with remarks, the estimate of Rs 231000 for the Scheme of — for the town of Tirupati, ordering the publication in the Fort St George Gazette of an application for a loan of Rs 59000 for the work from Provincial funds, requesting the Pwd to post the work in hand without delay, and noting the liberality of the Mahant in contributing towards the cost of the work.

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

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Government {1897} of Madras.

LOCAL AND MUNICIPAL.

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G.O., No. 48 M., 16th January 1897.

JANUARY.

Water-supply.

Sanctioning, with remarks, the estimate of Rs. 2,31,000 for the scheme of — for the town of Tirupati; ordering the publication in the *Fort St. George Gazette* of an application for a loan of Rs. 59,000 for the work from Provincial funds; requesting the Public Works Department to put the work in hand without delay; and noting the liberality of the Mahant in contributing towards the cost of the work.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—the following papers:—

From J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E., Secretary, Sanitary Board (Engineering Branch), to the Chief Secretary to Government, dated Fort St. George, 1st April 1896, No. 1019.

I have the honour to forward herewith a report, plans and estimates in reference to the water-supply scheme for Tirupati as approved by the Sanitary Board.

ENCLOSURES.

REPORT on a Scheme for the Water-supply of Tirupati.

There are several sources from which water might have been supplied to the town of Tirupati. There is water in a number of places within a short distance of the town. The choice of the source of supply therefore depended upon (1) the quality of water, (2) the cost of the scheme.

2. An unfailing and sufficient supply of water might have been obtained by infiltration works either in the bed or on the banks of the Suvarnamukhi river, which flows 2½ miles to the south of Tirupati. Water could also have been obtained in various degrees of abundance by infiltration works in the valleys of the several hill streams which intersect the country around Tirupati.

3. The first site explored for a source of supply was a valley to the north of the town marked B on accompanying plan. The possibility of a supply from this valley was suggested to the Assistant Sanitary Engineer by the Sanitary Commissioner.

4. Four trial-pits were sunk at the spot indicated by the Sanitary Commissioner. The soil consists of red sandy earth varying in depth from 5 to 11 feet. The stratum below this consists of bluish-grey clay intermixed with lime nodules. Water was found close to the surface of ground. The maximum inflow in one of the trial pits was ½ cubic foot per minute; in the others it was a little less. The depth of water in all the trial pits was 10 feet. The sub-soil, though slightly porous, is sufficiently hard to stand almost vertical without shoring and the gallery could be easily deepened to 15 feet below water-level, which would give an increased flow.

This source of supply has however many disadvantages:—

(1) Pumping would be necessary. The lift would be about 60 feet, and the annual expenditure (all charges included) would be about Rs. 11,000 on the assumption that Government contributed half the initial cost. The annual expenditure of the scheme finally adopted, on the same basis, will be Rs. 8,000.

(2) The supply would not be so copious as in the suggested scheme.

(3) The result of the chemical analysis of the water (Appendix I) from these pits is not favourable.

(4) The drainage of that slope of the hill on which the path to Upper Tirupati lies is received by this valley. The Sanitary Commissioner was unaware of this when he suggested this source of supply, or he would have condemned it as being liable to pollution from cholera matter from persons taken ill on their way to Upper Tirupati.

5. Some more trial-pits were dug in search of underground water in other directions, but the above objections excepting No. 4 seemed to apply to all these sources of supply in a more or less degree.

6. Attention was next turned to the Suvarnamukhi river as a source of supply. The easiest scheme would have been to construct infiltration works in the bed of the river at the point nearest the town. Such a scheme would have involved pumping to a considerable height, and there are extensive tracts of cultivated land on both banks of the river above this point. It

was therefore decided to go higher up the river to minimise the chance of possible pollution of the water by the drainage from cultivated lands on its banks. It became apparent as the levelling operations progressed that by going sufficiently far up the river, a site could be found for infiltration works which would allow water to be conducted to the town by gravitation. To find a point which fulfilled the above two conditions in the highest degree possible with a due regard to cost, it was necessary to go some distance up the Kalyani, which is the main tributary of the Suvarnamukhi.

7. The site selected is on the right bank of the Kalyani at the angle formed by the river and the South Indian Railway which crosses it. At this place there is a spring head from which a channel is led off to irrigate certain lands below. The spring has never been known to fail within the memory of the oldest resident. This water has a very high reputation and is considered by the people superior to the water in the bed of the stream. The soil of the bank at this spot and around it is a red sandy earth, and to this circumstance the superior quality of the water may be attributed. The water has been analysed and classed as usable. The result of the analysis will be found in Appendix II. With infiltration works in which water will be absolutely protected from direct contamination by men and animals and in which a lower, and therefore presumably a purer, stratum of water will be tapped, it would not be incorrect to surmise that the purity of water would be greater than that of the sample submitted to the Chemical Examiner.

8. The population of Tirupati was, at the census of 1881, 13,232, and at the census of 1891, 14,242. A provision for 24,000 people at 15 gallons per head is considered sufficient for the requirements of the town, including the pilgrims visiting the town during festivals. The quantity of water required is therefore 360,000 gallons per day or 250 gallons per minute.

9. No experiments have been made to test the yield of water, because there is enough of circumstantial evidence as regards the probable yield of water. Through the courtesy of the Chief Engineer, South Indian Railway, the accompanying tracing, giving particulars of soil passed through and amount of pumping required in building the piers of the railway bridge across the Kalyani, was obtained. The water in the excavation for west abutment, which is on the right bank of the river and close to the site of the proposed infiltration works, was, with great difficulty, kept down by a six-inch centrifugal pump, which is capable of discharging about 600 gallons per minute. This quantity is double the maximum requirements of Tirupati. The Chief Engineer of the South Indian Railway, however, says that the foundations of this bridge were taken out in an unfavourable season. Constant small freshes came down the river while the work was in progress. The infiltration gallery will be 1½ feet deeper than the west abutment of the railway bridge and 330 feet in length, which is about twenty times the length of excavation taken out for the abutment. The length of gallery provided in the scheme is considered ample.

10. If the scheme, however, is approved, it is suggested that experimental pumping should take place in the next dry season to test the yield before any of the works are begun.

11. The water from the sandy bed of the Suvarnamukhi river has also been analysed and pronounced "usable." Should the proposed infiltration gallery not give the required supply—which is a very remote contingency—the supply could be easily augmented by collecting the water in the bed of the river by a line of open-jointed pipes laid in the sand and connected with the collecting well as shown on plan No. 2.

12. *Drawing Nos.* 2, 3.—The infiltration works will be formed by cutting a trench 330 feet long with its bottom six feet wide and at the level of 605·00. Four rows of open-jointed six-inch stoneware pipes will be laid in the bottom of the trench, and the trench will be filled up to a height of five feet with stones varying in size from four inches to the size of a pea, the largest-sized stones being placed just over the pipes. Above the level of the stones the trench will be filled up with pure sand from the bed of the river At the two extreme ends of the gallery there will be a well eight feet in diameter with its bottom, which will remain unsealed, at the level of 600·00 or five feet below the level of the infiltration pipes. These two wells are provided in the hope of tapping deeper springs which the main cutting would not touch. The advisability of sinking the two extreme wells at a deeper level is suggested by the pumping particulars given by the Chief Engineer of the South Indian Railway as regards pier No. 3, which was taken down to the level of 602·14 and required two six-inch centrifugal pumps to cope with the water in the excavation

13. The lowest water-level has been ascertained to be 115·00. The infiltration pipes will therefore be ten feet below low-water level and the bottom of the end wells fifteen feet below low-water level.

14 The infiltration pipes from the right and left will be connected with a central well. As it would be inconvenient to connect four rows of pipes, each requiring a valve to control it, with the central well, the four rows of six-inch pipes will terminate in an oblong cistern on each side of the well, and from this cistern a single line of pipes will be connected with the well. The mouths of the two pipes into the well will be controlled by valves.

PROCEEDINGS of the Sanitary Board (Sanitary Engineering Branch), dated 1st April 1896, No. 1018.

* * * * *

Read—G.O., Mis. No. 883 M., dated 9th July 1894.

Read—also the Sanitary Engineer's report, dated 18th October 1895, on the water-supply of Tirupati, accompanied by plans and estimates.

Resolution.—The Board considers that, as the scheme drawn up by the Sanitary Engineer provides for 24,000 or 10,000 in excess of existing population at 15 gallons per head, the scheme may be generally approved with the following amendments:—

(1) Break-pressure tanks to be provided on stoneware pipe main instead of manholes or overflows.

(2) Six bathing-houses for twelve persons each to be provided.

(3) The masonry fountains to be faced with glazed bricks instead of cement.

(4) Perforated iron pipes to be used in filtration gallery instead of stoneware loose-jointed pipes.

(5) The service reservoir to be increased from one containing two-thirds of a day's supply as designed by the Sanitary Engineer so as to contain two days' supply and to be divided into two compartments.

The plans, estimate and report have been modified accordingly and will be forwarded to Government for sanction.

2. The Board recommends that a sum of Rs. 10,000 be granted as soon as possible to construct filter-well and test the yield during the immediately approaching dry season.

No. 551.

Referred to the Municipal Council, Tirupati, for early remarks and report as to how it proposes to meet the annual expenditure on account of the scheme, assuming that Government will make a grant of three-fourths of the cost of the scheme, and lend the remaining one-fourth to be repaid in thirty years with interest at $4\frac{1}{4}$ per cent. per annum.

(By order.)

FORT ST. GEORGE,
16*th May* 1896.

(Signed) W. W. PHILLIPS,
Acting Assistant Secretary.

To the Chairman, Municipal Council, Tirupati.

From J. A JONES, Esq., MEM. INST. C.E., F.R.S.E., Sanitary Engineer to Government, to the Chief Secretary to Government, dated Fort St. George, 9th July 1896, No. 2143.

With reference to G.O., Mis., No. 843 M., dated 15th May 1896, sanctioning the construction of filter-well, &c., at Tirupati for testing the yield, I have the honour to point out that, if the yield is satisfactory, the council should be in a position to proceed with the remaining works, because otherwise if the well and trenches remain open and unprotected, additional expenses will be incurred for pumping, clearing trenches and excavated foundations in trenches, &c.

2. I have, therefore, the honour to suggest that Government will be pleased to make some financial arrangements for the works being proceeded with in, say, five months from this date (when the experiments are likely to be complete).

3. The possible contributions from Tirupati and Mahant are noted in the report which accompanied the estimate and plans sent with the Sanitary Board's resolution, No. 1018, of 1st April 1896.

From M.R.Ry. K. GOPALA CHARIYAR Avargal, Rao Sahib, Chairman, Municipal Council, Tirupati, to the Chief Secretary to Government (through the Head Assistant Collector of North Arcot), dated 20th June 1896, No. 295.

In reply to your endorsement, No. 551, dated 16th May last, on the report of the Secretary, Sanitary Board, Engineering Branch, in connection with the water-supply scheme for this town, I have the honour to forward herewith an extract from the minutes of proceedings of the Municipal Council, Tirupati, containing its views towards meeting the annual expenditure on account of the said scheme.

2. The papers received in this connection are herewith returned in original.

ENCLOSURE.

EXTRACT from the Minutes of Proceedings of the Municipal Council, Tirupati, passed at its adjourned special meeting held at 5-30 P.M. on the 16th June 1896.

