Public Works (1897) Department.

G.O., No. 712W

DATED 11 March 1897

[Despatch Abstract.]

Watersupply scheme for the town of Kurnool. Pros:

Local and Municipal Dept. sanctioning with remarks the revised estimate of Rs. 2,40,555 for the scheme — and the estimate of Rs. 23,112 for certain extensions proposed by the Municipal Council. Comt. to E. III Circle for information

11/3/97

Indexed. 15/3/97

BACK PAPERS.

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Public Works (1897) Department

Government (1897) of Madras.

LOCAL AND MUNICIPAL.

Current No. 1959

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Enclosures

Spare copies 8

G.O., No. 76 M., 21st January 1897.

B/… 12 … 11-3-97

Communicated to the Supdg Engr. III Circle for information.

6/3/97

JANUARY.

T… B… S. S. III Circle

13/3/97

Water-supply. — Kurnool —

Sanctioning, with remarks, the revised estimate of Rs. 2,40,555 submitted by the Sanitary Engineer for the scheme of — for the town of Kurnool and the estimate of Rs. 23,112 prepared by the same officer for the extension of the works proposed by the municipal council.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—the following papers:—

From the Public Works Department, No. 1332-C., dated 9th March 1896.

ABSTRACT.—Transferring memorial from Mr. Prendergast and others, residents of Kurnool, regarding water-works at Kurnool.

No. 392, dated 25th March 1896.

Referred to the Sanitary Engineer for early remarks.

(By order)

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

From Surgeon-Lieutenant-Colonel W. G. KING, M.B., C.M., D.P.H., Sanitary Commissioner for Madras, to the Secretary to Government, Public Works Department, dated Fort St. George, 10th March 1896, No. 549-S.

I have the honour to inform you that I am in receipt of a copy of a petition from certain inhabitants of Kurnool municipality in which they refer to the absence of provision for the supply of water for houses occupied by Europeans. I agree with the petitioners in thinking that, if it be possible for these to be commanded by the water-works, it is most desirable for sanitary reasons that they should not be neglected.

2. I would also take this opportunity of pointing out that the absence of provision for the supply of the suburb of Budapett is, in my opinion, a serious defect in the original scheme.

No. 1535-C., dated 19th March 1896.

Transferred to the Local and Municipal Department.

(Signed) D. McNEIL CAMPBELL, Col., R.E.,
Joint Secy. to Government, P.W.D.

No. 402, dated 27th March 1896.

Referred to the Sanitary Engineer for remarks in continuation of Government endorsement No. 392, dated 25th March 1896.

(By order)

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

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, 14th April 1896, No. 1133.

In reply to reference Nos 392 and 402 of 25th and 27th March 1896, respectively, and which are herewith returned along with the petition from certain residents in Kurnool, I have the honour to report as follows:—

2. The scheme for Kurnool, as you are aware, it has been possible to carry out only by very large and extraordinary grants from Government and the scheme was therefore limited to supplying the main bulk of the population and not the outlying portions of the town. Government are also aware that the scheme, even as it now stands, is likely to cost considerably more than estimated. It is quite true, as stated by Mr. Thorburn in his demi-official accompanying the papers noted, that "the Sanitary Engineer's department did all this with their eyes open," simply because of financial considerations. It does not affect this department in any way whether more or less piping is laid down, and if Government can see their way, looking to the circumstance hereafter stated, to extend the supply as required, no doubt, the distribution will be more complete than it now is; the question, however, is: Are the benefits which may accrue worth the additional expense?

3. Taking first the petition from the residents and referring to paragraph 3, I have prepared an estimate which will meet the request for water, items A, B, C and E. The cost of extending pipes to these sites amounts to Rs. 11,050. The population to be served is not known exactly, but may be as follows:—

Collector's house	10
Forest-officer's house	8
District Board's office	5 (staff during day).
Travellers' bungalow	4
American Mission	20
Total	47

But suppose the population is 100, then the expenditure will be Rs. 110 per head.

4. I have not included in the above the taluk cutcherry, the Superintendent of Police's house, the house of the Nawab of Banganapalle, the Local Fund Engineer's house and the Roman Catholic Priest's house because these are already served by existing arrangements.

5. The Sanitary Commissioner suggests that Buddavarampet should be supplied. This is outside the town on the opposite side to Kurnool of the Hindri river. The population may be about 1,000, the cost will be Rs. 9,440. It may be stated that water of very fair quality is obtainable near the above village.

6. The Assistant Sanitary Engineer in reporting on the matter points out that a portion of the town not supplied under the present limits of the scheme is the village of Nawabpet where the police lines are, and that this portion has greater claim for water-supply than any other. The cost of supplying this village will be Rupees 5,100.

7. The total extension proposed therefore amounts to—

	Rs.
Houses of English residents	11,050
Extension to Buddavarampet	9,440
Do. to Nawabpet	5,100
Total	25,590

The Sanitary Commissioner in a recent note to the Sanitary Board also proposes that the supply should be carried to Rozapet. This would cost about another Rupees 5,000.

8. The scheme is based on a supply for 30,000 people. The population of Kurnool, including the villages referred, was, according to the census of 1891, 24,523; the distribution system can therefore be extended at any time. It is not believed that the financial circumstances of Kurnool are such as to allow of these extensions at present.

From C. M. MULLALY, Esq., Collector of Kurnool, to the Chief Secretary to Government, dated Kurnool, 11th May 1896, No. 815-Eng.

With reference to the accompanying copy of letter from the Sanitary Engineer to Government, No. 1363, dated 4th May 1896, I have the honour to state that this morning, for the first time, I have seen the plan of distribution of water in the new water-works scheme and consider it to be very incomplete.

2. On the left of the main channel, the following are omitted :—

(1) The new petta which is very densely populated.
(2) The Police lines.
(3) The new Police hospital.
(4) The new Head-quarter Police office (to be built).
(5) The suburb of Roza.
(6) The travellers' bungalow.
(7) The Mission house and Boarding school.
(8) The Collector's house.
(9) The Club.
(10) The District Forest-officer's house.

All these could be very easily served by a main distributary taking off close to the District Forest-officer's house and proceeding nearly in the inverse order to the above. The Assistant Sanitary Engineer approves, I believe, of this line of pipes and will shortly lay it before the municipal council.

3. On the right of the main distributary, the following are omitted :—

(1) Buduvarapet.
(2) Huzur cutcherry which, when complete, will provide accommodation for both the Head-quarter and Kurnool Deputy Collectors.
(3) Sub-jail which acts as a district jail.
(4) The new combined Tahsildar's cutcherry and Sub-Magistrate's Court (to be built).
(5) The Cotton press.
(6) The Assistant Sanitary Engineer's house (Government property).
(7) The Judge's house.
(8) The Toll-gate.
(9) The District Board's office.

4. The Sanitary Commissioner has all along advocated Roza and Buduvarapet being included in the scheme. The only excuse for omitting the latter from the scheme is that it is cut off from the rest of the town by the river Hindri, but this is not sufficient reason for omitting a populous suburb containing the most important offices in the town and the only jail.

5. As I have had only a cursory look at the plan and have now no records before me, I have no intention of fully discussing the scheme, but merely of bringing to the notice of Government that the scheme is at present very incomplete and of raising the question whether it is advisable and the intention of Government that such important schemes should be submitted without any reference at all to the Collector. Municipal and Public Works budgets pass through the Collector who is invariably consulted in matters of importance and I fail to see why water schemes should form an exception.

Enclosure.

From J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E., Sanitary Engineer to Government, to the Collector of Kurnool, dated Fort St. George, 4th May 1896, No. 1363.

With reference to your letter No. 815 of 1st May 1896 I have the honour to inform you that it has not been the practice in this department to consult the Collectors of districts in regard to the details of distribution in water-supply schemes. The Chairman of the town concerned is usually consulted.

2. I have, however, requested the Assistant Sanitary Engineer at Kurnool to show you the plans and papers connected with the scheme. The whole question is now before Government.

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, 24th June 1896, No. 1977.

In forwarding, as requested, the accompanying extract from the proceedings of the municipal council of Kurnool with certain correspondence and an estimate in reference thereto, I have the honour to point out that the first item in Mr. Lockyer's estimate includes a portion of the first and the whole of the last items of the estimate given in my No. 1133 of 14th April 1896. The 10th item is the same as the remaining item in my estimate as above but is less in amount owing to the smaller amount of piping and fountains proposed for that suburb (Bhudavaram or Bhudwar Petta).

2. The other items are small and amount to only some Rs. 7,000—2,681=Rs. 4,319 or allowing for the piping to be removed, say Rs. 4,319—1,080=Rs. 3,239 and there is no objection to these proposals.

3. I have delayed sending in the revised estimate for Kurnool until I could render a final estimate which will be in a week or two after the tenders for pipe-laying have been accepted, but meantime I may say that I have been able to effect large reductions on the cost of the works besides those proposed by Colonel Campbell which will bring down the cost probably below the amount at present sanctioned.

4. Under these circumstances it might be well that a decision regarding extension be delayed until Government have the final estimate before them.

Enclosures.

Extract from the Proceedings of a meeting of the Municipal Councillors, Kurnool, held on the 13th June 1896.

* * * * *

The following business was transacted :—

1. Read the plan of the pipe line of the Kurnool water-works as prepared by the Assistant Sanitary Engineer.

Read also petition from some of the European gentlemen, dated 13th May 1896.

Read also petition from several of the inhabitants of Street No. 11, Fort, dated 16th April 1896.

Resolution.—The council finds that in the plan of the pipe line as prepared by the Assistant Sanitary Engineer several important localities have been left out of consideration and therefore resolves to propose the following alterations and additions to the existing pipe lines and to request the Government to sanction them as being very necessary :—

(1) Kottapeta is a very important suburb attached to Kurnool. The Council understands that it was left out of consideration by the Assistant Sanitary Engineer when preparing the plan of the pipe line because this suburb had not been marked in the plan of the Kurnool town furnished to him. This suburb and these other places should be connected with the pipe line, as otherwise there will be a very great difficulty for water for the inhabitants of these localities. An extension of the pipe line to these parts is therefore very necessary.

Kottapeta Police lines, travellers' bungalow, the Mission compound, Collector's bungalow, Forest-officer's bungalow and the Kurnool Club compound.

(2) *Street No.* 11, *Fort.*—The plan as prepared by the Engineer takes the pipe line along the Judge's Court Road (Street No. 13, Fort), from the Police office. There are no houses along that road. On the other hand Street No. 11, Fort, which is thickly inhabited, is left out of consideration. The pipe line along the Judge's Court Road may therefore be omitted and the line through Street No. 11, Fort, substituted therefor.

