16-5-07

al & Munl. (1896) Department.

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103

G.O., No. 847 M.

DATED 15th May 1896.

Notes will be printed on reverse of paper from file -

[Despatch Abstract.]

Sanitary Works.

Declining, with remarks, to reconsider G.O., No. 2073 M., dated 9th December 1895, regarding the execution of ----- and passing orders on certain questions raised by the Sanitary Engineer and the Public Works Department in connection with the preparation of specification and schedules for such works, the amendment of schemes, &c.

BACK PAPERS.

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

FURTHER PAPERS.

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Government of Madras.

LOCAL AND MUNICIPAL DEPARTMENT.

Recd. } 1896. *Enclosures*

Regd. *Spare copies*

G.O., No. 847 M., 15th May 1896.

Sanitary works.

Declining, with remarks, to reconsider G.O., No. 2073 M., dated 9th December 1895, regarding the execution of —, and passing orders on certain questions raised by the Sanitary Engineer and the Public Works Department in connection with the preparation of specification and schedules for such works, the amendment of schemes, etc.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—the following papers :—

I

G.O., No. 2073 M., dated 9th December 1895.

ABSTRACT.—Passing orders about the appointment of an additional Assistant Sanitary Engineer, and ordering that the execution of the next water-supply or drainage scheme be entrusted to the Public Works Department.

II

Office-note—from the Hon'ble Colonel D. MCNEIL CAMPBELL, R.E., Joint Secretary to Government, Public Works Department.
To—the Chief Secretary to Government, Local and Municipal Department.
Dated—Madras, the 11th January 1896.
No.—172-C.

With reference to orders in the Local and Municipal Department, No. 2073 M., dated 9th December 1895, please let me know whether further orders may be expected on the subject of the contributions payable to the Public Works Department for the execution of sanitary works for Municipalities. In paragraph 3 of his office-note, No. 3268-C., dated 2nd November 1895, Colonel Pennycuick proposed a scale of charges which he considered suitable ; but the order thereon in the Local and Municipal Department makes no reference to this matter.

III

Note by the Chief Engineer, Public Works Department.

The best manner of dealing with the organisation of the Sanitary Engineering Department has been under discussion for several years and there are some conflicting orders on the subject ; but it was finally decided in G.O., No. 2073 M., dated 9th December 1895, that the work of the Sanitary Engineer should be confined to investigating water-supply, drainage, &c., projects, and drawing up the necessary plans and estimates which should be submitted to Government through the Sanitary Board. The construction of the works, and obtaining the plant, required for the next project of the description to be carried out, was to be entrusted to the Public Works Department.

2. Mr. Jones, the Sanitary Engineer, now requests that Government will be pleased to reconsider that order.

3. The reasons that led to the passing of the order objected to by Mr. Jones were that, owing to the rapid increase of sanitary works, it was found necessary to increase the Engineering establishment, and Colonel Pennycuick was of opinion that it was not advisable to lend officers and subordinates from this department to work under the orders of the Sanitary Engineer, and that it would be better to put the execution of the works entirely under the Public Works Department. There seems to me to be objections both to lending men to the Sanitary Engineer and also to carrying out the work by the ordinary Public Works Department establishment, and it really amounts to a choice of two evils, both of which are necessitated by

financial considerations, and the question is which is the lesser evil of the two. The objections to lending men are that it is doubtful if they could be spared, and, as Colonel Pennycuick states, there would be partial responsibility in giving advice and lending subordinates for work nominally under the control of another department. The objections to giving the execution of works to the Public Works Department are given in Mr. Jones' letter, and with these objections, I agree as also did Colonel A. C. Smith when he was officiating Chief Engineer. In my opinion the only satisfactory solution of the question is to make the Sanitary Engineering Department, entirely independent, somewhat on the lines indicated in the note by Colonel A. C. Smith and Mr. Jones. The separation of the department is all the more necessary as Sanitary Engineering is a special branch of the profession.

On G.O., Mis. No. 479 M., of 2nd April 1891.

4. Colonel Pennycuick says himself that this would be the most satisfactory arrangement, but is of opinion that it is altogether out of the question on financial grounds, and no doubt it would be if sanitary works are to be carried out as at present, that is all over the presidency from Ganjám to Cape Comorin and Malabar ; but I see no reason why sanitary works should not be carried out by areas, that is, suppose each of the Public Works Department circles were taken up in turns and the water-supply and drainage projects in each completed before those in the next were begun. The establishment required would then be very small. Mr. Jones would be the Superintending Engineer of the circle as regards sanitary works and with one Executive Engineer and three Assistant Engineers and some subordinates he should be able to carry out all the required works, and I don't think the cost would be more than at present. While the works in one circle were under execution, Mr. Jones could be preparing plans and estimates for the works required in the next. I believe that the works would be much better supervised than at present when they are scattered all over the presidency, and it must be remembered that there are few works that require such close supervision as water-works, and I am doubtful if members of the Public Works establishment could spare time to attend to sanitary works in addition to their present duties.

5. Of course the division into circles corresponding to the Public Works circles is only a suggestion, as the extent of the circles will have to depend on the amount of work and the maximum establishment that can be employed. All these details will have to be worked out should the general suggestions be approved.

6. From a list of works in the Sanitary Engineer's Department submitted with Mr. Jones' letter, dated 3rd April 1895, No. 929, to the Chief Secretary to Government, it would appear that if the work is divided according to Public Works circles there would be work in I Circle only, in Vizagapatam and Vizianagram.

7. In II Circle, Bezwada, Masulipatam, Guntur, Ellore, Ongole ; so that I and II Public Works circles might form one circle for sanitary works, and so on.

8. But if my proposals are to be adopted it would be better to deal with all the towns in one circle requiring water-supply and drainage before taking up the next. It may be argued as a reason against my proposals that urgent works outside the circle of operations might have to be postponed till the works in the circle were completed. But, as the towns have gone for hundreds of years without a water-supply and drainage scheme, there will seldom be any case in which the work is really urgent, and if such a case does occur, a special establishment can be employed for the time being. As regards the works actually in progress, I think they should be carried on as at present, extra assistance being given to the Sanitary Engineer if required.

9. Should my proposals not be approved, and it be still deemed advisable to entrust the execution of all sanitary works to the Public Works Department, the questions put by Mr. Jones in paragraph 18 can be answered as follows :—

(1) The specifications and schedules for schemes should be prepared by the Sanitary Engineer who is to draw up the schemes.

(2) Trifling alterations in design can be sanctioned by the Superintending Engineer of the circle, material alterations proposed should be submitted by the Superintending Engineer to the Chief Engineer who, if he thinks advisable, will refer to the Sanitary Engineer for opinion.

(3) The Sanitary Engineer will not be required to visit and report on schemes under execution, the Superintending Engineer and Executive Engineer will do that duty.

(4) As the works will be under the Public Works Department, the rules in force in that department regarding tender for English supplies will be adhered to.

10. Mr. Jones further raises the question of the maintenance of completed schemes, and I must say that I agree with him that it will be a fatal mistake to hand over the care of completed schemes to the Municipalities concerned; but I doubt if it would be possible to carry out his suggestions. The question of improving the status and efficiency of the Local Fund Engineers is now under consideration and it is possible that these officers might be made to look after completed water-supply and drainage works, contribution for this purpose being made by the Municipalities who benefit thereby.

5th February 1896.

D. McNeil Campbell, Col., R.E.,
Chief Engineer, P.W.D.

Enclosure.

Letter—from J. A. Jones, Esq., mem. inst. c.e., f.r.s.e., Sanitary Engineer to Government.
To—the Chief Secretary to Government (through the Chief Engineer, Public Works Department).
Dated—Fort St. George, the 29th January 1896.
No.—261.

With reference to G.O., No. 2073 M., dated 9th December 1895, I have the honour to request that Government will be pleased to consider the following remarks which I venture to submit after careful consideration of the consequences that, I fear, will follow the changes ordered and because the interests involved are such that I consider Government should be in possession of the following views—views which I have not hitherto had an opportunity of laying before Government; I regret that Colonel Pennycuick has retired, because had he still been here, I feel sure, he would have given them his earnest consideration.

2. It might be understood from the tenor of the Government Order under reference that I had desired and advocated the changes, but it will be seen from a perusal of my letter embodied in the Government Order in question, that I have never advocated that the work of the Sanitary Engineer should be limited in the manner lately sanctioned. At the same time it is right to say that I, as a member of the Sanitary Board, acquiesced in a proposal made by the Sanitary Board that the work should be so limited, but this was because I saw it was hopeless under the then existing régime of the Public Works Department to obtain assistance from that department by method of temporary transfers. Whether other counsels prevail now I am not in a position to say, but I suggest that the policy is possible of reversal or modification, and thus many of Colonel Pennycuick's objections to the existing system would be met.

3. In fact this was the original intention of Government as may be seen by a perusal of G.O., No. 1838 M., dated 26th October 1891, wherein it is ordered that "supervisors and overseers required for the permanent staff referred to by the Sanitary Engineer as class (A) should, if possible, be obtained from the Public Works Department."

4. Government will learn from a perusal of past correspondence that I have never asked to be relieved of any portion of the duties until lately appertaining to me, but that I have, on the other hand, merely desired to carry out these duties in an efficient manner, which could be done only by an increase in staff.

5. I beg to submit to Government that the refusal to grant this extra staff cannot have been on financial grounds, because the cost of any staff granted is recouped from the body for whom the works are being carried out as will still be the case in the proposed arrangement for the Public Works Department to execute works. I further submit that if the works already executed had been so by the Public Works Department the following would have been the financial result, that is, that the acceptance of Colonel Pennyquick's terms or proposals will, for a similar amount of work in the future, entail on the local bodies concerned an increased contribution amounting to Rs. 88,000 under one alternative or Rs. 1,15,000 under the other. This over say about five years actual expenditure is Rs. 23,000 a year and that is an amount which would pay for three more Assistant Engineers than that at present.

No.	Town.	Actual cost of work.	Actual cost of pipes, machinery and lands.	Net cost of work (*i.e.*, the difference between columns 3 and 4).	Contribution required by the P.W.D., at 24½ per cent. on net cost of work—(column 5).	Estimated cost of work.
1	2	3	4	5	6	7
		Rs.	Rs.	Rs.	Rs.	Rs.
1	Adóni	1,58,119	87,325	70,794	17,344	1,62,000—Water-supply.
2	Coonoor	41,840	..	41,840	10,250	48,000—Drainage.
3	Cuddapah	17,556	9,347	8,209	2,011	19,385—Water-supply.
4	Kumbakónam	1,12,134	35,521	76,613	18,770	1,10,000—Drainage.
5	Madura	3,94,485	2,19,152	1,75,333	42,956	3,91,000—Water-supply.
6	Tanjore	4,23,953	2,27,542	1,96,411	48,120	4,47,420 do.
7	Trichinopoly	* 5,20,000	2,84,664	2,35,336	57,657	5,20,000 do.
	Total ..	16,68,087	8,63,551	8,04,536	1,97,108	16,97,805

No.	Town.	Contribution required by the P.W.D., on the estimated cost of work—column 7.		Cost of establishment actually incurred by the Sanitary Engineer when executed under his supervision.	Difference between columns 6 and 10.	Difference between columns 9 and 10.
		Percentage.	Amount.			
		8	9	10	11	12
			Rs.	Rs.	Rs.	Rs.
1	Adóni	12½	20,250	8,259	9,085	11,991
2	Coonoor	20	9,600	5,017	5,233	4,583
3	Cuddapah	12½	2,423	2,194	— 183	229
4	Kumbakónam	20	22,000	17,591	1,179	4,409
5	Madura	12½	48,875	21,870	21,086	27,005
6	Tanjore	12½	55,927	24,135	23,985	31,792
7	Trichinopoly	12½	65,000	29,760	27,897	35,240
	Total ..	..	2,24,075	1,08,826	88,282	1,15,249

* Approximate—work in progress.

6. Therefore the transfer to the Public Works Department of the execution of works does not find justification on financial grounds.

7. Colonel Pennycuick's strongest point for the transfer is that the Sanitary Engineer cannot give the proper supervision. I am unaware on what grounds he came to this conclusion, but I can conscientiously say that none of the works up to date have lacked proper supervision nor have suffered from want of proper supervision.

8. The next point to which I wish to request the attention of Government is that, while the Public Works Department have never been able, or more properly I might say willing to lend the services of officers to this department, it is proposed to give the work to the officers of that department. From this it can be deduced that unwillingness to afford the assistance asked on several occasions and not inability to do so was the cause of refusal. If now the works can be undertaken without extra staff, which is a matter of doubt (even by Colonel Pennycuick himself), the officers of the Public Works Department must either have not enough work at present, a premise unlikely to be agreed to, or else the work of executing the Sanitary Engineer's schemes will not have that care and attention they require, and this is more likely to be the case. But there is the likelihood that extra staff (under the powers of the Chief Engineer) will be engaged from time to time, so that it comes to this, that extra staff will be used by the Public Works Department while the execution of works has been taken away from the Sanitary Engineer because extra staff is required.

9. It is not consistent with Colonel Pennycuick's objection against the employment of temporary staff in the Sanitary Engineer's Department to propose to employ temporary men in Public Works Department for the same purpose, and if these proposals mean that those temporary men would be put in permanent posts of the Public Works Department and thus allow of the alienation of the services of higher grade officers to sanitary schemes, the same plan was possible of adoption when the Sanitary Engineer wanted the services of members of Public Works Department staff, such an arrangement can be made now and all objection to the existing state of things would then disappear while the work would be much more cheaply done, and I venture to add efficiently done, and supervised than under the proposal recently sanctioned.

10. I would quote here from a report to Government by Colonel A. C. Smith, Acting Chief Engineer, and myself, a portion which could only have been written on Colonel Smith's authority :—

"It is thought that the proposal that the works when designed and estimated by the Sanitary Engineer and duly approved by Government should be carried out by Executive Engineers of Divisions will not be at all a satisfactory arrangement, for—

"Works of this class require *constant*, if not *continuous* supervision and it will be impossible for an Executive Engineer of the Public Works Department, who now-a-days has so large a charge that it takes him a year to see the whole of it, to devote sufficient time for this purpose.

"It is always very difficult in this class of work to carry out, without constant reference, the plans and estimates made by others.

"There would be a dual control—no man can serve two masters—on the one hand the Superintending Engineer of the circle would have just cause for complaint if the Executive Engineer neglected, as he would be obliged to do, his own proper work in order to supervise work for the Sanitary Engineer, and the latter would undoubtedly grumble if his work was either not carried on expeditiously or scamped in the absence of proper supervision.

"Then again the Sanitary Engineer would be quite justified in declining all responsibility in the results of his designs if he were not placed in the position of a Superintending officer with powers to alter or modify such designs, for in these kind of works it is impossible to foresee all requirements.

"Then as regards the position of the Chief Engineer, Public Works Department, with regard to the Sanitary Department, if he is to scrutinise or revise the designs and lend his officers to the Sanitary Department to carry them out in case of failure or misadventure, the Public Works Department would be held to blame, though, as is above shown, it will be impossible for it to undertake such works satisfactorily.

"Taking all these things into consideration, it is thought advisable to make the Sanitary Engineer and his department totally independent of the Public Works Department as far as designing and execution of work is concerned, except, of course, that the Chief Engineer, Public Works Department, should act as adviser to the Government on all schemes they may wish to consult him about."

11. In these sentences will be found, I venture to say, an endorsement of the views I have already set forth and they also include what is to my mind a very potent argument against the possibility of the arrangements ordered being in any way a success. I refer to the question of dual responsibility.

12. Under the new arrangement the plans framed by the Sanitary Engineer will have the approval of the Sanitary Board which at present includes the Chief Engineer. So long as the Chief Engineer is the President of the Board, there is an incidental security that the designs, etc., passed will be carried out to a greater or less extent. But in no Engineer's experience and certainly not in mine is it the case that the designs of one Engineer will be completely accepted or satisfactorily carried out by another. The Public Works Department have already experience of this in regard to the tank maintenance scheme. Any Engineer receiving the design of another to carry out would have his first thoughts directed to amendment whether an improvement or not would remain to be seen, such amendments under present order of Government could not be sent back to the Sanitary Engineer for approval, or the Sanitary Engineer would be in the relation of a Superintending Engineer to an Executive officer of the Public Works Department, and therefore the Superintending Engineer, Public Works Department, would have to approve or otherwise of such amendments, or they would eventually reach the Chief Engineer who might or might not have approved of the original plans. For any amendments or alteration the Sanitary Engineer could in no way be held responsible, and therefore in no way for the success or failure of any scheme.

13. In addition to this there will be a considerable additional and continuous correspondence needed when the design of one Engineer is carried out by another and this point and that point must come back for elucidation, etc. Such correspondence would be of the most unsatisfactory character and the Sanitary Engineer would not be in a position to suggest alterations himself in the design as his experience does suggest as work proceeds, because it is a portion of his duty which Government have determined to relieve him. No work has ever been carried out exactly as designed. Therefore every scheme will be more or less amended by other persons than its author—by persons having less interest and less skill in that particular class of work and the result must be such that the Sanitary Engineer can have no dependence that his schemes will be in any case carried out as designed and approved.

14. It may be brought forward as an argument that the designs of the Consulting Architect to Government are so carried out; but any that are so are works of a less technical nature and of a character allied to those which a Public Works Department officer usually executes.

15. Again, with the plant and materials being ordered by each individual officer unless it is ordered that the type designs of the Sanitary Engineer are to be adhered to in all cases, the works will not have that uniformity of design and in the class of materials used such as valves,

fountains, pipes, etc., as are now maintained throughout the Presidency, so that such materials are interchargeable and one municipality may in times of emergency borrow from another ; nor are Public Works officers, who do not devote special attention to such works, likely to be acquainted with the best class of materials and design such as it is the special duty of this department to keep itself acquainted with ; nor will individual Public Works Department officers have the same facility or opportunity of borrowing and using plant and stores of one municipality by another simply because they cannot have the knowledge of the plant already used and which may be used by another officer. In short, there will be a loss of centralization to a great extent.

16. One reason for the proposal to create the office of Sanitary Engineer was because the Public Works officers could not find time to get up schemes (and therefore it may be reasonably supposed they had not time to devote to their execution). This has not been found to be the case in other Presidencies and where the Public Works Department executes schemes as in Bombay, they also draw them up and the duty of the Sanitary Engineer and Sanitary Board is only to review and amend such schemes so that the design and execution of the schemes are not divided from each other as is now ordered to be done in this Presidency. It is a well-known axiom that the best person to carry out a scheme is its designer and that he alone can do it justice.

17. I venture to place these remarks before Government. They are disinterested, as far as I am personally concerned, because the result of the order under reference is to lessen my work and therefore only because I very strongly believe that the proposal and its acceptance has been made without a consideration of the facts which I have now placed before Government, do I send them forward.

18. I am sending this letter through the Chief Engineer, Public Works Department, for his remarks thereon, and should Government still consider that the order already issued should not be modified, I have to ask that the following points may be decided :—

(1) By whom the specification and schedules for schemes should be prepared—by this office or by the Public Works Department?

(2) To whom proposals for amendments of schemes framed by the Sanitary Engineer and approved by the Sanitary Board and sanctioned by Government should be made, and whether reference is to be made to the Sanitary Engineer in reference to such proposed amendments?

(3) Whether the Sanitary Engineer should visit and report on the schemes under execution and make suggestion to the officer in charge for alteration admissible, etc. ?

(4) Whether this department or the Public Works Department are to obtain tenders for English materials, and, if so, through the Secretary of State, or through the Sanitary Engineer's Agents (Messrs. Henry S. King & Co.), or by tender in India ?

19. Government have also decided in the order under reference that no aid can be given to municipalities to maintain schemes in working order, and as to this also I ask permission to make a few remarks.

20. Government are aware that no mofussil municipality has an Engineer and I venture to submit that without professional supervision none of the works in operation can be maintained, even with the best endeavour of Municipal Councils, in the order they ought to be. The necessity for proper supervision of engineering works is one that has never been disputed, and in England no water or drainage works, on which the health of the people so materially depends, are without the attendance of a duly qualified Engineer.

21. In the Resolution of the Government of India recently issued in regard to a reorganization of the Sanitary Department it is proposed that there should be a Health officer for a group of towns to aid committees in proposing sanitary improvements; but these could be carried out only by professional agency. The principle therefore of a group of municipalities having the services of an Engineer is one that finds its analogy in that proposal and I cannot but think that an Assistant Sanitary Engineer is no less necessary than a Health officer in any improvement of the Sanitary Department.

22. It is a proposal made to Government some years ago and the proposal of the Government of India as to Health officer would seem almost to carry with it the necessity for an Engineering officer who would, as a colleague, control the same areas. The cost of a staff, say, of three Assistant Sanitary Engineers who would look after the execution of not only the major but all the minor works, would cost very little, even if Government made no provision from Provincial funds. Three Assistant Sanitary Engineers at an average of Rs. 700 + 100 travelling allowance monthly would amount to $12 \times 800 \times 3 = 28{,}800$ annually, and this divided over 56 municipalities would be under Rs. 500 a year. A sum of Rs. 1,000 might be payable by some municipalities and others only Rs. 100 or so, but the benefit obtained would be large in proportion to the assistants which would be rendered, and I am also of opinion that the financial result to municipalities by having their schemes properly carried out would more than cover the cost of the staff.

23. I need not say that I have already taken steps to hand over the completed water-works to the care of the Municipal Councils concerned, but I have done so with much regret and with little doubt as to the ultimate result of their being taken away from our care. It is as if when a railway line was complete the traffic branch of a railway were left to not only work the line but maintain it. The engines and pumps of water-works, etc., it is true, will receive two inspections annually, but the reservoir, head-works, filters, pipes and valves, etc., are left in the hands of persons with no professional knowledge whatever nor has provision been made for annual inspection of the work or for provision against additions or alterations to a system being made without the previous sanction of this department which alone has the knowledge to decide whether and where extension, etc., can be made without detriment to the original and existing system. These perhaps are points in which Government may now desire to pass further orders should no reconsideration of the method of supervising works in operation be deemed necessary or feasible.

24. Government have, while not granting an Assistant Engineer, rendered it possible for Mr. Minchin's services to be availed of to a greater and greater extent as the works now under construction are completed; and this arrangement is one that, under present orders, meets the request made for extra assistance.

25. At present as Government are aware the pay and travelling allowance of the Assistant Sanitary Engineer are recouped eventually from the Councils for whom the works are being executed, but when Mr. Minchin is employed on investigation, etc., there will be no estimates from which his pay can be provided for. Some schemes may never be executed, others not so for many years and there will be intervals between his services on one scheme and another which it will be difficult to debit to any municipality. This is brought to notice because the expenditure and receipts for staff will not balance eventually as they would do under existing arrangements, and I therefore request to be informed if this is understood and approved of by Government.

IV

Memorandum No. 734-C., Public Works, dated 10th February 1896.

Transferred to the Local and Municipal Department.

D. MCNEIL CAMPBELL, Col., R.E.,
Joint Secretary to Government, P.W.D.

To the Local and Municipal Department, with letter No. 261, dated 29th January 1896, from the Sanitary Engineer to Government, returned.

V

Letter—from J. A. JONES, Esq., MEN.INST.C.E., F.R.S.E., Sanitary Engineer to Government.
To—the Chief Secretary to Government (through the Chief Engineer, Public Works Department).
Dated—Fort St. George, the 14th February 1896.
No.—463.

In continuation of my letter No. 261 of the 29th ultimo, I have the honour to forward herewith an extract from the Report on the Sanitary Works of the North-Western Provinces and the Punjab by the Sanitary Engineer to the Government of Bombay and Member of the Sanitary Board of that Presidency. The opinion of this very senior officer of the Public Works Department of that Presidency emphasises very strongly the opinion expressed in my letter above quoted.

ENCLOSURE.

Extract from the Report on the Sanitary Works of the North-Western Provinces and the Punjab.

* * * * *

Up to the time that Sir Auckland Colvin became Lieutenant-Governor of the North-Western Provinces in 1887, all sanitary works had been carried out by the Public Works Department as they are still elsewhere in India except in Madras. The difficulties and delays of this system, caused by want of the special knowledge on the part of most of the Executive Engineers and the difficulty for them to spare sufficient time from their ordinary duties, and also the apathy and obstruction of the municipalities, which are still apparent elsewhere, caused him to appoint a special officer for supervising all such works and he also passed the Water Works Act I of 1891.

* * * * *

The water-works of the larger towns were carried out in the following order:—Agra, Allahabad, Benares, Cawnpore and Lucknow. Agra, Cawnpore and Benares are now carrying out drainage works and Meerut is now having water-works; the average time for each was only about two years although the cost varied from 12 to 25 lakhs. All the works were carried out by large contractors which accounts for the rapidity of construction to a great extent. The Punjab works of a similar nature done under the old system present a most striking contrast. In the few cases where water has been supplied, *i.e.*, Umballa Cantonment, Delhi, Lahore and Peshawar, the designs were altered and re-altered during construction the works extended over many years, and in the cases of Umballa Cantonment and Delhi they are a decided failure. Umballa city is now having its water-works made, and as an Engineer who has been specially trained in that branch is in charge it will probably be a success. In all the Punjab works the neglected and *unfinished* look of the head-works is most striking; whilst in the case of the North-Western Provinces they compare favourably with similar works in England in neatness and finish, and there has been none of the subsequent complaint or trouble that has resulted from every one of the Punjab works.

* * * * *

Part I is well on towards completion, but it is impossible to say when the various independent estimates for the different bazaars of Part II can be done under the system in force in the Punjab, the Local Executive Engineer is supposed to do all sanitary works in addition to his own proper work; and if this is adhered to as regards Part II, the twentieth century will be far advanced before the project is completed, if indeed it ever is. It is, I think, quite impossible that any Executive Engineer with a large district could possibly give up the time required for such a work for such a city; and the getting up of the project must drag on wearily from one Executive Engineer to another as transfers occur, involving loss of continuity of thought and design and if ever finished the result must be an unsatisfactory patch-work. It will be interesting to note the difference of results in Cawnpore where the drainage is being worked out and carried out by a Special Public Works Department Engineer who has had a special training in this branch and who is working direct under the Sanitary Engineer.