* * * * *

3. Read endorsement, No. 551, dated 16th May last, from Government, forwarding estimates, plans, &c., for Rs. 2,31,000 on account of the water-supply scheme for the Tirupati town for remarks, and report as to how the council proposes to meet the annual expenditure on account of the said scheme assuming that Government will make a grant of three-fourths of the cost of the scheme and lend the remaining one-fourth to be repaid in thirty years' instalments at $4\frac{1}{4}$ per cent. per annum. Read also statements prepared by the council, showing particulars of receipts and expenditure expected from the Tirupati Municipality.

Resolution.—Out of Rs. 6,000 which the council has to meet owing to the introduction of the new water-supply scheme, the council expects to realize Rs. 3,000 from water-tax. The council has then to account for the remaining Rs. 3,000. It will be seen from the statement prepared at the meeting very carefully that the receipts are expected to be Rs. 13,500 in round figures, and expenditure to be Rs. 11,400, leaving an unexpended balance of Rs. 2,100 per annum at its credit.

2. Bearing in mind the heavy demand it has to meet with, the council has cut short some of the items of expenditure as detailed below, hoping at the same time to keep up the efficiency of the administration within its means:—

(*a*) The usual allotment for the maintenance of roads has been on an average Rs. 1,200 per annum. Rs. 410 sanctioned in the current year's budget for the upkeep of a permanent gang of coolies will merge in that allotment.

(*b*) The conservancy establishment will be restricted to only Rs. 3,000.

(*c*) The services of the avenue cooly will be dispensed with, as also that of one of the gardeners.

(*d*) The services of one of the office peons will be dispensed with.

(*e*) The services of the private scavenging maistri and of a scavenger will be dispensed with.

3. Rupees 400 is being paid annually on an average as salary grants to the Hindu Lutheran German Mission High School, Tirupati. Considering that the Sri Mahant of Tirupati keeps up a high school of his own without any aid from this council, and that this council maintains four primary schools of its own it is just the time that it should be relieved of this heavy burden, and this will leave an additional saving of Rs. 400, making in all Rs. 2,500.

4. It is not unknown to the benevolent Government that Tirupati is the most important place of pilgrimage in the whole of India, and as such it deserves more aid from the Government. In its crippled state of finances, this council has not only to meet the wants of the residents of this town, but also of another extra population of more than two-thirds coming from all parts of India. It is the Sri Mahant of Tirupati, the trustee of the temple, that is virtually benefited by the flow of pilgrims, and it is more or less his paramount duty to look to their comforts. The Sri Mahant must, therefore, be induced to stretch out his liberal hands, and contribute the remaining one-fourth of the expenditure besides the Rs. 30,000 which he has so kindly promised. If unfortunately, however, the Sri Mahant is not kind enough so to contribute, the Government will be pleased to allow the credit of the Sri Mahant's contribution of Rs. 30,000 towards this municipality, the Government itself bearing three-fourths of the cost.

* * * * *

Cur. No. 1141-Eng.

Forwarded through the Collector.

12*th July* 1896. (Signed) V. RAMASESHA AIYAR,
Dy. Collector of Arni, in charge.

Forwarded.

13*th July* 1896. (Signed) R. H. CAMPBELL,
Acting Collector.

From the Collector of North Arcot, Dis. No. 1771, Eng., dated 4th October 1896.

ABSTRACT.—Stating that the Mahant of Tirupati has promised to contribute Rs. 77,000 towards the water-supply scheme for the town.

From the Collector of North Arcot, No. 11, Confdl., dated 15th November 1896.

ORDER—No. 48 M., dated 16th January 1897.

The municipal council's proposal to reduce the ordinary expenditure under the several heads in order to provide for the annual charges of the water-supply scheme does not commend itself to Government. As, however, the resources of the municipality under the Act which is now before the Legislative Council will, it is believed, be sufficient to meet the additional charges, the estimate for the work, which, as modified by the Sanitary Board, amounts to Rs. 2,31,000, is sanctioned.

2. The Mahant of Tirupati has generously agreed to contribute one-third of the cost of the scheme, and the remaining two-thirds will be paid as a grant from Provincial funds. A sum of Rs. 6,000 has already been paid by the Mahant and he has undertaken to pay the balance in annual instalments of Rs. 12,000, the first payment being made when the work is begun. Excluding, therefore, the sum of Rs. 18,000 which will thus be available at the commencement of the work and the Government grant of Rs. 1,54,000, the municipal council will have to find Rs. 59,000. This amount the Government will be prepared to advance as a loan at $4\frac{1}{4}$ per cent. repayable in five years. In order that the loan of Rs. 45,000 provided for this purpose in the revised estimate of Provincial loans should be drawn before the end of the year, an application in the prescribed form will be published in the *Fort St. George Gazette*.

3. The Public Works Department is requested to put the work in hand without delay and to note that the proposed compensation to landholders should not be paid until it is ascertained that they actually suffer from the diminution of the water-supply in the springs, as it appears to be quite possible that they will not.

4. His Excellency the Governor in Council is pleased to note the liberality of the Mahant in contributing so generously towards the cost of this important scheme.

(True Extract.)

Secretary to Government.

To the Chairman, Municipal Council, Tirupati.
" Collector of North Arcot.
" Sanitary Board.
" Sanitary Commissioner.
" Sanitary Engineer.
" Accountant-General.
" Public Works Department.
" Financial Department.
Editors' Table.
Gazette.

Exd. A. F. Eccleston.

ANNEXURES.

APPLICATION of the Tirupati Municipal Council for a loan from Government under section 5 of the Local Authorities Loans Act, 1879.

The work or works for the construction or repair of which the loan is required and an estimate of the cost thereof.	The amount which it is proposed to borrow.	The fund or funds on the security of which it is proposed to borrow.	The law or laws under which the said fund or funds is or are levied, received or held.	The period for which the loan is required, the number and amount of the instalments, if any, in which it is proposed that the loan shall be taken, the dates proposed for receiving such instalments, and the instalments, if any, in which it is proposed to repay the loan.	A detailed account of the revenue and expenditure of the local authority for the three last preceding years.	All existing prior charges upon the funds of the local authority.
1	2	3	4	5	6	7
Water-supply scheme for the town of Tirupati estimated to cost Rs. 2,31,000.	Rs. 59,000	Tirupati Municipal fund.	The Madras District Municipalities Act (IV of 1884).	The loan is required for five years. It will be taken in two instalments of Rs. 45,000 in 1896-97 and Rs. 14,000 in 1897-98 and repaid in five annual instalments, with interest at $4\frac{1}{4}$ per cent. per annum.	Attached herewith.	*Nil.*

DETAILED Account of the revenue and expenditure of the Tirupati Municipality during 1893–94, 1894–95 and 1895–96.

	Actuals, 1893–94.	Actuals, 1894–95.	Actuals, 1895–96.
Receipts.	Rs.	Rs.	Rs.
Balance brought forward	12	6,497	10,987
Tax on Arts	2,795	2,235	2,077
" on Buildings and Lands	7,551	6,190	5,807
" on Vehicles and Animals	858	775	738
" on Carts	662	626	640
Tolls	1,136	1,376	1,540
Realizations under Special Acts	55	..	..
Rent of Lands, Buildings, &c., and Sale-proceeds of Lands, &c. ..	258	175	306
Conservancy Receipts	189	151	253
Fees and Revenue from Educational Institutions	187	198	237
Income from Markets and Slaughter-houses	580	835	799
License Fees	70	113	101
Other Fees	42	61	42
Fines under Municipal and other Acts	76	211	426
Grants and Contributions from Government	71	25	..
" from other bodies	3,060	3,055	55
Recoveries for Services to Private Individuals	577	635	693
Miscellaneous	38	13	42
Advances Recovered	50	32	111
Total ..	18,267	23,201	24,854
Charges.			
GRANT—			
New Works—			
Communications	..	48	..
Buildings	1,718	76	664
Water-supply	105	141	466
Repairs—			
Communications	760	1,257	2,377
Buildings	121	364	333
Drainage	..	16	..
Water-supply	702	846	428
Establishment	180	179	180
Tools and Plant and other Stores	1	62	..
Total ..	3,587	2,989	4,448

Detailed Account of the revenue and expenditure of the Tirupati Municipality during 1893–94, 1894–95 and 1895–96—*cont.*

—	Actuals, 1893–94.	Actuals, 1894–95.	Actuals, 1895–96.
Charges—cont.	Rs.	Rs.	Rs.
GRANT II—			
Training Schools	..	146	2
Municipal Schools—			
On the Salary-result System	785	734	894
Salary Grants	395	342	407
Result Grants	221	222	258
Inspection	67	67	67
Miscellaneous	..	..	135
Total ..	1,468	1,511	1,763
GRANT III—			
Contributions	47	162	152
Vaccination	380	350	373
Registration of Births and Deaths	125	88	111
Conservancy, Road-cleaning and Road-watering	3,667	4,207	4,526
Total ..	4,219	4,807	5,162
GRANT IV—			
Lighting	749	1,046	1,104
Markets and Slaughter-houses	33	14	8
Avenues	..	66	56
Public Garden, Survey of Land, Fire and other charges	443	550	506
Total ..	1,225	1,676	1,674
GRANT V—			
Supervision and Management	1,296	1,113	1,481
Advances Recoverable	45	118	92
Balance	6,497	10,987	10,284
Total ..	18,267	23,201	24,854

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K.K. Please see queries within. MAS 8/2/97

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10. If the scheme, however, is approved, it is suggested that experimental pumping should take place in the next dry season to test the yield before any of the works are begun.

11. The water from the sandy bed of the Suvarnamukhi river has also been analysed and pronounced "usable." Should the proposed infiltration gallery not give the required supply—which is a very remote contingency—the supply could be easily augmented by collecting the water in the bed of the river by a line of open-jointed pipes laid in the sand and connected with the collecting well as shown on plan No. 2.

12. *Drawing Nos.* 2, 3.—The infiltration works will be formed by cutting a trench 330 feet long with its bottom six feet wide and at the level of 605·00. Four rows of open-jointed six-inch stoneware pipes will be laid in the bottom of the trench, and the trench will be filled up to a height of five feet with stones varying in size from four inches to the size of a pea, the largest-sized stones being placed just over the pipes. Above the level of the stones the trench will be filled up with pure sand from the bed of the river. At the two extreme ends of the gallery there will be a well eight feet in diameter with its bottom, which will remain unsealed, at the level of 600·00 or five feet below the level of the infiltration pipes. These two wells are provided in the hope of tapping deeper springs which the main cutting would not touch. The advisability of sinking the two extreme wells at a deeper level is suggested by the pumping particulars given by the Chief Engineer of the South Indian Railway as regards pier No. 3, which was taken down to the level of 602·14 and required two six-inch centrifugal pumps to cope with the water in the excavation.

13. The lowest water-level has been ascertained to be 115·00. The infiltration pipes will therefore be ten feet below low-water level and the bottom of the end wells fifteen feet below low-water level.

14. The infiltration pipes from the right and left will be connected with a central well. As it would be inconvenient to connect four rows of pipes, each requiring a valve to control it, with the central well, the four rows of six-inch pipes will terminate in an oblong cistern on each side of the well, and from this cistern a single line of pipes will be connected with the well. The mouths of the two pipes into the well will be controlled by valves.

15. From this central well and valve-house the delivery pipe to the service reservoir in Tirupati will be led off. The delivery pipe will have its bottom at the level of 610·00 at the collecting well, which will allow of a depth of five feet below low-water level.