(3) *The Old Jail.*—A branch from the main line in Street No. 1, Fort, from the western corner of the Old Jail to Street No. 14, Fort, is necessary. This would be of very great use to the people living in that street and in the lanes adjoining it. Otherwise they will have to go a great distance for water.

(4) *The extension to the Water-gate.*—The main pipe line in Street No. 1, Fort, stops at the eastern end of the Old Jail and then turns to the south. It is necessary that the main line should be extended as far as the Water-gate. This short extension is very essential for the use of the people living in Streets Nos. 2 and 5, Fort.

(5) *The Cart-stand.*—This extension to the cart-stand from the main line in Street No. 1 Peta is necessary for the convenience of the public and the cattle at the cart-stand, where it is necessary to have a water trough for cattle. This is necessary also for the use of the inhabitants in Street No. 19 Peta and the adjoining lanes.

(6) *Pinjarwada.*—A branch from the main line in Street No. 1 Peta to the Pinjarwada is necessary for the use of the inhabitants living in Streets Nos. 8, 9 and 12 Peta.

(7) *Street No. 6 Peta.*—In the plan prepared by the Assistant Sanitary Engineer the pipe line stops at the middle of this long Street No. 6 Peta. It is a very thickly populated street and therefore for the convenience of the inhabitants living in that and in the adjoining streets, which are also thickly populated it is necessary to extend this line and connect it with the line in street No. 3 Peta called the Kallur Darwaja road.

(8) *Sonar Gulli and Kumbhar Gulli.*—According to the present plan there is a pipe line from the eastern end of Kumbhar Gulli running towards the south and connected with the line in Street No. 36 Peta, called the Gadthimadugu Darwaja road. The greater portion of this line is not necessary as there are not many houses in that locality. This line should therefore be omitted. Sonar Gulli (Street No. 28 Peta) and Kumbhar Gulli (Street No. 35 Peta), which are thickly populated and where there are at present water channels and reservoirs, have been left out of consideration altogether. A branch from the main line in street No. 1 Peta, running through these streets (Sonar Gulli and Kumbhar Gulli) is therefore very essential.

(9) *Staughter-house.*—The line from the Gadthimadugu gate towards the south Rampart is almost unnecessary as running through a portion of the town which is for the most part ruined. This line may be omitted and the main line in Street No. 1 Peta may be extended from the Nannur Gate as far as the slaughter-house, as it is very necessary that there should be a good supply of water at the slaughter-house to keep the premises clean.

(10) *Budhwarpeta.*—This important suburb has also been omitted from the original plan. The Collector's office is situated in this suburb and some important public offices will also be shortly constructed in this suburb. It is therefore very necessary to supply this suburb with water. The pipe line should therefore be extended to Budhwarpeta. It should be carried over the Hindri bridge from the Vizianagram Maharaja's fountain.

As regards the fountains, the council understands that according to the present scheme there are to be only 30 fountains, 25 of which are to be single-tapped and five double-tapped. This number of fountains is quite insufficient for an extensive town like Kurnool with a population of 24,376. At present there are above 150 cisterns in the town, of which 60 are public. The inhabitants of this town have enjoyed very great convenience for water for the last 30 years and it will be a hardship to them to give them only 30 fountains or 35 taps. The council therefore consider that there should be at least 45 additional fountains, of which 25 should be single-tapped and 20 double-tapped.

When the plan was originally prepared the Municipal Council was not consulted and consequently the council had no idea about the pipe lines and the number of fountains sanctioned. They were not thus in a position to make any representations on the subject earlier. The council therefore resolves to lay the matter before Government, through the Sanitary Engineer, who will be requested to submit the same to Government with his recommendation at an early date. The council learns that there is some savings in the estimate for water-works already sanctioned.

Plan and estimate for the additions and alterations proposed by the council, as prepared by the Assistant Sanitary Engineer, will also be submitted.

* * * * *

From J. E. LOCKYER, Esq., Assoc. M. Inst. C. E., F. I. Inst., Assistant Sanitary Engineer, to the Chairman, Municipal Council, Kurnool, dated 15th May 1896, No. 228.

In reply to your No. 57, dated May 1896, I have the honour to forward a tracing with the proposed extensions marked on it, also an approximate estimate of the cost of the same, the total amounting in round figures to Rs. 20,000. It is a lot of money, but the whole of the extensions are necessary, and practically the whole of them urgent.

2. It has been suggested to lay an alternative line to Budhwarpeta, as shown in black dotted lines, but this does not recommend itself. The idea is that by laying the line in this direction, it will cost little more than laying it over the bridge, and that it will serve the house I am living, the two mosques, the toll-gate, the Judge's house and pass through the jail and Collector's cutcherry compound. This is not so—it would be cheaper to lay a separate branch as far as the Judge's house and retain the present route over the bridge. Irrespective of cost, there are

engineering objections to taking this route as it would necessitate a syphon in the river bed, but as it would be probably Rs. 3,000 cheaper to lay a separate branch to the Judge's house, the black line need not be discussed any further.

3. To the lines discussed at the meeting, I have added a short branch to Pinjarwada—this will serve a very large number of people and approval of the council.

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, 23rd July 1896, No. 2279.

With reference to G.O., Mis. No. 846 M., dated the 15th May 1896, and in continuation of paragraph 3 of my No. 1977, dated 24th June 1896, I have now the honour to forward the revised estimates for Kurnool water-supply, amounting to Rs. 2,37,555, which is less than the amount estimated in my No. 2172 of 6th August 1895 (the present sanction) and this notwithstanding the heavy increases which were expected to result from the acceptance of the only practicable tender for the head works.

2. I forward estimates in detail and also a comparative statement showing how the anticipated cost of the works stood at each stage.

3. It was impossible at the stage which the work had reached on the date of the receipt of the Government Order above quoted to consider the question of omitting any portion of the work, but such proposal would not have been feasible owing to the amount of silt in the water to be purified and supplied and the Sanitary Commissioner is even now doubtful whether sufficient purification will be ensured.

4. But notwithstanding that the works will be carried out in their entirety, it will be satisfactory to Government to find that they can be so without the cost being much increased over the amount mentioned in my No. 2172 of 6th August 1895. The cost indeed would have been under that amount did I not consider that a provision of Rs. 3,000 should be made for quarters for workmen and watchmen huts on the works extending over half a mile in length.

5. Colonel Campbell's proposals would have allowed the reduction of the estimate by Rs. 5,876. By careful consideration of the whole design and amendments in details and by reason that exchange has considerably advanced, I have in addition been able to save no less than Rs. 25,554.

6. The various items are shown in the comparative statement; had there not been unavoidable increases the reduction would have been still more.

7. Taking the items *seriatim*, the first item shows a large excess. Mr. Ellis' design showed the water to be drawn from the canal on the same side as the engine-house. This was found impossible owing to the large amount of silt and a resultant sand bank found there. To have retained the inlet on that side would have meant continual blocking. The inlet arrangements had therefore to be arranged for on the opposite side. The inlet main is laid in the same trench as the main to the town and the alteration also assists in a saving in regard to the engine-house itself, so that the excess is counterbalanced by savings on these items of engine-house and laying and jointing pipes.

8. The reduction shown against engine and boiler house is due to the above and to baling having been found necessary and to a saving in foundation due to suitable rock being higher than expected.

9. The next item saved on is the pumping main. This was first designed to enter at the side of the settling tank furthest from the engine-house and the outlet for the settling tank was to have been from the opposite side. But as the former is of iron and the latter of stoneware and therefore much cheaper their positions were reversed and the saving thus effected. For the same reason Rs. 85 is saved on laying and jointing pumping main.

10. There is a very large saving on the settling tank. Rock was found nearer the surface than expected and the bottom of the tank was raised 2 feet, there being ample embankment to maintain the tank of the same capacity, a large saving in

excavation results. A further saving is caused by the substitution of dry stone pitching for hammer dressed rubble in soorkie as proposed in the original estimate or in lime as proposed by Colonel Campbell. This was possible because it was found by experiment that the soil in which the tank was excavated was water tight and it is believed that the process of settling will tend to fill in the joints with silt. The central walls is in rubble stone hammer dressed in lime instead of soorkie. The total saving altogether is Rs. 13,602.

11. On the filter beds there is a small saving (Rs. 911) due to the substitution of vertical for sloping walls, the area of the beds remaining the same.

12. On the service reservoir Colonel Campbell proposed a saving of Rs. 1,021 calculated on the basis that the contractor would execute rubble arching at Rs. 40–8–0 for 100 cubic feet. He eventually, however, agreed to do the arching at Rs. 24 per 100 cubit feet, for such portions as were of rubble and Rs. 45 for dressed bond stones. Colonel Campbell's saving was therefore increased by Rs. 2,005 making in all Rs. 3,026.

13. The saving of Rs. 8,094 in supply of pipes, &c., is mainly due to rise in exchange. The exchange on 6th August 1895 was 1*s.* $1\frac{5}{32}$*d.* at the time the contract for pipes was accepted it was 1*s* $2\frac{3}{32}$*d*, there are, however, variations in rates between the estimate and accepted tender.

14. *Laying and jointing Main and Branches.*—This work is not yet done. The accepted tender for this work amounts to Rs. 12,220. There are always unforeseen extras and it has been deemed advisable to enter the figure of Rs. 14,500 for this work; this gives a slight increase of Rs. 1,200.

15. *As to Tools and Plant.*—These are difficult to estimate the cost of, but the original figure which was due to $2\frac{1}{2}$ per cent. on the estimate has been reduced from Rs. 5,000 to Rs. 3,200.

16. *Establishment, Office and Contingencies.*—The original figure is due to its being $7\frac{1}{2}$ per cent. on the estimate. Basing the revised figures on past expenditure and supposing that the works will be completed within ten months, the revised figure of Rs. 22,000 has been entered, showing an excess of Rs. 4,000. If the works are completed sooner, as they may be, the figure will be less.

17. The amount of unforeseen contingencies was calculated according to order at 5 per cent. on the amount of estimate. Past expenditure shows that this amount is not likely to be approached and a reduction from Rs. 11,400 to Rs. 5,000 or of Rupees 6,400 has been made.

18. The result as previously stated is a revised estimate of Rs. 2,37,855 against Rs. 2,39,380. But it is advisable as pointed out to add Rs. 3,000 for quarters and watchmen sheds. The total of the estimate then stands at Rs. 2,40,555 or about the same as the present sanction.