* * * * *

No. 941-C., dated 18th February 1896.

Forwarded to the Local and Municipal Department in continuation of this office endorsement, No. 734-C., dated 10th February 1896.

D. MCNEIL CAMPBELL, Col., R.E.,
Joint Secretary to Government, P.W.D.

Order—No. 847 M., dated 15th May 1896.

In the first of his letters read above the Sanitary Engineer asks for a reconsideration of the orders conveyed in G.O., No. 2073 M., dated 9th December 1895, defining the duties of his department. It has never been denied that if funds were abundant, the best plan would be to create a Sanitary Engineering Department complete in itself, and strong enough, not only to design works, but also to carry them out. But this plan being unfortunately not feasible on financial grounds, it was decided, after much discussion and consideration, to adopt the scheme laid down in G.O., No. 2073 M., dated 9th December 1895, the execution of the works being entrusted to the Public Works Department, and the duty of designing them to the Sanitary Engineer. The scheme is not free from objections, but has been determined by financial limitations and by what the Government considers to be sufficient for the actual requirements of sanitary projects at the present time. It was settled after due deliberation and must be adhered to until it shall prove to be inadequate.

2. In forwarding Mr. Jones' letter, the Chief Engineer has suggested a means of considerably reducing the cost of a separate department. This is to group municipalities into circles and to centralize in one circle all the works being carried on at one time, so that their supervision could be undertaken by a very small staff. While these works were being executed, designs and estimates for works in the next circle would be prepared and the works taken up on completion of those in the first circle.

The execution of sanitary projects cannot, however, follow any such procrustean order or distribution; and for this and other reasons the Government considers that the proposal is impracticable.

3. Mr. Jones further submits certain questions arising out of the orders in G.O., No. 2073 M., dated 9th December 1895, and requests that he may be favoured with orders on them in the event of Government being unwilling to reconsider that Government Order. The questions, four in number, are dealt with in paragraph 9 of the Chief Engineer's memorandum, with whose conclusions Government agrees with slight modifications. The points as answered by Government are as follows:—

(1) By whom should the specification and schedules for schemes be prepared—by this office or by the Public Works Department?

They should be prepared by the Sanitary Engineer, whose duty it is to draw up the schemes.

(2) To whom should proposals be made for amendments of schemes framed by the Sanitary Engineer and approved by the Sanitary Board and sanctioned by Government, and should reference be made to the Sanitary Engineer in regard to such proposed amendments?

Trifling alterations in design may be sanctioned by the Superintending Engineer of the Circle, but material alterations should be submitted by the Superintending Engineer for the orders of the Chief Engineer, who will consult the Sanitary Board if and when he thinks fit to do so.

(3) Should the Sanitary Engineer visit and report on the schemes under execution and make suggestions to the officer in charge for alterations admissible, etc.?

The Sanitary Engineer will not be required to visit and report on schemes in course of execution. If the executive department entrusted with the work meets with difficulties it may freely consult the Sanitary Board who may, if necessary, obtain a report from the Sanitary Engineer.

(4) Should the Sanitary Engineer or the Public Works Department obtain tenders for English materials, and, if so, through the Secretary of State or through the Sanitary Engineer's Agents (Messrs. Henry S. King and Co.) or by tender in India?

It has already been distinctly decided that the plant should be obtained by the Public Works Department, and therefore the rules in force in that department regarding tender for English supplies will be followed.

4. The last point brought forward by the Sanitary Engineer is the question of maintenance of existing water-supply and drainage schemes. Government has decided that this must be left to municipalities, as in the course of a few years the increasing number of schemes would preclude the possibility of their maintenance by Government. As, however, municipal schemes have been largely assisted by Government, it is advisable that some control should be exercised over municipalities in their upkeep, and this can best be secured by periodical inspections. The Sanitary Engineer himself or his Assistant will therefore be requested to inspect each work once a year at least and bring to the notice of Government any defects that may be found with the remedies suggested. The Public Works Department will also be requested to arrange for a half-yearly inspection of these works by the Executive Engineer of the division in which they are situated. This course, together with the two annual inspections of engines, pumps, etc., by the Boiler Inspector will, it is hoped, be sufficient to ensure the machinery and plant being maintained in proper order by the local authorities.

5. There remains the question of the rate at which the municipalities should contribute to the Public Works Department for the cost of supervision. Two rates appear to have been proposed by Colonel Pennycuick, in one place (paragraph 3 of note in G.O., No. 2073 M., dated 9th December 1895), the ordinary Public Works Department charge of $24\frac{1}{2}$ per cent. on the expenditure on works, exclusive of charges for land and stores imported from England, and in another place (paragraph 11 of note in G.O., No. 2380 L., dated 16th November 1894) $12\frac{1}{2}$ per cent. on the total of estimates for water-supply and 20 per cent. on those for drainage. In the former

case it is not stated what charges are to be covered by the rate proposed, while in the latter the $12\frac{1}{2}$ and 20 per cent., respectively, are to cover all charges for supervision of work and also preparation of estimates. As this last-mentioned work is to be carried out by the Sanitary Engineer, there does not seem to be any reason why any charge should be made by the Public Works Department on this account. What charge should be made for supervision of work is a question open to doubt and dispute, of which it would be extremely difficult to find a settlement satisfactory to all parties. However, inasmuch as practically in every case half the cost of the works is met from Provincial funds, whatever may be the rate that is determined on, half of the sum recovered will merely be transferred from one side of the Provincial account to the other, *i.e.*, from 45. Civil Works—Miscellaneous Public Improvements—to XXXII. Civil Works. Under these circumstances the Government considers that the best way to settle the question will be to make no charge on municipalities for supervision of the works executed, and this plan will accordingly be adopted in future.

(True Extract.)

J. F. PRICE,
Chief Secretary.

To the Public Works Department.
,, the Joint Secretary, Sanitary Board (Engineering Branch).
,, the ,, ,, ,, (Sanitary Branch).
,, the Sanitary Engineer.
,, the Sanitary Commissioner.
,, all Chairmen of Municipal Councils.
,, all Collectors.
,, all Presidents of District Boards.
,, the President, Municipal Commission, Madras.

NOTES CONNECTED WITH G.O., No. 847 M., DATED 15th MAY 1896.

[Subject.—*Duties of the Sanitary Engineer.*]

From the Public Works Department, dated 11*th January* 1896, *No.* 172 *C.*
" " " " 10*th February* " " 734 *C.*
" *Sanitary Engineer, dated* 14*th February* 1896, *No.* 463.

In the first of these currents, the Public Works Department asks for orders as to the rate at which contributions are to be paid by Municipalities for the execution of sanitary works entrusted to that department. Colonel Pennycuick suggested certain rates in his note (in G.O., No. 2073 M.,* dated 9th December 1895), but no orders were passed on that point. The second current is also from the Public Works Department forwarding with a note by the Chief Engineer an objection to the orders conveyed in G.O., No. 2073 M., dated 9th December 1895, raised by the Sanitary Engineer. His first objection is that if the rates proposed by Colonel Pennycuick are approved, the execution of drainage and water-supply schemes will be much more costly than they have been hitherto. Applying those rates to the works carried out in the last five years, he shows that there has been a saving of Rs. 23,000 a year by the execution of these works by his own department. It would appear from these figures that the rates proposed by Colonel Pennycuick are too high. (The proposed rates are $12\frac{1}{2}$ per cent. on the total estimates for water-supply and 20 per cent. on those for drainage, or else the ordinary Public Works Department rate of $24\frac{1}{2}$ per cent. of expenditure on works, exclusive of cost of land and stores imported from England.)

* Paragraph 3 of note of 2nd November 1895 at page 5 of the Government Order and paragraph 11 of note of 8th May 1894.

G. S. Forbes.

2. The following are the main reasons for which the Sanitary Engineer wishes G.O., No. 2073 M., dated 9th December 1895, to be reconsidered:—

(*a*) In the first place, he considers that unless the Public Works Department is underworked at present, it will have to employ extra hands for the execution of sanitary works, and therefore there is no reason why these extra hands should not be given to the Sanitary Engineer's department instead of to the Public Works Department.

No doubt in the way of subordinates: but the point is that the Executive Engineers and superior supervising establishment will be able to look after the carrying out of the works, without general increase in strength.

G. S. Forbes.
H. B[liss].

(*b*) The next point he takes objection to is "dual control". The plans are to be prepared by the Sanitary Engineer and carried out by the Public Works Department. In support of this he quotes a note by Colonel A. C. Smith and himself (in G.O., No. 1306 M., dated 14th August 1891) which is strongly in favour of leaving the execution of the works to the Sanitary Engineer; for if the Sanitary Engineer's designs are carried out by the Executive Engineer, there are sure to be some alterations required, for which the former cannot be held responsible. Again, it would be very hard for the Executive Engineer to carry out his ordinary work and also the sanitary work, and would probably have to neglect one for the other, thus giving either the Superintending Engineer or the Sanitary Engineer just cause for complaint because his works are not carried out.

See note below.

G. S. Forbes.

The question raised as to the responsibility for alterations in designs is met to a great extent by the fact that the Chief Engineer is to be President of the Sanitary Board, which has to approve of the designs in the first instance.

(*c*) In paragraph 15, the Sanitary Engineer says that if different works are to be carried out by different Executive Engineers there is no guarantee that the same designs of machinery, plant, etc., will be used for all projects, which is most desirable so as to allow of their being interchangeable: and also that one Engineer will not know what plant has been used in another scheme and may be available for use by him. But as these Executive Engineers all belong to the Public Works Department, the Chief Engineer as head of the department, can see to these requirements just as well as the Sanitary Engineer.

G. S. Forbes.
H. B[liss].

3. The Chief Engineer, Colonel Campbell, generally supports Mr. Jones' objections to the works being entrusted to the Public Works Department and states that Colonel Pennycuick also disapproved of it, but chose it as the lesser of two evils [these being (1) lending Public Works Department officers to the Sanitary Engineer and (2) entrusting execution of works to Public Works Department], as for financial reasons a properly constituted Sanitary Engineer department was impossible.

4. Last of all, Mr. Jones objects to the works being entrusted to Municipalities after completion, as he says that it is absolutely essential that they should be supervised by a properly qualified Engineer. He proposes to appoint such an Engineer to be utilised by groups of Municipalities. At present, however, very few Municipalities are in a position to incur this expenditure.

5. In the event of Government not reconsidering its orders, Mr. Jones propounds certain questions in paragraph 18 of his letter, to which answers are given by Colonel Campbell, which may be accepted.

6. The Chief Engineer admits the objections to entrusting the work to the Public Works Department and says that not only will Public Works Department officers not have time to properly supervise sanitary works, as they should be supervised, but also that now-a-days Sanitary Engineering is quite a special branch, needing special study, and thinks that the financial difficulty in the way of constituting a properly constituted Sanitary Engineering department may be got over. His proposal is to concentrate the work. In order to do this, he suggests that Municipalities should be grouped together in circles, and that works should only be undertaken in one circle at a time. While works are being executed in one circle, plans, etc., might be got ready for the next circle, which would be executed in their turn. For this the only establishment necessary would be Mr. Jones as Superintending Engineer, one Executive Engineer and three assistants with a few subordinates. He agrees with Mr. Jones that the upkeep of works should not be entrusted to Municipalities, but does not consider his suggestion feasible, and suggests that Local Fund Engineers might undertake the work.

But the sanitary works that are being carried out in most Municipalities at present are simple drainage and water-works systems—not the difficult city, and especially house, sanitation which in England has become a separate profession.

G. S. Forbes.

This scheme would be quite impracticable.

H. B[liss].

This would be to take up Municipal works not in the order of the importance of the towns, but in the order of their local distribution on the face of the globe.

G. S. Forbes.

7. In the last current, the Sanitary Engineer forwards a report on sanitary works in the Punjab and North-West Provinces, in which the two provinces are compared, greatly to the benefit of the latter, where they are carried out under the supervision of a special officer, whereas in the former they are carried out by the Public Works Department. The report is by the Sanitary Engineer to Government, Bombay, and supports Mr. Jones' views.

8. The objection to the grouping of Municipalities for the execution of works, is that at present there are not a sufficient number of Municipalities in one circle, who have the money to carry out these works. In most cases, it is only with great care that the money can be scraped together to carry out major schemes, and very likely at

the time when one circle was being undertaken, Municipalities in it would not have sufficient funds, which they might raise subsequently, when work had been transferred to another circle.

W. W. Phillips—27-2-96.

As soon as Colonel Pennycuick's back is turned, Mr. Jones takes the first available opportunity to attack the policy embodied in G.O., No. 2073 M., dated 9th December 1895. Without previously obtaining permission to lay his views before Government, I think, whatever the merits of the case may be, the course he has taken is in rather questionable taste. He virtually reagitates the whole of the issues that Government settled after full and careful deliberation.

2. As I understand, the position created by Government by G.O., No. 2073 M., dated 9th December 1895, was to place the Sanitary Engineer in a relation to the Public Works Department executive, somewhat similar to that occupied by the Consulting Architect. In the case of the latter, we do not hear of all the difficulties and friction which Mr. Jones conjures up in the shape of a "*dual control*." Moreover, as the Assistant Secretary points out, alterations in designs will be made by or in the name of the Sanitary Board of which the Chief Engineer is President.

H. B[liss].

3. With regard to Mr. Jones' queries in paragraph 18 of his letter, the Chief Engineer's proposed answers seem generally right, but the following points require consideration :—

4. No. (2) as to amendments of design, the Chief Engineer proposes that material alterations should be submitted by the Superintending Engineer to the Chief Engineer, who may consult the Sanitary Engineer, but perhaps material alterations should be submitted to the *Sanitary Board* of which both Chief Engineer and Sanitary Engineer are members.

I think the Chief Engineer might be left to consult the Sanitary Board if and when he thought fit to do so.

H. B[liss].

5. No. (3) seems right. The Sanitary Engineer is responsible that the design is right. If he could intermeddle with the execution, he would be tempted to raise difficulties and create the necessity for the particular mode of execution he favours. If he is to inspect, he should report to the *Sanitary Board*. But the works are simple. If the executive department however find difficulties, they should freely consult the Sanitary Board, who may get a report from the Sanitary Engineer if necessary.

H.B.

6. As to (4), this raises, quite needlessly apparently, the question of tenders for English materials. At present the Sanitary Engineer freely recommends English terms to Municipalities and Local Boards. The decision of Government to keep this power officially with the Public Works Department and discard the "Sanitary Engineer's agents" should be firmly maintained.

Most decidedly. Hitherto Mr. Jones has had the control of the spending of large sums of money without anyone to supervise him. In fact, I do not know who audits the accounts of his expenditure. The position is an extremely improper one and should not be allowed to continue.

H. B[liss].

7. As to the maintenance of schemes in working order, the Government has distinctly resolved that for the present Municipalities must make their own arrangements. Mr. Jones puts forward no new arguments. At the same time, there should be provision for periodical inspections. I do not see why the Executive Engineer of the district should not do this once every half-year; and the Sanitary Engineer himself or his Assistant (Mr. Minchin) once a year at least. There are very few Municipalities with a regular system of water-works. In a few years other arrangements will have to be made. I understand that Government quite recognized this with regard to the whole scheme sanctioned in G.O., No. 2073 M., dated 9th December 1895. It is meant to be a scheme to meet requirements as they at present are and it is also limited by financial exigencies.

This might be ordered.

H. B[liss].

H. B[liss].—7-3-96.

8. As to the contributions to be paid by Municipalities, see paragraph 3 of note of 2nd November 1895 at page 6 of G.O., No. 2073 M., dated 9th December 1895.

9. For orders.

G. S. FORBES—5-3-96.

No one, so far as I know, ever thought or said that, if funds were no object, it would not be best to have a Sanitary Engineering Department complete in itself and strong enough to carry out all works as well as to design them. But we cannot afford this; and after much discussion and consideration decided on the plan laid down in G.O., No. 2073 M., dated 9th December 1895, that, while the Sanitary Engineer designed works, the ordinary establishment of the Public Works Department should carry them out. This plan is by no means free from objections, but it was deliberately determined on and should be adhered to until it is proved to be a failure.

2. As to the rates which should be charged by the Public Works Department for supervision of the execution of the works, in one place Colonel Pennycuick proposed $12\frac{1}{2}$ per cent. on the total of estimates for water-supply and 20 per cent. upon estimates for drainage works (paragraph 11 of his note of May 1894, in G.O., No. 2380 L., dated 16th November 1894) and in another place $24\frac{1}{2}$ per cent. on the expenditure on works, exclusive of charges for land and stores imported from England (paragraph 3 of his note on page 6 of G.O., No. 2073 M., dated 9th December 1895). In the former case, the charge of $12\frac{1}{2}$ or 20 per cent. (I may here note that I do not know why the rates for water and drainage works should have differed, unless it be that more English stores, in proportion, are used in water-works) was to cover all charges for preparation of estimates and supervision of work; in the latter case, Colonel Pennycuick did not state what charges were to be covered. But as it has been arranged that the Sanitary Engineer is to prepare designs and estimates, I do not see why the Public Works Department should in any case make any charge on this account. It should charge only for supervision of work. What charge it should make on this account seems to me to be a matter on which there is room for any amount of doubt and dispute and as to which a decision satisfactory to all parties will be almost impossible. This may be clearly seen from Mr. Jones' own statement. He makes out an average saving of so much a year, as compared with Colonel Pennycuick's two rates of $24\frac{1}{2}$ and $12\frac{1}{2}$ or 20 per cent., in favour of his own plan; but he has made no allowance for the cost, or any part of the cost, of himself and his office for the five years in question. If that were added in, there would be a different tale to tell. Whatever may be the rate charged, inasmuch as in practically every case half the cost of the works is borne by Provincial, half of the sum recovered will merely be transferred from one side of the Provincial account to the other, from, that is, 45. Civil works, Miscellaneous Public Improvements to XXXII. Civil works. Under these circumstances, it seems to me that the best way will be to make no charge on Municipalities on account of the supervision by the Public Works Department of the execution of water-supply and drainage works. The Public Works receipts will thereby be slightly reduced, but we can always balance that, if we find it necessary to do so, by giving slightly smaller grants to Municipalities for the above objects. I believe the adoption of this course would save a great deal of trouble and give general satisfaction, if it is allowable to adopt it, which I do not know.

H. B[LISS].

I quite agree with the Hon'ble Mr. Bliss. Financial considerations make it impossible to adopt any scheme that would be free from objections.

J. G[ROSE]—16-3-96.

To the Public Works Department for favour of counter initials with special reference to paragraph 5 of the order.

W. W. PHILLIPS—21-3-96.

To be read with the Honourable Member's notes.

G. S. FORBES—27-3-96.

D. MCNEIL CAMPBELL—2-4-96.

Draft for approval.

2. It has been initialled by the Secretary in the Public Works Department.

G. S. FORBES—2-4-96.

Draft Order.

In the first of his letters read above, the Sanitary Engineer asks for a reconsideration of the orders conveyed in G.O., No. 2073 M., dated 9th December 1895, defining the duties of his department. It has never been denied that if funds were abundant, the best plan would be to create a Sanitary Engineering Department complete in itself, and strong enough, not only to design works, but also to carry them out. But this plan being unfortunately not feasible on financial grounds, it was decided, after much discussion and consideration, to adopt the scheme laid down in G.O., No. 2073 M., dated 9th December 1895, the execution of the works being entrusted to the Public Works Department, and the duty of designing them to the Sanitary Engineer. The scheme is not free from objections, but has been determined by financial limitations and by what the Government considers to be sufficient for the actual requirements of sanitary projects at the present time. It was settled after due deliberation and must be adhered to until it shall prove to be inadequate.

2. In forwarding Mr. Jones' letter, the Chief Engineer has suggested a means of considerably reducing the cost of a separate department. This is to group Municipalities into circles and to centralize in one circle all the works being carried on at one time, so that their supervision could be undertaken by a very small staff. While these works were being executed, designs and estimates for works in the next circle would be prepared and the works taken up on completion of those in the first circle. The execution of sanitary projects cannot, however, follow any such procrustean order or distribution; and for this and other reasons the Government considers that the proposal is impracticable.

3. Mr. Jones further submits certain questions arising out of the orders in G.O., No. 2073 M., dated 9th December 1895, and requests that he may be favoured with orders on them in the event of Government being unwilling to reconsider that Government Order. The questions, four in number, are dealt with in paragraph 9 of the Chief Engineer's memorandum, with whose conclusions Government agrees with slight modifications. The points as answered by Government are as follows:—

(1) By whom should the specification and schedules for schemes be prepared—by this office or by the Public Works Department?

They should be prepared by the Sanitary Engineer, whose duty it is to draw up the schemes.

(2) To whom should proposals be made for amendments of schemes framed by the Sanitary Engineer and approved by the Sanitary Board and sanctioned by Government, and should reference be made to the Sanitary Engineer in regard to such proposed amendments?

Trifling alterations in design may be sanctioned by the Superintending Engineer of the Circle, but material alterations should be submitted by the Superintending Engineer for the orders of the Chief Engineer, who will consult the Sanitary Board if and when he thinks fit to do so.

(3) Should the Sanitary Engineer visit and report on the schemes under execution and make suggestions to the officer in charge for alterations admissible, etc.?

The Sanitary Engineer will not be required to visit and report on schemes in course of execution. If the executive department entrusted with the work meets with difficulties it may freely consult the Sanitary Board, who may, if necessary, obtain a report from the Sanitary Engineer.

(4) Should the Sanitary Engineer or the Public Works Department obtain tenders for English materials, and, if so, through the Secretary of State or through the Sanitary Engineer's Agents (Messrs. Henry S. King & Co.), or by tender in India?

It has already been distinctly decided that the plant should be obtained by the Public Works Department, and therefore the rules in force in that department regarding tender for English supplies will be followed.

4. The last point brought forward by the Sanitary Engineer is the question of maintenance of existing water-supply and drainage schemes. Government has decided that this must be left to Municipalities, as in the course of a few years the increasing number of schemes would preclude the possibility of their maintenance by Government. As, however, municipal schemes have been largely assisted by Government, it is advisable that some control should be exercised over Municipalities in their upkeep, and this can best be secured by periodical inspections. The Sanitary Engineer himself or his Assistant will, therefore, be requested to inspect each work once a year at least and bring to the notice of Government any defects that may be found with the remedies suggested. The Public Works Department will also be requested to arrange for a half-yearly inspection of these works by the Executive Engineer of the division in which they are situated. This course, together with the two annual inspections of engines, pumps, etc., by the Boiler Inspector will, it is hoped, be sufficient to ensure the machinery and plant being maintained in proper order by the local authorities.

5. There remains the question of the rate at which the Municipalities should contribute to the Public Works Department for the cost of supervision. Two rates appear to have been proposed by Colonel Pennycuick—in one place (paragraph 3 of note in G.O., No. 2073 M., dated 9th December 1895) the ordinary Public Works Department charge of 4½ per cent. on the expenditure on works, exclusive of charges for land and stores imported from England, and in another place (paragraph 11 of note in G.O., No. 2380 L., dated 16th November 1894) 12½ per cent. on the total of estimates for water-supply and 20 per cent. on those for drainage. In the former case it is not stated what charges are to be covered by the rate proposed, while in the latter the 12½ and 20 per cent., respectively, are to cover all charges for supervision of work and also preparation of estimates. As this last-mentioned work is to be carried out by the Sanitary Engineer, there does not seem to be any reason why any charge should be made by the Public Works Department on this account. What charge should be made for supervision of work is a question open to doubt and dispute of which it would be extremely difficult to find a settlement satisfactory to all parties. [This may be clearly seen from Mr. Jones' own statement; for he calculates that there has been a saving of Rs. 23,000 a year in schemes completed during the last five years by comparing the actual cost of supervision with the rates proposed by Colonel Pennycuick, but as these rates include the preparation of estimates, Mr. Jones should have included the cost, or part of the cost, of himself and his office establishment by whom all the schemes were investigated and the plans and estimates prepared.] However, inasmuch as practically in every case half the cost of the works is met from Provincial funds, whatever may be the rate that is determined on, half of the sum recovered will merely be transferred from one side of the Provincial account to the other, *i.e.*, from 45. Civil Works—Miscellaneous Public Improvements, to XXXII. Civil Works. Under these circumstances the Government considers that the best way to settle the question will be to make no charge on Municipalities for supervision of the works executed, and this plan will accordingly be adopted in future. The slight reduction thereby caused in the receipts of the Public Works Department may be balanced, if necessary, by the reduction of the grants given by Provincial in furtherance of these water-supply, etc., schemes, so that the ultimate net expenditure by Government under this head will remain the same, and the necessity for fixing the charge for supervision will be obviated.

I would omit the passage between brackets.
A. E. H[AVELOCK]—14-4-96.

A

B

I cannot reconcile passage marked **A** with that marked **B**. If **A** is seriously intended, I would leave out **B**.
A. E. H[AVELOCK]—14-4-96.

W. W. PHILLIPS—21-3-96.

G. S. FORBES.

This draft correctly expresses my views in which the Hon'ble Mr. Grose has concurred. But as the matter is of importance and has long been the subject of more or less controversy, and as difficulties may in future arise out of it, I think it will be safest that His Excellency the Governor should see the draft before issue.

H. B[LISS]—4-4-96.

Submitted to Hon'ble Mr. Bliss with reference to His Excellency the Governor's remarks.

W. W. PHILLIPS—17-4-96.

J. F. PRICE—17-4-96.

His Excellency has noted on two passages on the preceding page. In the first case, I think we should retain the passage proposed to be omitted. If not, it will be equivalent to admitting the accuracy of Mr. Jones' calculations, which we do not do. As to the passage marked **B** (*i.e.*, from "The slight reduction" to the end of the paragraph), that may be omitted if His Excellency wishes, though I should prefer to retain it, as I think it makes the position clearer.