16. The delivery pipe will be of stoneware nine inches in diameter, and with a fall of 1·4 in 1,000 at which it is proposed to lay it will deliver 258 gallons per minute or 371,000 gallons per day. Where the pipe crosses a stream or tank it will be of cast iron. There will be manholes at all bends in the pipe line and special pipes with inspection holes at every 300 feet. The pipe line will be 35,810 feet in length and terminate at the level of 559·87 in a service reservoir to the north-west of the town. The pipe will not be under pressure, and overflows will be provided from manholes near the various ~~vankas~~. But it may be found preferable to introduce one or two break-pressure valves and make the other manholes thoroughly air-tight.

17. The service reservoir could have been placed nearer the town with some economy, but as during festivals pilgrims camp along the main road to Tirupati it was considered advisable to locate the reservoir at a safe distance from the road. It will be 99′ × 45′ with a depth of 10½ feet of water. The full reservoir level will be at 560·00; the bottom of the outlet main to the town will be at the level of 550·00.

18. The reservoir is designed to contain 272,000 gallons, which is equal to ¾ of a day's supply as provided in the scheme. Considering the length of the delivery pipe, it would be wise to have a second reservoir of the same size. There is, however, no immediate necessity for it and it is therefore not included in the estimate.

19. The distribution pipes are calculated to deliver fifteen gallons per head in twelve hours. The distribution system consists of—

1,818	feet of	12 ″	cast-iron pipes.
729	,,	8 ″	,, ,,
1,503	,,	7 ″	,, ,,
576	,,	6 ″	,, ,,
2,277	,,	5 ″	,, ,,
5,895	,,	4 ″	,, ,,
1,341	,,	3 ″	,, ,,
720	,,	2½″	,, ,,
61	sluice valves.		
5	air valves.		
20	hydrants.		
40	pillar and wall tap fountains.		

The minimum pressure at the hospital, which is the highest point in the town to be supplied with water, will be 8 feet, but at nights there will be a pressure of 18 feet. The minimum pressure in the town will be nowhere less than 25 feet Two thousand five hundred feet of additional piping are included in the estimate for providing extra taps with a view to meet the requirements of the town during the time of the festivals. These extra taps will be arranged for in consultation with the Sanitary Commissioner when the works are in progress.

20. The initial cost of the scheme is estimated as follows:—

	RS.
Compensation to landholders deprived of the water of the Bungaru channel (fed by spring taken for infiltration works) ..	6,000
Infiltration works	15,448
Delivery pipe	58,300
Service reservoir	14,760
Distribution of pipes, &c.	52,350
Laying and jointing pipes	15,290
	1,62,148
Temporary offices and conservancy during construction	2,500
Tools and plant at 2½ per cent.	4,059
Establishment at 7½ ,, ...	12,176
Contingencies at 5 ,, ...	8,117
	1,89,000

The annual expenditure will be—

Interest and sinking fund at 5·96 per cent. on Rs. 94,500 (half the initial cost)	5,633
Establishment and maintenance of works	2,367
	8,000

A water-tax at 4 per cent. would yield about Rs. 3,000. Even with the strictest economy in expenditure and efforts at improvement of the municipal revenue in other directions, an annual expenditure of Rs. 8,000 for the water-supply is beyond the means of the municipality. It has been ascertained from the Chairman of the Municipality that about Rs. 6,000 is the utmost that it could provide, and that with the prospect of an enhanced water-tax.

21. Tirupati is an instance of a town that deserves more liberal aid from Government than the usual contribution of a moiety of the cost. Its population is about 14,000, but in view of the large number of pilgrims that resort to the place a scheme for a population of 24,000 has had to be designed, and thus the burden of providing for an outside population falls on the inhabitants of Tirupati. Considering how important a water-supply is for the protection of the health of not only the town of Tirupati, but indirectly that of the whole Presidency, it is suggested that Government may be pleased to make a grant of three-fourths of the cost of the scheme on the condition that whatever contribution the Mahant of Tirupati makes should be handed over to Government. On this assumption the annual expenditure will be—

	RS.
Interest and sinking fund at 5·96 per cent. on Rs. 47,250	2,817
Establishment and maintenance of works	2,383
Total ..	5,200

The Mahant of Tirupati has promised a contribution of Rs. 30,000 towards the scheme in annual instalments of Rs. 3,000. If he could be induced to pay the whole amount at once, the contribution from Government may be reduced by Rs. 30,000, and it will then be Rupees 1,11,750, which is 59 per cent. of the initial cost.

22. In Sanitary Engineer's letter to Government, No. 116-T, dated 15th May 1894, the annual cost of a water-supply scheme for Tirupati was stated to be Rs. 6,500. But this was not only before a scheme was investigated but before there was any definite idea as to the location of the source of supply. Every source of supply nearer the town than the one adopted here will involve pumping, and the annual expenditure would be in each case more, besides having disadvantages as regards copiousness and purity of water. Moreover, a gravitation scheme is much simpler, much safer, more effective, and one that will find more favour with the public than a pumping scheme.

23. The scheme proposed is due to Mr. Hormusji Nowroji, Assistant Sanitary Engineer to Government, who also carried out the investigation and design. M.R.Ry. K. Gopalachariar, Chairman of the Tirupati Municipality, rendered much assistance during the investigation.

APPENDIX I.

	Sample trial well No. 3.	Sample trial well No. 4
Total solids, Grms. per litre	0·440	0·520
Volatile solids ,, ...	0·100	0·140
Chlorine ,, ...	0·017	0·017
Total hardness, Clark's scale	8°·750	7°·000
Permanent hardness ,, ...	Trace	Trace
Free ammonia, Ml. Grms. per litre	0·048	0·080
Albumenoid ammonia ,, ...	0·224	0·400
Nitric acid (as ammonia) ,, ...	1·500	1·200
Apparent quality of the water as inferred from the results obtained on examination	Suspicious.	Suspicious.

APPENDIX II.

	Sample A. From the bed of the Kalyani.	Sample B. From a spring head in the bank of the Kalyani.
Total solids, Grms. per litre	0·420	0·490
Volatile solids ,, ...	0·120	0·140
Chlorine ,, ...	0·024	0·028
Total hardness, Clark's scale	8°·750	9°·450
Permanent hardness ,, ...	0°·525	0°·525
Free ammonia, Ml. Grms. per litre	Trace	Trace
Albumenoid ammonia ,, ...	0·048	0·040
Nitric acid (as ammonia) ,, ...	Trace	2·100
Apparent quality of the water for potability as inferred from the results obtained on examination ..	Usable.	Usable.

Remarks.—Sample B may become contaminated. The nitrates in this sample are indication of this danger.

PROCEEDINGS of the Sanitary Board (Sanitary Engineering Branch), dated 1st April 1896, No. 1018.

* * * * *

Read—G.O., Mis. No. 883 M., dated 9th July 1894.

Read—also the Sanitary Engineer's report, dated 18th October 1895, on the water-supply of Tirupati, accompanied by plans and estimates.

Resolution.—The Board considers that, as the scheme drawn up by the Sanitary Engineer provides for 24,000 or 10,000 in excess of existing population at 15 gallons per head, the scheme may be generally approved with the following amendments:—

(1) Break-pressure tanks to be provided on stoneware pipe main instead of manholes or overflows.

(2) Six bathing-houses for twelve persons each to be provided.

(3) The masonry fountains to be faced with glazed bricks instead of cement.

(4) Perforated iron pipes to be used in filtration gallery instead of stoneware loose-jointed pipes.

(5) The service reservoir to be increased from one containing two-thirds of a day's supply as designed by the Sanitary Engineer so as to contain two days' supply and to be divided into two compartments.

The plans, estimate and report have been modified accordingly and will be forwarded to Government for sanction.

2. The Board recommends that a sum of Rs. 10,000 be granted as soon as possible to construct filter-well and test the yield during the immediately approaching dry season.

No. 551.

Referred to the Municipal Council, Tirupati, for early remarks and report as to how it proposes to meet the annual expenditure on account of the scheme, assuming that Government will make a grant of three-fourths of the cost of the scheme, and lend the remaining one-fourth to be repaid in thirty years with interest at $4\frac{1}{4}$ per cent. per annum.

(By order.)

FORT ST. GEORGE,
16*th May* 1896.

(Signed) W. W. PHILLIPS,
Acting Assistant Secretary.

To the Chairman, Municipal Council, Tirupati.

From J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E., Sanitary Engineer to Government, to the Chief Secretary to Government, dated Fort St. George, 9th July 1896, No. 2143.

With reference to G.O., Mis., No. 845 M., dated 15th May 1896, sanctioning the construction of filter-well, &c., at Tirupati for testing the yield, I have the honour to point out that, if the yield is satisfactory, the council should be in a position to proceed with the remaining works, because otherwise if the well and trenches remain open and unprotected, additional expenses will be incurred for pumping, clearing trenches and excavated foundations in trenches, &c.

2. I have, therefore, the honour to suggest that Government will be pleased to make some financial arrangements for the works being proceeded with in, say, five months from this date (when the experiments are likely to be complete).

3. The possible contributions from Tirupati and Mahant are noted in the report which accompanied the estimate and plans sent with the Sanitary Board's resolution, No. 1018, of 1st April 1896.

From M.R.Ry. K. GOPALA CHARRIAR Avargal, Rao Sahib, Chairman, Municipal Council, Tirupati, to the Chief Secretary to Government (through the Head Assistant Collector of North Arcot), dated 20th June 1896, No. 295.

In reply to your endorsement, No. 551, dated 16th May last, on the report of the Secretary, Sanitary Board, Engineering Branch, in connection with the water-supply scheme for this town, I have the honour to forward herewith an extract from the minutes of proceedings of the Municipal Council, Tirupati, containing its views towards meeting the annual expenditure on account of the said scheme.

2. The papers received in this connection are herewith returned in original.

ENCLOSURE.

EXTRACT from the Minutes of Proceedings of the Municipal Council, Tirupati, passed at its adjourned special meeting held at 5-30 P.M. on the 16th June 1896.

* * * * *

3. Read endorsement, No. 551, dated 16th May last, from Government, forwarding estimates, plans, &c., for Rs. 2,31,000 on account of the water-supply scheme for the Tirupati town for remarks, and report as to how the council proposes to meet the annual expenditure on account of the said scheme assuming that Government will make a grant of three-fourths of the cost of the scheme and lend the remaining one-fourth to be repaid in thirty years' instalments at $4\frac{1}{4}$ per cent. per annum. Read also statements prepared by the council, showing particulars of receipts and expenditure expected from the Tirupati Municipality.

Resolution.—Out of Rs. 6,000 which the council has to meet owing to the introduction of the new water-supply scheme, the council expects to realize Rs. 3,000 from water-tax. The council has then to account for the remaining Rs. 3,000. It will be seen from the statement prepared at the meeting very carefully that the receipts are expected to be Rs. 13,500 in round figures, and expenditure to be Rs. 11,400, leaving an unexpended balance of Rs. 2,100 per annum at its credit.

2. Bearing in mind the heavy demand it has to meet with, the council has cut short some of the items of expenditure as detailed below, hoping at the same time to keep up the efficiency of the administration within its means:—

(*a*) The usual allotment for the maintenance of roads has been on an average Rs. 1,200 per annum. Rs. 410 sanctioned in the current year's budget for the upkeep of a permanent gang of coolies will merge in that allotment.

(*b*) The conservancy establishment will be restricted to only Rs. 3,000.

(*c*) The services of the avenue cooly will be dispensed with, as also that of one of the gardeners.

(*d*) The services of one of the office peons will be dispensed with.

(*e*) The services of the private scavenging maistry and of a scavenger will be dispensed with.