19. I trust Government will consider that their orders as to every economy being effected have been attended to as far as consistent with the proper execution of the works.

20. Government have already had reports as to the alterations and extensions proposed in the distribution mains by the residents of Kurnool, &c. If Government are prepared to give effect to any of these proposals, it is desirable that very early order should issue, so that pipes, &c., may be got, otherwise increases must take place in the cost of establishment, contingencies, &c.

Reference No. 956, dated 15th August 1896.

The Sanitary Engineer will be requested to report at an early date how far the estimate submitted by the Assistant Sanitary Engineer in his letter, No. 228, of 15th May 1896, provides for the extensions proposed by the municipal council in its

resolution of the 13th June last and to send up a plan showing any difference that there may be and the reasons for them. The streets referred to in the resolution should also be marked on the plan.

(By Order)

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

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, 20th August 1896, No. 2560.

With reference to official memorandum No. 956, dated 15th August 1896, I have the honour to forward herewith a plan showing the proposed lines of piping referred to in Municipal Council's resolution, dated 13th June last, and to state that the plan and estimate submitted by the Assistant Sanitary Engineer, Kurnool, in his letter, No. 228 of 15th May last, provides for all the extensions proposed in the resolution, but for 20 extra fountains only, instead of 45 fountains as asked for by the council.

2. There is already in the sanctioned scheme 30 fountains and if 45 additional taps are now to be sanctioned, this will give one fountain for every 334 people. If only 20 additional fountains are sanctioned, this will give one for every 500 people.

3. I consider 20 additional fountains and six bullock services, together with the number above already sanctioned, as sufficient. We ordinarily estimate for one fountain for every 1,000 people.

4. Mr. Lockyer's estimate included the cost of 20 fountains and six bullock services with a total of Rs. 20,000. The estimate now forwarded includes 45 fountains as well as all the extensions required by the Municipal Council and amounts to Rs. 26,000. If 25 fountains (single and double taps) be omitted, this estimate will be reduced to Rs. 22,650. The reason for the increase over the Assistant Sanitary Engineer's estimate is that it is thought desirable to have 4″ instead of 3″ pipes to Bhudawarampet and to Mission house compound to admit of a future extension to the suburb of Roza, also to provide for 10 double-tap and 10 single-tap fountains instead of 20 single-tap fountains provided for in the Assistant Sanitary Engineer's estimate.

5. The plan shows distinctly the streets for which pipes in the sanctioned scheme are to be omitted (these shown by dotted blue lines) and the extra lines required by the council (these being shown by full red lines).

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, 25th August 1896, No. 2588.

In continuation of my No. 2560, dated 20th August 1896, I have the honour to state, that, of the extensions proposed by the Municipal Council in its resolution of the 13th June last, the extension to Pinjarwada (*vide* plan forwarded with my No. 1977, dated 24th June 1896) has, by an oversight, not been included in the estimates furnished with my No. 2560 of 20th August 1896.

2. The estimated cost of the line to Pinjarwada (370 feet of 3″ piping) amounts to Rs. 462. The estimate for *all* the extensions proposed by the council including 45 fountains will now amount to Rs. 26,000 + 462 or Rs. 26,462. If 25 fountains (single and double taps) be omitted, the estimate will be reduced to Rs. 23,112.

From M.R.Ry. T. CHIDAMBARA RAO, Chairman, Municipal Council, Kurnool, to the Chief Secretary to Government, dated Kurnool, 25th August 1896, No. 310.

I have the honour to submit herewith a copy of the resolution passed at a special meeting of the Municipal Councillors, Kurnool, held on the 22nd August 1896, for considering the proposals of Mr. W. M. Thorburn (District Judge) as set forth in his letter to the Chief Secretary to Government, dated the 20th August 1896, a copy of which he sent to the municipality.

Enclosure.

Proceedings of a special meeting of the Municipal Councillors, Kurnool, held on the 22nd August 1896, No. 11.

* * * * *

Read letter from Mr. Thorburn, dated 21st August 1896, forwarding a copy of his letter, dated 20th August 1896, addressed to the Chief Secretary to Government, making certain proposals in respect of the Kurnool water-works.

Resolution.—The following resolution was passed:—

The proposals of Mr. Thorburn have the unanimous approval of the council. The council having already (in its Resolution No. 1, dated 13th June 1896, a copy of which was submitted to Government through the Sanitary Engineer on 18th June 1896,) decided about the necessity for a branch pipe line to the north of the main line for serving the northern group of houses in the civil station, it is at present necessary to consider only about the three lines—1,900 feet, 500 feet and 1,100 feet in length—referred to in paragraphs 7 and 8 of Mr. Thorburn's letter for serving the southern group of houses. Of these three lines the council considers the second line, 500 feet long, unnecessary. The total length of the other two lines comes up to about 3,000 feet and the cost of laying them amounts to about Rs. 2,500. If it be possible to make any reductions in the rates as suggested by Mr. Thorburn, it will be not necessary to exceed the estimates already sanctioned and to incur any additional expenditure on account of these branch lines. But even if it be found necessary to incur any additional expenditure, the council does not consider the additional expenditure too much, having regard to the very large amount (over 2½ lakhs of rupees) that is being spent on account of the water works and to the heavy taxes which the owners and occupiers of the buildings to be served by these lines pay to the municipality. By laying these lines the municipality will be in a position to collect from the owners of the southern group of houses a good sum in the shape of water-tax, which it will not be entitled to levy otherwise. If the proposed branch lines be sanctioned, the requirements of all the residents of the civil station will have been attended to and there will then be no ground for complaint that anybody has been shut out from the benefits of the water works so generously sanctioned by Government. The council, therefore, resolves to request Government to sanction these branch lines, even if it be necessary to incur an additional expenditure, which they consider not at all heavy under the circumstances.

The council takes this opportunity to observe that it would not have been necessary either for the council, the Sanitary Engineer's department or the rate payers to trouble Government with frequent requests for additions or alterations in the water-supply scheme, if the municipality had been given at the outset an opportunity of expressing its views and requirements in respect of the water-supply scheme.

A copy of this Resolution will be submitted to Government.

Copy also to Mr. Thorburn.

From W. M. THORBURN, Esq., District Judge, Kurnool, dated 21st August 1896.

Endorsement No. 1108, dated 25th September 1896.

Transferred to the Public Works Department . . . . with the request that the Chief Engineer will favour Government with his opinion . . . .

(By Order)

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

Note by Colonel D. McNEIL CAMPBELL, R.E., Chief Engineer, Public Works Department, dated 5th November 1896.

The chief differences between Mr. Thorburn's proposals and those of the Sanitary Engineer are that the former considers that two pipes—one 1,900′ and the other 1,100′ long—are preferable to the round about 6,000′ line proposed by the latter, also that 2½″ and 2″ pipes would answer as well as the 3″ proposed by Mr. Jones. From an engineering point of view the line proposed by Mr. Jones is preferable to the two shorter lines, as there are objections to "dead" or "loose" ends if they can be avoided; they are a source of impurity and interfere with the free circulation of water. Moreover, with the continuous line, water can be supplied to each fountain from two directions, so that in the event of damage to a pipe, the supply need not be stopped. Of course the two lines proposed by Mr. Thorburn are much cheaper, and if it is thought that sanitary requirements and convenience of supply are not essential in Kurnool, they may be adopted; for my own part, I would go further than Mr. Jones has and making the north line continuous by joining it on to the line shown, as proposed by the Assistant Sanitary Engineer on tracing dated 6th December 1892.

2. As regards the size of pipes, Mr. Thorburn is wrong when he says the diameter is a simple matter of hydraulics, as there are limits to the size of pipes that should be used. I have no means of ascertaining whether the 2½″ and 2″ pipes proposed by Mr. Thorburn would give sufficient discharges as I have no levels; but the supply required being very small, I think there is no doubt that they would.

3. A minimum diameter of 3″ is generally considered sufficient for distribution pipes. Burton, in his book on Water-supply, lays down 5″ as a maximum. Taning suggests 8″. Others lay down that no pipe less than 3″ should be carried further than 400′; but this is again a question of cost, and if it is thought that in Kurnool the rules ordinarily applied to water works need not be adhered to, then 2½″ and 2″ pipes may be used. Altogether from an engineering and sanitary point of view I prefer Mr. Jones' arrangement, though I would go further and make the northern line continuous; from a financial point of view Mr. Thorburn's are undoubtedly the best, they will be much cheaper and will answer in a way though not so satisfactory as the other arrangement. Mr. Thorburn goes into detail as regards the cost of 2″ and 2½″ piping and he complains of the high prices charged by Mr. Jones; but as the latter does not propose to use either 2″ or 2½″ pipes, I do not see how any comparison can be made; however, Mr. Thorburn seems to think that the cost of 3″ pipes as given by the Sanitary Engineer is high, and the following gives a comparison of the charges of different firms, cost of carriage to site of works being added:—

3″ pipes cast iron.

Mr. Jones' price Rs. 1-4-0 per foot, including bends, valves and laying.

	Rs.	A.	P.	
Burns & Co.	1	0	10	pipes only.
Richardson and Cruddas	0	13	0	,,
Massey & Co.	0	12	9	,,
Oakes & Co.	0	14	8	,,
India Office	0	11	8	,,

Without knowing the lines selected for the pipes and the nature of the soil, it is not possible to tell the cost of laying: Mr. Jones' estimate seems somewhat high, but no doubt he would give details explaining the reason.

I can say nothing about the prices charged by Mr. Jones for stand pipes, as there are very many different patterns, the cost of each of which is different.

* * * * *

Note by Colonel D. McNEIL CAMPBELL, R.E., Chief Engineer, Public Works Department, dated 4th December 1896.

The last sanction in connection with the Kurnool water-supply scheme is that conveyed in G.O., No. 1082 M., dated 9th July 1895, and amounts to Rs. 2,39,380.

2. Subsequently, in consequence of a petition from certain residents of Kurnool, dated 27th February 1896, the municipal council, in its resolutions, dated 13th June 1896 and 22nd August 1896, recommends certain further extensions, the execution of which, the council considers, will render the scheme complete and satisfy the requirements of all the inhabitants of the civil station, leaving no grounds for further complaint.