H. W. B[LISS]—20-4-96.

Resubmitted to His Excellency the Governor with reference to the above note of the Hon'ble Mr. Bliss.

W. W. PHILLIPS—22-4-96.

J. F. PRICE—27-4-96.

I would suggest that it is not Mr. Jones' figures that are wrong, but Colonel Pennycuick's. No allowance was made by Colonel Pennycuick for the fact that the plans and estimates would be prepared by the Sanitary Engineer and his staff, and consequent on this oversight, his charge for execution and supervision is too high. If this error is corrected and a lower rate adopted, the total charge which would have been made for the works executed during the last five years, if they had been carried out by the Public Works officers, would be less than the figures given by Mr. Jones, and the saving he refers to, would also be less. As Mr. Jones and his staff prepare the estimates under both systems, the cost of his establishment, if included at all in the comparison he makes, should be included in both sides of the account, and this would not alter the difference he brings out. But, as we have decided to make no charge for supervision, it seemed to me on reading the draft, that the passage marked between brackets, was in reality superfluous, and as I had a doubt of its accuracy, I suggested its omission.

2. As regards the passages marked **A** and **B**, it seemed to me to involve an inconsistency. The draft distinctly states that the Government proposes to make no charge for supervision. It then goes on to say that the slight reduction in receipts caused by making no charge, could be balanced by the reduction of the grants given to the Municipalities. This appears to me to be giving with one hand and taking away with the other. As I supposed the Government do not wish to do this, I suggested the omission of the passage marked **B**.

3. I should be obliged if the Hon'ble Mr. Bliss would once again look over the draft with the above remarks.

A. E. H[AVELOCK]—3-5-96.

Resubmitted to Hon'ble Mr. Bliss with reference to His Excellency the Governor's note of 3rd May 1896.

W. W. PHILLIPS—4-5-96.

J. F. PRICE—7-5-96.

Mr. Jones compared his actual cost (column 10 of his statement) with Colonel Pennycuick's proposed rates of charge, *i.e.*, (1) at 4½ per cent. on cost of works, deducting cost of pipes, machinery and land (column 6 of statement), and (2) at 12½

or 20 per cent. (columns 8 and 9 of statement). As I did not know exactly what the $24\frac{1}{2}$ per cent. included, I omitted that from consideration, and dealt only with the $12\frac{1}{2}$ (or 20) per cent. rate. This includes cost of preparation of estimates, which Mr. Jones' actuals do not. Hence my remark, which I still think was correct. However, it really does not much matter whether the remark stands or not. The same may be said of the passage marked **B**. Let them both be omitted as His Excellency wishes.

H. W. B[LISS]—8-5-96.

[G.O., No. 847 M., dated 15th May 1896.]

Please strike it out and keep 3 copies ready 17.11.96

No. 847 M., 15TH MAY 1896.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—the following papers :—

I

G.O., No. 2073 M., dated 9th December 1895.

ABSTRACT.—Passing orders about the appointment of an additional Assistant Sanitary Engineer, and ordering that the execution of the next water-supply or drainage scheme be entrusted to the Public Works Department.

II

Office-note—from the Hon'ble Colonel D. MCNEIL CAMPBELL, R.E., Joint Secretary to Government, Public Works Department.

To—the Chief Secretary to Government, Local and Municipal Department.

Dated—Madras, the 11th January 1896.

No.—172-C.

With reference to orders in the Local and Municipal Department, No. 2073 M., dated 9th December 1895, please let me know whether further orders may be expected on the subject of the contributions payable to the Public Works Department for the execution of sanitary works for Municipalities. In paragraph 3 of his office-note, No. 3268-C., dated 2nd November 1895, Colonel Pennycuick proposed a scale of charges which he considered suitable; but the order thereon in the Local and Municipal Department makes no reference to this matter.

III

Note by the Chief Engineer, Public Works Department.

The best manner of dealing with the organisation of the Sanitary Engineering Department has been under discussion for several years and there are some conflicting orders on the subject; but it was finally decided in G.O., No. 2073 M., dated 9th December 1895, that the work of the Sanitary Engineer should be confined to investigating water-supply, drainage, &c., projects, and drawing up the necessary plans and estimates which should be submitted to Government through the Sanitary Board. The construction of the works, and obtaining the plant, required for the next project of the description to be carried out, was to be entrusted to the Public Works Department.

2. Mr. Jones, the Sanitary Engineer, now requests that Government will be pleased to reconsider that order.

3. The reasons that led to the passing of the order objected to by Mr. Jones were that, owing to the rapid increase of sanitary works, it was found necessary to increase the Engineering establishment, and Colonel Pennycuick was of opinion that it was not advisable to lend officers and subordinates from this department to work under the orders of the Sanitary Engineer, and that it would be better to put the execution of the works entirely under the Public Works Department. There seems to me to be objections both to lending men to the Sanitary Engineer and also to carrying out the work by the ordinary Public Works Department establishment, and it really amounts to a choice of two evils, both of which are necessitated by

financial considerations, and the question is which is the lesser evil of the two. The objections to lending men are that it is doubtful if they could be spared, and, as Colonel Pennycuick states, there would be partial responsibility in giving advice and lending subordinates for work nominally under the control of another department. The objections to giving the execution of works to the Public Works Department are given in Mr. Jones' letter, and with these objections, I agree as also did Colonel A. C. Smith when he was officiating Chief Engineer. In my opinion the only satisfactory solution of the question is to make the Sanitary Engineering Department, entirely independent, somewhat on the lines indicated in the note by Colonel A. C. Smith and Mr. Jones. The separation of the department is all the more necessary as Sanitary Engineering is a special branch of the profession.

On G.O. Mis. No. 479 M., of 2nd April 1891.

4. Colonel Pennycuick says himself that this would be the most satisfactory arrangement, but is of opinion that it is altogether out of the question on financial grounds, and no doubt it would be if sanitary works are to be carried out as at present, that is all over the presidency from Ganjám to Cape Comorin and Malabar; but I see no reason why sanitary works should not be carried out by areas, that is, suppose each of the Public Works Department circles were taken up in turns and the water-supply and drainage projects in each completed before those in the next were begun. The establishment required would then be very small. Mr. Jones would be the Superintending Engineer of the circle as regards sanitary works and with one Executive Engineer and three Assistant Engineers and some subordinates he should be able to carry out all the required works, and I don't think the cost would be more than at present. While the works in one circle were under execution, Mr. Jones could be preparing plans and estimates for the works required in the next. I believe that the works would be much better supervised than at present when they are scattered all over the presidency, and it must be remembered that there are few works that require such close supervision as water-works, and I am doubtful if members of the Public Works establishment could spare time to attend to sanitary works in addition to their present duties.

5. Of course the division into circles corresponding to the Public Works circles is only a suggestion, as the extent of the circles will have to depend on the amount of work and the maximum establishment that can be employed. All these details will have to be worked out should the general suggestions be approved.

6. From a list of works in the Sanitary Engineer's Department submitted with Mr. Jones' letter, dated 3rd April 1895, No. 929, to the Chief Secretary to Government, it would appear that if the work is divided according to Public Works circles there would be work in I Circle only, in Vizagapatam and Vizianagram.

7. In II Circle, Bezwada, Masulipatam, Guntur, Ellore, Ongole; so that I and II Public Works circles might form one circle for sanitary works, and so on.

8. But if my proposals are to be adopted it would be better to deal with all the towns in one circle requiring water-supply and drainage before taking up the next. It may be argued as a reason against my proposals that urgent works outside the circle of operations might have to be postponed till the works in the circle were completed. But, as the towns have gone for hundreds of years without a water-supply and drainage scheme, there will seldom be any case in which the work is really urgent, and if such a case does occur, a special establishment can be employed for the time being. As regards the works actually in progress, I think they should be carried on as at present, extra assistance being given to the Sanitary Engineer if required.

9. Should my proposals not be approved, and it be still deemed advisable to entrust the execution of all sanitary works to the Public Works Department, the questions put by Mr. Jones in paragraph 18 can be answered as follows:—

(1) The specifications and schedules for schemes should be prepared by the Sanitary Engineer who is to draw up the schemes.

(2) Trifling alterations in design can be sanctioned by the Superintending Engineer of the circle, material alterations proposed should be submitted by the Superintending Engineer to the Chief Engineer who, if he thinks advisable, will refer to the Sanitary Engineer for opinion.

(3) The Sanitary Engineer will not be required to visit and report on schemes under execution, the Superintending Engineer and Executive Engineer will do that duty.

(4) As the works will be under the Public Works Department, the rules in force in that department regarding tender for English supplies will be adhered to.

10. Mr. Jones further raises the question of the maintenance of completed schemes, and I must say that I agree with him that it will be a fatal mistake to hand over the care of completed schemes to the Municipalities concerned; but I doubt if it would be possible to carry out his suggestions. The question of improving the status and efficiency of the Local Fund Engineers is now under consideration and it is possible that these officers might be made to look after completed water-supply and drainage works, contribution for this purpose being made by the Municipalities who benefit thereby.

5th February 1896.

D. McNEIL CAMPBELL, Col., R.E.,
Chief Engineer, P.W.D.

ENCLOSURE.

Letter—from J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E., Sanitary Engineer to Government.
To—the Chief Secretary to Government (through the Chief Engineer, Public Works Department).
Dated—Fort St. George, the 29th January 1896.
No.—261.

With reference to G.O., No. 2073 M., dated 9th December 1895, I have the honour to request that Government will be pleased to consider the following remarks which I venture to submit after careful consideration of the consequences that, I fear, will follow the changes ordered and because the interests involved are such that I consider Government should be in possession of the following views—views which I have not hitherto had an opportunity of laying before Government; I regret that Colonel Pennycuick has retired, because had he still been here, I feel sure, he would have given them his earnest consideration.

2. It might be understood from the tenor of the Government Order under reference that I had desired and advocated the changes, but it will be seen from a perusal of my letter embodied in the Government Order in question, that I have never advocated that the work of the Sanitary Engineer should be limited in the manner lately sanctioned. At the same time it is right to say that I, as a member of the Sanitary Board, acquiesced in a proposal made by the Sanitary Board that the work should be so limited, but this was because I saw it was hopeless under the then existing régime of the Public Works Department to obtain assistance from that department by method of temporary transfers. Whether other counsels prevail now I am not in a position to say, but I suggest that the policy is possible of reversal or modification, and thus many of Colonel Pennycuick's objections to the existing system would be met.

3. In fact this was the original intention of Government as may be seen by a perusal of G.O., No. 1878 M., dated 26th October 1891, wherein it is ordered that "supervisors and overseers required for the permanent staff referred to by the Sanitary Engineer as class (A) should, if possible, be obtained from the Public Works Department."

4. Government will learn from a perusal of past correspondence that I have never asked to be relieved of any portion of the duties until lately appertaining to me, but that I have, on the other hand, merely desired to carry out these duties in an efficient manner, which could be done only by an increase in staff.

5. I beg to submit to Government that the refusal to grant this extra staff cannot have been on financial grounds, because the cost of any staff granted is recouped from the body for whom the works are being carried out as will still be the case in the proposed arrangement for the Public Works Department to execute works. I further submit that if the works already executed had been so by the Public Works Department the following would have been the financial result, that is, that the acceptance of Colonel Pennyquick's terms or proposals will, for a similar amount of work in the future, entail on the local bodies concerned an increased contribution amounting to Rs. 88,000 under one alternative or Rs. 1,15,000 under the other. This over say about five years actual expenditure is Rs. 23,000 a year and that is an amount which would pay for three more Assistant Engineers than that at present.

No.	Town.	Actual cost of work.	Actual cost of pipes, machinery and lands.	Net cost of work (*i.e.*, the difference between columns 3 and 4).	Contribution required by the P.W.D., at 24½ per cent. on net cost of work—(column 5).	Estimated cost of work.
1	2	3	4	5	6	7
		Rs.	Rs.	Rs.	Rs.	Rs.
1	Adóni	1,58,119	87,325	70,794	17,344	1,62,000—Water-supply.
2	Coonoor	41,840	..	41,840	10,250	48,000—Drainage.
3	Cuddapah	17,556	9,347	8,209	2,011	19,385—Water-supply.
4	Kumbakónam	1,12,134	35,521	76,613	18,770	1,10,000—Drainage.
5	Madura	3,94,485	2,19,152	1,75,333	42,956	3,91,000—Water-supply.
6	Tanjore	4,23,953	2,27,542	1,96,411	48,120	4,47,420 do.
7	Trichinopoly	* 5,20,000	2,84,664	2,35,336	57,657	5,20,000 do.
	Total ..	16,68,087	8,63,551	8,04,536	1,97,103	16,97,805

No.	Town.	Contribution required by the P.W.D., on the estimated cost of work—column 7.		Cost of establishment actually incurred by the Sanitary Engineer when executed under his supervision.	Difference between columns 6 and 10.	Difference between columns 9 and 10.
		Percentage.	Amount.			
		8	9	10	11	12
			Rs.	Rs.	Rs.	Rs.
1	Adóni	12½	20,250	8,259	9,085	11,991
2	Coonoor	20	9,600	5,017	5,233	4,583
3	Cuddapah	12½	2,423	2,194	— 183	229
4	Kumbakónam	20	22,000	17,591	1,179	4,409
5	Madura	12½	48,875	21,870	21,086	27,005
6	Tanjore	12½	55,927	24,135	23,985	31,792
7	Trichinopoly	12½	65,000	29,760	27,897	35,240
	Total ..	..	2,24,075	1,08,826	88,282	1,15,249

* Approximate—work in progress.

6. Therefore the transfer to the Public Works Department of the execution of works does not find justification on financial grounds.

7. Colonel Pennycuick's strongest point for the transfer is that the Sanitary Engineer cannot give the proper supervision. I am unaware on what grounds he came to this conclusion, but I can conscientiously say that none of the works up to date have lacked proper supervision nor have suffered from want of proper supervision.

8. The next point to which I wish to request the attention of Government is that, while the Public Works Department have never been able, or more properly I might say willing to lend the services of officers to this department, it is proposed to give the work to the officers of that department. From this it can be deduced that unwillingness to afford the assistance asked on several occasions and not inability to do so was the cause of refusal. If now the works can be undertaken without extra staff, which is a matter of doubt (even by Colonel Pennycuick himself), the officers of the Public Works Department must either have not enough work at present, a premise unlikely to be agreed to, or else the work of executing the Sanitary Engineer's schemes will not have that care and attention they require, and this is more likely to be the case. But there is the likelihood that extra staff (under the powers of the Chief Engineer) will be engaged from time to time, so that it comes to this, that extra staff will be used by the Public Works Department while the execution of works has been taken away from the Sanitary Engineer because extra staff is required.

9. It is not consistent with Colonel Pennycuick's objection against the employment of temporary staff in the Sanitary Engineer's Department to propose to employ temporary men in Public Works Department for the same purpose, and if these proposals mean that those temporary men would be put in permanent posts of the Public Works Department and thus allow of the alienation of the services of higher grade officers to sanitary schemes, the same plan was possible of adoption when the Sanitary Engineer wanted the services of members of Public Works Department staff, such an arrangement can be made now and all objection to the existing state of things would then disappear while the work would be much more cheaply done, and I venture to add efficiently done, and supervised than under the proposal recently sanctioned.

10. I would quote here from a report to Government by Colonel A. C. Smith, Acting Chief Engineer, and myself, a portion which could only have been written on Colonel Smith's authority :—

"It is thought that the proposal that the works when designed and estimated by the Sanitary Engineer and duly approved by Government should be carried out by Executive Engineers of Divisions will not be at all a satisfactory arrangement, for—

"Works of this class require *constant*, if not *continuous* supervision and it will be impossible for an Executive Engineer of the Public Works Department, who now-a-days has so large a charge that it takes him a year to see the whole of it, to devote sufficient time for this purpose.

"It is always very difficult in this class of work to carry out, without constant reference, the plans and estimates made by others.

"There would be a dual control—no man can serve two masters—on the one hand the Superintending Engineer of the circle would have just cause for complaint if the Executive Engineer neglected, as he would be obliged to do, his own proper work in order to supervise work for the Sanitary Engineer, and the latter would undoubtedly grumble if his work was either not carried on expeditiously or scamped in the absence of proper supervision,

"Then again the Sanitary Engineer would be quite justified in declining all responsibilit in the results of his designs if he were not placed in the position of a Superintending officer with powers to alter or modify such designs, efr in these kind of works it is impossible to foresee all requirements.

"Then as regards the position of the Chief Engineer, Public Works Department, with regard to the Sanitary Department, if he is to scrutinise or revise the designs and lend his officers to the Sanitary Department to carry them out in case of failure or misadventure, the Public Works Department would be held to blame, though, as is above shown, it will be impossible for it to undertake such works satisfactorily.

"Taking all these things into consideration, it is thought advisable to make the Sanitary Engineer and his department totally independent of the Public Works Department as far as designing and execution of work is concerned, except, of course, that the Chief Engineer, Public Works Department, should act as adviser to the Government on all schemes they may wish to consult him about."

11. In these sentences will be found, I venture to say, an endorsement of the views I have already set forth and they also include what is to my mind a very potent argument against the possibility of the arrangements ordered being in any way a success. I refer to the question of dual responsibility.

12. Under the new arrangement the plans framed by the Sanitary Engineer will have the approval of the Sanitary Board which at present includes the Chief Engineer. So long as the Chief Engineer is the President of the Board, there is an incidental security that the designs, etc., passed will be carried out to a greater or less extent. But in no Engineer's experience and certainly not in mine is it the case that the designs of one Engineer will be completely accepted or satisfactorily carried out by another. The Public Works Department have already experience of this in regard to the tank maintenance scheme. Any Engineer receiving the design of another to carry out would have his first thoughts directed to amendment whether an improvement or not would remain to be seen, such amendments under present order of Government could not be sent back to the Sanitary Engineer for approval, or the Sanitary Engineer would be in the relation of a Superintending Engineer to an Executive officer of the Public Works Department, and therefore the Superintending Engineer, Public Works Department, would have to approve or otherwise of such amendments, or they would eventually reach the Chief Engineer who might or might not have approved of the original plans. For any amendments or alteration the Sanitary Engineer could in no way be held responsible, and therefore in no way for the success or failure of any scheme.

13. In addition to this there will be a considerable additional and continuous correspondence needed when the design of one Engineer is carried out by another and this point and that point must come back for elucidation, etc. Such correspondence would be of the most unsatisfactory character and the Sanitary Engineer would not be in a position to suggest alterations himself in the design as his experience does suggest as work proceeds, because it is a portion of his duty which Government have determined to relieve him. No work has ever been carried out exactly as designed. Therefore every scheme will be more or less amended by other persons than its author—by persons having less interest and less skill in that particular class of work and the result must be such that the Sanitary Engineer can have no dependence that his schemes will be in any case carried out as designed and approved.

14. It may be brought forward as an argument that the designs of the Consulting Architect to Government are so carried out; but any that are so are works of a less technical nature and of a character allied to those which a Public Works Department officer usually executes.

15. Again, with the plant and materials being ordered by each individual officer unless it is ordered that the type designs of the Sanitary Engineer are to be adhered to in all cases, the works will not have that uniformity of design and in the class of materials used such as valves,

fountains, pipes, etc., as are now maintained throughout the Presidency, so that such materials are interchargeable and one municipality may in times of emergency borrow from another ; nor are Public Works officers, who do not devote special attention to such works, likely to be acquainted with the best class of materials and design such as it is the special duty of this department to keep itself acquainted with ; nor will individual Public Works Department officers have the same facility or opportunity of borrowing and using plant and stores of one municipality by another simply because they cannot have the knowledge of the plant already used and which may be used by another officer. In short, there will be a loss of centralization to a great extent.

16. One reason for the proposal to create the office of Sanitary Engineer was because the Public Works officers could not find time to get up schemes (and therefore it may be reasonably supposed they had not time to devote to their execution). This has not been found to be the case in other Presidencies and where the Public Works Department executes schemes as in Bombay, they also draw them up and the duty of the Sanitary Engineer and Sanitary Board is only to review and amend such schemes so that the design and execution of the schemes are not divided from each other as is now ordered to be done in this Presidency. It is a well-known axiom that the best person to carry out a scheme is its designer and that he alone can do it justice.

17. I venture to place these remarks before Government. They are disinterested, as far as I am personally concerned, because the result of the order under reference is to lessen my work and therefore only because I very strongly believe that the proposal and its acceptance has been made without a consideration of the facts which I have now placed before Government, do I send them forward.

18. I am sending this letter through the Chief Engineer, Public Works Department, for his remarks thereon, and should Government still consider that the order already issued should not be modified, I have to ask that the following points may be decided :—

(1) By whom the specification and schedules for schemes should be prepared—by this office or by the Public Works Department ?

(2) To whom proposals for amendments of schemes framed by the Sanitary Engineer and approved by the Sanitary Board and sanctioned by Government should be made, and whether reference is to be made to the Sanitary Engineer in reference to such proposed amendments ?

(5) Whether the Sanitary Engineer should visit and report on the schemes under execution and make suggestion to the officer in charge for alteration admissible, etc. ?

(4) Whether this department or the Public Works Department are to obtain tenders for English materials, and, if so, through the Secretary of State, or through the Sanitary Engineer's Agents (Messrs. Henry S. King & Co.), or by tender in India ?

19. Government have also decided in the order under reference that no aid can be given to municipalities to maintain schemes in working order, and as to this also I ask permission to make a few remarks.

20. Government are aware that no mofussil municipality has an Engineer and I venture to submit that without professional supervision none of the works in operation can be maintained, even with the best endeavour of Municipal Councils, in the order they ought to be. The necessity for proper supervision of engineering works is one that has never been disputed, and in England no water or drainage works, on which the health of the people so materially depends, are without the attendance of a duly qualified Engineer.

21. In the Resolution of the Government of India recently issued in regard to a re-organization of the Sanitary Department it is proposed that there should be a Health officer for a group of towns to aid committees in proposing sanitary improvements; but these could be carried out only by professional agency. The principle therefore of a group of municipalities having the services of an Engineer is one that finds its analogy in that proposal and I cannot but think that an Assistant Sanitary Engineer is no less necessary than a Health officer in any improvement of the Sanitary Department.

22. It is a proposal made to Government some years ago and the proposal of the Government of India as to Health officer would seem almost to carry with it the necessity for an Engineering officer who would, as a colleague, control the same areas. The cost of a staff, say, of three Assistant Sanitary Engineers who would look after the execution of not only the major but all the minor works, would cost very little, even if Government made no provision from Provincial funds. Three Assistant Sanitary Engineers at an average of Rs. 700 + 100 travelling allowance monthly would amount to $12 \times 800 \times 3 = 28{,}800$ annually, and this divided over 56 municipalities would be under Rs. 500 a year. A sum of Rs. 1,000 might be payable by some municipalities and others only Rs. 100 or so, but the benefit obtained would be large in proportion to the assistants which would be rendered, and I am also of opinion that the financial result to municipalities by having their schemes properly carried out would more than cover the cost of the staff.

23. I need not say that I have already taken steps to hand over the completed water-works to the care of the Municipal Councils concerned, but I have done so with much regret and with little doubt as to the ultimate result of their being taken away from our care. It is as if when a railway line was complete the traffic branch of a railway were left to not only work the line but maintain it. The engines and pumps of water-works, etc., it is true, will receive two inspections annually, but the reservoir, head-works, filters, pipes and valves, etc., are left in the hands of persons with no professional knowledge whatever nor has provision been made for annual inspection of the work or for provision against additions or alterations to a system being made without the previous sanction of this department which alone has the knowledge to decide whether and where extension, etc., can be made without detriment to the original and existing system. These perhaps are points in which Government may now desire to pass further orders should no reconsideration of the method of supervising works in operation be deemed necessary or feasible.

24. Government have, while not granting an Assistant Engineer, rendered it possible for Mr. Minchin's services to be availed of to a greater and greater extent as the works now under construction are completed; and this arrangement is one that, under present orders, meets the request made for extra assistance.

25. At present as Government are aware the pay and travelling allowance of the Assistant Sanitary Engineer are recouped eventually from the Councils for whom the works are being executed, but when Mr. Minchin is employed on investigation, etc., there will be no estimates from which his pay can be provided for. Some schemes may never be executed, others not so for many years and there will be intervals between his services on one scheme and another which it will be difficult to debit to any municipality. This is brought to notice because the expenditure and receipts for staff will not balance eventually as they would do under existing arrangements, and I therefore request to be informed if this is understood and approved of by Government.

IV

Memorandum No. 734-C., Public Works, dated 10th February 1896.

Transferred to the Local and Municipal Department.

D. MCNEIL CAMPBELL, Col., R.E.,
Joint Secretary to Government, P.W.D.

To the Local and Municipal Department, with letter No. 261, dated 29th January 1896, from the Sanitary Engineer to Government, returned.

V

Letter—from J. A. JONES, Esq., MEN.INST.C.E., F.R.S.E., Sanitary Engineer to Government.

To—the Chief Secretary to Government (through the Chief Engineer, Public Works Department).

Dated—Fort St. George, the 14th February 1896.

No.—463.

In continuation of my letter No. 261 of the 29th ultimo, I have the honour to forward herewith an extract from the Report on the Sanitary Works of the North-Western Provinces and the Punjab by the Sanitary Engineer to the Government of Bombay and Member of the Sanitary Board of that Presidency. The opinion of this very senior officer of the Public Works Department of that Presidency emphasises very strongly the opinion expressed in my letter above quoted.

ENCLOSURE.

Extract from the Report on the Sanitary Works of the North-Western Provinces and the Punjab.