3. Rupees 400 is being paid annually on an average as salary grants to the Hindu Lutheran German Mission High School, Tirupati. Considering that the Sri Mahant of Tirupati keeps up a high school of his own without any aid from this council, and that this council maintains four primary schools of its own it is just the time that it should be relieved of this heavy burden, and this will leave an additional saving of Rs. 400, making in all Rs. 2,500.

4. It is not unknown to the benevolent Government that Tirupati is the most important place of pilgrimage in the whole of India, and as such it deserves more aid from the Government. In its crippled state of finances, this council has not only to meet the wants of the residents of this town, but also of another extra population of more than two-thirds coming from all parts of India. It is the Sri Mahant of Tirupati, the trustee of the temple, that is virtually benefited by the flow of pilgrims, and it is more or less his paramount duty to look to their comforts. The Sri Mahant must, therefore, be induced to stretch out his liberal hands, and contribute the remaining one-fourth of the expenditure besides the Rs 30,000 which he has so kindly promised. If unfortunately, however, the Sri Mahant is not kind enough so to contribute, the Government will be pleased to allow the credit of the Sri Mahant's contribution of Rs. 30,000 towards this municipality, the Government itself bearing three-fourths of the cost.

* * * * *

Cur. No. 1141-Eng.

Forwarded through the Collector,

12*th July* 1896. (Signed) V-Ramascha Ayar
Dy. Collector of Arni, in charge.

Forwarded.

13*th July* 1896. (Signed) R. H. CAMPBELL,
Acting Collector.

From the Collector of North Arcot, Dis. No. 1771, Eng., dated 4th October 1896.

ABSTRACT.—Stating that the Mahant of Tirupati has promised to contribute Rs. 77,000 towards the water-supply scheme for the town.

From the Collector of North Arcot, No. 11, Confdl., dated 15th November 1896.

ORDER—No. 48 M., dated 16th January 1897.

The municipal council's proposal to reduce the ordinary expenditure under the several heads in order to provide for the annual charges of the water-supply scheme does not commend itself to Government. As, however, the resources of the municipality under the Act which is now before the Legislative Council will, it is believed, be sufficient to meet the additional charges, the estimate for the work, which, as modified by the Sanitary Board, amounts to Rs. 2,31,000, is sanctioned.

2. The Mahant of Tirupati has generously agreed to contribute one-third of the cost of the scheme, and the remaining two-thirds will be paid as a grant from Provincial funds. A sum of Rs. 6,000 has already been paid by the Mahant and he has undertaken to pay the balance in annual instalments of Rs. 12,000, the first payment being made when the work is begun. Excluding, therefore, the sum of Rs. 18,000 which will thus be available at the commencement of the work and the Government grant of Rs. 1,54,000, the municipal council will have to find Rs. 59,000. This amount the Government will be prepared to advance as a loan at $4\frac{1}{4}$ per cent. repayable in five years. In order that the loan of Rs. 45,000 provided for this purpose in the revised estimate of Provincial loans should be drawn before the end of the year, an application in the prescribed form will be published in the *Fort St. George Gazette*.

3. The Public Works Department is requested to put the work in hand without delay and to note that the proposed compensation to landholders should not be paid until it is ascertained that they actually suffer from the diminution of the water-supply in the springs, as it appears to be quite possible that they will not.

4. His Excellency the Governor in Council is pleased to note the liberality of the Mahant in contributing so generously towards the cost of this important scheme.

(True Extract.)

Secretary to Government.

To the Chairman, Municipal Council, Tirupati.
" Collector of North Arcot.
" Sanitary Board.
" Sanitary Commissioner.
" Sanitary Engineer.
" Public Works Department.
" Financial Department.
Editors' Table.
Gazette.
Exd A. F. Eccleston.

Local & Munl. (1896) Department.

CURRENT No. 3116 M

From The Collector of North Arcot

Order

SECRETARY TO GOVERNMENT LOCAL & MUNICIPAL DEPARTMENT

No. 48-M.-1896

Dated 15th November 1896

Received 18-11-96

Registered 18-11-96

Enclosures 0

Spare copies.

SUBJECT.

Stating that it seems obvious to the Collector that the Mahant of Tirupati cannot give a legal agreement binding his successors to a voluntary contribution in connection with the Water supply scheme of that place.

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

Application of the Tirupati Mun: Comm: for a loan from Govt. under sec. 5 of the Local Authorities Loan Act 1879.

The work or works for the construction or repair of which the loan is required and an estimate of the cost thereof.	The amount which it is proposed to borrow.	The fund or funds on the security of which it is proposed to borrow.	The law or laws under which the said fund or funds is or are levied, received or held.	The period for which the loan is required, the number and amount of the instalments, if any, in which it is proposed that the loan shall be taken, the date proposed for receiving such instalments, and the instalments, if any, in which it is proposed to repay the loan.	A detailed account of the revenue and expenditure of the local authority for the three last preceding years.	All existing prior charges upon the funds of the local authority.
1	2	3	4	5	6	7
Water-Supply Scheme for the Town of Tirupati estimated to cost Rs 231,000	Rs 59,000	Tirupati Municipal fund	The Madras Distt: Municipalities Act IV of 1884.	(1) The loan is required for five years. It will be taken in two instalments of Rs 45000 in 1896-97 & Rs 14,000 in 1897-98 and repaid in five annual instalments, with interest at 4½ per cent per annum.	Attached herewith	Nil

Appendix No. I.

Detailed Account of the revenue and expenditure of the Tirupati Municipality during 1893-94, 1894-95 and 1895-96.

	Rs	Actuals 1893-94. Rs.	Actuals, 1894-95. Rs.	Actuals 1895-96. Rs.
Receipts.				
Balance brought forward		12	6,497	10,987
Tax on Arts		2,795	2,238	2,077
Tax on Buildings and Lands		7,551	6,190	5,807
~~Water-Tax on Buildings and Lands~~				
Tax on Vehicles and Animals		858	775	738
Tax on Carts		662	626	640
Tolls		1,136	1,376	1,540
Realizations under Special Acts		55		
Rent of Lands, Buildings, &c , and sale-proceeds of Lands, &c.		258	175	306
Conservancy Receipts		187	151	253
Fees and Revenue from Educational Institutions ..		187	198	237
Fees and Revenue from Medical Institutions				
Income from Markets and Slaughter-houses		580	833	799
License fees		70	113	101
Other fees		42	61	42
Fines under Municipal and other Acts		76	211	426
Interest on Investments and premium on Loans ..				
Grants and Contributions from Government		71	25	-
Do. from Local Boards				
Do. from other bodies		3,060	3058	55
Recoveries for services to private individuals		577	635	693
Miscellaneous		38	13	42
Loans		"	"	"
Sale-proceeds of Government Securities, &c., and Realizations of Sinking Fund				
Advances Recovered		50	32	111
Total ..		18,267	23,201	24,854

Charges.	Actuals, 1893-9	Actuals 1894-95	Actuals 1895-96	Actuals 1896-97
	Rs.	Rs.	Rs.	Rs.
Grant I.				
New Works—				
Communications		"	48	"
Buildings		1,718	76	664
Drainage		-		
Water-supply		108	141	466
Repairs—				
Communications		760	1257	2377
Buildings		121	364	333
Drainage		"	16	"
Water-supply		702	846	428
Establishment		180	179	180
Tools and Plant and other Stores		1	62	"
Contributions for Public Works				
Total ..		3,587	2989	4448
Grant II—				
Training Schools		"	146	2
Municipal Schools—				
(*a*) On the Salary System				
(*b*) On the Salary Result System		785	734	894
Salary Grants		398	342	407
Result Grants		221	222	258
~~Combined Grants~~				
Inspection		67	67	67
Miscellaneous		"	"	135
Total ..		1,468	1,511	1,763
Grant III—				
Hospitals and Dispensaries				
Contributions		47	162	152
Vaccination		380	350	373
Registration of Births and Deaths		125	88	111
Conservancy, Road-cleaning and Road-watering ..		3667	4,207	4526
Total ..		4,219	4,807	5,162
Grant IV—				
Lighting		749	1046	1104
Markets and Slaughter-houses		33	14	8
Choultries				
Traveller's Bungalows				
Avenues		"	66	56
Public Garden, Survey of Land, Fire and other charges.		443	550	506
Total ..		1,225	1,676	1,674.
Grant V—				
Supervision and Management		1,226	1,113	1,481
Repayment of Debt				
Interest on loan				
Advances Recoverable		45	118	92
Refunds				
Discount				
Pensions and Gratuities				
Investments				
Balance		6,497	10,987	10234
Total ..		18,267	23,201	24,854.

LOCAL AND MUNICIPAL DEPARTMENT.

Papers to be read in Proceedings :— 238

Again G.O., dated 189 , No.

Current No. 1071-M of 1896, dated 1st April 1896 from the Sanitary Board.
" 2001-M do. " 9th July 1896 from the Sanitary Engineer.
Current No. 2058-M of 1896, dated 20th June 1896 from the Chairman, Municipal Council,
" 2707-M of do. " 4th October 1896 from the Collector of North Arcot.
" 3116-M of do " 15th November 1896 from do — do

P.S. Order. No. 48 Mud. 16-1-97

The Municipal Council's proposal to reduce the ordinary expenditure under the several heads in order to provide for the annual charges of the water supply scheme does not commend itself to Government. As however the resources of the Municipality under the Act which is now before the Leg. Council, ~~amended act~~ will, it is believed, be sufficient to meet the additional charges ~~on this account~~, the estimate for the work which, as modified by the Sanitary Board, amounts to Rs.2,31,000 is sanctioned.

2. The Mahant of Tirupati has generously agreed to contribute one-third of the cost of the scheme and the remaining two-thirds will be paid as a grant from Provincial funds. A sum of Rs.6,000 has already been paid by the Mahant and he has undertaken to pay the balance in annual instalments of Rs.12,000, the first payment being made when the work is begun. Excluding therefore the sum of Rs.18,000 ~~that would~~ which will thus be available at the commencement of the work and the Government grant of Rs.154,000, the Municipal Council will have to find Rs.59,000. This amount ~~which~~ the Government will be prepared

prepared to advance as a loan at 4½ per cent, repayable in five years. As ~~it is desirable~~ In order that the loan of Rs.45,000 provided for this purpose in the Revised Estimate of Provincial loans should be drawn before the end of the year, an application in the prescribed form will be published in the Fort St.George Gazette.

3. The Public Works Department is requested to put the work in hand without delay and to note that the proposed compensation to landholders should not be paid until it is ascertained that they actually suffer from the diminution of the water supply in the springs, as it appears to be quite possible that they will not.

4. His Excellency the Governor in Council is pleased to ~~see~~ note the liberality of the Mahant in contributing so generously towards the cost of ~~the~~ this important scheme.

(From orders)

To

The Chairman, M. C., Tirupati.
,, Collector of North Arcot.
,, Sanitary Board.
,, Sanitary Comr.
,, Sanitary Engineer.
,, P.W.D. (with plans & estimates)
,, Financial Dept.
Editors' Table.
Gazette.

(who will communicate para 4 & the first two sentences of para 2 to the Mahant of Tirupati)

[G 74] 300—30-7-96

NOTE FOR THE CHIEF SECRETARY.

The H.M. directed that the papers in the accompanying three files relating to the Tirupati, Vizagapatam and Cocanada water supply schemes should first be considered in the Financial department, before orders could be issued.