3. To provide for these extensions, the Sanitary Engineer has submitted for sanction revised estimates as follows :—

	Rs.
(i) A revised estimate, dated 23rd July 1896, amounting to ..	2,37,555
(ii) A supplemental estimate, dated 20th August 1896, for Rupees 26,000 corrected in Sanitary Engineer's No. 2588 of 25th August 1896, to	26,462
Total ..	2,64,017

4. This total apparently does not include a sum of Rs. 3,000, which the Sanitary Engineer in paragraph 18 of his letter, No. 2279, of 23rd July 1896, considers "advisable to provide for quarters and watchmen's sheds;" but this amount may, I think, be omitted; the amount for which sanction is now asked for will be Rs. 2,64,017, being an excess of Rs. 24,637 on the last sanction.

5. I have already given my opinion on the supplemental estimate of Rs. 26,462 in my note, dated 9th November 1896, No. 3980-C, in which I approved of Mr. Jones' lines for and sizes of piping; but I qualified this by stating to the effect that, if the financial position of the Kurnool Municipality be such that they could not afford to carry out a water-supply on the most approved principles, the suggestions of Mr. Thorburn might be accepted, as no doubt, they would answer the purpose in a way.

6. As regards the revision of the original estimates, I have little to say; the rates are fair. The cost of piping, as given by Mr. Jones, is Rs. 118 per ton. This is almost exactly the same as the India Office prices. Burn & Co.'s price would be Rs. 175 delivered in Kurnool, Messrs. Richardson and Cruddas Rs. 148.

From J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E., Sanitary Engineer to Government, to the Secretary to Government, Local and Municipal Department, dated Fort St. George, 7th December 1896, No. 3409.

I have the honour to invite your attention to correspondence ending with my letter, No. 2588, dated 25th August 1896, with reference to pipe extensions in the town of Kurnool, and to request that orders may be passed on the subject as early as possible. My reason for making this request is that it is advisable that the extra pipes, if they are to be sanctioned, should be laid by the present water works staff, and that delay in sanction will cause staff to be retained longer than was anticipated and thus increase cost of supervision.

ORDER—No. 76 M., dated 21st January 1897.

The revised estimate of Rs. 2,40,555 for the water-supply scheme of Kurnool submitted by the Sanitary Engineer, and the extension of the works proposed by the municipal council, which, as slightly modified by Mr. Jones, is estimated to cost Rs. 23,112, are sanctioned. As observed by the Chief Engineer in paragraph 3 of his note, dated 5th November 1896, the rates charged for pipes, including the cost of laying, in Mr. Jones' estimate appear to be somewhat high. The rates should accordingly be carefully reconsidered and the required pipes procured in the Indian market if they can be had at less cost. The pattern of standpipe which consistently with efficiency is cheapest should also be selected.

2. The total cost of the scheme including the extensions now sanctioned amounts to Rs. 2,63,667 or Rs. 24,287 in excess of the estimate approved in G.O., No. 1082 M., dated 9th July 1895. The Government will be prepared to make a grant of three-fourths of this additional cost and to lend the balance at 4¼ per cent. interest repayable in thirty years. The municipal council will be requested to submit the necessary applications without delay.

3. The Government is surprised to learn from Mr. Mullaly that he saw the plan of distribution of the water works for the first time on the morning of the 11th of May 1896. He has long been Collector of the district and was aware of the general progress of the project; and he might, at any time, have called for the plans and other documents relating to it and kept himself in touch with the discussions regarding it, as it was his duty to do. It is observed that the municipal council has made a similar complaint of not being afforded a sufficient opportunity of indicating its views and requirements in respect of the scheme. The Sanitary Engineer should in all such cases keep both the local body concerned and the Collector fully informed regarding the main lines of the projects in which they are interested, consulting them freely where necessary.

4. Mr. Thorburn will be informed that the terms and tone of his reference to the Chief Engineer in paragraph 14 of his letter, dated the 21st August 1896, are improper.

(True Extract.)

Secretary to Government.

To the Chairman, Municipal Council, Kurnool.
" the Collector of Kurnool.
" the Sanitary Board.
" the Sanitary Commissioner.
" the Sanitary Engineer (with plans and estimates).
" the Public Works Department.
" W. M. Thorburn, Esq., District Judge, Kurnool.

Exd. C. M. Thumbuswamy.

Indexed.

N. 712 PWD 11/3/97

Note by W dated October 1st.

The following information must be got from Madras:-

Cost of 2," 2½," 3" & 4" piping as given by Richardson & Cruddas Bombay, Burn & Co. Calcutta, Massey & Co. or Oakes & Co. Madras, and if got through India Office.

Add, Cost of carriage from Bombay, Calcutta & Madras to Kurnul being ... miles by rail and 33 miles by road.

Cost of single and double stand pipes of different sorts at the above mentioned firms. carriage to be added.

? ? Cost of spring push cocks at same places.

SAW Please obtain this information as soon as possible.

R. S.
1 Oct 96

W Submitted.
C.. 20/10/96

T

Indexed. 13/11/…

Data showing cost &c. for Cast iron water pipes with turned & bored joints.

Particulars.		Messrs. Burn & Company.				Messrs. Richardson & Cantlie				Remarks.
Bore of pipe	Inches	2"	2½"	3"	4"	2"	2½"	3"	4"	
Length of pipe	feet.	6	..	9	9	6	6	9	9	
Thickness of metal	Inches	3/8"	..	3/8"	3/8"	5/16"	5/16"	3/8"	3/8"	
Weight per foot	lbs	10	..	13·5	17·8	10	11·2	13·6	18·1	
Length per cwt	feet	11·2	..	8·3	6·3	11·2	10·0	8·9	6·2	
Prime cost of pipes per cwt.	Rs.	6.8..	..	6.8..	6.8..	5.4..	5.4..	5.4..	5.4..	Cost per cwt at Howrah Calcutta & Bombay
Cost of transit	per cwt Rs.	2.4..	..	2.4..	2.4..	2.2.6	2.2.6	2.2.6	2.2.6	Details overleaf.
Cost of pipes at site of work.	Cwt.	8.12..	..	8.12..	8.12..	7.6.6	7.6.6	7.6.6	7.6.6.	⌀ Shews Rs 1.... per cwt to ordinary pipes
Do. Do. Bends & Tees	cwt.	9.12..	..	9.12..	9.12..	10.2.6	10.2.6	10.2.6	10.2.6.	* Do. 2.12.. do. do. stronger pipes

⊙ Rs 6.8.. per cwt if obtained through India Office with details attached.

Transit charges.

From Calcutta.

Freight from Calcutta to Madras	per Ton	12	8	..
Shipping charges & Harbour dues at Calcutta & Madras	do.	5	..	..
Cartage to Salt Golaums, say. (Madras Goods Shed)	do	1	..	.. x
Rail fare from Madras to Guntakal junction via Arcotnum on the Madras railway, a distance of 275¼ miles at 13·61 pies, per mile, per ton of 27 maunds.	do	19	8	2 x
Transhipping charges at Guntakal junction, say.	do	..	8	.. x
Rail fare from Guntakal to Kurnool road station on the S. M. R, a distance of 43 miles at 13·61 pies, per ton per mile	do	3	0	10 x
Cartage by road from Kurnool road station to site of work a distance of 33 miles. say	do	2	..	.. x
Contingencies		1	7	..
Total freight & carriage by rail & road from Calcutta to Kurnool, per ton.		45	..	..
—— do. —— do. —— do. —— per cwt. —— Rs		2	4	..
Cost of Cast iron pipes, turned & bored joints at Messrs Burn & Co.		6	8	. cwt
—— do. —— do. —— do. —— Bends & Tees —— do.		7	8	.. do.

For transit from Madras to Kurnool for Messrs. Oakes & Massey pipes —— items x. } 26-1-0

Contingencies — .. 15 ..

Total charges per Ton Rs 27-2-0

— do — per cwt. Rs 1-5-7 or

Say Rs 1-6-0.

Transit charges.

From Bombay.

Freight from Bombay to Mormugoa	per Ton	10	..	..
Shipping charges & harbour fees at Bombay & Goa say		5	..	..
Rail fare from Mormugoa Harbour ~~not~~ to Guntakal junction via Londa, Hubli & Gadag junctions, distances 285½ miles at 13·6 pies, per mile, per Ton.	do.	20	3	9.
Rail fare to Kurnool road station from Guntakal junction a distance of 43 miles at 13·61 pies, per mile, per Ton.	do.	3	0	10.
Loading & unloading charges, say.	do	2	..	..
Cartage by road to site of work a distance of 33 miles say		2	..	..
Contingencies		~~4·3~~	11	5
Total freight & carriage by rail & road from Bombay to Kurnool, per Ton		43	..	..
—— do. —— do. —— do. —— per cwt.		2	2	6.
Cost of Cast iron pipes, turned & bored joints from Messrs Richardson & Cruddas		5	4	..
—— do. —— do. —— do. —— Bends & Tees. —— do. —— cwt		8	..	..
—— do —— do. —— flanged joints —— do. —— cwt		6	8	..
—— do. —— do. —— do. —— Bends & Tees —— do. —— cwt		9	..	..

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"Debts of cast iron water pipes with socket joints."

Particulars		Messrs Massey & Co.				Messrs Oakes & Company				Remarks
Bore of pipes	inches	2"	2½"	3"	4"	2"	2½"	3"	4"	
Length of pipe	feet	6	6	9	9	6	6	9	9	
Thickness of metal	inches	5/16	5/16	3/8	3/8	5/16	5/16	3/8	3/8	Not mentioned by either of the firms. Thickness of metal & weight are approximately taken from Messrs Richardson & Cruddas.
Weight per foot	lbs	10	11.2	12.6	18.1	10	11.2	12.6	18.1	
Prime cost of pipe per 9ft length	Rs	..	5.2..	5.12..	8.12..	..	..	..	..	
Cost of — do. — per cwt.	Rs	6.0.0 approx.				6.12..	6.12..	6.12..	6.12..	
Cost of transit per cwt.	Rs	1.6..	1.6..	1.6..	1.6..	1.6..	1.6..	1.6..	1.6..	
Cost of pipe at site of work per cwt.	Rs	7.6..	7.6..	7.6..	7.6..	8.2..	8.2..	8.2..	8.2..	For details please see item marked in red for pipes from Calcutta.

Cost of pillar fountains & self closing cocks &c.