* * * * *

Up to the time that Sir Auckland Colvin became Lieutenant-Governor of the North-Western Provinces in 1887, all sanitary works had been carried out by the Public Works Department as they are still elsewhere in India except in Madras. The difficulties and delays of this system, caused by want of the special knowledge on the part of most of the Executive Engineers and the difficulty for them to spare sufficient time from their ordinary duties, and also the apathy and obstruction of the municipalities, which are still apparent elsewhere, caused him to appoint a special officer for supervising all such works and he also passed the Water Works Act I of 1891.

* * * * * *

No. 847 M., 15TH MAY 1896.

The water-works of the larger towns were carried out in the following order :—Agra, Allahabad, Benares, Cawnpore and Lucknow. Agra, Cawnpore and Benares are now carrying out drainage works and Meerut is now having water-works; the average time for each was only about two years although the cost varied from 12 to 25 lakhs. All the works were carried out by large contractors which accounts for the rapidity of construction to a great extent. The Punjab works of a similar nature done under the old system present a most striking contrast. In the few cases where water has been supplied, *i.e.*, Umballa Cantonment, Delhi, Lahore and Peshawar, the designs were altered and re-altered during construction the works extended over many years, and in the cases of Umballa Cantonment and Delhi they are a decided failure. Umballa city is now having its water-works made, and as an Engineer who has been specially trained in that branch is in charge it will probably be a success. In all the Punjab works the neglected and *unfinished* look of the head-works is most striking; whilst in the case of the North-Western Provinces they compare favourably with similar works in England in neatness and finish, and there has been none of the subsequent complaint or trouble that has resulted from every one of the Punjab works.

* * * * *

Part I is well on towards completion, but it is impossible to say when the various independent estimates for the different bazaars of Part II can be done under the system in force in the Punjab, the Local Executive Engineer is supposed to do all sanitary works in addition to his own proper work; and if this is adhered to as regards Part II, the twentieth century will be far advanced before the project is completed, if indeed it ever is. It is, I think, quite impossible that any Executive Engineer with a large district could possibly give up the time required for such a work for such a city; and the getting up of the project must drag on wearily from one Executive Engineer to another as transfers occur, involving loss of continuity of thought and design and if ever finished the result must be an unsatisfactory patch-work. It will be interesting to note the difference of results in Cawnpore where the drainage is being worked out and carried out by a Special Public Works Department Engineer who has had a special training in this branch and who is working direct under the Sanitary Engineer.

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No. 941-*C.*, *dated* 18*th February* 1896.

Forwarded to the Local and Municipal Department in continuation of this office endorsement, No. 734-C., dated 10th February 1896.

D. MCNEIL CAMPBELL, Col., R.E.,
Joint Secretary to Government, P.WD.

Order—No. 847 M., dated 15th May 1896.

In the first of his letters read above the Sanitary Engineer asks for a reconsideration of the orders conveyed in G.O., No. 2073 M., dated 9th December 1895, defining the duties of his department. It has never been denied that if funds were abundant, the best plan would be to create a Sanitary Engineering Department complete in itself, and strong enough, not only to design works, but also to carry them out. But this plan being unfortunately not feasible on financial grounds, it was decided, after much discussion and consideration, to adopt the scheme laid down in G.O., No. 2073 M., dated 9th December 1895, the execution of the works being entrusted to the Public Works Department, and the duty of designing them to the Sanitary Engineer. The scheme is not free from objections, but has been determined by financial limitations and by what the Government considers to be sufficient for the actual requirements of sanitary projects at the present time. It was settled after due deliberation and must be adhered to until it shall prove to be inadequate.

2. In forwarding Mr. Jones' letter, the Chief Engineer has suggested a means of considerably reducing the cost of a separate department. This is to group municipalities into circles and to centralize in one circle all the works being carried on at one time, so that their supervision could be undertaken by a very small staff. While these works were being executed, designs and estimates for works in the next circle would be prepared and the works taken up on completion of those in the first circle.

The execution of sanitary projects cannot, however, follow any such procrustean order or distribution; and for this and other reasons the Government considers that the proposal is impracticable.

3. Mr. Jones further submits certain questions arising out of the orders in G.O., No. 2073 M., dated 9th December 1895, and requests that he may be favoured with orders on them in the event of Government being unwilling to reconsider that Government Order. The questions, four in number, are dealt with in paragraph 9 of the Chief Engineer's memorandum, with whose conclusions Government agrees with slight modifications. The points as answered by Government are as follows:—

(1) By whom should the specification and schedules for schemes be prepared—by this office or by the Public Works Department?

They should be prepared by the Sanitary Engineer, whose duty it is to draw up the schemes.

(2) To whom should proposals be made for amendments of schemes framed by the Sanitary Engineer and approved by the Sanitary Board and sanctioned by Government, and should reference be made to the Sanitary Engineer in regard to such proposed amendments?

Trifling alterations in design may be sanctioned by the Superintending Engineer of the Circle, but material alterations should be submitted by the Superintending Engineer for the orders of the Chief Engineer, who will consult the Sanitary Board if and when he thinks fit to do so.

(3) Should the Sanitary Engineer visit and report on the schemes under execution and make suggestions to the officer in charge for alterations admissible, etc.?

The Sanitary Engineer will not be required to visit and report on schemes in course of execution. If the executive department entrusted with the work meets with difficulties it may freely consult the Sanitary Board who may, if necessary, obtain a report from the Sanitary Engineer.

(4) Should the Sanitary Engineer or the Public Works Department obtain tenders for English materials, and, if so, through the Secretary of State or through the Sanitary Engineer's Agents (Messrs. Henry S. King and Co.) or by tender in India?

It has already been distinctly decided that the plant should be obtained by the Public Works Department, and therefore the rules in force in that department regarding tender for English supplies will be followed.

4. The last point brought forward by the Sanitary Engineer is the question of maintenance of existing water-supply and drainage schemes. Government has decided that this must be left to municipalities, as in the course of a few years the increasing number of schemes would preclude the possibility of their maintenance by Government. As, however, municipal schemes have been largely assisted by Government, it is advisable that some control should be exercised over municipalities in their upkeep, and this can best be secured by periodical inspections. The Sanitary Engineer himself or his Assistant will therefore be requested to inspect each work once a year at least and bring to the notice of Government any defects that may be found with the remedies suggested. The Public Works Department will also be requested to arrange for a half-yearly inspection of these works by the Executive Engineer of the division in which they are situated. This course, together with the two annual inspections of engines, pumps, etc., by the Boiler Inspector will, it is hoped, be sufficient to ensure the machinery and plant being maintained in proper order by the local authorities.

5. There remains the question of the rate at which the municipalities should contribute to the Public Works Department for the cost of supervision. Two rates appear to have been proposed by Colonel Pennycuick, in one place (paragraph 3 of note in G.O., No. 2073 M., dated 9th December 1895) the ordinary Public Works Department charge of $2\frac{1}{2}$ per cent. on the expenditure on works, exclusive of charges for land and stores imported from England, and in another place (paragraph 11 of

note in G.O., No. 2380 L., dated 16th November 1894) 12½ per cent. on the total of estimates for water-supply and 20 per cent. on those for drainage. In the former case it is not stated what charges are to be covered by the rate proposed, while in the latter the 12½ and 20 per cent., respectively, are to cover all charges for supervision of work and also preparation of estimates. As this last-mentioned work is to be carried out by the Sanitary Engineer, there does not seem to be any reason why any charge should be made by the Public Works Department on this account. What charge should be made for supervision of work is a question open to doubt and dispute, of which it would be extremely difficult to find a settlement satisfactory to all parties. However, inasmuch as practically in every case half the cost of the works is met from Provincial funds, whatever may be the rate that is determined on, half of the sum recovered will merely be transferred from one side of the Provincial account to the other, *i.e.*, from 45. Civil Works—Miscellaneous Public Improvements—to XXXII. Civil Works. Under these circumstances the Government considers that the best way to settle the question will be to make no charge on municipalities for supervision of the works executed, and this plan will accordingly be adopted in future.

(True Extract.)

J. F. PRICE,
Chief Secretary.

To the Public Works Department.
,, the Joint Secretary, Sanitary Board (Engineering Branch).
,, the ,, ,, ,, (Sanitary Branch).
,, the Sanitary Engineer.
,, the Sanitary Commissioner.
,, all Chairmen of Municipal Councils.
,, all Collectors.
,, all Presidents of District Boards.
,, the President, Municipal Commission, Madras.

G.O., No. 847 M., 15th May 1896.

Sanitary works.

Declining, with remarks, to reconsider G.O., No. 2073 M., dated 9th December 1895, regarding the execution of —, and passing orders on certain questions raised by the Sanitary Engineer and the Public Works Department in connection with the preparation of specification and schedules for such works, the amendment of schemes, etc.

No. 847 M., 15TH MAY 1896.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—the following papers :—

I

G.O., No. 2073 M., dated 9th December 1895.

ABSTRACT.—Passing orders about the appointment of an additional Assistant Sanitary Engineer, and ordering that the execution of the next water-supply or drainage scheme be entrusted to the Public Works Department.

II

Office-note—from the Hon'ble Colonel D. MCNEIL CAMPBELL, R.E., Joint Secretary to Government, Public Works Department.

To—the Chief Secretary to Government, Local and Municipal Department.

Dated—Madras, the 11th January 1896.

No.—172-C.

With reference to orders in the Local and Municipal Department, No. 2073 M., dated 9th December 1895, please let me know whether further orders may be expected on the subject of the contributions payable to the Public Works Department for the execution of sanitary works for Municipalities. In paragraph 3 of his office-note, No. 3268-C., dated 2nd November 1895, Colonel Pennycuick proposed a scale of charges which he considered suitable ; but the order thereon in the Local and Municipal Department makes no reference to this matter.

III

Note by the Chief Engineer, Public Works Department.

The best manner of dealing with the organisation of the Sanitary Engineering Department has been under discussion for several years and there are some conflicting orders on the subject ; but it was finally decided in G.O., No. 2073 M., dated 9th December 1895, that the work of the Sanitary Engineer should be confined to investigating water-supply, drainage, &c., projects, and drawing up the necessary plans and estimates which should be submitted to Government through the Sanitary Board. The construction of the works, and obtaining the plant, required for the next project of the description to be carried out, was to be entrusted to the Public Works Department.

2. Mr. Jones, the Sanitary Engineer, now requests that Government will be pleased to reconsider that order.

3. The reasons that led to the passing of the order objected to by Mr. Jones were that, owing to the rapid increase of sanitary works, it was found necessary to increase the Engineering establishment, and Colonel Pennycuick was of opinion that it was not advisable to lend officers and subordinates from this department to work under the orders of the Sanitary Engineer, and that it would be better to put the execution of the works entirely under the Public Works Department. There seems to me to be objections both to lending men to the Sanitary Engineer and also to carrying out the work by the ordinary Public Works Department establishment, and it really amounts to a choice of two evils, both of which are necessitated by

financial considerations, and the question is which is the lesser evil of the two. The objections to lending men are that it is doubtful if they could be spared, and, as Colonel Pennycuick states, there would be partial responsibility in giving advice and lending subordinates for work nominally under the control of another department. The objections to giving the execution of works to the Public Works Department are given in Mr. Jones' letter, and with these objections, I agree as also did Colonel A. C. Smith when he was officiating Chief Engineer. In my opinion the only satisfactory solution of the question is to make the Sanitary Engineering Department, entirely independent, somewhat on the lines indicated in the note by Colonel A. C. Smith and Mr. Jones. The separation of the department is all the more necessary as Sanitary Engineering is a special branch of the profession.

[On G.O. Mis. No. 479 M., of 2nd April 1891.

4. Colonel Pennycuick says himself that this would be the most satisfactory arrangement, but is of opinion that it is altogether out of the question on financial grounds, and no doubt it would be if sanitary works are to be carried out as at present, that is all over the presidency from Ganjám to Cape Comorin and Malabar; but I see no reason why sanitary works should not be carried out by areas, that is, suppose each of the Public Works Department circles were taken up in turns and the water-supply and drainage projects in each completed before those in the next were begun. The establishment required would then be very small. Mr. Jones would be the Superintending Engineer of the circle as regards sanitary works and with one Executive Engineer and three Assistant Engineers and some subordinates he should be able to carry out all the required works, and I don't think the cost would be more than at present. While the works in one circle were under execution, Mr. Jones could be preparing plans and estimates for the works required in the next. I believe that the works would be much better supervised than at present when they are scattered all over the presidency, and it must be remembered that there are few works that require such close supervision as water-works, and I am doubtful if members of the Public Works establishment could spare time to attend to sanitary works in addition to their present duties.

5. Of course the division into circles corresponding to the Public Works circles is only a suggestion, as the extent of the circles will have to depend on the amount of work and the maximum establishment that can be employed. All these details will have to be worked out should the general suggestions be approved.

6. From a list of works in the Sanitary Engineer's Department submitted with Mr. Jones' letter, dated 3rd April 1895, No. 929, to the Chief Secretary to Government, it would appear that if the work is divided according to Public Works circles there would be work in I Circle only, in Vizagapatam and Vizianagram.

7. In II Circle, Bezwada, Masulipatam, Guntur, Ellore, Ongole; so that I and II Public Works circles might form one circle for sanitary works, and so on.

8. But if my proposals are to be adopted it would be better to deal with all the towns in one circle requiring water-supply and drainage before taking up the next. It may be argued as a reason against my proposals that urgent works outside the circle of operations might have to be postponed till the works in the circle were completed. But, as the towns have gone for hundreds of years without a water-supply and drainage scheme, there will seldom be any case in which the work is really urgent, and if such a case does occur, a special establishment can be employed for the time being. As regards the works actually in progress, I think they should be carried on as at present, extra assistance being given to the Sanitary Engineer if required.

9. Should my proposals not be approved, and it be still deemed advisable to entrust the execution of all sanitary works to the Public Works Department, the questions put by Mr. Jones in paragraph 18 can be answered as follows:—

(1) The specifications and schedules for schemes should be prepared by the Sanitary Engineer who is to draw up the schemes.

(2) Trifling alterations in design can be sanctioned by the Superintending Engineer of the circle, material alterations proposed should be submitted by the Superintending Engineer to the Chief Engineer who, if he thinks advisable, will refer to the Sanitary Engineer for opinion.

(3) The Sanitary Engineer will not be required to visit and report on schemes under execution, the Superintending Engineer and Executive Engineer will do that duty.

(4) As the works will be under the Public Works Department, the rules in force in that department regarding tender for English supplies will be adhered to.

10. Mr. Jones further raises the question of the maintenance of completed schemes, and I must say that I agree with him that it will be a fatal mistake to hand over the care of completed schemes to the Municipalities concerned; but I doubt if it would be possible to carry out his suggestions. The question of improving the status and efficiency of the Local Fund Engineers is now under consideration and it is possible that these officers might be made to look after completed water-supply and drainage works, contribution for this purpose being made by the Municipalities who benefit thereby.

5th February 1896.

D. McNEIL CAMPBELL, Col., R.E.,
Chief Engineer, P.W.D.

ENCLOSURE.

Letter—from J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E., Sanitary Engineer to Government.
To—the Chief Secretary to Government (through the Chief Engineer, Public Works Department).
Dated—Fort St. George, the 29th January 1896.
No.—261.

With reference to G.O., No. 2073 M., dated 9th December 1895, I have the honour to request that Government will be pleased to consider the following remarks which I venture to submit after careful consideration of the consequences that, I fear, will follow the changes ordered and because the interests involved are such that I consider Government should be in possession of the following views—views which I have not hitherto had an opportunity of laying before Government; I regret that Colonel Pennycuick has retired, because had he still been here, I feel sure, he would have given them his earnest consideration.

2. It might be understood from the tenor of the Government Order under reference that I had desired and advocated the changes, but it will be seen from a perusal of my letter embodied in the Government Order in question, that I have never advocated that the work of the Sanitary Engineer should be limited in the manner lately sanctioned. At the same time it is right to say that I, as a member of the Sanitary Board, acquiesced in a proposal made by the Sanitary Board that the work should be so limited, but this was because I saw it was hopeless under the then existing régime of the Public Works Department to obtain assistance from that department by method of temporary transfers. Whether other counsels prevail now I am not in a position to say, but I suggest that the policy is possible of reversal or modification, and thus many of Colonel Pennycuick's objections to the existing system would be met.

3. In fact this was the original intention of Government as may be seen by a perusal of G.O., No. 1858 M., dated 26th October 1891, wherein it is ordered that "supervisors and overseers required for the permanent staff referred to by the Sanitary Engineer as class (A) should, if possible, be obtained from the Public Works Department."

4. Government will learn from a perusal of past correspondence that I have never asked to be relieved of any portion of the duties until lately appertaining to me, but that I have, on the other hand, merely desired to carry out these duties in an efficient manner, which could be done only by an increase in staff.

5. I beg to submit to Government that the refusal to grant this extra staff cannot have been on financial grounds, because the cost of any staff granted is recouped from the body for whom the works are being carried out as will still be the case in the proposed arrangement for the Public Works Department to execute works. I further submit that if the works already executed had been so by the Public Works Department the following would have been the financial result, that is, that the acceptance of Colonel Pennyquick's terms or proposals will, for a similar amount of work in the future, entail on the local bodies concerned an increased contribution amounting to Rs. 88,000 under one alternative or Rs. 1,15,000 under the other. This over say about five years actual expenditure is Rs. 23,000 a year and that is an amount which would pay for three more Assistant Engineers than that at present.

No.	Town.	Actual cost of work.	Actual cost of pipes, machinery and lands.	Net cost of work (*i.e.*, the difference between columns 3 and 4).	Contribution required by the P.W.D., at 24½ per cent. on net cost of work—(column 5).	Estimated cost of work.
1	2	3	4	5	6	7
		Rs.	Rs.	Rs.	Rs.	Rs.
1	Adóni	1,58,119	87,325	70,794	17,344	1,62,000—Water-supply.
2	Coonoor	41,840	..	41,840	10,250	48,000—Drainage.
3	Cuddapah	17,556	9,347	8,209	2,011	19,385—Water-supply.
4	Kumbakónam	1,12,134	35,521	76,613	18,770	1,10,000—Drainage.
5	Madura	3,94,485	2,19,152	1,75,333	42,956	3,91,000—Water-supply.
6	Tanjore	4,23,953	2,27,542	1,96,411	48,120	4,47,420 do.
7	Trichinopoly	* 5,20,000	2,84,664	2,35,336	57,657	5,20,000 do.
	Total ..	16,68,087	8,63,551	8,04,536	1,97,108	16,97,805

No.	Town.	Contribution required by the P.W.D., on the estimated cost of work—column 7.		Cost of establishment actually incurred by the Sanitary Engineer when executed under his supervision.	Difference between columns 6 and 10.	Difference between columns 9 and 10.
		Percentage.	Amount.			
		8	9	10	11	12
			Rs.	Rs.	Rs.	Rs.
1	Adóni	12½	20,250	8,259	9,085	11,991
2	Coonoor	20	9,600	5,017	5,233	4,583
3	Cuddapah	12½	2,423	2,194	— 183	229
4	Kumbakónam	20	22,000	17,591	1,179	4,409
5	Madura	12½	48,875	21,870	21,086	27,005
6	Tanjore	12½	55,227	24,135	23,985	31,792
7	Trichinopoly	12½	65,000	29,760	27,897	35,240
	Total ..	..	2,24,075	1,08,826	88,282	1,15,249

* Approximate—work in progress.

6. Therefore the transfer to the Public Works Department of the execution of works does not find justification on financial grounds.

7. Colonel Pennycuick's strongest point for the transfer is that the Sanitary Engineer cannot give the proper supervision. I am unaware on what grounds he came to this conclusion, but I can conscientiously say that none of the works up to date have lacked proper supervision nor have suffered from want of proper supervision.

8. The next point to which I wish to request the attention of Government is that, while the Public Works Department have never been able, or more properly I might say willing to lend the services of officers to this department, it is proposed to give the work to the officers of that department. From this it can be deduced that unwillingness to afford the assistance asked on several occasions and not inability to do so was the cause of refusal. If now the works can be undertaken without extra staff, which is a matter of doubt (even by Colonel Pennycuick himself), the officers of the Public Works Department must either have not enough work at present, a premise unlikely to be agreed to, or else the work of executing the Sanitary Engineer's schemes will not have that care and attention they require, and this is more likely to be the case. But there is the likelihood that extra staff (under the powers of the Chief Engineer) will be engaged from time to time, so that it comes to this, that extra staff will be used by the Public Works Department while the execution of works has been taken away from the Sanitary Engineer because extra staff is required.

9. It is not consistent with Colonel Pennycuick's objection against the employment of temporary staff in the Sanitary Engineer's Department to propose to employ temporary men in Public Works Department for the same purpose, and if these proposals mean that those temporary men would be put in permanent posts of the Public Works Department and thus allow of the alienation of the services of higher grade officers to sanitary schemes, the same plan was possible of adoption when the Sanitary Engineer wanted the services of members of Public Works Department staff, such an arrangement can be made now and all objection to the existing state of things would then disappear while the work would be much more cheaply done, and I venture to add efficiently done, and supervised than under the proposal recently sanctioned.

10. I would quote here from a report to Government by Colonel A. C. Smith, Acting Chief Engineer, and myself, a portion which could only have been written on Colonel Smith's authority :—

"It is thought that the proposal that the works when designed and estimated by the Sanitary Engineer and duly approved by Government should be carried out by Executive Engineers of Divisions will not be at all a satisfactory arrangement, for—

"Works of this class require *constant*, if not *continuous* supervision and it will be impossible for an Executive Engineer of the Public Works Department, who now-a-days has so large a charge that it takes him a year to see the whole of it, to devote sufficient time for this purpose.

"It is always very difficult in this class of work to carry out, without constant reference, the plans and estimates made by others.

"There would be a dual control—no man can serve two masters—on the one hand the Superintending Engineer of the circle would have just cause for complaint if the Executive Engineer neglected, as he would be obliged to do, his own proper work in order to supervise work for the Sanitary Engineer, and the latter would undoubtedly grumble if his work was either not carried on expeditiously or scamped in the absence of proper supervision.

"Then again the Sanitary Engineer would be quite justified in declining all responsibilit in the results of his designs if he were not placed in the position of a Superintending officer with powers to alter or modifiy such designs, efr in these kind of works it is impossible to foresee all requirements.

"Then as regards the position of the Chief Engineer, Public Works Department, with regard to the Sanitary Department, if he is to scrutinise or revise the designs and lend his officers to the Sanitary Department to carry them out in case of failure or misadventure, the Public Works Department would be held to blame, though, as is above shown, it will be impossible for it to undertake such works satisfactorily.

"Taking all these things into consideration, it is thought advisable to make the Sanitary Engineer and his department totally independent of the Public Works Department as far as designing and execution of work is concerned, except, of course, that the Chief Engineer, Public Works Department, should act as adviser to the Government on all schemes they may wish to consult him about."

11. In these sentences will be found, I venture to say, an endorsement of the views I have already set forth and they also include what is to my mind a very potent argument against the possibility of the arrangements ordered being in any way a success. I refer to the question of dual responsibility.

12. Under the new arrangement the plans framed by the Sanitary Engineer will have the approval of the Sanitary Board which at present includes the Chief Engineer. So long as the Chief Engineer is the President of the Board, there is an incidental security that the designs, etc., passed will be carried out to a greater or less extent. But in no Engineer's experience and certainly not in mine is it the case that the designs of one Engineer will be completely accepted or satisfactorily carried out by another. The Public Works Department have already experience of this in regard to the tank maintenance scheme. Any Engineer receiving the design of another to carry out would have his first thoughts directed to amendment whether an improvement or not would remain to be seen, such amendments under present order of Government could not be sent back to the Sanitary Engineer for approval, or the Sanitary Engineer would be in the relation of a Superintending Engineer to an Executive officer of the Public Works Department, and therefore the Superintending Engineer, Public Works Department, would have to approve or otherwise of such amendments, or they would eventually reach the Chief Engineer who might or might not have approved of the original plans. For any amendments or alteration the Sanitary Engineer could in no way be held responsible, and therefore in no way for the success or failure of any scheme.

13. In addition to this there will be a considerable additional and continuous correspondence needed when the design of one Engineer is carried out by another and this point and that point must come back for elucidation, etc. Such correspondence would be of the most unsatisfactory character and the Sanitary Engineer would not be in a position to suggest alterations himself in the design as his experience does suggest as work proceeds, because it is a portion of his duty which Government have determined to relieve him. No work has ever been carried out exactly as designed. Therefore every scheme will be more or less amended by other persons than its author—by persons having less interest and less skill in that particular class of work and the result must be such that the Sanitary Engineer can have no dependence that his schemes will be in any case carried out as designed and approved.

14. It may be brought forward as an argument that the designs of the Consulting Architect to Government are so carried out; but any that are so are works of a less technical nature and of a character allied to those which a Public Works Department officer usually executes.

15. Again, with the plant and materials being ordered by each individual officer unless it is ordered that the type designs of the Sanitary Engineer are to be adhered to in all cases, the works will not have that uniformity of design and in the class of materials used such as valves,

fountains, pipes, etc., as are now maintained throughout the Presidency, so that such materials are interchargeable and one municipality may in times of emergency borrow from another ; nor are Public Works officers, who do not devote special attention to such works, likely to be acquainted with the best class of materials and design such as it is the special duty of this department to keep itself acquainted with ; nor will individual Public Works Department officers have the same facility or opportunity of borrowing and using plant and stores of one municipality by another simply because they cannot have the knowledge of the plant already used and which may be used by another officer. In short, there will be a loss of centralization to a great extent.

16. One reason for the proposal to create the office of Sanitary Engineer was because the Public Works officers could not find time to get up schemes (and therefore it may be reasonably supposed they had not time to devote to their execution). This has not been found to be the case in other Presidencies and where the Public Works Department executes schemes as in Bombay, they also draw them up and the duty of the Sanitary Engineer and Sanitary Board is only to review and amend such schemes so that the design and execution of the schemes are not divided from each other as is now ordered to be done in this Presidency. It is a well-known axiom that the best person to carry out a scheme is its designer and that he alone can do it justice.