2. They have been held over pending the passing of the more important budgets in view to ascertaining more clearly the position of Provincial revenues. This has been forecasted as far as possible in the papers submitted with the P.W.Estimates and the forecast shows that the amounts provided for grants outside in the estimates are impossible.

3. In the estimates just received unofficially from the Local and Municipal Department it is shown that the schemes have been provided for as follows:-

	Vizagapatam	Tirupati	Cocanada.
Total cost of scheme	4·21	2·31	4·16
Proposed grant.....	2·10	1·73	1·73
,, loan	2·11	·58	1·73
Provision in the estimate			
Grants			
1896-97.....	1·40	·10	·79
1897-98.....	·70	1·63	·56
1898-99.....	,,	,,	·38
	2·10	1·73	1·73
Loans.			
1896-97.....	1·50	·45	·93
1897-98.....	·51	·13	·81
	2·01	·58	1·74
Total	4·11	2·31	3·47

As grants ~~No provision for the schemes has~~ have been considered by the H.E. when passing the Budget which the H.E. has passed in the Local and Municipal department, there is no necessity for to trouble him again with these files.

Returned to Local and Municipal with reference to the above note.

A Arundel
Ag. Chief Secretary
17.12

CWS
16.12.96.

Note for the Secretary.

Please see the remarks inserted in the notes for orders.

V.R
18/12/96

Tirupati Water Supply Scheme.

LOCAL AND MUNICIPAL DEPARTMENT.

Current No.s 1071, 2001, 2058, 2707 & 3116

From

FOR ORDERS.

Please see the notes and orders flagged A & B.

2. In his report on the Tirupati water supply scheme submitted with the first of the currents read above the Sanitary Engineer reported that the Mahant had promised a contribution of Rs.30,000 towards the cost of the scheme to be paid in annual instalments of Rs.300 In current No.2058 M, the Municipal Council suggested that as the Mahant in his capacity of Trustee of the temple benefits largely by the influx of pilgrims into the town, he should be induced to contribute ¼th of the total cost in addition to the sum of Rs.30,000 above referred to. On this, the Collector was requested to report whether the Mahant is was willing to do so, and if not, whether he will pay in one instalment the balance (Rs.24,000) of the contribution already promised. In reply to this the Collector

reported(C.No.2707 M)that the Mahant had agreed to contribute the sum of Rs.77,000,or 1/3rd of the cost of the scheme to be paid in annual instalments of Rs.12,000,the first of which was to be paid only when the work is commenced. The Collector submitted a statement in writing to this effect obtained by him from the Mahant; but he was again requested to report whether the Mahant's promise could bind his successor and whether the Mahant would give a legal agreement in favour of the Municipal Council regarding this contribution. In reply to this, the Collector states in the last of the currents read above, that as regards the first point, the legal advisers of Govt. should be consulted, though he is himself of opinion that the Mahant's agreement cannot bind his successors as there is no legal consideration for it. As to the other point, he says that it was with great difficulty he persuaded the Mahant to agree to contribute Rs.77,000, and that he is afraid that if the Mahant is asked to bind himself by a legal agreement he might back out of his promise altogether. At the same time the collector thinks ~~that~~ it is very probable that the Mahant's successor, who will be one of his disciples, will consider himself bound by the Mahant's promise, just as the latter respected that of his predecessor to contribute Rs.30,000. There appears to be therefore

no

This ought should obviously not have been made officially

BS

If the work was begun & money expended on the faith of the promise, there wd. be consideration at any rate to bind the present Mahant. Whether the promise binds his successors does not I think depend on q^n of "consideration"

Leave

B

no use in trying to get a better assurance from the Mahant than what he has given already. It is therefore submitted that the Government may, as proposed in the second note for orders (B), make a grant of Rs.1,54,000, being two-thirds ~~of his cost~~ of the estimated cost of the scheme and lend a sum of Rs.59,000 [Rs.77,000 - 18,000(Rs.6,000 already paid by the Mahant + 12,000 promised to be paid at the commencement of the work)] to the Municipal Council to be repaid in annual instalments of Rs.12,000 as they are recovered from the Mahant.

V.R. 25/11/16

A.M.

I agree that we must be content with what we have got.

Now the case must be returned in the F.D. so that we may be able to say when we can find the money - Can we do this at once.

BS 27/11/16

I don't think we can get any further forward with the Mahant; if we do so take his promise for what it is worth we shall be in danger of loosing the contribution he may himself be able to pay.

BK 26

To the Fin. Dept c/o.

B.K 30/11/16

Note for the Secretary

Provision has been made for a grant of three-fourths of the Estimated Cost of the Scheme and a loan of the balance in the Estimate of Provincial grants & loans as shown below:-

	1896-97	1897-98.
	Lakhs	Lakhs
Grant	.10	1.63
Loan	.45	1.13

Draft Govt approving &c & that the work be put on hand with a letter as proposed

V.R. 28/12

FOR ORDERS.

H.M.

The Fmil. Dept= have in the sanctioned estimates made provision for a grant of 3/4th. of the Estimated cost & a loan of the balance — vide pages 4 and 5 of Gp. No. 884, 885 Fl. dated 16th December 1896 (Flag Z.)

In the note above it was suggested that a 2/3rds. grant was sufficient, having in view the Mahants Contribution. #

It is for orders now whether in communicating ~~orders~~ with the Mahant we shd. tell them that Govt. will give them a 3/4th. or a 2/3rds grant.

When we told them by endorst. No 551 d. 16 May 96 (Flag E) ~~to finance the scheme on the basis that they could depend upon~~ that a grant of 3/4ths would be given, we did not take into consdn. the Mahants money. Apparently 2/3rds. grant shd. suffice.

S.R. 4/11/96

which is 1/3rd of the Estimated Ac

Temple Water Supply

LOCAL AND MUNICIPAL DEPARTMENT.

Again G.O., dated 189 , No.

Current No. 1071 M — of 1896, dated 1st April 1896 from the Sanitary Board

Current No. 2001 M of 1896, dated 9th July 1896 from the — do — Engineer

— — — 2058 M. . . . 20th June 1896 . . Chairman, Mc. Tirupa

. . . 2707 M . . . . 4th October 1896 — Collector of N. Arcot

1309
14.11.96.

Flag A.

FOR ORDERS.

Please see the notes and orders on the first three of the cur rents read above. In reply to the reference made thereon the Collector now reports in the last current that the Mahant has agreed to contribute Rs 77.700 or one-third of the total cost of the scheme (including the sum of Rs 30.000 already promised in annual instalments of Rs 12.000 each, the first to be paid only when the work is commenced. In these circumstances, it is submitted that the Government may make a grant of Rs. 154.000, being two-thirds of the cost of the scheme and Rs 59.000 (Rs. 77.000 — (Rs. 18000 Rs. 6.000 already paid by the Mahant + Rs. 12.000 promised to be paid at the commencement of the work) to the municipal commit

to

I think this will do, provided we can rely on the Mahant's promise. But can we? He may die & may be succeeded by another Mahant who may not recognize his promise. Is there any way in which he can be bound down?

4/11/96

H.M.

Please see the Mahants promise (Flag B) accompanying Mr. Wyme's letter of 4-10-96. at the bottom of this file. Mr Wyme says he could get better terms. I doubt if the promise binds his successor. If he wd. deposit the whole money, it might be worth while our paying interest on it until the work was commenced & then on the decreasing deposit during the next six years: & promising to repay any proportionate

14/11/96

to be repaid in annual instalments of Rs. 12.000. The council will be able to meet the working charges and the interest payable on the loan when the amended District Municipalities Act is passed.

V.R
16/10/96

W.W.D
19.10.96

V.R 2/11/96

Reference 1309
14/11/96

The Collector is requested to report whether the Mahanto's promise to contribute Rs. 77,000 towards the cost of the water-supply scheme can bind his successors, and, if so, whether he is willing to give a legal agreement to the municipal council.

(from orders).

V.R
11/11/96

H. 16.

amount unspent.

V.R
5/11/96

Ask the Colr. if the Mahant can bind his successor. If yes, perhaps he would not object to giving the legal agreement to the M.C.

BS
7/11/96

To The Collector of North Arcot. ✓

Dup. 14/11/96

FOR ORDERS.

LOCAL AND MUNICIPAL DEPARTMENT.

Current Nos. 1071, 2001 and 2058 M.

From

H.M.

FOR ORDERS.

With the first of the letters read above the Sanitary Board submitted a scheme of water supply for the town of Tirupati, as approved by the Board. It was referred to the Municipal Council of Tirupati for report as to how it proposed to finance the scheme, assuming that Government would contribute three-fourths of the cost and the balance to the council on the usual terms. The third current contains the Council's reply to this. The second letter is from the Sanitary Engineer, requesting the Government to make such financial arrangements as would make it possible to take up the construc-tion of the works, at the end of about five months, if the experimental filter well for which a sum of Rs.10,000 has been sanctioned in G.O., No.843 M., dated 15th May 1896, should yield satisfactory results.

2.

2. The cost of the scheme as approved by the Sanitary Board amounts to Rupees 2,31,000. On the assuption that the Government makes a grant of three-fourths of this sum and lends the remain-der to the Council on the usual terms, the annual charges on account of the scheme are estimated at Rs.5,900. The Council estimates its receipts in future years at Rs.13,500 per annum, and by means of certain economies proposes to keep its expenditure within Rs.11,400, so as to leave a balance of Rs.2,100, which is to be made available for the charges on account of the water-suuply scheme. The Council expects a revenue of Rs.3,000 from a water tax, and sug-gests that it might be allowed to dis-continue the grant of about Rs.400 per annum which it pays at present to the H.L.G.M. High school, as the Mahant is keeping up a High school and the Coun-cil itself is maintaining four primary schools. The Council will thus be able to meet only Rs.5,500 out of Rs.5,900 required. Moreover the proposed reduc-tions in the expenditure seem to be of questionable expediency. ~~The town may~~ be expected to grow in course of time, and it will not be possible as the Coun-cil apparently thinks it will be, to keep the expenditure on communications and the cost of the conservancy esta-blishment always within the limit of Rs.1,200 and Rs.3,000 respectively now fixed by it. The other proposals which

involve

involve petty reductions in the Municipal establishments are not likely to cause any substantial diminution in the total expenditure and appear besides to be in-advisable.

3. If however the amended Municipal Act becomes law the Council will be in a posi-tion to augment its revenues by levying the tax on buildings and lands and the water tax at higher rates than those al-lowed by the present Act, and will thus be able without resorting to these reduc-tions to meet the cost of maintaining the water-supply works. In the budget for 1896-97 the receipts from the tax on buildings and lands, levied at 7½ per cent on their annual value, are estimated at Rs.5,720. If the rate is raised to, say, 8½ per cent, this tax will bring in an in-crease of Rs.760.* A water and drainage tax at, say, 6 per cent will give an ad-ditional income of Rs.4,580.* The total additional receipts would then be Rupees 5,340.⊛ If the proposed scheme is intro-duced, the expenditure amounting to abou Rs.600 per annum which ~~was~~ is now being incurre on water-supply works may be also saved, and the total amount available will thu be Rs.5,940, while the amount required Rs.5,900.