Particulars	Messrs Richardson & Cruddas: Prime cost	Transit 50%	Total cost	Messrs Burn & Co.: Prime cost	Transit 50%	Total cost	Massey & Company: Prime cost	Transit 50%	Total cost	Messrs Oakes & Company: Prime cost	Transit 50%	Total cost
Self closing pillar fountain — each	48	24	72	50	25	75	..	..	..	..	..	..
— do. — do. with 2 ordinary inside taps — do.	78	39	117	..	..	..	..	..	..	..	..	..
Hydrant stand post without hose connection with 1 brass push cock 3/4" diam.	28	14	42	..	..	..	..	..	..	..	..	..
— do. — do. — with 2 brass push cocks 3/4" diam.	33	16 8	49 8	..	..	..	..	..	..	..	..	..
Self closing wall fountains for building into brickwork	15	7 8	22 8	..	..	..	..	..	..	..	..	..
Self closing brass push cocks 1/2" diam. each	3 8	1 12	5 4	..	..	..	..	..	..	10	5	15
Self closing brass push cocks 3/4" — do.	4 8	2 4	6 12	..	..	..	..	..	..	15	7 8	22 8
Self closing brass push cocks 1" — do.	6	3	9	..	..	..	..	..	..	18	9	27

Note. No quotations are given for fountains & cocks in Messrs Burn & Co. & Massey & Co. [prices which]. Transit charges are approximately taken at 50% as the weight of fountains &c. are not known.

5,000—30-11-96.
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Cost of Cast iron pipes with turned & bored joints if obtained through Indian Office.

Prime cost of Cast iron pipes in England. F.O.B. (vide rate list)	£	4	15	..
Sea-freight to Port of Madras per Ton.	£	0	17	..
Cost of Cast iron pipes per Ton at Madras port		5	12	..
£ 5.12.. converted into Rs at s. 1. d. 1½ per rupee =	Rs	99	8	10
Incidental charges. Boat hire for landing pipes at Madras per Ton		1	8	..
Harbour dues ——— do.		1	8	..
Conveyance to Salt Cotaurs station ——— do.		1	..	..
Rail fare from Madras to Guntakal junction via Arconum a distance of 275¼ miles on Madras Railway at 13.61 pies per Ton		19	8	2
Transhipping charges at Guntakal junction say ——— Ton		..	8	..
Rail fare from Guntakal junction to Kurnool road station a distance of 43 miles on the S. Mr. R. at 13.61 pies per Ton per mile		3	..	10
Cartage by road from Kurnool road station to Zilla Depôt at Kurnool a distance of 33 miles, say per Ton ———		2	..	..
Contingencies ———		1	6	2
Cost of Cast iron pipes if obtained through Indian Office. Ton		130	..	..
——— D°.. ——— D°.. ———	per Cent.	6	8	..

Rates for stand pipes, scour cocks &c. are not quoted in the rate list issued by the D. G. of Railways.

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Data showing cost £ s. d. for wrought iron welded pipes

Particulars	Messrs Bunn & Company				Messrs Richardson & Sudden				Messrs Massey & Company				Messrs Oakes & Company			
Bore of pipe ____ Inches	2"	2½"	3"	4"	2"	2½"	3"	4"	2"	2½"	3"	4"	2"	2½"	3"	4"
Weight of pipe per foot run. ____ lbs	4·36	5·60	6·72	8·96	4·36	5·60	6·72	8·96	4·36	5·60	6·72	8·96	4·36	5·60	6·72	8·96
Prime cost of pipe per cwt. ____ £ s d	11·4·..	16·4·..	18·11·3	18·11·2	10·7·..	15·..·..	18·11·3	21·12·9	15·4·..	21·4·..	23·15·4	29·11·2	12·13·5	20·..·..	25·..·..	[illegible]
Cost of transit per cwt. ____ £ s d	2·4·..	2·4·..	2·4·..	2·4·..	2·2·6	2·2·6	2·2·6	2·2·6	1·6·..	1·6·..	1·6·..	1·6·..	1·6·..	1·6·..	1·6·..	1·6·..
Total cost of pipe at site of work per cwt. ____ £ s d	13·8·..	18·8·..	20·15·2	20·15·2	12·9·6	17·2·6	20·13·6	26·15·3	16·10·..	22·10·..	25·5·4	31·1·2	14·3·5	21·6·..	26·6·..	[illegible]
Prime cost of pipe per foot run ____ £ s d	..7·4	..13·..	1·2·..	1·8·..	..6·6	..12·..	1·2·..	1·12·..	..9·6	1·1·..	1·7·..	2·6·..	..8·..	1·..·..	1·8·..	2·..·..
Cost of transit per foot run ____ £ s d	..1·4	..1·9	..2·1	..2·10	..1·3	..1·9	..2·..	..2·7	..·.10	..1·1	..1·3	..1·9	..0·10	..1·1	..1·3	..1·9
Total cost of pipe at site of work per foot run £ s d	..8·4	..14·9	1·4·1	1·10·10	..7·9	..13·9	1·4·..	1·14·7	..10·4	1·2·1	1·8·3	2·7·9	..8·10	1·1·1	1·9·3	2·5·9

Note. Prices quoted for 2" piping from India office & for galvanized pipe
all other rates are for black piping.

Data showing cost &c. for Cast iron water pipes with turned & bored joints.

Particulars		Messrs. Burn & Company				Messrs. Richardson & Cuddon				Messrs. Massey & Co.				Messrs. Oakes & Co.				
Bore of pipes	Inches	2"	2½"	3"	4"	2"	2½"	3"	4"	2"	2½"	3"	4"	2"	2½"	3"	4"	
Length of pipes	feet	6'	"	9'	9'	6'	6'	9'	9'	6'	6'	9'	9'	6'	6'	9'	9'	
Thickness of metal	inches	3/8"	"	3/8"	3/8"	5/16"	5/16"	3/8"	3/8"	5/16"	5/16"	3/8"	3/8"	5/16"	5/16"	3/8"	3/8"	
Weight of pipes per foot	lbs	10	"	13·5	17·8	10	11·2	12·6	18·1	10	11·2	12·6	18·1	10	11·2	12·6	18·1	
Cost of piping per cwt.	£s	6.8..	"	6.8..	6.8	5.4..	5.4..	5.4..	5.4..	6....	6....	6....	6....	6.12..	6.12..	6.12..	6.12..	5...
Cost of Ironsit per cwt.	£s	2.4..	"	2.4..	2.4..	2.2.6	2.2.6	2.2.6	2.2.6	1.6..	1.6..	1.6..	1.6..	1.6..	1.6..	1.6..	1.6..	1.4..
Cost of Ironsit per cwt.	£s	8.12..	"	8.12..	8.12..	7.6.6	7.6.6	7.6.6	7.6.6	7.6..	7.6..	7.6..	7.6..	8.2..	8.2..	8.2..	8.2..	6.8..
Total cost of pipes at site of work per cwt.	£s	8.12..	"	8.12..	8.12..	7.6.6	7.6.6	7.6.6	7.6.6	7.6..	7.6..	7.6..	7.6..	8.2..	8.2..	8.2..	8.2..	6.8..
Prime cost of piping per foot run	£s	..9·3	"	..12.6	1...6	..7.6	..8.5	..9.1	..13.5	..8.7	..9.1	..10.3	..15.7	..9.7	..10.9	..12.2	1.1.5	..7..
Cost of Ironsit ___ do.	£s	..3.2	"	..4.4	..5.9	..3...	..3.5	..3.11	..5.6	..2...	..2.2	..2.6	..3.6	..2...	..2.2	..2.6	..3.6	..2..
Total cost of pipes at site of work per ft. run	£s	..12.5	"	1...10	1.6.3	..10.6	..11.10	..13..	1.2.11	..10.7	..11.3	..12.9	1.3.1	..11.7	..12.11	..14.8	1.4.11	..9..

...rom India Office

...ning length of pipe
...ness of metal &
...the same as R & C

5	5	5 .. ..
1 . 8 ..	1 . 8 ..	1 . 8 ..
.. 8 ..	6 . 8 ..	6 . 8 ..
. 8 ..	.. 9 ..	.. 13 ..
. 2 . 5	.. 2 . 8	.. 3 . 10
0 . 5	.. 11 . 8	1 .. . 10

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

Read—the following papers:—

From the Public Works Department, No. 1332-C., dated 9th March 1896.

Abstract.—Transferring memorial from Mr. Prendergast and others, residents of Kurnool, regarding water-works at Kurnool.

No. 392, dated 25th March 1896.

Referred to the Sanitary Engineer for early remarks.

(By order)

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

From Surgeon-Lieutenant-Colonel W. G. KING, M.B., C.M., D.P.H., Sanitary Commissioner for Madras, to the Secretary to Government, Public Works Department, dated Fort St. George, 10th March 1896, No. 549-S.

I have the honour to inform you that I am in receipt of a copy of a petition from certain inhabitants of Kurnool municipality in which they refer to the absence of provision for the supply of water for houses occupied by Europeans. I agree with the petitioners in thinking that, if it be possible for these to be commanded by the water-works, it is most desirable for sanitary reasons that they should not be neglected.

2. I would also take this opportunity of pointing out that the absence of provision for the supply of the suburb of Budapett is, in my opinion, a serious defect in the original scheme.

No. 1535-C., dated 19th March 1896.

Transferred to the Local and Municipal Department.

(Signed) D. McNEIL CAMPBELL, Col., R.E.,
Joint Secy. to Government, P.W.D.

No. 402, dated 27th March 1896.

Referred to the Sanitary Engineer for remarks in continuation of Government endorsement No. 392, dated 25th March 1896.

(By order)

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

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, 14th April 1896, No. 1133.

In reply to reference Nos. 392 and 402 of 25th and 27th March 1896, respectively, and which are herewith returned along with the petition from certain residents in Kurnool, I have the honour to report as follows:—

2. The scheme for Kurnool, as you are aware, it has been possible to carry out only by very large and extraordinary grants from Government and the scheme was therefore limited to supplying the main bulk of the population and not the outlying portions of the town. Government are also aware that the scheme, even as it now stands, is likely to cost considerably more than estimated. It is quite true, as stated by Mr. Thorburn in his demi-official accompanying the papers noted, that "the Sanitary Engineer's department did all this with their eyes open," simply because of financial considerations. It does not affect this department in any way whether more or less piping is laid down, and if Government can see their way, looking to the circumstance hereafter stated, to extend the supply as required, no doubt, the distribution will be more complete than it now is; the question, however, is: Are the benefits which may accrue worth the additional expense?

3. Taking first the petition from the residents and referring to paragraph 3, I have prepared an estimate which will meet the request for water, items A, B, C and E. The cost of extending pipes to these sites amounts to Rs. 11,050. The population to be served is not known exactly, but may be as follows:—

Collector's house	10	
Forest-officer's house	8	
District Board's office	5	(staff during day).
Travellers' bungalow	4	
American Mission	20	
Total	47	

But suppose the population is 100, then the expenditure will be Rs. 110 per head.