17. I venture to place these remarks before Government. They are disinterested, as far as I am personally concerned, because the result of the order under reference is to lessen my work and therefore only because I very strongly believe that the proposal and its acceptance has been made without a consideration of the facts which I have now placed before Government, do I send them forward.

18. I am sending this letter through the Chief Engineer, Public Works Department, for his remarks thereon, and should Government still consider that the order already issued should not be modified, I have to ask that the following points may be decided :—

(1) By whom the specification and schedules for schemes should be prepared—by this office or by the Public Works Department ?

(2) To whom proposals for amendments of schemes framed by the Sanitary Engineer and approved by the Sanitary Board and sanctioned by Government should be made, and whether reference is to be made to the Sanitary Engineer in reference to such proposed amendments ?

(3) Whether the Sanitary Engineer should visit and report on the schemes under execution and make suggestion to the officer in charge for alteration admissible, etc. ?

(4) Whether this department or the Public Works Department are to obtain tenders for English materials, and, if so, through the Secretary of State, or through the Sanitary Engineer's Agents (Messrs. Henry S. King & Co.), or by tender in India ?

19. Government have also decided in the order under reference that no aid can be given to municipalities to maintain schemes in working order, and as to this also I ask permission to make a few remarks.

20. Government are aware that no mofussil municipality has an Engineer and I venture to submit that without professional supervision none of the works in operation can be maintained, even with the best endeavour of Municipal Councils, in the order they ought to be. The necessity for proper supervision of engineering works is one that has never been disputed, and in England no water or drainage works, on which the health of the people so materially depends, are without the attendance of a duly qualified Engineer.

21. In the Resolution of the Government of India recently issued in regard to a re-organization of the Sanitary Department it is proposed that there should be a Health officer for a group of towns to aid committees in proposing sanitary improvements; but these could be carried out only by professional agency. The principle therefore of a group of municipalities having the services of an Engineer is one that finds its analogy in that proposal and I cannot but think that an Assistant Sanitary Engineer is no less necessary than a Health officer in any improvement of the Sanitary Department.

22. It is a proposal made to Government some years ago and the proposal of the Government of India as to Health officer would seem almost to carry with it the necessity for an Engineering officer who would, as a colleague, control the same areas. The cost of a staff, say, of three Assistant Sanitary Engineers who would look after the execution of not only the major but all the minor works, would cost very little, even if Government made no provision from Provincial funds. Three Assistant Sanitary Engineers at an average of Rs. 700 + 100 travelling allowance monthly would amount to $12 \times 800 \times 3 = 28,800$ annually, and this divided over 56 municipalities would be under Rs. 500 a year. A sum of Rs. 1,000 might be payable by some municipalities and others only Rs. 100 or so, but the benefit obtained would be large in proportion to the assistants which would be rendered, and I am also of opinion that the financial result to municipalities by having their schemes properly carried out would more than cover the cost of the staff.

23. I need not say that I have already taken steps to hand over the completed water-works to the care of the Municipal Councils concerned, but I have done so with much regret and with little doubt as to the ultimate result of their being taken away from our care. It is as if when a railway line was complete the traffic branch of a railway were left to not only work the line but maintain it. The engines and pumps of water-works, etc., it is true, will receive two inspections annually, but the reservoir, head-works, filters, pipes and valves, etc., are left in the hands of persons with no professional knowledge whatever nor has provision been made for annual inspection of the work or for provision against additions or alterations to a system being made without the previous sanction of this department which alone has the knowledge to decide whether and where extension, etc., can be made without detriment to the original and existing system. These perhaps are points in which Government may now desire to pass further orders should no reconsideration of the method of supervising works in operation be deemed necessary or feasible.

24. Government have, while not granting an Assistant Engineer, rendered it possible for Mr. Minchin's services to be availed of to a greater and greater extent as the works now under construction are completed; and this arrangement is one that, under present orders, meets the request made for extra assistance.

25. At present as Government are aware the pay and travelling allowance of the Assistant Sanitary Engineer are recouped eventually from the Councils for whom the works are being executed, but when Mr. Minchin is employed on investigation, etc., there will be no estimates from which his pay can be provided for. Some schemes may never be executed, others not so for many years and there will be intervals between his services on one scheme and another which it will be difficult to debit to any municipality. This is brought to notice because the expenditure and receipts for staff will not balance eventually as they would do under existing arrangements, and I therefore request to be informed if this is understood and approved of by Government.

IV

Memorandum No. 734-C., Public Works, dated 10th February 1896.

Transferred to the Local and Municipal Department.

D. MCNEIL CAMPBELL, Col., R.E.,
Joint Secretary to Government, P.W.D.

To the Local and Municipal Department, with letter No. 261,
dated 29th January 1896, from the Sanitary Engineer
to Government, returned.

V

Letter—from J. A. JONES, Esq., MEN.INST.C.E., F.R.S.E., Sanitary Engineer to Government.

To—the Chief Secretary to Government (through the Chief Engineer, Public Works Department).

Dated—Fort St. George, the 14th February 1896.

No.—463.

In continuation of my letter No. 261 of the 29th ultimo, I have the honour to forward herewith an extract from the Report on the Sanitary Works of the North-Western Provinces and the Punjab by the Sanitary Engineer to the Government of Bombay and Member of the Sanitary Board of that Presidency. The opinion of this very senior officer of the Public Works Department of that Presidency emphasises very strongly the opinion expressed in my letter above quoted.

ENCLOSURE.

Extract from the Report on the Sanitary Works of the North-Western Provinces and the Punjab.

* * * * * *

Up to the time that Sir Auckland Colvin became Lieutenant-Governor of the North-Western Provinces in 1887, all sanitary works had been carried out by the Public Works Department as they are still elsewhere in India except in Madras. The difficulties and delays of this system, caused by want of the special knowledge on the part of most of the Executive Engineers and the difficulty for them to spare sufficient time from their ordinary duties, and also the apathy and obstruction of the municipalities, which are still apparent elsewhere, caused him to appoint a special officer for supervising all such works and he also passed the Water Works Act I of 1891.

* * * * *

No. 847 M., 15TH MAY 1896.

The water-works of the larger towns were carried out in the following order :—Agra, Allahabad, Benares, Cawnpore and Lucknow. Agra, Cawnpore and Benares are now carrying out drainage works and Meerut is now having water-works; the average time for each was only about two years although the cost varied from 12 to 25 lakhs. All the works were carried out by large contractors which accounts for the rapidity of construction to a great extent. The Punjab works of a similar nature done under the old system present a most striking contrast. In the few cases where water has been supplied, *i.e.*, Umballa Cantonment, Delhi, Lahore and Peshawar, the designs were altered and re-altered during construction the works extended over many years, and in the cases of Umballa Cantonment and Delhi they are a decided failure. Umballa city is now having its water-works made, and as an Engineer who has been specially trained in that branch is in charge it will probably be a success. In all the Punjab works the neglected and *unfinished* look of the head-works is most striking; whilst in the case of the North-Western Provinces they compare favourably with similar works in England in neatness and finish, and there has been none of the subsequent complaint or trouble that has resulted from every one of the Punjab works.

* * * * *

Part I is well on towards completion, but it is impossible to say when the various independent estimates for the different bazaars of Part II can be done under the system in force in the Punjab, the Local Executive Engineer is supposed to do all sanitary works in addition to his own proper work; and if this is adhered to as regards Part II, the twentieth century will be far advanced before the project is completed, if indeed it ever is. It is, I think, quite impossible that any Executive Engineer with a large district could possibly give up the time required for such a work for such a city; and the getting up of the project must drag on wearily from one Executive Engineer to another as transfers occur, involving loss of continuity of thought and design and if ever finished the result must be an unsatisfactory patch-work. It will be interesting to note the difference of results in Cawnpore where the drainage is being worked out and carried out by a Special Public Works Department Engineer who has had a special training in this branch and who is working direct under the Sanitary Engineer.

* * * * *

No. 941-*C.*, *dated* 18*th February* 1896.

Forwarded to the Local and Municipal Department in continuation of this office endorsement, No. 734-C., dated 10th February 1896.

D. MCNEIL CAMPBELL, Col., R.E.,
Joint Secretary to Government, P.WD.

Order—No. 847 M., dated 15th May 1896.

In the first of his letters read above the Sanitary Engineer asks for a reconsideration of the orders conveyed in G.O., No. 2073 M., dated 9th December 1895, defining the duties of his department. It has never been denied that if funds were abundant, the best plan would be to create a Sanitary Engineering Department complete in itself, and strong enough, not only to design works, but also to carry them out. But this plan being unfortunately not feasible on financial grounds, it was decided, after much discussion and consideration, to adopt the scheme laid down in G.O., No. 2073 M., dated 9th December 1895, the execution of the works being entrusted to the Public Works Department, and the duty of designing them to the Sanitary Engineer. The scheme is not free from objections, but has been determined by financial limitations and by what the Government considers to be sufficient for the actual requirements of sanitary projects at the present time. It was settled after due deliberation and must be adhered to until it shall prove to be inadequate.

2. In forwarding Mr. Jones' letter, the Chief Engineer has suggested a means of considerably reducing the cost of a separate department. This is to group municipalities into circles and to centralize in one circle all the works being carried on at one time, so that their supervision could be undertaken by a very small staff. While these works were being executed, designs and estimates for works in the next circle would be prepared and the works taken up on completion of those in the first circle.

The execution of sanitary projects cannot, however, follow any such procrustean order or distribution; and for this and other reasons the Government considers that the proposal is impracticable.

3. Mr. Jones further submits certain questions arising out of the orders in G.O., No. 2073 M., dated 9th December 1895, and requests that he may be favoured with orders on them in the event of Government being unwilling to reconsider that Government Order. The questions, four in number, are dealt with in paragraph 9 of the Chief Engineer's memorandum, with whose conclusions Government agrees with slight modifications. The points as answered by Government are as follows :—

(1) By whom should the specification and schedules for schemes be prepared—by this office or by the Public Works Department ?

They should be prepared by the Sanitary Engineer, whose duty it is to draw up the schemes.

(2) To whom should proposals be made for amendments of schemes framed by the Sanitary Engineer and approved by the Sanitary Board and sanctioned by Government, and should reference be made to the Sanitary Engineer in regard to such proposed amendments ?

Trifling alterations in design may be sanctioned by the Superintending Engineer of the Circle, but material alterations should be submitted by the Superintending Engineer for the orders of the Chief Engineer, who will consult the Sanitary Board if and when he thinks fit to do so.

(3) Should the Sanitary Engineer visit and report on the schemes under execution and make suggestions to the officer in charge for alterations admissible, etc.?

The Sanitary Engineer will not be required to visit and report on schemes in course of execution. If the executive department entrusted with the work meets with difficulties it may freely consult the Sanitary Board who may, if necessary, obtain a report from the Sanitary Engineer.

(4) Should the Sanitary Engineer or the Public Works Department obtain tenders for English materials, and, if so, through the Secretary of State or through the Sanitary Engineer's Agents (Messrs. Henry S. King and Co.) or by tender in India ?

It has already been distinctly decided that the plant should be obtained by the Public Works Department, and therefore the rules in force in that department regarding tender for English supplies will be followed.

4. The last point brought forward by the Sanitary Engineer is the question of maintenance of existing water-supply and drainage schemes. Government has decided that this must be left to municipalities, as in the course of a few years the increasing number of schemes would preclude the possibility of their maintenance by Government. As, however, municipal schemes have been largely assisted by Government, it is advisable that some control should be exercised over municipalities in their upkeep, and this can best be secured by periodical inspections. The Sanitary Engineer himself or his Assistant will therefore be requested to inspect each work once a year at least and bring to the notice of Government any defects that may be found with the remedies suggested. The Public Works Department will also be requested to arrange for a half-yearly inspection of these works by the Executive Engineer of the division in which they are situated. This course, together with the two annual inspections of engines, pumps, etc., by the Boiler Inspector will, it is hoped, be sufficient to ensure the machinery and plant being maintained in proper order by the local authorities.

5. There remains the question of the rate at which the municipalities should contribute to the Public Works Department for the cost of supervision. Two rates appear to have been proposed by Colonel Pennycuick, in one place (paragraph 3 of note in G.O., No. 2073 M., dated 9th December 1895) the ordinary Public Works Department charge of $24\frac{1}{2}$ per cent. on the expenditure on works, exclusive of charges for land and stores imported from England, and in another place (paragraph 11 of

note in G.O., No. 2380 L., dated 16th November 1894) 12½ per cent. on the total of estimates for water-supply and 20 per cent. on those for drainage. In the former case it is not stated what charges are to be covered by the rate proposed, while in the latter the 12½ and 20 per cent., respectively, are to cover all charges for supervision of work and also preparation of estimates. As this last-mentioned work is to be carried out by the Sanitary Engineer, there does not seem to be any reason why any charge should be made by the Public Works Department on this account. What charge should be made for supervision of work is a question open to doubt and dispute, of which it would be extremely difficult to find a settlement satisfactory to all parties. However, inasmuch as practically in every case half the cost of the works is met from Provincial funds, whatever may be the rate that is determined on, half of the sum recovered will merely be transferred from one side of the Provincial account to the other, *i.e.*, from 45. Civil Works—Miscellaneous Public Improvements—to XXXII. Civil Works. Under these circumstances the Government considers that the best way to settle the question will be to make no charge on municipalities for supervision of the works executed, and this plan will accordingly be adopted in future.

(True Extract.)

J. F. PRICE,
Chief Secretary.

To the Public Works Department.
,, the Joint Secretary, Sanitary Board (Engineering Branch).
,, the ,, ,, ,, (Sanitary Branch).
,, the Sanitary Engineer.
,, the Sanitary Commissioner.
,, all Chairmen of Municipal Councils.
,, all Collectors.
,, all Presidents of District Boards.
,, the President, Municipal Commission, Madras.

G.O., No. 847 M., 15th May 1896.

Sanitary works.

Declining, with remarks, to reconsider G.O., No. 2073 M., dated 9th December 1895, regarding the execution of —, and passing orders on certain questions raised by the Sanitary Engineer and the Public Works Department in connection with the preparation of specification and schedules for such works, the amendment of schemes, etc.

LOCAL AND MUNICIPAL DEPARTMENT.

NOTES CONNECTED WITH G.O., No. 847 M., DATED 15TH MAY 1896.

[SUBJECT.—~~Organisation~~ of the Sanitary Engineering ~~Department~~.]

From the Public Works Department, dated 11*th January* 1896, *No.* 172 *C.*
" " " 10*th February* " " 734 *C.*
" *Sanitary Engineer, dated* 14*th February* 1896, *No.* 463.

In the first of these currents, the Public Works Department asks for orders as to the rate at which contributions are to be paid by Municipalities for the execution of sanitary works entrusted to that department. Colonel Pennycuick suggested certain rates in his note (in G.O., No. 2073 M.,* dated 9th December ~~1905~~), but no orders were passed on that point. The second current is also from the Public Works Department forwarding with a note by Chief Engineer an objection to the orders conveyed in G.O., No. 2073 M., dated 9th December 1895, raised by the Sanitary Engineer. His first objection is that if the rates proposed by Colonel Pennycuick are approved, the execution of drainage and water-supply schemes will be much more costly than they have been hitherto. Applying those rates to the works carried out in the last five years, he shows that there has been a saving of Rs. 23,000 a year by the execution of these works by his own department. It would appear from these figures that the rates proposed by Colonel Pennycuick are too high. (The proposed rates are $12\frac{1}{2}$ per cent. on the total estimates for water-supply and 20 per cent. on those for drainage, or else the ordinary Public Works Department rate of $24\frac{1}{2}$ per cent. of expenditure on works, exclusive of cost of land and stores imported from England.)

* Paragraph 3 of note of 2nd November 1895 at page 5 of the Government Order and paragraph 11 of note of 8th May 1894

G. S. FORBES.

2. The following are the main reasons for which the Sanitary Engineer wishes G.O., No. 2073 M., dated 9th December 1895, to be reconsidered—

(*a*) In the first place, he considers that unless the Public Works Department is underworked at present, it will have to employ extra hands for the execution of sanitary works, and therefore there is no reason why these extra hands should not be given to the Sanitary Engineer's department instead of to the Public Works Department.

No doubt in the way of subordinates: but the point is that the Executive Engineers and superior supervising establishment will be able to look after the carrying out of the works, without general increase in strength.

G. S. FORBES.
H. B[LISS].

(*b*) The next point he takes objection to is "dual control". The plans are to be prepared by the Sanitary Engineer and carried out by the Public Works Department. In support of this he quotes a note by Colonel A. C. Smith and himself (in G.O., No. 1306 M., dated 14th August 1891) which is strongly in favour of leaving the execution of the works to the Sanitary Engineer; for if the Sanitary Engineer's designs are carried out by the Executive Engineer, there are sure to be some alterations required, for which the former cannot be held responsible. Again it would be very hard for the Executive Engineer to carry out his ordinary work and also the sanitary work, and would probably have to neglect one for the other, thus giving either the Superintending Engineer or the Sanitary Engineer just cause for complaint because his works are not carried out.

See note below.

G. S. FORBES.

The question raised as to the responsibility for alterations in designs is met to a great extent by the fact that the Chief Engineer is to be President of the Sanitary Board, which has to approve of the designs in the first instance.

(*c*) In paragraph 15 the Sanitary Engineer says that if different works are to be carried out by different Executive Engineers there is no guarantee that the same designs of machinery, plant, etc., will be used for all projects, which is most desirable so as to allow of their being interchangeable: and also that one Engineer will not know

what plant has been used in another scheme and may be available for use by him. But as these Executive Engineers all belong to the Public Works Department, the Chief Engineer as head of the department, can see to these requirements just as well as the Sanitary Engineer.

G. S. Forbes.
H. B[liss]

3. The Chief Engineer, Colonel Campbell, generally supports Mr. Jones' objections to the works being entrusted to the Public Works Department and states that Colonel Pennycuick also disapproved of it, but chose it as the lesser of two evils, these being (1) lending Public Works Department officers to the Sanitary Engineer and (2) entrusting execution of works to Public Works Department, as for financial reasons a properly constituted Sanitary Engineer department was impossible.

4. Last of all, Mr. Jones objects to the works being entrusted to Municipalities after completion, as he says that it is absolutely essential that they should be supervised by a properly qualified Engineer. He proposes to appoint such an Engineer to be utilised by groups of Municipalities. At present, however, very few Municipalities are in a position to incur this expenditure.

5. In the event of Government not reconsidering ~~them~~ its orders, Mr. Jones propounds certain questions in paragraph 18 of his letter, to which answers are given by Colonel Campbell, which may be accepted.

6. The Chief Engineer admits the objections to entrusting the work to the Public Works Department and says that not only will Public Works Department officers not have time to properly supervise sanitary works, as they should be supervised, but also that now-a-days Sanitary Engineering is quite a special branch, needing special study, and thinks that the financial difficulty in the way of constituting a properly constituted Sanitary Engineering department may be got over. His proposal is to concentrate the work. In order to do this, he suggests that Municipalities should be grouped together in circles, and that works should only be undertaken in one circle at a time. While works are being executed in one circle, plans, etc., might be got ready for the next circle, which would be executed in their turn.* For this the only establishment necessary would be Mr. Jones as Superintending Engineer, one Executive Engineer and three assistants with a few subordinates. He agrees with Mr. Jones that the upkeep of works should not be entrusted to Municipalities, but does not consider his suggestion feasible, and suggests that Local Fund Engineers might undertake the work.

But the sanitary works being carried out in most municipalities at present are simple drainage and water-works systems—not the difficult city and especially house sanitation which in England has become a separate profession.

G. S. Forbes.

This scheme would be quite impracticable.

H. B[liss].

This would be to take up municipal works not in the order of the importance of the towns, but in the order of their local distribution on the face of the globe.

G. S. Forbes.

~~Please see over paragraph 8.~~

7. In the last current, the Sanitary Engineer forwards a report on sanitary works in the Punjab and North-West Provinces, in which the two provinces are compared, greatly to the benefit of the latter, where they are carried out under the supervision of a special officer, whereas in the former they are carried out by the Public Works Department. The report is by the Sanitary Engineer to Government, Bombay, and supports Mr. Jones' views.

8. The objection to the grouping of Municipalities for the execution of works, is that at present there are not a sufficient number of Municipalities in one circle, who have the money to carry out these works. In most cases it is only with great care that the money can be scraped together to carry out major schemes, and very likely at the time when one circle was being undertaken, Municipalities in it would not have sufficient funds, which they might raise subsequently, when work had been transferred to another circle.

W. W. Phillips—27-2-96.

As soon as Colonel Pennycuick's back is turned, Mr. Jones takes the first available opportunity to attack the policy embodied in G.O., No. 2073 M., dated 9th December 1895. Without previously obtaining permission to lay his views before Government, I think, whatever the merits of the case may be, the course he has taken is in rather questionable taste. He virtually reagitates the whole of the issues that Government settled after full and careful deliberation.

2. As I understand, the position created by Government by [the G.O., of December last] was to place the Sanitary Engineer in a relation to the Public Works Department executive somewhat similar to that occupied by the Consulting Architect. G.O., No. 2073 M., dated 9th December 1895

H.B.

In the case of the latter, we do not hear of all the difficulties and friction which Mr. Jones conjures up in the shape of a "*dual control.*" Moreover, as the Assistant Secretary points out, alterations in designs will be made by or in the name of the Sanitary Board of which the Chief Engineer is President.

3. With regard to Mr. Jones' queries in paragraph 18 of his letter, the Chief Engineer's proposed answers seem generally right, but the following points require consideration:—

H.B.

4. No. (2) as to amendments of design, the Chief Engineer proposes that material alterations should be submitted by the Superintending Engineer to the Chief Engineer, who may consult the Sanitary Engineer, but perhaps material alterations should be submitted to the *Sanitary Board* of which both Chief Engineer and Sanitary Engineer are members.

I think the Chief Engineer might be left to consult the Sanitary Board if and when he thought fit to do so.

H.B.

5. No. (3) seems right. The Sanitary Engineer is responsible that the design is right. If he could intermeddle with the execution, he would be tempted to raise difficulties and create the necessity for the particular mode of execution he favours. If he is to inspect, he should report to the *Sanitary Board*. But the works are simple. If the executive department however find difficulties, they should freely consult the Sanitary Board, who may get a report from the Sanitary Engineer if necessary.

6. As to (4), this raises, quite needlessly apparently, the question of tenders for English materials. At present the Sanitary Engineer freely recommends English terms to Municipalities and Local Boards. The decision of Government to keep this power officially with the Public Works Department and discard the "Sanitary Engineer's agents" should be firmly maintained.

Most decidedly. Hitherto Mr. Jones has had the control of the spending of large sums of money without anyone to supervise him. In fact, I do not know who audits the accounts of his expenditure. The position is an extremely improper one and should not be allowed to continue.

H.B.

7. As to the maintenance of schemes in working order, the Government has distinctly resolved that for the present Municipalities must make their own arrangements. Mr. Jones puts forward no new arguments. At the same time there should be provision for periodical inspections. I do not see why the Executive Engineer of the district should not do this once every half-year; and the Sanitary Engineer himself or his Assistant (Mr. Minchin) once a year at least. There are very few municipalities with a regular system of water-works. In a few years other arrangements will have to be made. I understand that Government quite recognized this with regard to the whole scheme sanctioned in ~~the~~ ~~December~~ G.O. It is meant to be a scheme to meet requirements as they at present are and it is also limited by financial exigencies.

This might be ordered.

H.B.

~~*Vide* paragraph 24.~~

~~H.B.—7-3-96.~~

8. As to the contributions to be paid by Municipalities, see paragraph 3 of note of 2nd November 1895 at page 5 of G.O., No. 2073 M., dated 9th December 1895.

9. For orders.

G. S. Forbes—5-3-96.

No one, so far as I know, ever thought or said that, if funds were no object, it would not be best to have a Sanitary Engineering Department complete in itself and strong enough to carry out all works as well as to design them. But we cannot afford this; and after much discussion and consideration decided on the plan laid down in G.O., No. 2073 M., dated 9th December 1895, that, while the Sanitary Engineer designed works, the ordinary establishment of the Public Works Department should carry them out. This plan is by no means free from objections, but it was deliberately determined on and should be adhered to until it is proved to be a failure.

2. As to the rates which should be charged by the Public Works Department for supervision of the execution of the works, in one place Colonel Pennycuick proposed $12\frac{1}{2}$ per cent. on the total of estimates for water-supply and 20 per cent. upon estimates for drainage works (paragraph 11 of his note of May 1894, in G.O., No. 2380 L., dated 16th November 1894) and in another place $24\frac{1}{2}$ per cent. on the expenditure on works, exclusive of charges for land and stores imported from England (paragraph 3 of his note on page 5 of G.O., No. 2073 M., dated 9th December 1895). In the former case, the charge of $12\frac{1}{2}$ or 20 per cent. (I may here note that I do not know why the rates for water and drainage works should have differed, unless it be that more English stores, in proportion, are used in water-works) was to cover all charges for preparation of estimates and supervision of work; in the latter case, Colonel Pennycuick did not state what charges were to be covered. But as it has been arranged that the Sanitary Engineer is to prepare designs and estimates, I do not see why the Public Works Department should in any case make any charge on this account. It should charge only for supervision of work. What charge it should make on this account seems to me to be a matter on which there is room for any amount of doubt and dispute and as to which a decision satisfactory to all parties will be almost impossible. This may be clearly seen from Mr. Jones' own statement. He makes out an average saving of so much a year, as compared with Colonel Pennycuick's two rates of $24\frac{1}{2}$ and $12\frac{1}{2}$ or 20 per cent., in favour of his own plan; but he has made no allowance for the cost, or any part of the cost, of himself and his office for the five years in question. If that were added in, there would be a different tale to tell. Whatever may be the rate charged, inasmuch as in practically every case half the cost of the works is borne by Provincial, half of the sum recovered will merely be transferred from one side of the Provincial account to the other, from, that is, 45. Civil works, Miscellaneous Public Improvements to XXXII Civil works. Under these circumstances, it seems to me that the best way will be to make no charge on Municipalities on account of the supervision by the Public Works Department of the execution of water-supply and drainage works. The Public Works receipts will thereby be slightly reduced, but we can always balance that, if we find it necessary to do so, by giving slightly smaller grants to Municipalities for the above objects. I believe the adoption of this course would save a great deal of trouble and give general satisfaction, if it is allowable to adopt it, which I do not know.