4. From para.21 of the Sanitary Engi-neer's report received with the first l -ter, it appears that the Mahant has pr mised a contribution of Rs.30,000 towar the cost of this scheme in annual inst ment of Rs.3,000. The Council states t as it is the Mahant who as trustee of the

temp

* $\frac{1144}{5720 \times 2} \times \frac{17}{2} = \frac{1944\frac{8}{3}}{3} = 6482\frac{2}{3} \sim Rs.64$

Rs 6480 - 5720 = Rs.760

∴ $\frac{1144}{5720 \times 2} \times 6 = 4576 \sim Rs.4580$

⊛ Rs.4580 + Rs.760 = Rs.5340

temple is largely benefited by the influx of pilgrims into the town, he should be induced to contribute one-fourth of the cost of the scheme, in addition to the Rs.30,000, referred to above. The Collector may be requested to report whether the Mahant is willing to increase his contribution. In the event of the Mahant not agreeing to this, the Council requests that the sum of Rupees 30,000 which has been promised by him may, if realised once for all, be deduct-ed from the one-fourth share it has to provide. This request it is submitted, is, having regard to its financial position, reasonable and if granted would reduce the annual cost of the scheme from Rs.5,900 to Rs.4,110. The Mahant would then have to pay the Rs 30000 in one instalment, unless [illegible] is allowed to lose the interest for 10 years. In the Budget for 96-97 provision is made for a grant of Rs 75000 or a loan of Rs 47,250- whichever course is adopted sufficient funds will be available this year. As per the Secretary's letter (C 2005 Ry), he will not be ready to begin work until the beginning of December next, and to date the expenditure will only have been Rs 10,000, sanctioned for a test well. (G.O. 2nd Sep 1896) It is submitted that the Mahant may now be asked thro' the Collector whether he is willing to pay 1/4 the cost of the scheme i.e. Rs 57,750 or if not whether he will pay down the Rs 30000 in one instalment. The amount of grant & loan, respectively, can be later determined on receipt of his reply.

If by the time the amending Bill passes the Council can finance the scheme well enough. It would seem advisable to try to get as much down from the Mahant: he is however not very likely to pay at once.

Ry
4/8/96.

C.S.
Ry. 974
19/8/96

The Collector will be requested to ascertain from the Mahant of Tirupati whether he is willing, as proposed by the Council, to contribute, in addition to his promised donation of Rs 30000, an additional sum of Rs 57,750, being one quarter of the estimated cost of the scheme, & if not, whether he will pay the balance of his contribution in one instalment. The Collector should deal with this matter personally.

(From orders) Ry 28/8/96

Initd
8.8.96

Initd
29.7.96

No harm in asking. The Colr. should deal with the matter personally.

KW
6/8/96

with CNo. 107 (as altered)
(Printed)
Dispatched
2-8-96

× Note. The Mahant has already contributed Rs 6000. Last year he would not give any instalment, as he said he preferred to wait until the work was in hand.

To
The Collector of North Arcot

Tirupati Water Supply

FOR ORDERS.

Statement shewing particulars of Receipts and Expenditure, Expected from the Tirupati Municipality per annum.

Heads	Rupees	
Receipts.		
Tax on Arts.	2000	0 0
Tax on Buildings	5400	0 -
Tax on Lands	300	. .
Tolls.	1500	. .
Market Rents	500	. .
Slaughter House	500	. .
Cart Stand	25	. .
Private Scavenging fees.	500	. .
Tax on Vehicles	200	. .
Tax on Animals	700	. .
Tax on Carts	650	. .
Rent of Lands	25	. .
Avenue Receipts.	50	. .
Garden Receipts.	25	. .
Sale proceeds of old Materials	25	. .
Conservancy Receipts.	500	. .
School fees	200	. .
License fees.	100	. .
Magisterial fines	100	. .
Grant from Provincial funds	150	. .
Private Contentention for Tank watering	60	. .
Sundry Receipts such as Mundaru fees.	25	. .
	13535	- . or 13500 . .

Expenditure.

New works.			
Communications.	100 . .		
Civil Buildings	100		
Repairs.			
Communications	1200 . .		
Civil Buildings	100 . .		
Drains	200 . .		
Tank watchmen	180 . .		
Contingencies	20 . .		
Overseer.	180 . .		
Tools and plants.	30 . .	2110	. .
Grant II. Education.			
Fixed payments	620 . .		
Results Grants	200 . .		
Contingencies	200 . .		
Salary grants.	400 . .		
Results grants.	300 . .		
Municipal School. Establishment.	180 . .		
Contingencies	10 . .		
Gymnasium	120 . .		
Contingencies	30 . .	2060	. .
Grant III. Sanitation and Medical &c.			
Contributions. Medical College			
Sanitary Inspection and Medical	100 . .		
Reserve staff. - - - - -			
Vaccination	260 . .		
Contingencies	120 . .		
Registration. Establishment.	120 . .		
Contingencies	10 . .		
Carried over	610 . .	4170	. .

Brought forward -	610 . .	4170	. .
Conservancy Est.			
Establishment.	3000 . .		
Other Charges.	100 . .		
Private Scavenging Establishment	430 . .		
Contingencies	50 . .		
Cholera Charges	100 . .		
Brama utsavam	100 . .		
Prickly pear removal and other Sundry Contingencies.	100.	4490	. .
Grant IV.			
Lighting Establishment.	300 . .		
Contingencies	700 . .		
Slaughter House Contingencies	10 . .		
Garden Establishment.	60 . .		
Contingencies	40 . .		
Rewards.	20 . .		
Printing	400 . .	1500	. .
Grant V.			
Office Establishment.	710 . .		
Collection Establishment.	190 . .		
Office Contingencies.	250 . .		
Contribution.	100 . .	1250	. .
Total Expenditure —		11410	. . or 11400.
Receipts.	13500 . .		
Expenditure -	11400 . .		
	2100 . .		

16. 6. 96. (True Copy)

K. Thompson
Chairman

I agree to contribute the
sum of Rs 77,000 being one
third of the cost of the Tampathi
water supply scheme in annual
instalments of Rs ~~15,000~~ 12,000 This
contribution does
includes the ~~instalment~~ of Rs 30,000
already promised. The first instalment
is to be paid when the work is begun
and not before.

~~Sd/- Gopalaswamy Mudaliar, Diwan~~

Sd/- R. Bryant
Collr

NORTH ARCOT, COLLECTOR'S OFFICE.

Camp Tirupati 4-10-1896.

No. 1771 of 1896.

From

S. H. Lynne, Esquire

Collector & District Magistrate,

North Arcot.

To

The Chief Secretary to Government

Local and Municipal

Department,

Madras

Sir,

In reply to memo 974/19.8.96 I have the honor to enclose a memorandum signed by the Mahant, promising a total sum of Rs 77,000 in instalments of Rs 12,000 per annum. This sum bears the same proportion to the total cost as the sum of Rs 30,000 already promised bore to the cost of the drainage scheme for which it was originally intended. The first instal-ment is not to be paid till the work is begun. He insisted on this condition because of the instalments already paid by him without any result.

2 I had great difficulty in obtaining his consent and could not get better terms.

I have the honor to

Confidential
No 11

North Arcot Collectorate Office
15th November 1876.

Local Dept.
Cir... 3118 M

From,

S. H. Wynne Esquire
Collector of North Arcot.

To,

The Secretary to Government
Local & Municipal Dept.

Sir,

In reply to Memo No 1309 dated the 14th Instant I have the honour to state that it seems obvious to me that the Inahamdar cannot give a legal agreement binding his successors to a voluntary contribution. It is only by estoppel that such an agreement could, I believe, have any effect, since there is no legal consideration, and so far as my opinion goes, a future Inahamdar

Government {1897} of Madras.

LOCAL AND MUNICIPAL.

Recd. } 1897. *Enclosures*

Regd. } *Spare copies*

G.O., No. 43 M., 16th January 1897.

JANUARY.

Water-supply.

Sanctioning, with remarks, the estimate of Rs. 2,31,000 for the scheme of — for the town of Tirupati; ordering the publication in the *Fort St. George Gazette* of an application for a loan of Rs. 59,000 for the work from Provincial funds; requesting the Public Works Department to put the work in hand without delay; and noting the liberality of the Mahant in contributing towards the cost of the work.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—the following papers:—

From J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E., Secretary, Sanitary Board (Engineering Branch), to the Chief Secretary to Government, dated Fort St. George, 1st April 1896, No. 1019.

I have the honour to forward herewith a report, plans and estimates in reference to the water-supply scheme for Tirupati as approved by the Sanitary Board.

ENCLOSURES.

REPORT on a Scheme for the Water-supply of Tirupati.

There are several sources from which water might have been supplied to the town of Tirupati. There is water in a number of places within a short distance of the town. The choice of the source of supply therefore depended upon (1) the quality of water, (2) the cost of the scheme

2. An unfailing and sufficient supply of water might have been obtained by infiltration works either in the bed or on the banks of the Suvarnamukhi river, which flows 2½ miles to the south of Tirupati. Water could also have been obtained in various degrees of abundance by infiltration works in the valleys of the several hill streams which intersect the country around Tirupati.

3. The first site explored for a source of supply was a valley to the north of the town marked B on accompanying plan. The possibility of a supply from this valley was suggested to the Assistant Sanitary Engineer by the Sanitary Commissioner.

4. Four trial-pits were sunk at the spot indicated by the Sanitary Commissioner. The soil consists of red sandy earth varying in depth from 5 to 11 feet. The stratum below this consists of bluish-grey clay intermixed with lime nodules. Water was found close to the surface of ground. The maximum inflow in one of the trial pits was ½ cubic foot per minute; in the others it was a little less. The depth of water in all the trial pits was 10 feet. The sub-soil, though slightly porous, is sufficiently hard to stand almost vertical without shoring and the gallery could be easily deepened to 15 feet below water-level, which would give an increased flow.

This source of supply has however many disadvantages:—

(1) Pumping would be necessary. The lift would be about 60 feet, and the annual expenditure (all charges included) would be about Rs. 11,000 on the assumption that Government contributed half the initial cost. The annual expenditure of the scheme finally adopted, on the same basis, will be Rs. 8,000.

(2) The supply would not be so copious as in the suggested scheme.

(3) The result of the chemical analysis of the water (Appendix I) from these pits is not favourable.

(4) The drainage of that slope of the hill on which the path to Upper Tirupati lies is received by this valley. The Sanitary Commissioner was unaware of this when he suggested this source of supply, or he would have condemned it as being liable to pollution from cholera matter from persons taken ill on their way to Upper Tirupati.

5. Some more trial-pits were dug in search of underground water in other directions, but the above objections excepting No. 4 seemed to apply to all these sources of supply in a more or less degree.

6 Attention was next turned to the Suvarnamukhi river as a source of supply. The easiest scheme would have been to construct infiltration works in the bed of the river at the point nearest the town. Such a scheme would have involved pumping to a considerable height, and there are extensive tracts of cultivated land on both banks of the river above this point. It

was therefore decided to go higher up the river to minimise the chance of possible pollution of the water by the drainage from cultivated lands on its banks. It became apparent as the levelling operations progressed that by going sufficiently far up the river, a site could be found for infiltration works which would allow water to be conducted to the town by gravitation. To find a point which fulfilled the above two conditions in the highest degree possible with a due regard to cost, it was necessary to go some distance up the Kalyani, which is the main tributary of the Suvarnamukhi.

7. The site selected is on the right bank of the Kalyani at the angle formed by the river and the South Indian Railway which crosses it. At this place there is a spring head from which a channel is led off to irrigate certain lands below. The spring has never been known to fail within the memory of the oldest resident. This water has a very high reputation and is considered by the people superior to the water in the bed of the stream. The soil of the bank at this spot and around it is a red sandy earth, and to this circumstance the superior quality of the water may be attributed. The water has been analysed and classed as usable. The result of the analysis will be found in Appendix II. With infiltration works in which water will be absolutely protected from direct contamination by men and animals and in which a lower, and therefore presumably a purer, stratum of water will be tapped, it would not be incorrect to surmise that the purity of water would be greater than that of the sample submitted to the Chemical Examiner.