4. I have not included in the above the taluk cutcherry, the Superintendent of Police's house, the house of the Nawab of Banganapalle, the Local Fund Engineer's house and the Roman Catholic Priest's house because these are already served by existing arrangements.

5. The Sanitary Commissioner suggests that Buddavarampet should be supplied. This is outside the town on the opposite side to Kurnool of the Hindri river. The population may be about 1,000, the cost will be Rs. 9,440. It may be stated that water of very fair quality is obtainable near the above village.

6. The Assistant Sanitary Engineer in reporting on the matter points out that a portion of the town not supplied under the present limits of the scheme is the village of Nawabpet where the police lines are, and that this portion has greater claim for water-supply than any other. The cost of supplying this village will be Rupees 5,100.

7. The total extension proposed therefore amounts to—

	Rs.
Houses of English residents	11,050
Extension to Buddavarampet	9,440
Do. to Nawabpet	5,100
Total	25,590

The Sanitary Commissioner in a recent note to the Sanitary Board also proposes that the supply should be carried to Rozapet. This would cost about another Rupees 5,000.

8. The scheme is based on a supply for 30,000 people. The population of Kurnool, including the villages referred, was, according to the census of 1891, 24,523; the distribution system can therefore be extended at any time. It is not believed that the financial circumstances of Kurnool are such as to allow of these extensions at present.

From C. M. MULLALY, Esq., Collector of Kurnool, to the Chief Secretary to Government, dated Kurnool, 11th May 1896, No. 815-Eng.

With reference to the accompanying copy of letter from the Sanitary Engineer to Government, No. 1363, dated 4th May 1896, I have the honour to state that this morning, for the first time, I have seen the plan of distribution of water in the new water-works scheme and consider it to be very incomplete.

2. On the left of the main channel, the following are omitted :—

(1) The new petta which is very densely populated.
(2) The Police lines.
(3) The new Police hospital.
(4) The new Head-quarter Police office (to be built).
(5) The suburb of Roza.
(6) The travellers' bungalow.
(7) The Mission house and Boarding school.
(8) The Collector's house.
(9) The Club.
(10) The District Forest-officer's house.

All these could be very easily served by a main distributary taking off close to the District Forest-officer's house and proceeding nearly in the inverse order to the above. The Assistant Sanitary Engineer approves, I believe, of this line of pipes and will shortly lay it before the municipal council.

3. On the right of the main distributary, the following are omitted :—

(1) Buduvarapet.
(2) Huzur cutcherry which, when complete, will provide accommodation for both the Head-quarter and Kurnool Deputy Collectors.
(3) Sub-jail which acts as a district jail.
(4) The new combined Tahsildar's cutcherry and Sub-Magistrate's Court (to be built).
(5) The Cotton press.
(6) The Assistant Sanitary Engineer's house (Government property).
(7) The Judge's house.
(8) The Toll-gate.
(9) The District Board's office.

4. The Sanitary Commissioner has all along advocated Roza and Buduvarapet being included in the scheme. The only excuse for omitting the latter from the scheme is that it is cut off from the rest of the town by the river Hindri, but this is not sufficient reason for omitting a populous suburb containing the most important offices in the town and the only jail.

5. As I have had only a cursory look at the plan and have now no records before me, I have no intention of fully discussing the scheme, but merely of bringing to the notice of Government that the scheme is at present very incomplete and of raising the question whether it is advisable and the intention of Government that such important schemes should be submitted without any reference at all to the Collector. Municipal and Public Works budgets pass through the Collector who is invariably consulted in matters of importance and I fail to see why water schemes should form an exception.

Enclosure.

From J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E., Sanitary Engineer to Government, to the Collector of Kurnool, dated Fort St. George, 4th May 1896, No. 1363.

With reference to your letter No. 815 of 1st May 1896 I have the honour to inform you that it has not been the practice in this department to consult the Collectors of districts in regard to the details of distribution in water-supply schemes. The Chairman of the town concerned is usually consulted.

2. I have, however, requested the Assistant Sanitary Engineer at Kurnool to show you the plans and papers connected with the scheme. The whole question is now before Government.

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, 24th June 1896, No. 1977.

In forwarding, as requested, the accompanying extract from the proceedings of the municipal council of Kurnool with certain correspondence and an estimate in reference thereto, I have the honour to point out that the first item in Mr. Lockyer's estimate includes a portion of the first and the whole of the last items of the estimate given in my No. 1133 of 14th April 1896. The 10th item is the same as the remaining item in my estimate as above but is less in amount owing to the smaller amount of piping and fountains proposed for that suburb (Bhudavaram or Bhudwar Petta).

2. The other items are small and amount to only some Rs. 7,000—2,681= Rs. 4,319 or allowing for the piping to be removed, say Rs. 4,319—1,080=Rs. 3,239 and there is no objection to these proposals.

3. I have delayed sending in the revised estimate for Kurnool until I could render a final estimate which will be in a week or two after the tenders for pipe-laying have been accepted, but meantime I may say that I have been able to effect large reductions on the cost of the works besides those proposed by Colonel Campbell which will bring down the cost probably below the amount at present sanctioned.

4. Under these circumstances it might be well that a decision regarding extension be delayed until Government have the final estimate before them.

Enclosures.

Extract from the Proceedings of a meeting of the Municipal Councillors, Kurnool, held on the 13th June 1896.

* * * * *

The following business was transacted :—

1. Read the plan of the pipe line of the Kurnool water-works as prepared by the Assistant Sanitary Engineer.

Read also petition from some of the European gentlemen, dated 13th May 1896.

Read also petition from several of the inhabitants of Street No. 11, Fort, dated 16th April 1896.

Resolution.—The council finds that in the plan of the pipe line as prepared by the Assistant Sanitary Engineer several important localities have been left out of consideration and therefore resolves to propose the following alterations and additions to the existing pipe lines and to request the Government to sanction them as being very necessary :—

(1) Kottapeta is a very important suburb attached to Kurnool. The Council understands that it was left out of consideration by the Assistant Sanitary Engineer when preparing the plan of the pipe line because this suburb had not been marked in the plan of the Kurnool town furnished to him. This suburb and these other places should be connected with the pipe line, as otherwise there will be a very great difficulty for water for the inhabitants of these localities. An extension of the pipe line to these parts is therefore very necessary.

Kottapeta Police lines, travellers' bungalow, the Mission compound, Collector's bungalow, Forest-officer's bungalow and the Kurnool Club compound.

(2) *Street No.* 11, *Fort.*—The plan as prepared by the Engineer takes the pipe line along the Judge's Court Road (Street No. 13, Fort), from the Police office. There are no houses along that road. On the other hand Street No. 11, Fort, which is thickly inhabited, is left out of consideration. The pipe line along the Judge's Court Road may therefore be omitted and the line through Street No. 11, Fort, substituted therefor.

(3) *The Old Jail.*—A branch from the main line in Street No. 1, Fort, from the western corner of the Old Jail to Street No. 14, Fort, is necessary. This would be of very great use to the people living in that street and in the lanes adjoining it. Otherwise they will have to go a great distance for water.

(4) *The extension to the Water-gate.*—The main pipe line in Street No. 1, Fort, stops at the eastern end of the Old Jail and then turns to the south. It is necessary that the main line should be extended as far as the Water-gate. This short extension is very essential for the use of the people living in Streets Nos. 2 and 5, Fort.

(5) *The Cart-stand.*—This extension to the cart-stand from the main line in Street No. 1 Peta is necessary for the convenience of the public and the cattle at the cart-stand, where it is necessary to have a water trough for cattle. This is necessary also for the use of the inhabitants in Street No. 19 Peta and the adjoining lanes.

(6) *Pinjarwada.*—A branch from the main line in Street No. 1 Peta to the Pinjarwada is necessary for the use of the inhabitants living in Streets Nos. 8, 9 and 12 Peta.

(7) *Street No. 6 Peta.*—In the plan prepared by the Assistant Sanitary Engineer the pipe line stops at the middle of this long Street No. 6 Peta. It is a very thickly populated street and therefore for the convenience of the inhabitants living in that and in the adjoining streets, which are also thickly populated it is necessary to extend this line and connect it with the line in street No. 3 Peta called the Kallur Darwaja road.

(8) *Sonar Gulli and Kumbhar Gulli.*—According to the present plan there is a pipe line from the eastern end of Kumbhar Gulli running towards the south and connected with the line in Street No. 36 Peta, called the Gadthimadugu Darwaja road. The greater portion of this line is not necessary as there are not many houses in that locality. This line should therefore be omitted. Sonar Gulli (Street No. 28 Peta) and Kumbhar Gulli (Street No. 35 Peta), which are thickly populated and where there are at present water channels and reservoirs, have been left out of consideration altogether. A branch from the main line in street No. 1 Peta, running through these streets (Sonar Gulli and Kumbhar Gulli) is therefore very essential.

(9) *Staughter-house.*—The line from the Gadthimadugu gate towards the south Rampart is almost unnecessary as running through a portion of the town which is for the most part ruined. This line may be omitted and the main line in Street No. 1 Peta may be extended from the Nannur Gate as far as the slaughter-house, as it is very necessary that there should be a good supply of water at the slaughter-house to keep the premises clean.

(10) *Budhwarpeta.*—This important suburb has also been omitted from the original plan. The Collector's office is situated in this suburb and some important public offices will also be shortly constructed in this suburb. It is therefore very necessary to supply this suburb with water. The pipe line should therefore be extended to Budhwarpeta. It should be carried over the Hindri bridge from the Vizianagram Maharaja's fountain.

As regards the fountains, the council understands that according to the present scheme there are to be only 30 fountains, 25 of which are to be single-tapped and five double-tapped. This number of fountains is quite insufficient for an extensive town like Kurnool with a population of 24,376. At present there are above 150 cisterns in the town, of which 60 are public. The inhabitants of this town have enjoyed very great convenience for water for the last 30 years and it will be a hardship to them to give them only 30 fountains or 35 taps. The council therefore consider that there should be at least 45 additional fountains, of which 25 should be single-tapped and 20 double-tapped.

When the plan was originally prepared the Municipal Council was not consulted and consequently the council had no idea about the pipe lines and the number of fountains sanctioned. They were not thus in a position to make any representations on the subject earlier. The council therefore resolves to lay the matter before Government, through the Sanitary Engineer, who will be requested to submit the same to Government with his recommendation at an early date. The council learns that there is some savings in the estimate for water-works already sanctioned.

Plan and estimate for the additions and alterations proposed by the council, as prepared by the Assistant Sanitary Engineer, will also be submitted.