H. B[LISS].

I quite agree with the Hon'ble Mr. Bliss. Financial considerations make it impossible to adopt any scheme that would be free from objections.

J. G[ROSE]—16-3-96.

To the Public Works Department for favour of counter initials with special reference to paragraph 5 of the order.

W. W. PHILLIPS—21-3-96.

To be read with the Honourable Member's notes.

G. S. FORBES—27-3-96.

Draft for approval.

D. MCNEIL CAMPBELL—2-4-96.

2. It has been initialled by the Secretary in the Public Works Department.

G. S. FORBES—2-4-96.

Draft Order.

In the first of his letters read above the Sanitary Engineer asks for a reconsideration of the orders conveyed in G.O., No. 2073 M., dated 9th December 1895, defining the duties of his department. It has never been denied that if funds were abundant, the best plan would be to create a Sanitary Engineering Department complete in itself, and strong enough, not only to design works, but also to carry them out. But this plan being unfortunately not feasible on financial grounds, it was decided, after much discussion and consideration, to adopt the scheme laid down in G.O., No. 2073 M., dated 9th December 1895, the execution of the works being entrusted to the Public Works Department, and the duty of designing them to the Sanitary Engineer. The scheme is not free from objections, but has been determined by financial limitations and by what the Government considers to be sufficient for the actual requirements of sanitary projects at the present time. It was settled after due deliberation and must be adhered to until it shall prove to be inadequate.

2. In forwarding Mr. Jones' letter, the Chief Engineer has suggested a means of considerably reducing the cost of a separate department. This is to group municipalities into circles and to centralize in one circle all the works being carried on at one time, so that their supervision could be undertaken by a very small staff. While these works were being executed, designs and estimates for works in the next circle would be prepared and the works taken up on completion of those in the first circle. The execution of sanitary projects cannot, however, follow any such procrustean order or distribution; and for this and other reasons the Government considers that the proposal is impracticable.

3. Mr. Jones further submits certain questions arising out of the orders in G.O., No. 2073 M., dated 9th December 1895, and requests that he may be favoured with orders on them in the event of Government being unwilling to reconsider that Government Order. The questions, four in number, are dealt with in paragraph 9 of the Chief Engineer's memorandum, with whose conclusions Government agrees with slight modifications. The points as answered by Government are as follows:—

(1) By whom should the specification and schedules for schemes be prepared—by this office or by the Public Works Department?

They should be prepared by the Sanitary Engineer, whose duty it is to draw up the schemes.

(2) To whom should proposals be made for amendments of schemes framed by the Sanitary Engineer and approved by the Sanitary Board and sanctioned by Government, and should reference be made to the Sanitary Engineer in regard to such proposed amendments?

Trifling alterations in design may be sanctioned by the Superintending Engineer of the Circle, but material alterations should be submitted by the Superintending Engineer for the orders of the Chief Engineer, who will consult the Sanitary Board if and when he thinks fit to do so.

(3) Should the Sanitary Engineer visit and report on the schemes under execution and make suggestions to the officer in charge for alterations admissible, etc.?

The Sanitary Engineer will not be required to visit and report on schemes in course of execution. If the executive department entrusted with the work meets with difficulties it may freely consult the Sanitary Board, who may, if necessary, obtain a report from the Sanitary Engineer.

(4) Should the Sanitary Engineer or the Public Works Department obtain tenders for English materials, and, if so, through the Secretary of State or through the Sanitary Engineer's Agents (Messrs. Henry S. King & Co.), or by tender in India?

It has already been distinctly decided that the plant should be obtained by the Public Works Department, and therefore the rules in force in that department regarding tender for English supplies will be followed.

4. The last point brought forward by the Sanitary Engineer is the question of maintenance of existing water-supply and drainage schemes. Government has decided that this must be left to Municipalities as in the course of a few years the increasing number of schemes would preclude the possibility of their maintenance by Government. As, however, municipal schemes have been largely assisted by Government, it is advisable that some control should be exercised over Municipalities in their upkeep, and this can best be secured by periodical inspections. The Sanitary Engineer himself or his Assistant will, therefore, be requested to inspect each work once a year at least and bring to the notice of Government any defects that may be found with the remedies suggested. The Public Works Department will also be requested to arrange for a half-yearly inspection of these works by the Executive Engineer of the division in which they are situated. This course, together with the two annual inspections of engines, pumps, etc., by the Boiler Inspector will, it is hoped, be sufficient to ensure the machinery and plant being maintained in proper order by the local authorities.

5. There remains the question of the rate at which the Municipalities should contribute to the Public Works Department for the cost of supervision. Two rates appear to have been proposed by Colonel Pennycuick—in one place (paragraph 3 of note in G.O., No. 2073 M., dated 9th December 1895) the ordinary Public Works Department charge of $24\frac{1}{2}$ per cent. on the expenditure on works, exclusive of charges for land and stores imported from England, and in another place (paragraph 11 of note in G.O., No. 2380 L., dated 16th November 1894) $12\frac{1}{2}$ per cent. on the total of estimates for water-supply and 20 per cent. on those for drainage. In the former case it is not stated what charges are to be covered by the rate proposed, while in the latter the $12\frac{1}{2}$ and 20 per cent., respectively, are to cover all charges for supervision of work and also preparation of estimates. As this last-mentioned work is to be carried out by the Sanitary Engineer, there does not seem to be any reason why any charge should be made by the Public Works Department on this account. What charge should be made for supervision of work is a question open to doubt and dispute, of which it would be extremely difficult to find a settlement satisfactory to all parties. [This may be clearly seen from Mr. Jones' own statement; for he calculates that there has been a saving of Rs. 23,000 a year in schemes completed during the last five years by comparing the actual cost of supervision with the rates proposed by Colonel Pennycuick, but as these rates include the preparation of estimates, Mr. Jones should have included the cost, or part of the cost, of himself and his office establishment by whom all the schemes were investigated and the plans and estimates prepared.] However, inasmuch as practically in every case half the cost of the works is met from Provincial funds, whatever may be the rate that is determined on, half of the sum recovered will merely be transferred from one side of the Provincial account to the other, *i.e.*, from 45. Civil Works—Miscellaneous Public Improvements, to XXXII. Civil Works. Under these circumstances the Government considers that the best way to settle the question will be to make no charge on Municipalities for supervision of the works executed, and this plan will accordingly be adopted in future. The slight reduction thereby caused in the receipts of the Public Works Department may be balanced, if necessary, by the reduction of the grants given by Provincial in furtherance of these water-supply, etc., schemes, so that the ultimate net expenditure by Government under this head will remain the same, and the necessity for fixing the charge for supervision will be obviated.

W. W. PHILLIPS—21-3-96.

G. S. FORBES.

I would omit the passage between brackets.

A.E.H.—14-4-96.

A

I cannot reconcile passage marked **A** with that marked **B**. If **A** is seriously intended, I would leave out **B**.

A.E.H.—14-4-96.

B

This draft correctly expresses my views in which the Hon'ble Mr. Grose has concurred. But as the matter is of importance and has long been the subject of more or less controversy, and as difficulties may in future arise out of it, I think it will be safest that His Excellency the Governor should see the draft before issue.

H. B[LISS]—4-4-96.

Submitted to Hon'ble Mr. Bliss with reference to His Excellency the Governor's remarks.

W. W. PHILLIPS—17-4-96.
J. F. PRICE—17-4-96.

His Excellency has noted on two passages on the preceding page. In the first case, I think we should retain the passage proposed to be omitted. If not, it will be equivalent to admitting the accuracy of Mr. Jones' calculations, which we do not do. As to the passage marked **B** (*i.e.*, from "The slight reduction" to the end of the paragraph) that may be omitted if His Excellency wishes, though I should prefer to retain it, as I think it makes the position clearer.

H. W. B[LISS]—20-4-96.

Resubmitted to His Excellency the Governor with reference to the above note of Hon'ble Mr. Bliss.

W. W. PHILLIPS—22-4-96.
J. F. PRICE—11-4-96.

I would suggest that it is not Mr. Jones' figures that are wrong, but Colonel Pennycuick's. No allowance was made by Colonel Pennycuick for the fact that the plans and estimates would be prepared by the Sanitary Engineer and his staff, and consequent on this oversight, his charge for execution and supervision is too high. If this error is corrected and a lower rate adopted, the total charge which would have been made for the works executed during the last five years, if they had been carried out by the Public Works officers, would be less than the figures given by Mr. Jones, and the saving he refers to, would also be less. As Mr. Jones and his staff prepare the estimates under both systems, the cost of his establishment, if included at all in the comparison he makes, should be included in both sides of the account, and this would not alter the difference he brings out. But, as we have decided to make no charge for supervision, it seemed to me on reading the draft, that the passage marked between brackets, was in reality superfluous, and as I had a doubt of its accuracy, I suggested its omission.

2. As regards the passages marked **A** **B**., it seemed to me to involve an inconsistency. The draft distinctly states that the Government proposes to make no charge for supervision. It then goes on to say that the slight reduction in receipts caused by making no charge, could be balanced by the reduction of the grants given to the municipalities. This appears to me to be giving with one hand and taking away with the other. As I supposed the Government do not wish to do this, I suggested the omission of the passage marked **B**.

3. I should be obliged if the Hon'ble Mr. Bliss would once again look over the draft with the above remarks.

A. E. H[AVELOCK]—3-5-96.

Resubmitted to Hon'ble Mr. Bliss with reference to His Excellency the Governor's note of 3rd May 1896.

W. W. PHILLIPS—4-5-96.
J. F. PRICE—7-5-96.

Mr. Jones compared his actual cost (column 10 of his statement) with Colonel Pennycuick's proposed rates of charge, *i.e.*, (1) at 24½ per cent. on cost of works, deducting cost of pipes, machinery and law (column 6 of statement), and (2) at 12½ (or 20 per cent. (columns 8 and 9 of statement). As I did not know exactly what the 24½ per cent. included, I omitted that from consideration, and dealt only with the 12½ (or 20) per cent. rate. This includes cost of preparation of estimates, which Mr. Jones' actuals do not. Hence my remark, which I still think was correct. However, it really does not much matter whether the remark stands or not. The same may be said of the passage marked **B**. Let them both be omitted as His Excellency wishes.

H. W. B[LISS]—8-5-96.

[G.O., No. 847 M., dated 15th May 1896.]

No. 847 M., 5TH MAY 18

GOVERNMENT OF MADRA

LOCAL AND MUNICIPAL DEPA T.

READ—again the following pape —

G.O., No. 2073 M., dated n December 1895

ABSTRACT.—Passing orders about the appointmentf aadonal Ant Sanitary Engineer, and ordering that the execution of the next ater-ppnd dra scheme be entrusted to the Public Works Department.

READ—also the following papers :—

Office-note from the Honourable Colonel D. cNIL MPBE R.E., Joint Secretary to Government, Public Work Depatmeto the ef Secretary to Government, dated Madras, 11th Janry 1896. 172-(

With reference to orders in the Local idd Micipl Lrtmento. 2073 M., dated 9th December 1895, please let me kn qu whier furtherders n be expected on the subject of the contributions payabl s, pnat I ons Depment for the execution of sanitary works for Munici I have not hith ara. 3 ofs office-note, No. 3268-C., dated 2nd November 189 ceuick has retir vi propd a scale of charges which he considered suitable ; bu st consideration. en the Ll and Municipal Department makes no reference to t of the Governm ill be seen from ve never advocat tioned.

Note by the Chief Engineer, Pblic Works Dartment.

The best manner of dealing with the oganisation ofe Sanit Engineering Department has been under discussion for seral years andhere are ne conflicting orders on the subject ; but it was finally lcided in G.O.,No. 207 M., dated 9th December 1895, that the work of the Sanitary Engineer shod be coned to investigating water-supply, drainage and projects, ad drawing u the necary plans and estimates which should be submitted to Gernment throgh the nitary Board. The construction of the works and obtaining te plant requid for thext project of the description to be carried out was to be entsted to the Pblic Ws Department.

2. Mr. Jones, the Sanitary Engineer, nw requests that Govment will be pleased to reconsider that order.

3. The reasons that led to the passing the order bjected by Mr. Jones were that, owing to the rapid increase of sitary works, it wasound neces y to increase the Engineering establishment, ad Colonel Pennycuiwas of opion that it was not advisable to lend officers ad subordinates fromhis department to work under the orders of the Sanitary Engeer, and that it wd be better to put the execution of the works entirely underhe Public Works Dartment. There seems to me to be objections both to lendingnen to the Sanitary ngineer and also to carrying out the work by the ordinary Pulic Works Departmt establishment, and it really amounts to a choice of two vs, both of which e necessitated by

financia[illegible]idctions[illegible] questi[illegible] is which is the lesser evil of the two. The objectio[illegible] leing n[illegible]that it doubtful if they could be spare[illegible], and, as Colonel [illegible]cuk sta[illegible]e would [illegible] partial responsibility in giving advice and lending [illegible]dines fo[illegible]nominal under the control of another department. The obje[illegible]s to [illegible]ivingecution [illegible] works to the Public Works Department are given in Jon[illegible] lett with these objections, I agree as also did Colonel A. C. Sm[illegible]hen[illegible]e wating Chief Engineer. In my opinion the only satisfactory so[illegible]n [illegible]of[illegible]he q[illegible]is to [illegible]nake the Sanitary Engineering Department, entirely independent, somewhat on the

On G.O. No. 49 M., April 1891. lines indicated in the note by Colonel A. C. Smith and Mr. Jones. The separation of the [illegible]rtmot is more [illegible]ecessary as Sanitary Engineering is a special branch of t[illegible]ofesion.

4. Col[illegible]Pen[illegible]ycuirs him[illegible]lf that this would be the most satisfactory arrangement [illegible]' opin[illegible]tlt it is altogether out of the question on financial grounds, an[illegible]do it wd bif sanitary works are to be carried out as at present, that is all o[illegible]thesider fm Gan[illegible]ám to Cape Comorin and Malabar; but I see no reaso[illegible]y itary [illegible]orkshould not be carried out by areas, that is, suppose each of the lic[illegible]orks [illegible]parent circles were taken up in turns and the water-supply and dag[illegible]rojectin en completed before those in the next were begun. The establisht [illegible]uiredwou then be very small. Mr. Jones would be the Superintendi[illegible]Enger [illegible]c the[illegible]ircle as regards sanitary works and with one Executive E[illegible]reend th[illegible]e Astant Engineers and some subordinates he should be able to ca[illegible]ut the [illegible]quireworks, and I don't think the cost would be more than at prese[illegible] We the[illegible]workin[illegible] one circle were under execution, Mr. Jones could be prepg [illegible]s andestimes for the works required in the next. I believe that the work[illegible]oube much bter supervised than at present when they are scattered all c[illegible]theside[illegible]ncy, ani[illegible]st be remembered that there are few works that require s[illegible]cl[illegible]supervision, a[illegible]er-works, and I am doubtful if members of the Public Wks [illegible]eslishment co[illegible]+[illegible]re time to attend to sanitary works in addition to th[illegible]prdut[illegible]

5. Of cos th[illegible]isio[illegible] [illegible]corresponding to the Public Works circles is only a suggion, [illegible]e [illegible]ircles will have to depend on the amount of work and [illegible]maxm[illegible]hat can be employed. All these details will have to b[illegible]orke[illegible]t[illegible]ral suggestions be approved.

6. From [illegible]st o[illegible]rks [illegible]y Engineer's Department submitted with Mr. Jones' lett[illegible]datedd April 1895, N[illegible]929, to the Chief Secretary to Government, it would appea[illegible]hat [illegible]he work is divid according to Public Works circles there would be work I Cir[illegible]only, in Vizagpatam and Vizianagram.

7. In II Cle, Be[illegible]ada, Masulipatn, Guntúr, Ellore, Ongole; so that I and II Public Works [illegible]cles mht form one cir[illegible]e for sanitary works, and so on.

8. But if [illegible]propols are t[illegible]e adted it would be better to deal with all the towns in one cir[illegible]requring wa[illegible]er-supply and drainage before taking up the next. It may be argu[illegible]as a [illegible]ason against [illegible]y proposals that urgent works outside the circle of operatis migt have to be [illegible]sponed till the works in the circle were completed. Buts the towns have go[illegible]for hundreds of years without a water-supply and draize sch[illegible]me, there will [illegible]eldom be any case in which the work is really urgent, an[illegible]f sucha case does oc[illegible], a special establishment can be employed for the time bein[illegible] As [illegible]egards the wo[illegible]s actually in progress, I think they should be carried on as [illegible]presen[illegible], extra assista[illegible]being given to the Sanitary Engineer if required.

9. Should [illegible]m proposals not be [illegible]proved, and it be still deemed advisable to entrust the execu[illegible]on of all sanitary [illegible]rks to the Public Works Department, the questions put by [illegible]. Jones in paragrap[illegible].8 can be answered as follows:—

(1) The [illegible]spifications and sched[illegible]es for schemes should be prepared by the Sanitary Engineer [illegible]ho is to draw up th[illegible]schemes.

(2) Trifling alterations in design can be sanctioned by the Superintending Engineer of the circle, material alterations proposed should be submitted by the Superintending Engineer to the Chief Engineer who, if he thinks advisable, will refer to the Sanitary Engineer for opinion.

(3) The Sanitary Engineer will not be required to visit and report on schemes under execution, the Superintending Engineer and Executive Engineer will do that duty.

(4) As the works will be under the Public Works Department, the rules in force in that department regarding tender for English supplies will be adhered to.

10. Mr. Jones further raises the question of the maintenance of completed schemes, and I must say that I agree with him that it will be a fatal mistake to hand over the care of completed schemes to the Municipalities concerned; but I doubt if it would be possible to carry out his suggestions. The question of improving the status and efficiency of the Local Fund Engineers is now under consideration and it is possible that these officers might be made to look after completed water-supply and drainage works, contribution for this purpose being made by the Municipalities who benefit thereby.

(Signed) D. McNEIL CAMPBELL, Col., R.E.,
Chief Engineer, P.W.D.

5th February 1896.

ENCLOSURE.

From J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E., Sanitary Engineer to Government, to the Chief Secretary to Government (through the Chief Engineer, Public Works Department), dated Fort St. George, 29th January 1896, No. 261.

With reference to G.O., No. 2073 M., dated 9th December 1895, I have the honour to request that Government will be pleased to consider the following remarks which I venture to submit after careful consideration of the consequences that, I fear, will follow the changes ordered and because the interests involved are such that I consider Government should be in possession of the following views—views which, I have not hitherto had an opportunity of laying before Government; I regret that Colonel Pennycuick has retired, because had he still been here, I feel sure, he would have given them his earnest consideration.

2. It might be understood from the tenor of the Government Order under reference that I had desired and advocated the changes, but it will be seen from a perusal of my letter embodied in the Government Order in question, that I have never advocated that the work of the Sanitary Engineer should be limited in the manner lately sanctioned. At the same time it is right to say that I, as a member of the Sanitary Board, acquiesced in a proposal made by the Sanitary Board that the work should be so limited, but this was because I saw it was hopeless under the then existing régime of the Public Works Department to obtain assistance from that department by method of temporary transfers. Whether other counsels prevail now I am not in a position to say, but I suggest that the policy is possible of reversal or modification, and thus many of Colonel Pennycuick's objections to the existing system would be met.

3. In fact this was the original intention of Government as may be seen by a perusal of G.O., No. 1838 M., dated 26th October 1891, wherein it is ordered that "supervisors and overseers required for the permanent staff referred to by the Sanitary Engineer as class (A) should, if possible, be obtained from the Public Works Department."

4. Government will learn from a perusal of past correspondence that I have never asked to be relieved of any portion of the duties until lately appertaining to me, but that I have, on the other hand, merely desired to carry out these duties in an efficient manner, which could be done only by an increase in staff.

5. I beg to submit to Government that the refusal to grant this extra staff cannot have been on financial grounds, because the cost of any staff granted is recouped from the body for whom the works are being carried out as will still be the case in the proposed arrangement for the Public Works Department to execute works. I further submit that if the works already executed had been so by the Public Works Department the following would have been the financial result, that is, that the acceptance of Colonel Pennycuick's terms or proposals will, for a similar amount of work in the future, entail on the local bodies concerned an increased contribution amounting to Rs. 88,000 under one alternative or Rs. 1,15,000 under the other. This over say about five years actual expenditure is Rs. 23,000 a year and that is an amount which would pay for three more Assistant Engineers than that at present.

No.	Town.	Actual cost of work.	Actual cost of pipes, machinery and lands.	Net cost of work (*i.e.*, the difference between columns 3 and 4).	Contribution required by the P.W.D., at 24½ per cent. on net cost of work—column 5.	Estimated cost of work.
1	2	3	4	5	6	7
		Rs.	Rs.	Rs.	Rs.	Rs.
1	Adóni	1,58,119	87,325	70,794	17,344	1,62,000—Water-supply
2	Coonoor	41,840	..	41,840	10,250	48,000—Drainage.
3	Cuddapah	17,556	9,347	8,209	2,011	19,385—Water-supply
4	Kumbakónam	1,12,134	35,521	76,613	18,770	1,10,000—Drainage.
5	Madura	3,94,485	2,19,152	1,75,333	42,956	3,91,000—Water-supply
6	Tanjore	4,23,953	2,27,542	1,96,411	48,120	4,47,120 do.
7	Trichinopoly	* 5,20,000	2,84,664	2,35,336	57,657	5,20,000 do.
	Total ..	16,68,087	8,63,551	8,04,536	1,97,108	16,97,805

No.	Town.	Contribution required by the P.W.D., on the estimated cost of work—column 7.		Cost of establishment actually incurred by the Sanitary Engineer when executed under his supervision.	Difference between columns 6 and 10.	Difference between columns 9 and 10.
		Percentage.	Amount.			
		8	9	10	11	12
			Rs.	Rs.	Rs.	Rs.
1	Adóni	12½	20,250	8,259	9,085	11,991
2	Coonoor	20	9,600	5,017	5,233	4,583
3	Cuddapah	12½	2,423	2,194	— 183	229
4	Kumbakónam	20	22,000	17,591	1,179	4,409
5	Madura	12½	48,875	21,870	21,086	27,005
6	Tanjore	12½	55,927	24,135	23,985	31,792
7	Trichinopoly	12½	65,000	29,766	27,897	35,240
	Total ..	..	2,24,075	1,08,826	88,282	1,15,249

* Approximate—work in progress.

6. Therefore the transfer to the Public Works Department of the execution of works does not find justification on financial grounds.

7. Colonel Pennycuick's strongest point for the transfer is that the Sanitary Engineer cannot give the proper supervision. I am unaware on what grounds he came to this conclusion, but I can conscientiously say that none of the works up to date have lacked proper supervision nor have suffered from want of proper supervision.

8. The next point to which I wish to request the attention of Government is that, while the Public Works Department have never been able, or more properly I might say willing to lend the services of officers to this department, it is proposed to give the work to the officers of that department. From this it can be deduced that unwillingness to afford the assistance asked on several occasions and not inability to do so was the cause of refusal. If now the works can be undertaken without extra staff, which is a matter of doubt (even by Colonel Pennycuick himself), the officers of the Public Works Department must either have not enough work at present, a premise unlikely to be agreed to, or else the work of executing the Sanitary Engineer's schemes will not have that care and attention they require, and this is more likely to be the case. But there is the likelihood that extra staff (under the powers of the Chief Engineer) will be engaged from time to time, so that it comes to this, that extra staff will be used by the Public Works Department while the execution of works has been taken away from the Sanitary Engineer because extra staff is required.

9. It is not consistent with Colonel Pennycuick's objection against the employment of temporary staff in the Sanitary Engineer's Department to propose to employ temporary men in Public Works Department for the same purpose, and if these proposals mean that those temporary men would be put in permanent posts of the Public Works Department and thus allow of the alienation of the services of higher grade officers to sanitary schemes, the same plan was possible of adoption when the Sanitary Engineer wanted the services of members of Public Works Department staff, such an arrangement can be made now and all objection to the existing state of things would then disappear while the work would be much more cheaply done, and I venture to add efficiently done, and supervised than under the proposal recently sanctioned.

10. I would quote here from a report to Government by Colonel A. C. Smith, Acting Chief Engineer, and myself, a portion which could only have been written on Colonel Smith's authority.

"It is thought that the proposal that the works when designed and estimated by the Sanitary Engineer and duly approved by Government should be carried out by Executive Engineers of Divisions will not be at all a satisfactory arrangement, for—

Works of this class require *constant*, if not *continuous* supervision and it will be impossible for an Executive Engineer of the Public Works Department, who now-a-days has so large a charge that it takes him a year to see the whole of it, to devote sufficient time for this purpose.

It is always very difficult in this class of work to carry out, without constant reference, the plans and estimates made by others.

There would be a dual control—no man can serve two masters—on the one hand the Superintending Engineer of the circle would have just cause for complaint if the Executive Engineer neglected, as he would be obliged to do, his own proper work in order to supervise work for the Sanitary Engineer, and the latter would undoubtedly grumble if his work was either not carried on expeditiously or scamped in the absence of proper supervision.

Then again the Sanitary Enginer would be quite justified in declining all responsibility in the results of his designs if he were not placed in the position of a Superintending officer with powers to alter or modify such designs, for in these kind of works it is impossible to foresee all requirements.