8. The population of Tirupati was, at the census of 1881, 13,232, and at the census of 1891, 14,242. A provision for 24,000 people at 15 gallons per head is considered sufficient for the requirements of the town, including the pilgrims visiting the town during festivals. The quantity of water required is therefore 360,000 gallons per day or 250 gallons per minute.

9. No experiments have been made to test the yield of water, because there is enough of circumstantial evidence as regards the probable yield of water. Through the courtesy of the Chief Engineer, South Indian Railway, the accompanying tracing, giving particulars of soil passed through and amount of pumping required in building the piers of the railway bridge across the Kalyani, was obtained. The water in the excavation for west abutment, which is on the right bank of the river and close to the site of the proposed infiltration works, was, with great difficulty, kept down by a six-inch centrifugal pump, which is capable of discharging about 600 gallons per minute. This quantity is double the maximum requirements of Tirupati. The Chief Engineer of the South Indian Railway, however, says that the foundations of this bridge were taken out in an unfavourable season. Constant small freshes came down the river while the work was in progress. The infiltration gallery will be 1½ feet deeper than the west abutment of the railway bridge and 330 feet in length, which is about twenty times the length of excavation taken out for the abutment. The length of gallery provided in the scheme is considered ample.

10. If the scheme, however, is approved, it is suggested that experimental pumping should take place in the next dry season to test the yield before any of the works are begun.

11. The water from the sandy bed of the Suvarnamukhi river has also been analysed and pronounced "usable." Should the proposed infiltration gallery not give the required supply—which is a very remote contingency—the supply could be easily augmented by collecting the water in the bed of the river by a line of open-jointed pipes laid in the sand and connected with the collecting well as shown on plan No. 2.

12. *Drawing Nos.* 2, 3.—The infiltration works will be formed by cutting a trench 330 feet long with its bottom six feet wide and at the level of 605·00. Four rows of open-jointed six-inch stoneware pipes will be laid in the bottom of the trench, and the trench will be filled up to a height of five feet with stones varying in size from four inches to the size of a pea, the largest-sized stones being placed just over the pipes. Above the level of the stones the trench will be filled up with pure sand from the bed of the river. At the two extreme ends of the gallery there will be a well eight feet in diameter with its bottom, which will remain unsealed, at the level of 600·00 or five feet below the level of the infiltration pipes. These two wells are provided in the hope of tapping deeper springs which the main cutting would not touch. The advisability of sinking the two extreme wells at a deeper level is suggested by the pumping particulars given by the Chief Engineer of the South Indian Railway as regards pier No. 3, which was taken down to the level of 602·14 and required two six-inch centrifugal pumps to cope with the water in the excavation

13. The lowest water-level has been ascertained to be 115·00. The infiltration pipes will therefore be ten feet below low-water level and the bottom of the end wells fifteen feet below low-water level.

14. The infiltration pipes from the right and left will be connected with a central well. As it would be inconvenient to connect four rows of pipes, each requiring a valve to control it, with the central well, the four rows of six-inch pipes will terminate in an oblong cistern on each side of the well, and from this cistern a single line of pipes will be connected with the well. The mouths of the two pipes into the well will be controlled by valves,

15. From this central well and valve-house the delivery pipe to the service reservoir in Tirupati will be led off. The delivery pipe will have its bottom at the level of 610·00 at the collecting well, which will allow of a depth of five feet below low-water level.

16. The delivery pipe will be of stoneware nine inches in diameter, and with a fall of 1·4 in 1,000 at which it is proposed to lay it will deliver 258 gallons per minute or 371,600 gallons per day. Where the pipe crosses a stream or tank it will be of cast iron. There will be manholes at all bends in the pipe line and special pipes with inspection holes at every 300 feet. The pipe line will be 35,810 feet in length and terminate at the level of 559·87 in a service reservoir to the north-west of the town. The pipe will not be under pressure, and overflows will be provided from manholes near the various *vankas*. But it may be found preferable to introduce one or two break-pressure valves and make the other manholes thoroughly air-tight.

17. The service reservoir could have been placed nearer the town with some economy, but as during festivals pilgrims camp along the main road to Tirupati it was considered advisable to locate the reservoir at a safe distance from the road. It will be 99′ × 45′ with a depth of 10½ feet of water. The full reservoir level will be at 560·00; the bottom of the outlet main to the town will be at the level of 550·00.

18. The reservoir is designed to contain 272,000 gallons, which is equal to ¾ of a day's supply as provided in the scheme. Considering the length of the delivery pipe, it would be wise to have a second reservoir of the same size. There is, however, no immediate necessity for it and it is therefore not included in the estimate.

19. The distribution pipes are calculated to deliver fifteen gallons per head in twelve hours. The distribution system consists of—

1,818	feet of	12 ″	cast-iron pipes.
729	,,	8 ″	,, ,,
1,503	,,	7 ″	,, ,,
576	,,	6 ″	,, ,,
2,277	,,	5 ″	,, ,,
5,895	,,	4 ″	,, ,,
1,341	,,	3 ″	,, ,,
720	,,	2½″	,, ,,
61	sluice valves.		
5	air valves.		
20	hydrants.		
40	pillar and wall tap fountains.		

The minimum pressure at the hospital, which is the highest point in the town to be supplied with water, will be 8 feet, but at nights there will be a pressure of 18 feet. The minimum pressure in the town will be nowhere less than 25 feet. Two thousand five hundred feet of additional piping are included in the estimate for providing extra taps with a view to meet the requirements of the town during the time of the festivals. These extra taps will be arranged for in consultation with the Sanitary Commissioner when the works are in progress.

20. The initial cost of the scheme is estimated as follows:—

	Rs.
Compensation to landholders deprived of the water of the Bungaru channel (fed by spring taken for infiltration works) ..	6,000
Infiltration works	15,448
Delivery pipe	58,300
Service reservoir	14,760
Distribution of pipes, &c.	52,350
Laying and jointing pipes	15,290
	1,62,148
Temporary offices and conservancy during construction	2,500
Tools and plant at 2½ per cent.	4,059
Establishment at 7½ ,, ...	12,176
Contingencies at 5 ,, ...	8,117
	1,89,000

The annual expenditure will be—

Interest and sinking fund at 5·96 per cent. on Rs. 94,500 (half the initial cost)	5 633
Establishment and maintenance of works	2,367
	8,000

A water-tax at 4 per cent. would yield about Rs. 3,000. Even with the strictest economy in expenditure and efforts at improvement of the municipal revenue in other directions, an annual expenditure of Rs. 8,600 for the water-supply is beyond the means of the municipality. It has been ascertained from the Chairman of the Municipality that about Rs. 6,000 is the utmost that it could provide, and that with the prospect of an enhanced water-tax.

21. Tirupati is an instance of a town that deserves more liberal aid from Government than the usual contribution of a moiety of the cost. Its population is about 14,000, but in view of the large number of pilgrims that resort to the place a scheme for a population of 24,000 has had to be designed, and thus the burden of providing for an outside population falls on the inhabitants of Tirupati. Considering how important a water-supply is for the protection of the health of not only the town of Tirupati, but indirectly that of the whole Presidency, it is suggested that Government may be pleased to make a grant of three-fourths of the cost of the scheme on the condition that whatever contribution the Mahant of Tirupati makes should be handed over to Government. On this assumption the annual expenditure will be—

	Rs.
Interest and sinking fund at 5·96 per cent. on Rs. 47,250	2,817
Establishment and maintenance of works	2,383
Total ..	5,200

The Mahant of Tirupati has promised a contribution of Rs. 30,000 towards the scheme in annual instalments of Rs. 3,000. If he could be induced to pay the whole amount at once, the contribution from Government may be reduced by Rs. 30,000, and it will then be Rupees 1,11,750, which is 59 per cent. of the initial cost.

22. In Sanitary Engineer's letter to Government, No. 116-T, dated 15th May 1894, the annual cost of a water-supply scheme for Tirupati was stated to be Rs. 6,500. But this was not only before a scheme was investigated but before there was any definite idea as to the location of the source of supply. Every source of supply nearer the town than the one adopted here will involve pumping, and the annual expenditure would be in each case more, besides having disadvantages as regards copiousness and purity of water. Moreover, a gravitation scheme is much simpler, much safer, more effective, and one that will find more favour with the public than a pumping scheme.

23. The scheme proposed is due to Mr. Hormusji Nowroji, Assistant Sanitary Engineer to Government, who also carried out the investigation and design. M.R.Ry. K. Gopalachariyar, Chairman of the Tirupati Municipality, rendered much assistance during the investigation.

APPENDIX I.

	Sample trial well No. 3.	Sample trial well No. 4
Total solids, Grms. per litre	0·440	0·520
Volatile solids ,, ...	0·100	0·140
Chlorine ,, ...	0·017	0·017
Total hardness, Clark's scale	8°·750	7°·000
Permanent hardness ,, ...	Trace	Trace
Free ammonia, Ml. Grms. per litre	0·048	0·080
Albumenoid ammonia ,, ...	0·224	0·400
Nitric acid (as ammonia) ,, ...	1·500	1·200
Apparent quality of the water as inferred from the results obtained on examination	Suspicious.	Suspicious.

APPENDIX II.

	Sample A. From the bed of the Kalyani.	Sample B. From a spring head in the bank of the Kalyani.
Total solids, Grms. per litre	0·420	0·490
Volatile solids ,, ...	0·120	0·140
Chlorine ,, ...	0·024	0·028
Total hardness, Clark's scale	8°·750	9°·450
Permanent hardness ,, ...	0°·525	0°·525
Free ammonia, Ml. Grms. per litre	Trace	Trace
Albumenoid ammonia ,, ...	0·048	0·040
Nitric acid (as ammonia) ,, ...	Trace	2·100
Apparent quality of the water for potability as inferred from the results obtained on examination ..	Usable.	Usable.

Remarks.—Sample B may become contaminated. The nitrates in this sample are indication of this danger.

PROCEEDINGS of the Sanitary Board (Sanitary Engineering Branch), dated 1st April 1896, No. 1018.

* * * * *

Read—G.O., Mis. No. 883 M., dated 9th July 1894.

Read—also the Sanitary Engineer's report, dated 18th October 1895, on the water-supply of Tirupati, accompanied by plans and estimates.

Resolution.—The Board considers that, as the scheme drawn up by the Sanitary Engineer provides for 24,000 or 10,000 in excess of existing population at 15 gallons per head, the scheme may be generally approved with the following amendments:—

(1) Break-pressure tanks to be provided on stoneware pipe main instead of manholes or overflows.

(2) Six bathing-houses for twelve persons each to be provided.

(3) The masonry fountains to be faced with glazed bricks instead of cement.

(4) Perforated iron pipes to be used in filtration gallery instead of stoneware loose-jointed pipes.

(5) The service reservoir to be increased from one containing two-thirds of a day's supply as designed by the Sanitary Engineer so as to contain two days' supply and to be divided into two compartments.

The plans, estimate and report have been modified accordingly and will be forwarded to Government for sanction.

2. The Board recommends that a sum of Rs. 10,000 be granted as soon as possible to construct filter-well and test the yield during the immediately approaching dry season.

No. 551.