* * * * *

From J. E. LOCKYER, Esq., Assoc. M. Inst. C. E., F. I. Inst., Assistant Sanitary Engineer, to the Chairman, Municipal Council, Kurnool, dated 15th May 1896, No. 228.

In reply to your No. 57, dated May 1896, I have the honour to forward a tracing with the proposed extensions marked on it, also an approximate estimate of the cost of the same, the total amounting in round figures to Rs. 20,000. It is a lot of money, but the whole of the extensions are necessary, and practically the whole of them urgent.

2. It has been suggested to lay an alternative line to Budhwarpeta, as shown in black dotted lines, but this does not recommend itself. The idea is that by laying the line in this direction, it will cost little more than laying it over the bridge, and that it will serve the house I am living, the two mosques, the toll-gate, the Judge's house and pass through the jail and Collector's cutcherry compound. This is not so—it would be cheaper to lay a separate branch as far as the Judge's house and retain the present route over the bridge. Irrespective of cost, there are

engineering objections to taking this route as it would necessitate a syphon in the river bed, but as it would be probably Rs. 3,000 cheaper to lay a separate branch to the Judge's house, the black line need not be discussed any further.

3. To the lines discussed at the meeting, I have added a short branch to Pinjarwada—this will serve a very large number of people and approval of the council.

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, 23rd July 1896, No. 2279.

With reference to G.O., Mis. No. 846 M., dated the 15th May 1896, and in continuation of paragraph 3 of my No. 1977, dated 24th June 1896, I have now the honour to forward the revised estimates for Kurnool water-supply, amounting to Rs. 2,37,555, which is less than the amount estimated in my No. 2172 of 6th August 1895 (the present sanction) and this notwithstanding the heavy increases which were expected to result from the acceptance of the only practicable tender for the head works.

2. I forward estimates in detail and also a comparative statement showing how the anticipated cost of the works stood at each stage.

3. It was impossible at the stage which the work had reached on the date of the receipt of the Government Order above quoted to consider the question of omitting any portion of the work, but such proposal would not have been feasible owing to the amount of silt in the water to be purified and supplied and the Sanitary Commissioner is even now doubtful whether sufficient purification will be ensured.

4. But notwithstanding that the works will be carried out in their entirety, it will be satisfactory to Government to find that they can be so without the cost being much increased over the amount mentioned in my No. 2172 of 6th August 1895. The cost indeed would have been under that amount did I not consider that a provision of Rs. 3,000 should be made for quarters for workmen and watchmen huts on the works extending over half a mile in length.

5. Colonel Campbell's proposals would have allowed the reduction of the estimate by Rs. 5,876. By careful consideration of the whole design and amendments in details and by reason that exchange has considerably advanced, I have in addition been able to save no less than Rs. 25,554.

6. The various items are shown in the comparative statement; had there not been unavoidable increases the reduction would have been still more.

7. Taking the items *seriatim*, the first item shows a large excess. Mr. Ellis' design showed the water to be drawn from the canal on the same side as the engine-house. This was found impossible owing to the large amount of silt and a resultant sand bank found there. To have retained the inlet on that side would have meant continual blocking. The inlet arrangements had therefore to be arranged for on the opposite side. The inlet main is laid in the same trench as the main to the town and the alteration also assists in a saving in regard to the engine-house itself, so that the excess is counterbalanced by savings on these items of engine-house and laying and jointing pipes.

8. The reduction shown against engine and boiler house is due to the above and to baling having been found necessary and to a saving in foundation due to suitable rock being higher than expected.

9. The next item saved on is the pumping main. This was first designed to enter at the side of the settling tank furthest from the engine-house and the outlet for the settling tank was to have been from the opposite side. But as the former is of iron and the latter of stoneware and therefore much cheaper their positions were reversed and the saving thus effected. For the same reason Rs. 85 is saved on laying and jointing pumping main.

10. There is a very large saving on the settling tank. Rock was found nearer the surface than expected and the bottom of the tank was raised 2 feet, there being ample embankment to maintain the tank of the same capacity, a large saving in

excavation results. A further saving is caused by the substitution of dry stone pitching for hammer dressed rubble in soorkie as proposed in the original estimate or in lime as proposed by Colonel Campbell. This was possible because it was found by experiment that the soil in which the tank was excavated was water tight and it is believed that the process of settling will tend to fill in the joints with silt. The central walls is in rubble stone hammer dressed in lime instead of soorkie. The total saving altogether is Rs. 13,602.

11. On the filter beds there is a small saving (Rs. 911) due to the substitution of vertical for sloping walls, the area of the beds remaining the same.

12. On the service reservoir Colonel Campbell proposed a saving of Rs. 1,021 calculated on the basis that the contractor would execute rubble arching at Rs. 40–8–0 for 100 cubic feet. He eventually, however, agreed to do the arching at Rs. 24 per 100 cubit feet, for such portions as were of rubble and Rs. 45 for dressed bond stones. Colonel Campbell's saving was therefore increased by Rs. 2,005 making in all Rs. 3,026.

13. The saving of Rs. 8,094 in supply of pipes, &c., is mainly due to rise in exchange. The exchange on 6th August 1895 was 1*s.* $1\frac{5}{32}d.$ at the time the contract for pipes was accepted it was 1*s* $2\frac{3}{32}d$, there are, however, variations in rates between the estimate and accepted tender.

14. *Laying and jointing Main and Branches.*—This work is not yet done. The accepted tender for this work amounts to Rs. 12,220. There are always unforeseen extras and it has been deemed advisable to enter the figure of Rs. 14,500 for this work; this gives a slight increase of Rs. 1,200.

15. *As to Tools and Plant.*—These are difficult to estimate the cost of, but the original figure which was due to $2\frac{1}{2}$ per cent. on the estimate has been reduced from Rs. 5,000 to Rs. 3,200.

16. *Establishment, Office and Contingencies.*—The original figure is due to its being $7\frac{1}{2}$ per cent. on the estimate. Basing the revised figures on past expenditure and supposing that the works will be completed within ten months, the revised figure of Rs. 22,000 has been entered, showing an excess of Rs. 4,000. If the works are completed sooner, as they may be, the figure will be less.

17. The amount of unforeseen contingencies was calculated according to order at 5 per cent. on the amount of estimate. Past expenditure shows that this amount is not likely to be approached and a reduction from Rs. 11,400 to Rs. 5,000 or of Rupees 6,400 has been made.

18. The result as previously stated is a revised estimate of Rs. 2,37,855 against Rs. 2,39,380. But it is advisable as pointed out to add Rs. 3,000 for quarters and watchmen sheds. The total of the estimate then stands at Rs. 2,40,555 or about the same as the present sanction.

19. I trust Government will consider that their orders as to every economy being effected have been attended to as far as consistent with the proper execution of the works.

20. Government have already had reports as to the alterations and extensions proposed in the distribution mains by the residents of Kurnool, &c. If Government are prepared to give effect to any of these proposals, it is desirable that very early order should issue, so that pipes, &c., may be got, otherwise increases must take place in the cost of establishment, contingencies, &c.

Reference No. 956, dated 15th August 1896.

The Sanitary Engineer will be requested to report at an early date how far the estimate submitted by the Assistant Sanitary Engineer in his letter, No. 228, of 15th May 1896, provides for the extensions proposed by the municipal council in its

resolution of the 13th June last and to send up a plan showing any difference that there may be and the reasons for them. The streets referred to in the resolution should also be marked on the plan.

(By Order)

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

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, 20th August 1896, No. 2560.

With reference to official memorandum No. 956, dated 15th August 1896, I have the honour to forward herewith a plan showing the proposed lines of piping referred to in Municipal Council's resolution, dated 13th June last, and to state that the plan and estimate submitted by the Assistant Sanitary Engineer, Kurnool, in his letter, No. 228 of 15th May last, provides for all the extensions proposed in the resolution, but for 20 extra fountains only, instead of 45 fountains as asked for by the council.

2. There is already in the sanctioned scheme 30 fountains and if 45 additional taps are now to be sanctioned, this will give one fountain for every 354 people. If only 20 additional fountains are sanctioned, this will give one for every 500 people.

3. I consider 20 additional fountains and six bullock services, together with the number above already sanctioned, as sufficient. We ordinarily estimate for one fountain for every 1,000 people.

4. Mr. Lockyer's estimate included the cost of 20 fountains and six bullock services with a total of Rs. 20,000. The estimate now forwarded includes 45 fountains as well as all the extensions required by the Municipal Council and amounts to Rs. 26,000. If 25 fountains (single and double taps) be omitted, this estimate will be reduced to Rs. 22,650. The reason for the increase over the Assistant Sanitary Engineer's estimate is that it is thought desirable to have 4″ instead of 3″ pipes to Bhudawarampet and to Mission house compound to admit of a future extension to the suburb of Roza, also to provide for 10 double-tap and 10 single-tap fountains instead of 20 single-tap fountains provided for in the Assistant Sanitary Engineer's estimate.

5. The plan shows distinctly the streets for which pipes in the sanctioned scheme are to be omitted (these shown by dotted blue lines) and the extra lines required by the council (these being shown by full red lines).

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, 25th August 1896, No. 2588.

In continuation of my No. 2560, dated 20th August 1896, I have the honour to state, that, of the extensions proposed by the Municipal Council in its resolution of the 13th June last, the extension to Pinjarwada (*vide* plan forwarded with my No. 1977, dated 24th June 1896) has, by an oversight, not been included in the estimates furnished with my No. 2560 of 20th August 1896.

2. The estimated cost of the line to Pinjarwada (370 feet of 3″ piping) amounts to Rs. 462. The estimate for *all* the extensions proposed by the council including 45 fountains will now amount to Rs. 26,000 + 462 or Rs. 26,462. If 25 fountains (single and double taps) be omitted, the estimate will be reduced to Rs. 23,112.

From M.R.Ry. T. CHIDAMBARA RAO, Chairman, Municipal Council, Kurnool, to the Chief Secretary to Government, dated Kurnool, 25th August 1896, No. 310.

I have the honour to submit herewith a copy of the resolution passed at a special meeting of the Municipal Councillors, Kurnool, held on the 22nd August 1896, for considering the proposals of Mr. W. M. Thorburn (District Judge) as set forth in his letter to the Chief Secretary to Government, dated the 20th August 1896, a copy of which he sent to the municipality.

Enclosure.

Proceedings of a special meeting of the Municipal Councillors, Kurnool, held on the 22nd August 1896, No. 11.