Then as regards the position of the Chief Engineer, Public Works Department, with regard to the Sanitary Department, if he is to scrutinise or revise the designs and lend his officers to the Sanitary Department to carry them out in case of failure or misadventure, the Public Works Department would be held to blame, though, as is above shown, it will be impossible for it to undertake such works satisfactorily.

Taking all these things into consideration, it is thought advisable to make the Sanitary Engineer and his department totally independent of the Public Works Department as far as designing and execution of work is concerned, except, of course, that the Chief Engineer, Public Works Department, should act as adviser to the Government on all schemes they may wish to consult him about."

11. In these sentences will be found, I venture to say, an endorsement of the views I have already set forth and they also include what is to my mind a very potent argument against the possibility of the arrangements ordered being in any way a success. I refer to the question of dual responsibility.

12. Under the new arrangement the plans framed by the Sanitary Engineer will have the approval of the Sanitary Board which at present includes the Chief Engineer. So long as the Chief Engineer is the President of the Board, there is an incidental security that the designs, &c., passed will be carried out to a greater or less extent. But in no Engineer's experience and certainly not in mine is it the case that the designs of one Engineer will be completely accepted or satisfactorily carried out by another. The Public Works Department have already experience of this in regard to the tank maintenance scheme. Any Engineer receiving the design of another to carry out would have his first thoughts directed to amendment whether an improvement or not would remain to be seen, such amendments under present order of Government could not be sent back to the Sanitary Engineer for approval, or the Sanitary Engineer would be in the relation of a Superintending Engineer to an Executive Officer of the Public Works Department, and therefore the Superintending Engineer, Public Works Department, would have to approve or otherwise of such amendments, or they would eventually reach the Chief Engineer who might or might not have approved of the original plans. For any amendments or alteration the Sanitary Engineer could in no way be held responsible, and therefore in no way for the success or failure of any scheme.

13. In addition to this there will be a considerable additional and continuous correspondence needed when the design of one Engineer is carried out by another and this point and that point must come back for elucidation, &c. Such correspondence would be of the most unsatisfactory character and the Sanitary Engineer would not be in a position to suggest alterations himself in the design as his experience does suggest as work proceeds because it is a portion of his duty which Government have determined to relieve him. No work has ever been carried out exactly as designed. Therefore every scheme will be more or less amended by other persons than its author—by persons having less interest and less skill in that particular class of work and the result must be such that the Sanitary Engineer can have no dependence that his schemes will be in any case carried out as designed and approved.

14. It may be brought forward as an argument that the designs of the Consulting Architect to Government are so carried out; but any that are so are works of a less technical nature and of a character allied to those which a Public Works Department officer usually executes.

15. Again, with the plant and materials being ordered by each individual officer unless it is ordered that the type designs of the Sanitary Engineer are to be adhered to in all cases, the works will not have that uniformity of design and in the class of materials used such as valves,

fountains, pipes, &c., as are now maintained throughout the Presidency, so that such materials are interchargeable and one municipality may in times of emergency borrow from another nor are Public Works officers, who do not devote special attention to such works, likely to be acquainted with the best class of materials and design such as it is the special duty of this department to keep itself acquainted with; nor will individual Public Works Department officers have the same facility or opportunity of borrowing and using plant and stores of one municipality by another simply because they cannot have the knowledge of the plant already used and which may be used by another officer. In short, there will be a loss of centralization to a great extent.

16. One reason for the proposal to create the office of Sanitary Engineer was because the Public Works officers could not find time to get up schemes (and therefore it may be reasonably supposed they had not time to devote to their execution). This has not been found to be the case in other Presidencies and where the Public Works Department executes schemes as in Bombay, they also draw them up and the duty of the Sanitary Engineer and Sanitary Board is only to review and amend such schemes so that the design and execution of the schemes are not divided from each other as is now ordered to be done in this Presidency. It is a well-known axiom that the best person to carry out a scheme is its designer and that he alone can do it justice.

17. I venture to place these remarks before Government. They are disinterested, as far as I am personally concerned, because the result of the order under reference is to lessen my work and therefore only because I very strongly believe that the proposal and its acceptance has been made without a consideration of the facts which I have now placed before Government, do I send them forward.

18. I am sending this letter through the Chief Engineer, Public Works Department, for his remarks thereon, and should Government still consider that the order already issued should not be modified, I have to ask that the following points may be decided:—

(1) By whom the specification and schedules for schemes should be prepared—by this office or by the Public Works Department?

(2) To whom proposals for amendments of schemes framed by the Sanitary Engineer and approved by the Sanitary Board and sanctioned by Government should be made, and whether reference is to be made to the Sanitary Engineer in reference to such proposed amendments?

(3) Whether the Sanitary Engineer should visit and report on the schemes under execution and make suggestion to the officer in charge for alteration admissible, &c.?

(4) Whether this department or the Public Works Department are to obtain tenders for English materials, and, if so, through the Secretary of State, or through the Sanitary Engineer's Agents (Messrs. Henry S. King and Co.), or by tender in India?

19. Government have also decided in the order under reference that no aid can be given to municipalities to maintain schemes in working order, and as to this also I ask permission to make a few remarks.

20. Government are aware that no mofussil municipality has an Engineer and I venture to submit that without professional supervision none of the works in operation can be maintained, even with the best endeavour of Municipal Councils, in the order they ought to be. The necessity for proper supervision of engineering works is one that has never been disputed, and in England no water or drainage works, on which the health of the people so materially depends, are without the attendance of a duly-qualified Engineer.

21. In the Resolution of the Government of India recently issued in regard to a re-organization of the Sanitary Department it is proposed that there should be a Health officer for a group of towns to aid committees in proposing sanitary improvements; but these could be carried out only by professional agency. The principle therefore of a group of municipalities having the services of an Engineer is one that finds its analogy in that proposal and I cannot but think that an Assistant Sanitary Engineer is no less necessary than a Health officer in any improvement of the Sanitary Department.

22. It is a proposal made to Government some years ago and the proposal of the Government of India as to Health officer would seem almost to carry with it the necessity for an Engineering officer who would, as a colleague, control the same areas. The cost of a staff, say, of three Assistant Sanitary Engineers who would look after the execution of not only the major but all the minor works, would cost very little, even if Government made no provision from Provincial funds. Three Assistant Sanitary Engineers at an average of Rs. 700 + 100 travelling allowance monthly would amount to $12 \times 800 \times 3 = 28,800$ annually, and this divided over 56 municipalities would be under Rs. 500 a year. A sum of Rs. 1,000 might be payable by some municipalities and others only Rs. 100 or so, but the benefit obtained would be large in proportion to the assistance which would be rendered, and I am also of opinion that the financial result to municipalities by having their schemes properly carried out would more than cover the cost of the staff.

23. I need not say that I have already taken steps to hand over the completed water-works to the care of the Municipal Councils concerned, but I have done so with much regret and with little doubt as to the ultimate result of their being taken away from our care. It is as if when a railway line was complete the traffic branch of a railway were left to not only work the line but maintain it. The engines and pumps of water-works, &c., it is true, will receive two inspections annually, but reservoir, head-works, filters, pipes and valves, &c., are left in the hands of persons with no professional knowledge whatever nor has provision been made for annual inspection of the work or for provisions against additions or alterations to a system being made without the previous sanction of this department which alone has the knowledge to decide whether and where extension, &c., can be made without detriment to the original and existing system. These perhaps are points in which Government may now desire to pass further orders should no reconsideration of the method of supervising works in operation be deemed necessary or feasible.

24. Government have, while not granting an Assistant Engineer, rendered it possible for Mr. Minchin's services to be availed of to a greater and greater extent as the works now under construction are completed; and this arrangement is one that, under present orders, meets the request made for extra assistance.

25. At present as Government are aware the pay and travelling allowance of Assistant Sanitary Engineer are recouped eventually from the councils for whom the works are being executed, but when Mr. Minchin is employed on investigation, &c., there will be no estimates from which his pay can be provided for. Some schemes may never be executed, others not so for many years and there will be intervals between his services on one scheme and another which it will be difficult to debit to any municipality. This is brought to notice because the expenditure and receipts for staff will not balance eventually as they would do under existing arrangements, and I therefore request to be informed if this is understood and approved of by Government.

MEMORANDUM.

No. 734-C., Public Works.

Transferred to the Local and Municipal Department.

10*th February* 1896. (Signed) D. McNEIL CAMPBELL, Col., R.E.,
Joint Secretary to Government, P.W.D.

To the Local and Municipal Department, with letter No. 261, dated 29th January 1895, from the Sanitary Engineer to Government, returned

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From J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E., Sanitary Engineer to Government, to the Chief Secretary to Government (through the Chief Engineer, Public Works Department), dated Fort George, 14th February 1896, No. 463.

In continuation of my letter No. 261 of the 29th ultimo, I have the honour to forward herewith an extract from the Report on the Sanitary Works of the North-Western Provinces and Punjab by the Sanitary Engineer to Government of Bombay and Member of the Sanitary Board of that Presidency. The opinion of this very senior officer of the Public Works Department of that Presidency emphasises very strongly the opinion expressed in my letter above quoted.

ENCLOSURE.

EXTRACT from the Report on the Sanitary Works of the North-Western Provinces and Punjab.

* * * * * *

Up to the time that Sir Auckland Colvin became Lieutenant-Governor of the North-Western Provinces in 1887, all sanitary works had been carried out by the Public Works Department as they are still elsewhere in India except in Madras. The difficulties and delays of this system, caused by want of the special knowledge on the part of most of the Executive Engineers and the difficulty for them to spare sufficient time from their ordinary duties, and also the apathy and obstruction of the municipalities, which are still apparent elsewhere, caused him to appoint a special officer for supervising all such works and he also passed the Water Works Act I of 1891.

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The water-works of the larger towns were carried out in the following order:—Agra, Allahabad, Benares, Cawnpore and Lucknow. Agra, Cawnpore and Benares are now carrying out drainage works and Meerut is now having water-works; the average time for each was only about two years although the cost varied from 12 to 25 lakhs. All the works were carried out by large contractors which accounts for the rapidity of construction to a great extent. The Punjab works of a similar nature done under the old system present a most striking contrast. In the few cases where water has been supplied, *i.e.*, Umballa Cantonment, Delhi, Lahore and Peshawar, the designs were altered and re-altered during construction the works extended over many years, and in the cases of Umballa Cantonment and Delhi they are a decided failure. Umballa city is now having its water-works made, and as an Engineer who has been specially trained in that branch is in charge it will probably be a success. In all the Punjab works the neglected and *unfinished* look of the head-works is most striking; whilst in the case of the North-Western Provinces they compare favourably with similar works in England in neatness and finish, and there has been none of the subsequent complaint or trouble that has resulted from every one of the Punjab works.

* * * * *

Part I is well on towards completion, but it is impossible to say when the various independent estimates for the different bazaars of Part II can be done under the system in force in the Punjab, the Local Executive Engineer is supposed to do all sanitary works in addition to his own proper work; and if this is adhered to as regards Part II, the twentieth century will be far advanced before the project is completed, if indeed it ever is. It is, I think, quite impossible that any Executive Engineer with a large district could possibly give up the time required for such a work for such a city; and the getting up of the project must drag on wearily from one Executive Engineer to another as transfers occur, involving loss of continuity of thought and design and if ever finished the result must be an unsatisfactory patch-work. It will be interesting to note the difference of results in Cawnpore where the drainage is being worked out and carried out by a Special Public Works Department Engineer who has had a special training in this branch and who is working direct under the Sanitary Engineer.

* * * * *

No. 941-C.

Forwarded to the Local and Municipal Department in continuation of this office endorsement, No. 734-C., dated 10th February 1896.

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

18*th February* 1896.

ORDER—No. 847 M., dated 15th May 1896.

In the first of his letters read above the Sanitary Engineer asks for a reconsideration of the orders conveyed in G.O., No. 2073 M, dated 9th December 1895, defining the duties of his department. It has never been denied that if funds were abundant, the best plan would be to create a Sanitary Engineering Department complete in itself and strong enough not only to design works but also to carry them out. But this plan being unfortunately not feasible on financial grounds, it was decided, after much discussion and consideration, to adopt the scheme laid down in G.O., No. 2073 M., dated 9th December 1895, the execution of the works being entrusted to the Public Works Department, and the duty of designing them to the Sanitary Engineer. The scheme is not free from objections, but has been determined by financial limitations and by what the Government considers to be sufficient for the actual requirements of sanitary projects at the present time. It was settled after due deliberation and must be adhered to until it shall prove to be inadequate.

2. In forwarding Mr. Jones' letter, the Chief Engineer has suggested a means of considerably reducing the cost of a separate department. This is to group municipalities into circles and to centralize in one circle all the works being carried on at one time, so that their supervision could be undertaken by a very small staff. While these works were being executed, designs and estimates for works in the next circle would be prepared and the works taken up on completion of those in the first circle.

The execution of sanitary projects cannot, however, follow any such procrustean order or distribution; and for this and other reasons the Government considers that the proposal is impracticable.

3. Mr. Jones further submits certain questions arising out of the orders in G.O., No. 2073 M., dated 9th December 1895, and requests that he may be favoured with orders on them in the event of Government being unwilling to reconsider that Government Order. The questions, four in number, are dealt with in paragraph 9 of the Chief Engineer's memorandum, with whose conclusions Government agrees with slight modifications. The points as answered by Government are as follows:—

(1) By whom should the specification and schedules for schemes be prepared—by this office or by the Public Works Department?

They should be prepared by the Sanitary Engineer, whose duty it is to draw up the schemes.

(2) To whom should proposals be made for amendments of schemes framed by the Sanitary Engineer and approved by the Sanitary Board and sanctioned by Government, and should reference be made to the Sanitary Engineer in regard to such proposed amendments?

Trifling alterations in design may be sanctioned by the Superintending Engineer of the Circle, but material alterations should be submitted by the Superintending Engineer for the orders of the Chief Engineer, who will consult the Sanitary Board if and when he thinks fit to do so.

(3) Should the Sanitary Engineer visit and report on the schemes under execution and make suggestions to the officer in charge for alterations admissible, &c.?

The Sanitary Engineer will not be required to visit and report on schemes in course of execution. If the executive department entrusted with the work meets with difficulties it may freely consult the Sanitary Board who may, if necessary, obtain a report from the Sanitary Engineer.

(4) Should the Sanitary Engineer or the Public Works Department obtain tenders for English materials, and, if so, through the Secretary of State or through the Sanitary Engineer's Agents (Messrs. Henry S. King and Co.,) or by tender in India?

It has already been distinctly decided that the plant should be obtained by the Public Works Department, and therefore the rules in force in that department regarding tender for English supplies will be followed.

4. The last point brought forward by the Sanitary Engineer is the question of maintenance of existing water-supply and drainage schemes. Government has decided that this must be left to municipalities, as in the course of a few years the increasing number of schemes would preclude the possibility of their maintenance by Government. As, however, municipal schemes have been largely assisted by Government, it is advisable that some control should be exercised over municipalities in their upkeep, and this can best be secured by periodical inspections. The Sanitary Engineer himself or his Assistant will therefore be requested to inspect each work once a year at least and bring to the notice of Government any defects that may be found with the remedies suggested. The Public Works Department will also be requested to arrange for a half-yearly inspection of these works by the Executive Engineer of the division in which they are situated. This course, together with the two annual inspections of engines, pumps, &c., by the Boiler Inspector will, it is hoped, be sufficient to ensure the machinery and plant being maintained in proper order by the local authorities.

5. There remains the question of the rate at which the municipalities should contribute to the Public Works Department for the cost of supervision. Two rates appear to have been proposed by Colonel Pennycuick, in one place (paragraph 3 of note in G.O., No. 2073 L., dated 9th December 1895) the ordinary Public Works Department charge of $24\frac{1}{2}$ per cent. on the expenditure on works, exclusive of charges for land and stores imported from England, and in another place (paragraph 11 of note in G.O., No. 2380 L., dated 16th November 1894) $12\frac{1}{2}$ per cent. on the total of estimates for water-supply and 20 per cent. on those for drainage. In the former

case it is not stated what charges are to be covered by the rate proposed, while in the latter the 12½ and 20 per cent., respectively, are to cover all charges for supervision of work and also preparation of estimates. As this last-mentioned work is to be carried out by the Sanitary Engineer, there does not seem to be any reason why any charge should be made by the Public Works Department on this account. What charge should be made for supervision of work is a question open to doubt and dispute, of which it would be extremely difficult to find a settlement satisfactory to all parties. However, inasmuch as practically in every case half the cost of the works is met from Provincial funds, whatever may be the rate that is determined on, half of the sum recovered will merely be transferred from one side of the Provincial account to the other, *i.e.*, from 45. Civil Works—Miscellaneous Public Improvements—to XXXII. Civil Works. Under these circumstances the Government considers that the best way to settle the question will be to make no charge on municipalities for supervision of the works executed, and this plan will accordingly be adopted in future.

(True Extract.)

Under Secretary, P.W.D.,
for *Chief Secretary.*

To the Public Works Department.
" Joint Secretary, Sanitary Board (Engineering Branch).
"
" Sanitary Engineer. " " (Sanitary Branch).
" Sanitary Commissioner.
To all Chairmen of Municipal Councils.
" all Collectors.
" all Presidents of District Boards.
" President, Municipal Commission, Madras.

Exd. C. M. Brisson.

Govt. of {1896} Madras.

LOCAL AND MUNICIPAL.

Issued

Recd. *Encl.*

G.O., No. 847 M., 15th May 1896.

MAY.

Sanitary Works.

Declining, with remarks, to reconsider G.O., No. 2073 M., dated 9th December 1895, regarding the execution of —, and passing orders on certain questions raised by the Sanitary Engineer and the Public Works Department in connection with the preparation of specification and schedules for such works, the amendment of schemes, &c.

No. 847 M., 15TH MAY 1896.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—again the following paper :—

G.O., No. 2073 M., dated 9th December 1895.

ABSTRACT.—Passing orders about the appointment of an additional Assistant Sanitary Engineer, and ordering that the execution of the next water-supply or drainage scheme be entrusted to the Public Works Department.

READ—also the following papers :—

Office-note from the Honourable Colonel D. McNEIL CAMPBELL, R.E., Joint Secretary to Government, Public Works Department, to the Chief Secretary to Government, dated Madras, 11th January 1896, No. 172-C.

With reference to orders in the Local and Municipal Department, No. 2073 M., dated 9th December 1895, please let me know whether further orders may be expected on the subject of the contributions payable to the Public Works Department for the execution of sanitary works for Municipalities. In paragraph 3 of his office-note, No. 3268-C., dated 2nd November 1895, Colonel Pennycuick proposed a scale of charges which he considered suitable ; but the order thereon in the Local and Municipal Department makes no reference to this matter.

Note by the Chief Engineer, Public Works Department.

The best manner of dealing with the organisation of the Sanitary Engineering Department has been under discussion for several years and there are some conflicting orders on the subject ; but it was finally decided in G.O., No. 2073 M., dated 9th December 1895, that the work of the Sanitary Engineer should be confined to investigating water-supply, drainage, &c., projects, and drawing up the necessary plans and estimates which should be submitted to Government through the Sanitary Board. The construction of the works, and obtaining the plant, required for the next project of the description to be carried out, was to be entrusted to the Public Works Department.

2. Mr. Jones, the Sanitary Engineer, now requests that Government will be pleased to reconsider that order.

3. The reasons that led to the passing of the order objected to by Mr. Jones were that, owing to the rapid increase of sanitary works, it was found necessary to increase the Engineering establishment, and Colonel Pennycuick was of opinion that it was not advisable to lend officers and subordinates from this department to work under the orders of the Sanitary Engineer, and that it would be better to put the execution of the works entirely under the Public Works Department. There seems to me to be objections both to lending men to the Sanitary Engineer and also to carrying out the work by the ordinary Public Works Department establishment, and it really amounts to a choice of two evils, both of which are necessitated by

financial considerations, and the question is which is the lesser evil of the two. The objections to lending men are that it is doubtful if they could be spared, and, as Colonel Pennycuick states, there would be partial responsibility in giving advice and lending subordinates for work nominally under the control of another department. The objections to giving the execution of works to the Public Works Department are given in Mr. Jones' letter, and with these objections, I agree as also did Colonel A. C. Smith when he was officiating Chief Engineer. In my opinion the only satisfactory solution of the question is to make the Sanitary Engineering Department, entirely independent, somewhat on the lines indicated in the note by Colonel A. C. Smith and Mr. Jones. The separation of the department is all the more necessary as Sanitary Engineering is a special branch of the profession.

On G.O. Mis. No. 479 M., of 2nd April 1891.

4. Colonel Pennycuick says himself that this would be the most satisfactory arrangement, but is of opinion that it is altogether out of the question on financial grounds, and no doubt it would be if sanitary works are to be carried out as at present, that is all over the presidency from Ganjám to Cape Comorin and Malabar; but I see no reason why sanitary works should not be carried out by areas, that is, suppose each of the Public Works Department circles were taken up in turns and the water-supply and drainage projects in each completed before those in the next were begun. The establishment required would then be very small. Mr. Jones would be the Superintending Engineer of the circle as regards sanitary works and with one Executive Engineer and three Assistant Engineers and some subordinates he should be able to carry out all the required works, and I don't think the cost would be more than at present. While the works in one circle were under execution, Mr. Jones could be preparing plans and estimates for the works required in the next. I believe that the works would be much better supervised than at present when they are scattered all over the presidency, and it must be remembered that there are few works that require such close supervision as water-works, and I am doubtful if members of the Public Works establishment could spare time to attend to sanitary works in addition to their present duties.

5. Of course the division into circles corresponding to the Public Works circles is only a suggestion, as the extent of the circles will have to depend on the amount of work and the maximum establishment that can be employed. All these details will have to be worked out should the general suggestions be approved.

6. From a list of works in the Sanitary Engineer's Department submitted with Mr. Jones' letter, dated 3rd April 1895, No. 929, to the Chief Secretary to Government, it would appear that if the work is divided according to Public Works circles there would be work in I Circle only, in Vizagapatam and Vizianagram.

7. In II Circle, Bezwada, Masulipatam, Guntúr, Ellore, Ongole; so that I and II Public Works circles might form one circle for sanitary works, and so on.

8. But if my proposals are to be adopted it would be better to deal with all the towns in one circle requiring water-supply and drainage before taking up the next. It may be argued as a reason against my proposals that urgent works outside the circle of operations might have to be postponed till the works in the circle were completed. But, as the towns have gone for hundreds of years without a water-supply and drainage scheme, there will seldom be any case in which the work is really urgent, and if such a case does occur, a special establishment can be employed for the time being. As regards the works actually in progress, I think they should be carried on as at present, extra assistance being given to the Sanitary Engineer if required.

9. Should my proposals not be approved, and it be still deemed advisable to entrust the execution of all sanitary works to the Public Works Department, the questions put by Mr. Jones in paragraph 18 can be answered as follows:—

(1) The specifications and schedules for schemes should be prepared by the Sanitary Engineer who is to draw up the schemes.

(2) Trifling alterations in design can be sanctioned by the Superintending Engineer of the circle, material alterations proposed should be submitted by the Superintending Engineer to the Chief Engineer who, if he thinks advisable, will refer to the Sanitary Engineer for opinion.

(3) The Sanitary Engineer will not be required to visit and report on schemes under execution, the Superintending Engineer and Executive Engineer will do that duty.

(4) As the works will be under the Public Works Department, the rules in force in that department regarding tender for English supplies will be adhered to.

10. Mr. Jones further raises the question of the maintenance of completed schemes, and I must say that I agree with him that it will be a fatal mistake to hand over the care of completed schemes to the Municipalities concerned; but I doubt if it would be possible to carry out his suggestions. The question of improving the status and efficiency of the Local Fund Engineers is now under consideration and it is possible that these officers might be made to look after completed water-supply and drainage works, contribution for this purpose being made by the Municipalities who benefit thereby.

(Signed) D. McNEIL CAMPBELL, Col., R.E.,
Chief Engineer, P.W.D.

5th February 1896.

ENCLOSURE.

From J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E., Sanitary Engineer to Government, to the Chief Secretary to Government (through the Chief Engineer, Public Works Department), dated Fort St. George, 29th January 1896, No. 261.

With reference to G.O., No. 2073 M., dated 9th December 1895, I have the honour to request that Government will be pleased to consider the following remarks which I venture to submit after careful consideration of the consequences that, I fear, will follow the changes ordered and because the interests involved are such that I consider Government should be in possession of the following views—views which I have not hitherto had an opportunity of laying before Government; I regret that Colonel Pennycuick has retired, because had he still been here, I feel sure, he would have given them his earnest consideration.

2. It might be understood from the tenor of the Government Order under reference that I had desired and advocated the changes, but it will be seen from a perusal of my letter embodied in the Government Order in question, that I have never advocated that the work of the Sanitary Engineer should be limited in the manner lately sanctioned. At the same time it is right to say that I, as a member of the Sanitary Board, acquiesced in a proposal made by the Sanitary Board that the work should be so limited, but this was because I saw it was hopeless under the then existing régime of the Public Works Department to obtain assistance from that department by method of temporary transfers. Whether other counsels prevail now I am not in a position to say, but I suggest that the policy is possible of reversal or modification, and thus many of Colonel Pennycuick's objections to the existing system would be met.

3. In fact this was the original intention of Government as may be seen by a perusal of G.O., No. 1838 M., dated 26th October 1891, wherein it is ordered that "supervisors and overseers required for the permanent staff referred to by the Sanitary Engineer as class (A) should, if possible, be obtained from the Public Works Department."

4. Government will learn from a perusal of past correspondence that I have never asked to be relieved of any portion of the duties until lately appertaining to me, but that I have, on the other hand, merely desired to carry out these duties in an efficient manner, which could be done only by an increase in staff.