Referred to the Municipal Council, Tirupati, for early remarks and report as to how it proposes to meet the annual expenditure on account of the scheme, assuming that Government will make a grant of three-fourths of the cost of the scheme, and lend the remaining one-fourth to be repaid in thirty years with interest at $4\frac{1}{4}$ per cent. per annum.

(By order.)

FORT ST. GEORGE,
16*th May* 1896.

(Signed) W. W. PHILLIPS,
Acting Assistant Secretary.

To the Chairman, Municipal Council, Tirupati.

From J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E., Sanitary Engineer to Government, to the Chief Secretary to Government, dated Fort St. George, 9th July 1896, No. 2143.

With reference to G.O., Mis., No. 843 M., dated 15th May 1896, sanctioning the construction of filter-well, &c., at Tirupati for testing the yield, I have the honour to point out that, if the yield is satisfactory, the council should be in a position to proceed with the remaining works, because otherwise if the well and trenches remain open and unprotected, additional expenses will be incurred for pumping, clearing trenches and excavated foundations in trenches, &c.

2. I have, therefore, the honour to suggest that Government will be pleased to make some financial arrangements for the works being proceeded with in, say, five months from this date (when the experiments are likely to be complete).

3. The possible contributions from Tirupati and Mahant are noted in the report which accompanied the estimate and plans sent with the Sanitary Board's resolution, No. 1018, of 1st April 1896.

From M.R.Ry. K. GOPALA CHARIYAR Avargal, Rao Sahib, Chairman, Municipal Council, Tirupati, to the Chief Secretary to Government (through the Head Assistant Collector of North Arcot), dated 20th June 1896, No. 295.

In reply to your endorsement, No. 551, dated 16th May last, on the report of the Secretary, Sanitary Board, Engineering Branch, in connection with the water-supply scheme for this town, I have the honour to forward herewith an extract from the minutes of proceedings of the Municipal Council, Tirupati, containing its views towards meeting the annual expenditure on account of the said scheme.

2. The papers received in this connection are herewith returned in original.

ENCLOSURE.

EXTRACT from the Minutes of Proceedings of the Municipal Council, Tirupati, passed at its adjourned special meeting held at 5-30 P.M. on the 16th June 1896.

* * * * *

3. Read endorsement, No. 551, dated 16th May last, from Government, forwarding estimates, plans, &c., for Rs. 2,31,000 on account of the water-supply scheme for the Tirupati town for remarks, and report as to how the council proposes to meet the annual expenditure on account of the said scheme assuming that Government will make a grant of three-fourths of the cost of the scheme and lend the remaining one-fourth to be repaid in thirty years' instalments at $4\frac{1}{4}$ per cent. per annum. Read also statements prepared by the council, showing particulars of receipts and expenditure expected from the Tirupati Municipality.

Resolution.—Out of Rs. 6,000 which the council has to meet owing to the introduction of the new water-supply scheme, the council expects to realize Rs. 3,000 from water-tax. The council has then to account for the remaining Rs. 3,000. It will be seen from the statement prepared at the meeting very carefully that the receipts are expected to be Rs. 13,500 in round figures, and expenditure to be Rs. 11,400, leaving an unexpended balance of Rs. 2,100 per annum at its credit.

2. Bearing in mind the heavy demand it has to meet with, the council has cut short some of the items of expenditure as detailed below, hoping at the same time to keep up the efficiency of the administration within its means:—

(*a*) The usual allotment for the maintenance of roads has been on an average Rs. 1,200 per annum. Rs. 410 sanctioned in the current year's budget for the upkeep of a permanent gang of coolies will merge in that allotment.

(*b*) The conservancy establishment will be restricted to only Rs. 3,000.

(*c*) The services of the avenue cooly will be dispensed with, as also that of one of the gardeners.

(*d*) The services of one of the office peons will be dispensed with.

(*e*) The services of the private scavenging maistri and of a scavenger will be dispensed with.

3. Rupees 400 is being paid annually on an average as salary grants to the Hindu Lutheran German Mission High School, Tirupati. Considering that the Sri Mahant of Tirupati keeps up a high school of his own without any aid from this council, and that this council maintains four primary schools of its own it is just the time that it should be relieved of this heavy burden, and this will leave an additional saving of Rs. 400, making in all Rs. 2,500.

4. It is not unknown to the benevolent Government that Tirupati is the most important place of pilgrimage in the whole of India, and as such it deserves more aid from the Government. In its crippled state of finances, this council has not only to meet the wants of the residents of this town, but also of another extra population of more than two-thirds coming from all parts of India. It is the Sri Mahant of Tirupati, the trustee of the temple, that is virtually benefited by the flow of pilgrims, and it is more or less his paramount duty to look to their comforts. The Sri Mahant must, therefore, be induced to stretch out his liberal hands, and contribute the remaining one-fourth of the expenditure besides the Rs. 30,000 which he has so kindly promised. If unfortunately, however, the Sri Mahant is not kind enough so to contribute, the Government will be pleased to allow the credit of the Sri Mahant's contribution of Rs. 30,000 towards this municipality, the Government itself bearing three-fourths of the cost.

* * * * *

Cur. No. 1141-Eng.

Forwarded through the Collector.

(Signed) C. RAMASESHA AIYAR,
Dy. Collector of Arni, in charge.

12*th July* 1896.

Forwarded.

(Signed) R. H. CAMPBELL,
Acting Collector.

13*th July* 1896.

From the Collector of North Arcot, Dis. No. 1771, Eng., dated 4th October 1896.

ABSTRACT.—Stating that the Mahant of Tirupati has promised to contribute Rs. 77,000 towards the water-supply scheme for the town.

From the Collector of North Arcot, No. 11, Confdl., dated 15th November 1896.

ORDER—No. 48 M., dated 16th January 1897.

The municipal council's proposal to reduce the ordinary expenditure under the several heads in order to provide for the annual charges of the water-supply scheme does not commend itself to Government. As, however, the resources of the municipality under the Act which is now before the Legislative Council, will, it is believed, be sufficient to meet the additional charges, the estimate for the work, which, as modified by the Sanitary Board, amounts to Rs. 2,31,000, is sanctioned.

2. The Mahant of Tirupati has generously agreed to contribute one-third of the cost of the scheme, and the remaining two-thirds will be paid as a grant from Provincial funds. A sum of Rs. 6,000 has already been paid by the Mahant and he has undertaken to pay the balance in annual instalments of Rs. 12,000, the first payment being made when the work is begun. Excluding, therefore, the sum of Rs. 18,000 which will thus be available at the commencement of the work and the Government grant of Rs. 1,54,000, the municipal council will have to find Rs. 59,000. This amount the Government will be prepared to advance as a loan at $4\frac{1}{4}$ per cent. repayable in five years. In order that the loan of Rs. 45,000 provided for this purpose in the revised estimate of Provincial loans should be drawn before the end of the year, an application in the prescribed form will be published in the *Fort St. George Gazette*.

3. The Public Works Department is requested to put the work in hand without delay and to note that the proposed compensation to landholders should not be paid until it is ascertained that they actually suffer from the diminution of the water-supply in the springs, as it appears to be quite possible that they will not.

4. His Excellency the Governor in Council is pleased to note the liberality of the Mahant in contributing so generously towards the cost of this important scheme.

(True Extract.)

G. S. FORBES,
Secretary to Government.

To the Chairman, Municipal Council, Tirupati.
" Collector of North Arcot.
" Sanitary Board.
" Sanitary Commissioner.
" Sanitary Engineer.
" Accountant-General.
" Public Works Department.
" Financial Department.
Editors' Table.
Gazette.

Exd. A. F. Eccleston.

[Annexures.

ANNEXURES.

APPLICATION of the Tirupati Municipal Council for a loan from Government under section 5 of the Local Authorities Loans Act, 1879.

The work or works for the construction or repair of which the loan is required and an estimate of the cost thereof.	The amount which it is proposed to borrow.	The fund or funds on the security of which it is proposed to borrow.	The law or laws under which the said fund or funds is or are levied, received or held.	The period for which the loan is required, the number and amount of the instalments, if any, in which it is proposed that the loan shall be taken, the dates proposed for receiving such instalments, and the instalments, if any, in which it is proposed to repay the loan.	A detailed account of the revenue and expenditure of the local authority for the three last preceding years.	All existing prior charges upon the funds of the local authority.
1	2	3	4	5	6	7
Water-supply scheme for the town of Tirupati estimated to cost Rs. 2,31,000.	Rs. 59,000	Tirupati Municipal fund.	The Madras District Municipalities Act (IV of 1884).	The loan is required for five years. It will be taken in two instalments of Rs. 45,000 in 1896-97 and Rs. 14,000 in 1897-98 and repaid in five annual instalments, with interest at $4\frac{1}{4}$ per cent. per annum.	Attached herewith.	*Nil.*

DETAILED Account of the revenue and expenditure of the Tirupati Municipality during 1893-94, 1894-95 and 1895-96.

	Actuals, 1893-94.	Actuals, 1894-95.	Actuals, 1895-96.
Receipts.	RS.	RS.	RS.
Balance brought forward	12	6,497	10,987
Tax on Arts	2,795	2,235	2,077
" on Buildings and Lands	7,551	6,190	5,807
" on Vehicles and Animals	858	775	738
" on Carts	662	626	640
Tolls	1,136	1,376	1,540
Realizations under Special Acts	55	..	..
Rent of Lands, Buildings, &c., and Sale-proceeds of Lands, &c.	258	175	306
Conservancy Receipts	189	151	253
Fees and Revenue from Educational Institutions	187	198	237
Income from Markets and Slaughter-houses	580	836	799
License Fees	70	113	101
Other Fees	42	61	42
Fines under Municipal and other Acts	76	211	426
Grants and Contributions from Government	71	25	..
" " from other bodies	3,060	3,055	55
Recoveries for Services to Private Individuals	577	635	693
Miscellaneous	38	13	42
Advances Recovered	50	32	111
Total ..	18,267	23,201	24,854
Charges.			
GRANT 1—			
New Works—			
Communications	..	48	..
Buildings	1,718	76	664
Water-supply	105	141	466
Repairs—			
Communications	760	1,257	2,377
Buildings	121	364	333
Drainage	..	16	..
Water-supply	702	846	428
Establishment	180	179	180
Tools and Plant and other Stores	1	62	..
Total ..	3,587	2,989	4,448

Detailed Account of the revenue and expenditure of the Tirupati Municipality during 1893–94, 1894–95 and 1895–96—*cont.*

—	Actuals, 1893–94.	Actuals, 1894–95.	Actuals, 1895–96.
Charges—cont.			
GRANT 2—	RS.	RS.	RS.
Training Schools	..	146	2
Municipal Schools—			
On the Salary-result System	785	734	894
Salary Grants	395	342	407
Result Grants	221	222	258
Inspection	67	67	67
Miscellaneous	..	..	135
Total ..	1,468	1,511	1,763
GRANT 3—			
Contributions	47	162	152
Vaccination	380	350	373
Registration of Births and Deaths	125	88	111
Conservancy, Road-cleaning and Road-watering	3,667	4,207	4,526
Total ..	4,219	4,807	5,162
GRANT 4—			
Lighting	749	1,046	1,104
Markets and Slaughter-houses	33	14	8
Avenues	..	66	56
Public Garden, Survey of Land, Fire and other charges	443	550	506
Total ..	1,225	1,676	1,674
GRANT 5—			
Supervision and Management	1,226	1,113	1,481
Advances Recoverable	45	118	92
Balance	6,497	10,987	10,234
Total ..	18,267	23,201	24,854