* * * * *

Read letter from Mr. Thorburn, dated 21st August 1896, forwarding a copy of his letter, dated 20th August 1896, addressed to the Chief Secretary to Government, making certain proposals in respect of the Kurnool water-works.

Resolution.—The following resolution was passed :—

The proposals of Mr. Thorburn have the unanimous approval of the council. The council having already (in its Resolution No. 1, dated 13th June 1896, a copy of which was submitted to Government through the Sanitary Engineer on 18th June 1896,) decided about the necessity for a branch pipe line to the north of the main line for serving the northern group of houses in the civil station, it is at present necessary to consider only about the three lines—1,900 feet, 500 feet and 1,100 feet in length—referred to in paragraphs 7 and 8 of Mr. Thorburn's letter for serving the southern group of houses. Of these three lines the council considers the second line, 500 feet long, unnecessary. The total length of the other two lines comes up to about 3,000 feet and the cost of laying them amounts to about Rs. 2,500. If it be possible to make any reductions in the rates as suggested by Mr. Thorburn, it will be not necessary to exceed the estimates already sanctioned and to incur any additional expenditure on account of these branch lines. But even if it be found necessary to incur any additional expenditure, the council does not consider the additional expenditure too much, having regard to the very large amount (over 2½ lakhs of rupees) that is being spent on account of the water works and to the heavy taxes which the owners and occupiers of the buildings to be served by these lines pay to the municipality. By laying these lines the municipality will be in a position to collect from the owners of the southern group of houses a good sum in the shape of water-tax, which it will not be entitled to levy otherwise. If the proposed branch lines be sanctioned, the requirements of all the residents of the civil station will have been attended to and there will then be no ground for complaint that anybody has been shut out from the benefits of the water works so generously sanctioned by Government. The council, therefore, resolves to request Government to sanction these branch lines, even if it be necessary to incur an additional expenditure, which they consider not at all heavy under the circumstances.

The council takes this opportunity to observe that it would not have been necessary either for the council, the Sanitary Engineer's department or the rate payers to trouble Government with frequent requests for additions or alterations in the water-supply scheme, if the municipality had been given at the outset an opportunity of expressing its views and requirements in respect of the water-supply scheme.

A copy of this Resolution will be submitted to Government.

Copy also to Mr. Thorburn.

From W. M. THORBURN, Esq., District Judge, Kurnool, dated 21st August 1896.

Endorsement No. 1108, dated 25th September 1896.

Transferred to the Public Works Department . . . . with the request that the Chief Engineer will favour Government with his opinion . . . .

(By Order)

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

Note by Colonel D. McNEIL CAMPBELL, R.E., Chief Engineer, Public Works Department, dated 5th November 1896.

The chief differences between Mr. Thorburn's proposals and those of the Sanitary Engineer are that the former considers that two pipes—one 1,900′ and the other 1,100′ long—are preferable to the round about 6,000′ line proposed by the latter, also that 2½″ and 2″ pipes would answer as well as the 3″ proposed by Mr. Jones. From an engineering point of view the line proposed by Mr. Jones is preferable to the two shorter lines, as there are objections to "dead" or "loose" ends if they can be avoided ; they are a source of impurity and interfere with the free circulation of water. Moreover, with the continuous line, water can be supplied to each fountain from two directions, so that in the event of damage to a pipe, the supply need not be stopped. Of course the two lines proposed by Mr. Thorburn are much cheaper, and if it is thought that sanitary requirements and convenience of supply are not essential in Kurnool, they may be adopted ; for my own part, I would go further than Mr. Jones has and making the north line continuous by joining it on to the line shown, as proposed by the Assistant Sanitary Engineer on tracing dated 6th December 1892.

2. As regards the size of pipes, Mr. Thorburn is wrong when he says the diameter is a simple matter of hydraulics, as there are limits to the size of pipes that should be used. I have no means of ascertaining whether the 2½″ and 2″ pipes proposed by Mr. Thorburn would give sufficient discharges as I have no levels ; but the supply required being very small, I think there is no doubt that they would.

3. A minimum diameter of 3″ is generally considered sufficient for distribution pipes. Burton, in his book on Water-supply, lays down 5″ as a maximum. Taning suggests 8″. Others lay down that no pipe less than 3″ should be carried further than 400′; but this is again a question of cost, and if it is thought that in Kurnool the rules ordinarily applied to water works need not be adhered to, then 2½″ and 2″ pipes may be used. Altogether from an engineering and sanitary point of view I prefer Mr. Jones' arrangement, though I would go further and make the northern line continuous ; from a financial point of view Mr. Thorburn's are undoubtedly the best, they will be much cheaper and will answer in a way though not so satisfactory as the other arrangement. Mr. Thorburn goes into detail as regards the cost of 2″ and 2½″ piping and he complains of the high prices charged by Mr. Jones ; but as the latter does not propose to use either 2″ or 2½″ pipes, I do not see how any comparison can be made ; however, Mr. Thorburn seems to think that the cost of 3″ pipes as given by the Sanitary Engineer is high, and the following gives a comparison of the charges of different firms, cost of carriage to site of works being added :—

3″ pipes cast iron.

Mr. Jones' price Rs. 1–4–0 per foot, including bends, valves and laying.

	Rs.	A.	P.	
Burns & Co.	1	0	10	pipes only.
Richardson and Cruddas	0	13	0	,,
Massey & Co.	0	12	9	,,
Oakes & Co.	0	14	8	,,
India Office	0	11	8	,,

Without knowing the lines selected for the pipes and the nature of the soil, it is not possible to tell the cost of laying : Mr. Jones' estimate seems somewhat high, but no doubt he would give details explaining the reason.

I can say nothing about the prices charged by Mr. Jones for stand pipes, as there are very many different patterns, the cost of each of which is different.

* * * * *

Note by Colonel D. McNEIL CAMPBELL, R.E., Chief Engineer, Public Works Department, dated 4th December 1896.

The last sanction in connection with the Kurnool water-supply scheme is that conveyed in G.O., No. 1082 M., dated 9th July 1895, and amounts to Rs. 2,39,380.

2. Subsequently, in consequence of a petition from certain residents of Kurnool, dated 27th February 1896, the municipal council, in its resolutions, dated 13th June 1896 and 22nd August 1896, recommends certain further extensions, the execution of which, the council considers, will render the scheme complete and satisfy the requirements of all the inhabitants of the civil station, leaving no grounds for further complaint.

3. To provide for these extensions, the Sanitary Engineer has submitted for sanction revised estimates as follows :—

		Rs.
(i)	A revised estimate, dated 23rd July 1896, amounting to ..	2,37,555
(ii)	A supplemental estimate, dated 20th August 1896, for Rupees 26,000 corrected in Sanitary Engineer's No. 2588 of 25th August 1896, to	26,462
	Total ..	2,64,017

4. This total apparently does not include a sum of Rs. 3,000, which the Sanitary Engineer in paragraph 18 of his letter, No. 2279, of 23rd July 1896, considers "advisable to provide for quarters and watchmen's sheds;" but this amount may, I think, be omitted; the amount for which sanction is now asked for will be Rs. 2,64,017, being an excess of Rs. 24,637 on the last sanction.

5. I have already given my opinion on the supplemental estimate of Rs. 26,462 in my note, dated 9th November 1896, No. 3980-C, in which I approved of Mr. Jones' lines for and sizes of piping; but I qualified this by stating to the effect that, if the financial position of the Kurnool Municipality be such that they could not afford to carry out a water-supply on the most approved principles, the suggestions of Mr. Thorburn might be accepted, as no doubt, they would answer the purpose in a way.

6. As regards the revision of the original estimates, I have little to say; the rates are fair. The cost of piping, as given by Mr. Jones, is Rs. 118 per ton. This is almost exactly the same as the India Office prices. Burn & Co.'s price would be Rs. 175 delivered in Kurnool, Messrs. Richardson and Cruddas Rs. 148.

From J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E., Sanitary Engineer to Government, to the Secretary to Government, Local and Municipal Department, dated Fort St. George, 7th December 1896, No. 3409.

I have the honour to invite your attention to correspondence ending with my letter, No. 2588, dated 25th August 1896, with reference to pipe extensions in the town of Kurnool, and to request that orders may be passed on the subject as early as possible. My reason for making this request is that it is advisable that the extra pipes, if they are to be sanctioned, should be laid by the present water works staff, and that delay in sanction will cause staff to be retained longer than was anticipated and thus increase cost of supervision.

ORDER—No. 76 M., dated 21st January 1897.

The revised estimate of Rs. 2,40,555 for the water-supply scheme of Kurnool submitted by the Sanitary Engineer, and the extension of the works proposed by the municipal council, which, as slightly modified by Mr. Jones, is estimated to cost Rs. 23,112, are sanctioned. As observed by the Chief Engineer in paragraph 3 of his note, dated 5th November 1896, the rates charged for pipes, including the cost of laying, in Mr. Jones' estimate appear to be somewhat high. The rates should accordingly be carefully reconsidered and the required pipes procured in the Indian market if they can be had at less cost. The pattern of standpipe which consistently with efficiency is cheapest should also be selected.

2. The total cost of the scheme including the extensions now sanctioned amounts to Rs. 2,63,667 or Rs. 24,287 in excess of the estimate approved in G.O., No. 1082 M., dated 9th July 1895. The Government will be prepared to make a grant of three-fourths of this additional cost and to lend the balance at 4¼ per cent. interest repayable in thirty years. The municipal council will be requested to submit the necessary applications without delay.

3. The Government is surprised to learn from Mr. Mullaly that he saw the plan of distribution of the water works for the first time on the morning of the 11th of May 1896. He has long been Collector of the district and was aware of the general progress of the project; and he might, at any time, have called for the plans and other documents relating to it and kept himself in touch with the discussions regarding it, as it was his duty to do. It is observed that the municipal council has made a similar complaint of not being afforded a sufficient opportunity of indicating its views and requirements in respect of the scheme. The Sanitary Engineer should in all such cases keep both the local body concerned and the Collector fully informed regarding the main lines of the projects in which they are interested, consulting them freely where necessary.

4. Mr. Thorburn will be informed that the terms and tone of his reference to the Chief Engineer in paragraph 14 of his letter, dated the 21st August 1896, are improper.

(True Extract.)

G. S. FORBES,
Secretary to Government.

To the Chairman, Municipal Council, Kurnool.
" the Collector of Kurnool.
" the Sanitary Board.
" the Sanitary Commissioner.
" the Sanitary Engineer (with plans and estimates).
" the Public Works Department.
" W. M. Thorburn, Esq., District Judge, Kurnool.

Exd. C. M. Thumbuswamy.