5. I beg to submit to Government that the refusal to grant this extra staff cannot have been on financial grounds, because the cost of any staff granted is recouped from the body for whom the works are being carried out as will still be the case in the proposed arrangement for the Public Works Department to execute works. I further submit that if the works already executed had been so by the Public Works Department the following would have been the financial result, that is, that the acceptance of Colonel Pennycuick's terms or proposals will, for a similar amount of work in the future, entail on the local bodies concerned an increased contribution amounting to Rs. 88,000 under one alternative or Rs. 1,15,000 under the other. This over say about five years actual expenditure is Rs. 23,000 a year and that is an amount which would pay for three more Assistant Engineers than that at present.

No.	Town.	Actual cost of work.	Actual cost of pipes, machinery and lands.	Net cost of work (*i.e.*, the difference between columns 3 and 4.)	Contribution required by the P.W.D., at 2½ per cent. on net cost of work—(column 5.)	Estimated cost of work.
1	2	3	4	5	6	7
		Rs.	Rs.	Rs.	Rs.	Rs.
1	Adóni	1,58,119	87,325	70,794	17,344	1,62,000—Water-supply
2	Coonoor	41,840	..	41,840	10,250	48,000—Drainage.
3	Cuddapah	17,556	9,347	8,209	2,011	19,385—Water-supply
4	Kumbakónam	1,12,134	35,521	76,613	18,770	1,10,000—Drainage.
5	Madura	3,94,485	2,19,152	1,75,333	42,956	3,91,000—Water-supply
6	Tanjore	4,23,953	2,27,542	1,96,411	48,120	4,47,420 do.
7	Trichinopoly	* 5,20,000	2,84,664	2,35,336	57,657	5,20,000 do.
	Total ..	16,68,087	8,63,551	8,04,536	1,97,108	16,97,805

No.	Town.	Contribution required by the P.W.D., on the estimated cost of work—column 7.		Cost of establishment actually incurred by the Sanitary Engineer when executed under his supervision.	Difference between columns 6 and 10.	Difference between columns 9 and 10.
		Percentage.	Amount.			
		8	9	10	11	12
			Rs.	Rs.	Rs.	Rs.
1	Adóni	12½	20,250	8,259	9,085	11,991
2	Coonoor	20	9,600	5,017	5,233	4,583
3	Cuddapah	12½	2,423	2,194	— 183	229
4	Kumbakónam	20	22,000	17,591	1,179	4,409
5	Madura	12½	48,875	21,870	21,086	27,005
6	Tanjore	12½	55,927	24,135	23,985	31,792
7	Trichinopoly	12½	65,000	29,766	27,897	35,240
	Total ..	..	2,24,075	1,08,826	88,282	1,15,249

* Approximate—work in progress.

6. Therefore the transfer to the Public Works Department of the execution of works does not find justification on financial grounds.

7. Colonel Pennycuick's strongest point for the transfer is that the Sanitary Engineer cannot give the proper supervision. I am unaware on what grounds he came to this conclusion, but I can conscientiously say that none of the works up to date have lacked proper supervision nor have suffered from want of proper supervision.

8. The next point to which I wish to request the attention of Government is that, while the Public Works Department have never been able, or more properly I might say willing to lend the services of officers to this department, it is proposed to give the work to the officers of that department. From this it can be deduced that unwillingness to afford the assistance asked on several occasions and not inability to do so was the cause of refusal. If now the works can be undertaken without extra staff, which is a matter of doubt (even by Colonel Pennycuick himself), the officers of the Public Works Department must either have not enough work at present, a premise unlikely to be agreed to, or else the work of executing the Sanitary Engineer's schemes will not have that care and attention they require, and this is more likely to be the case. But there is the likelihood that extra staff (under the powers of the Chief Engineer) will be engaged from time to time, so that it comes to this, that extra staff will be used by the Public Works Department while the execution of works has been taken away from the Sanitary Engineer because extra staff is required.

9. It is not consistent with Colonel Pennycuick's objection against the employment of temporary staff in the Sanitary Engineer's Department to propose to employ temporary men in Public Works Department for the same purpose, and if these proposals mean that those temporary men would be put in permanent posts of the Public Works Department and thus allow of the alienation of the services of higher grade officers to sanitary schemes, the same plan was possible of adoption when the Sanitary Engineer wanted the services of members of Public Works Department staff, such an arrangement can be made now and all objection to the existing state of things would then disappear while the work would be much more cheaply done, and I venture to add efficiently done, and supervised than under the proposal recently sanctioned.

23. I need not say that I have already taken steps to hand over the completed water-works to the care of the Municipal Councils concerned, but I have done so with much regret and with little doubt as to the ultimate result of their being taken away from our care. It is as if when a railway line was complete the traffic branch of a railway were left to not only work the line but maintain it. The engines and pumps of water-works, &c., it is true, will receive two inspections annually, but the reservoir, head-works, filters, pipes and valves, &c., are left in the hands of persons with no professional knowledge whatever nor has provision been made for annual inspection of the work or for provision against additions or alterations to a system being made without the previous sanction of this department which alone has the knowledge to decide whether and where extension, &c., can be made without detriment to the original and existing system. These perhaps are points in which Government may now desire to pass further orders should no reconsideration of the method of supervising works in operation be deemed necessary or feasible.

24. Government have, while not granting an Assistant Engineer, rendered it possible for Mr. Minchin's services to be availed of to a greater and greater extent as the works now under construction are completed; and this arrangement is one that, under present orders, meets the request made for extra assistance.

25. At present as Government are aware the pay and travelling allowance of the Assistant Sanitary Engineer are recouped eventually from the councils for whom the works are being executed, but when Mr. Minchin is employed on investigation, &c., there will be no estimates from which his pay can be provided for. Some schemes may never be executed, others not so for many years and there will be intervals between his services on one scheme and another which it will be difficult to debit to any municipality. This is brought to notice because the expenditure and receipts for staff will not balance eventually as they would do under existing arrangements, and I therefore request to be informed if this is understood and approved of by Government.

MEMORANDUM.

No. 734-C., Public Works.

Transferred to the Local and Municipal Department.

10*th February* 1896. (Signed) D. McNEIL CAMPBELL, Col., R.E.,
Joint Secretary to Government, P.W.D.

To the Local and Municipal Department, with letter No. 261, dated 29th January 1896, from the Sanitary Engineer to Government, returned.

From J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E., Sanitary Engineer to Government, to the Chief Secretary to Government (through the Chief Engineer, Public Works Department), dated Fort George, 14th February 1896, No. 463.

In continuation of my letter No. 261 of the 29th ultimo, I have the honour to forward herewith an extract from the Report on the Sanitary Works of the North-Western Provinces and the Punjab by the Sanitary Engineer to the Government of Bombay and Member of the Sanitary Board of that Presidency. The opinion of this very senior officer of the Public Works Department of that Presidency emphasises very strongly the opinion expressed in my letter above quoted.

ENCLOSURE.

EXTRACT from the Report on the Sanitary Works of the North-Western Provinces and the Punjab.

* * * * *

Up to the time that Sir Auckland Colvin became Lieutenant-Governor of the North-Western Provinces in 1887, all sanitary works had been carried out by the Public Works Department as they are still elsewhere in India except in Madras. The difficulties and delays of this system, caused by want of the special knowledge on the part of most of the Executive Engineers and the difficulty for them to spare sufficient time from their ordinary duties and also the apathy and obstruction of the municipalities, which are still apparent elsewhere, caused him to appoint a special officer for supervising all such works and he also passed the Water Works Act I of 1891.

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The water-works of the larger towns were carried out in the following order:—Agra, Allahabad, Benares, Cawnpore and Lucknow. Agra, Cawnpore and Benares are now carrying out drainage works and Meerut is now having water-works; the average time for each was only about two years although the cost varied from 12 to 25 lakhs. All the works were carried out by large contractors which accounts for the rapidity of construction to a great extent. The Punjab works of a similar nature done under the old system present a most striking contrast. In the few cases where water has been supplied, *i.e.*, Umballa Cantonment, Delhi, Lahore and Peshawar, the designs were altered and re-altered during construction the works extended over many years, and in the cases of Umballa Cantonment and Delhi they are a decided failure. Umballa city is now having its water-works made, and as an Engineer who has been specially trained in that branch is in charge it will probably be a success. In all the Punjab works the neglected and *unfinished* look of the head-works is most striking; whilst in the case of the North-Western Provinces they compare favourably with similar works in England in neatness and finish, and there has been none of the subsequent complaint or trouble that has resulted from every one of the Punjab works.

* * * * *

Part I is well on towards completion, but it is impossible to say when the various independent estimates for the different bazaars of Part II can be done under the system in force in the Punjab, the Local Executive Engineer is supposed to do all sanitary works in addition to his own proper work; and if this is adhered to as regards Part II, the twentieth century will be far advanced before the project is completed, if indeed it ever is. It is, I think, quite impossible that any Executive Engineer with a large district could possibly give up the time required for such a work for such a city; and the getting up of the project must drag on wearily from one Executive Engineer to another as transfers occur, involving loss of continuity of thought and design and if ever finished the result must be an unsatisfactory patch-work. It will be interesting to note the difference of results in Cawnpore where the drainage is being worked out and carried out by a Special Public Works Department Engineer who has had a special training in this branch and who is working direct under the Sanitary Engineer.

* * * * *

No. 941-C.

Forwarded to the Local and Municipal Department in continuation of this office endorsement, No. 734-C., dated 10th February 1896.

(Signed) D. McNEIL CAMPBELL, Col., R.E.,
18*th February* 1896. *Joint Secretary to Government, P.W.D.*

ORDER—No. 847 M., dated 15th May 1896.

In the first of his letters read above the Sanitary Engineer asks for a reconsideration of the orders conveyed in G.O., No. 2073 M., dated 9th December 1895, defining the duties of his department. It has never been denied that if funds were abundant, the best plan would be to create a Sanitary Engineering Department complete in itself, and strong enough, not only to design works, but also to carry them out. But this plan being unfortunately not feasible on financial grounds, it was decided, after much discussion and consideration, to adopt the scheme laid down in G.O., No. 2073 M., dated 9th December 1895, the execution of the works being entrusted to the Public Works Department, and the duty of designing them to the Sanitary Engineer. The scheme is not free from objections, but has been determined by financial limitations and by what the Government considers to be sufficient for the actual requirements of sanitary projects at the present time. It was settled after due deliberation and must be adhered to until it shall prove to be inadequate.

2. In forwarding Mr. Jones' letter, the Chief Engineer has suggested a means of considerably reducing the cost of a separate department. This is to group municipalities into circles and to centralize in one circle all the works being carried on at one time, so that their supervision could be undertaken by a very small staff. While these works were being executed, designs and estimates for works in the next circle would be prepared and the works taken up on completion of those in the first circle.

The execution of sanitary projects cannot, however, follow any such procrustean order or distribution; and for this and other reasons the Government considers that the proposal is impracticable.

3. Mr. Jones further submits certain questions arising out of the orders in G.O., No. 2073 M., dated 9th December 1895, and requests that he may be favoured with orders on them in the event of Government being unwilling to reconsider that Government Order. The questions, four in number, are dealt with in paragraph 9 of the Chief Engineer's memorandum, with whose conclusions Government agrees with slight modifications. The points as answered by Government are as follows:—

(1) By whom should the specification and schedules for schemes be prepared—by this office or by the Public Works Department?

They should be prepared by the Sanitary Engineer, whose duty it is to draw up the schemes.

(2) To whom should proposals be made for amendments of schemes framed by the Sanitary Engineer and approved by the Sanitary Board and sanctioned by Government, and should reference be made to the Sanitary Engineer in regard to such proposed amendments?

Trifling alterations in design may be sanctioned by the Superintending Engineer of the Circle, but material alterations should be submitted by the Superintending Engineer for the orders of the Chief Engineer, who will consult the Sanitary Board if and when he thinks fit to do so.

(3) Should the Sanitary Engineer visit and report on the schemes under execution and make suggestions to the officer in charge for alterations admissible, &c.?

The Sanitary Engineer will not be required to visit and report on schemes in course of execution. If the executive department entrusted with the work meets with difficulties it may freely consult the Sanitary Board who may, if necessary, obtain a report from the Sanitary Engineer.

(4) Should the Sanitary Engineer or the Public Works Department obtain tenders for English materials, and, if so, through the Secretary of State or through the Sanitary Engineer's Agents (Messrs. Henry S. King and Co.,) or by tender in India?

It has already been distinctly decided that the plant should be obtained by the Public Works Department, and therefore the rules in force in that department regarding tender for English supplies will be followed.

4. The last point brought forward by the Sanitary Engineer is the question of maintenance of existing water-supply and drainage schemes. Government has decided that this must be left to municipalities, as in the course of a few years the increasing number of schemes would preclude the possibility of their maintenance by Government. As, however, municipal schemes have been largely assisted by Government, it is advisable that some control should be exercised over municipalities in their upkeep, and this can best be secured by periodical inspections. The Sanitary Engineer himself or his Assistant will therefore be requested to inspect each work once a year at least and bring to the notice of Government any defects that may be found with the remedies suggested. The Public Works Department will also be requested to arrange for a half-yearly inspection of these works by the Executive Engineer of the division in which they are situated. This course, together with the two annual inspections of engines, pumps, &c., by the Boiler Inspector will, it is hoped, be sufficient to ensure the machinery and plant being maintained in proper order by the local authorities.

5. There remains the question of the rate at which the municipalities should contribute to the Public Works Department for the cost of supervision. Two rates appear to have been proposed by Colonel Pennycuick, in one place (paragraph 3 of note in G.O., No. 2073 M., dated 9th December 1895) the ordinary Public Works Department charge of 24½ per cent. on the expenditure on works, exclusive of charges for land and stores imported from England, and in another place (paragraph 11 of note in G.O., No. 2380 L., dated 16th November 1894) 12½ per cent. on the total of estimates for water-supply and 20 per cent. on those for drainage. In the former

case it is not stated what charges are to be covered by the rate proposed, while in the latter the 12½ and 20 per cent., respectively, are to cover all charges for supervision of work and also preparation of estimates. As this last-mentioned work is to be carried out by the Sanitary Engineer, there does not seem to be any reason why any charge should be made by the Public Works Department on this account. What charge should be made for supervision of work is a question open to doubt and dispute, of which it would be extremely difficult to find a settlement satisfactory to all parties. However, inasmuch as practically in every case half the cost of the works is met from Provincial funds, whatever may be the rate that is determined on, half of the sum recovered will merely be transferred from one side of the Provincial account to the other, *i.e.*, from 45. Civil Works—Miscellaneous Public Improvements—to XXXII. Civil Works. Under these circumstances the Government considers that the best way to settle the question will be to make no charge on municipalities for supervision of the works executed, and this plan will accordingly be adopted in future.

(True Extract.)

J. F. PRICE,
Chief Secretary.

To the Public Works Department.
„ the Joint Secretary, Sanitary Board (Engineering Branch).
„ the „ „ „ (Sanitary Branch).
„ the Sanitary Engineer.
„ the Sanitary Commissioner.
„ all Chairmen of Municipal Councils.
„ all Collectors.
„ all Presidents of District Boards.
„ the President, Municipal Commission, Madras.

Exd. C. M. Brisson.

Govt. of {1896} Madras.

LOCAL AND MUNICIPAL.

Issued

Read. *Encl.*

G.O., No. 847 M., 15th May 1896.

MAY.

Sanitary Works.

Declining, with remarks, to reconsider G.O., No. 2073 M., dated 9th December 1895, regarding the execution of —, and passing orders on certain questions raised by the Sanitary Engineer and the Public Works Department in connection with the preparation of specification and schedules for such works, the amendment of schemes, &c.

No. 2073 M., 9TH DECEMBER 1895.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—the following papers:—

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, 3rd April 1895, No. 929.

I have the honour to inform you that I find the work of this office so heavy that if I am in any way to keep up to date the work I am called on to perform I require some additional assistance. As Government are aware I have only the Assistant Sanitary Engineer at head-quarters, and both of us are fully occupied with office work referring to construction, preparation of designs for new works and of inspection of existing works which leave very little time indeed to study any proposed scheme on the ground. Indeed, justice cannot be done to any particular scheme owing to the small space of time which can be allotted to it.

2. I have prepared a statement of the work I am supposed to get through this year—that is, before 1st January next—and very little has been done.

3. Where I require assistance most is in the investigation of new schemes. It will be seen some councils have given allotments for such purpose, but these only allow of my sending a surveyor and party to take levels, &c., and the investigation and consideration of the scheme, the selection of sites for sources of supply, outfall, &c., must be previously done by my assistant or myself, and we positively have not the proper time to devote to them which such important consideration requires.

4. The two other Assistant Engineers (not on the provincial list) whom I have at present are on works under construction, and if Government could see its way to giving me permanently an Assistant Engineer on Rs. 450 a month for the purposes I have noted above, it would go a long way to helping me to give schemes and projects the due investigation which they require.

5. I believe that the Chief Engineer, Public Works Department, if referred to, will consider that I cannot do justice to my work at present, and I am also certain that Government will consider that either less work should be given to the department or a sufficient staff for executing it properly provided.

ENCLOSURE.

SANITARY ENGINEER'S DEPARTMENT.

(1) *Works in progress.*

1. Madura water-supply.
2. Tanjore „
3. Trichinopoly water-supply.
4. Adóni water-supply.

(2) *Works to be begun in* 1895.

	Grant.	Loan.	Total.
	RS.	RS.	RS.
1. Dindigul water-supply	40,000	33,000	73,000
2. Kurnool „	1,34,730	56,220	1,90,950
3. Conjeeveram „	91,000	91,000	1,82,000
4. Ootacamund „	45,000	..	45,000
5. Coonoor „	..	80,000	80,000
6. Tirupati „	40,000	40,000	80,000
7. Cuddapah drainage	74,270	..	74,270

(3) *Schemes to be submitted to Government during* 1895.

1. Negapatam water-supply.
2. Tirupati water-supply.
3. Salem water-supply.
4. Calicut water-supply.
5. Cuddapah drainage.

(4) *Schemes to be investigated and Municipalities requested to provide the sum noted for surveys and investigation.*

1. Calicut water-supply—		
Pooloor hill scheme	3,000	Not provided.
Or testing the yield of Mananchera tank ..	500	
2. Guntúr water-supply	500	Provided.
3. Kumbakónam water-supply	1,500	,,
4. Negapatam water-supply	1,500	,,
5. Salem water-supply	2,000	,,
6. Tinnevelly municipality } joint water-supply	400	,,
7. Palamcottah municipality } joint water-supply	300	,,
8. Tinnevelly district board } joint water-supply	300	,,
9. Tirupati water-supply	500	,,
10. Vizianagram drainage	600	,,
11. Bellary water-supply	2,000	,,

(5) *Reports required by Government on the Water-supply or Drainage of the following towns.*

1. Mannárgudi water-supply.
2. Masulipatam water-supply and drainage.
3. Cochin water-supply.
4. Mangalore water-supply.
5. Erode water-supply.
6. Vellore water-supply.
7. Máyavaram water-supply.
8. Ongole water-supply.
9. Periyakulam water-supply.
10. Kodaikánal water-supply.
11. Ellore drainage.
12. Madura surface drainage.

(6) *Sanitary Engineer to advise the following Councils on the points named.*

1. Ootacamund—Bandy Shola swamp. | 2. Kumbakónam Drainage.

In addition all Sanitary Board's work such as Ootacamund, Cuddapah and Coonoor schemes and scrutiny of plans and estimates for sanitary works costing over Rs. 200.

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, 10th April 1895, No. 1037.

In continuation of my No. 929, of 3rd April 1895, I have the honour to inform you that this application was not made at the time or before my budget was submitted to Government because of my absence on leave and because it could not be anticipated that the department would be called upon to carry out such a large amount of construction nor to submit so many reports and schemes as it now is requested to do.

2. It would certainly be advisable that the charge for the Assistant Engineer should be a permanent one against Provincial revenues because the work will increase and not diminish and an officer is really very necessary; but if there is a difficulty in at once providing for his pay, I would ask that it be temporarily arranged that the pay drawn shall be eventually recoverable from municipalities and that when an estimate is framed for the construction of works, which the officer has been investigating, an amount shall be added to the estimate to cover the expense of such investigation.

3. It would not be possible to cover all his pay in this way as there might be investigations leading to no work whatever, but as a temporary arrangement the pay might be debited to advances recoverable and any balance irrecoverable eventually written off when Government makes provision in next budget, as I trust will be done, for the officer asked for.

No. 658.

Referred to the Chief Engineer, Public Works Department, for favour of remarks.

(By order.)

OOTACAMUND,
9th May 1895.

(Signed) C. G. TODHUNTER,
Ag. Assistant Secretary.

Note by the Chief Engineer, Public Works Department, dated 7th June 1895, No. 318-D.

I am quite satisfied that the Sanitary Engineer requires more subordinate assistance than he at present possesses, and that the additional staff asked for by him is by no means in excess of requirements.

2. At the same time, I am bound to say that I do not consider that an establishment, organised as the Sanitary Engineer's is, can ever cope satisfactorily with the constantly varying work which devolves upon it.

3. With the additional Assistant Engineer which Mr. Jones now asks for, his staff will consist of two permanent Assistants and two temporary ones, all on very nearly the same rate of pay (Rs. 400 to Rs. 500); this obviously does not allow of the regularly progressive increase of responsibility with corresponding increase of pay and position which is essential for the proper working of an organised establishment.

4. A man joining this staff must look forward to a long period of stagnation with the possible chance of a single big step of promotion; good men will not remain in any service on these terms, and the result will certainly be that very few good men will enter it, or, if they do enter it, it will be with the intention of looking out for other employment as soon as they become of real value in their profession.

5. It is, of course, possible for Government to make it worth the while of any individual to remain in its service by periodically increasing his pay, but as the nature of his work, from the conditions of the case, remains much the same, this means that his pay bears no proportion to his work, nor is the latter of a kind to satisfy a man who has any professional pride.

6. This state of affairs is a necessary consequence of the nature of the work carried on by the Sanitary Engineer's establishment, and as long as this establishment remains isolated, it will be filled by men who will either (and most frequently) be of very small professional ability, or who will join it with the deliberate intention of leaving it after a very short time.

7. The engineering work of the Sanitary Engineer's Department can only be placed on a satisfactory footing by its amalgamation with the Public Works Department, which is organised in such a manner as to provide the continuous increase of responsibility referred to in paragraph 3 of this note, and whose staff is sufficiently large to be practically unaffected by fluctuations in the work required of it, which would completely disorganise a smaller staff. It is obvious that an increase or reduction of work which would involve a complete readjustment of a staff of five men would be practically imperceptible by a staff of eighty.

8. The municipalities concerned would certainly have to pay no more than they do at present if the whole work of construction was handed over to this department under its regular rules, while they would gain greatly by the professional supervision which the departmental organisation gives, and which, with the best will in the world, the Sanitary Engineer cannot give at present.

9. I invite attention in this connection to my Notes, dated 23rd April and 8th May 1894, transferred to the Local and Municipal Department with endorsements, Nos. 44-D and 119-D, dated 25th April and 8th May 1894, respectively.

(Signed) J. PENNYCUICK, Col., R.E.,
Chief Engineer, P.W.D.

No. 319-D.

Transferred to the Local and Municipal Department with reference to endorsement in that department, No. 658, dated 9th May 1895.

7th June 1895. (Signed) J. PENNYCUICK, Col., R.E.,
Secretary to Govt., P.W.D.

MEMORANDUM, No. 604.

The Sanitary Engineer is requested to state what action it is proposed to take on paragraph 12 of the Chief Engineer's note disposed of in G.O., No. 566 M., dated 28th March 1895, in which Colonel Pennycuick remarks that Mr. Minchin's present charge is too heavy for one man and suggests that he should be relieved of the charge of the Madura and Dindigul projects.

2nd May 1895. (Signed) J. F. PRICE,
Chief 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, 3rd May 1895, No. 1247.

In reply to your memorandum, No. 604, of 2nd May 1895, I have the honour to inform you that I regret that I cannot relieve Mr. Minchin of his work at Dindigul and Madura as I have no one to take his work over. The work at Madura consists merely in supervising the working of the engines, pumps and head-works and of inspecting the state of the mains, valves, fountains, &c., from time to time. The works at Dindigul are just about to be begun, and though I propose to place a Supervisor in immediate charge, he must work under Mr. Minchin. Tanjore works are, however, approaching completion, and although it will be some time yet before they are in full working order, still the work in connection with Tanjore will be greatly reduced.

2. I could relieve Mr. Minchin of Madura to some extent by sending Mr. Turner, the Boiler Inspector, there occasionally, but the municipality might complain about the cost of such inspections if it is still proposed to debit them with the time spent by Mr. Turner on them.

3. It may be well to bring to the notice of Government that I consider that one Assistant Engineer will always be wanted (and more bye and bye) to continually inspect completed works as well as to aid municipalities in addition and repairs to such works as water-supplies; otherwise I am convinced that the works will gradually be allowed to deteriorate for want of proper supervision, which the municipalities cannot obtain by any officer of their own.

4. If that very necessary supervision could be otherwise secured, then as water-works were completed this department might sever all connection with them and they might be handed over to the councils at once; but this is a course I am very averse to suggesting to Government, and I therefore do not see how Mr. Minchin can be relieved of Madura.

Office-note from the Secretary to Government, Public Works Department, to the Chief Secretary to Government, dated Madras, 2nd November 1895, No. 3268-C.

[Your office-note, No. —, dated 22nd October 1895.]

There seems to have been some misunderstanding on this matter.

2. I have never contemplated any strengthening or increase to the regular staff of this department on account of the execution of works now carried out by the Sanitary Engineer, and had overlooked the sentence at the end of His Excellency's

note of the 10th July which implies that His Excellency was expecting the submission of proposals for such strengthening; in any case, however, I could not have taken action on this note until the principle of the transfer had been accepted by Government and the acceptance embodied in an order.

3. What this department is prepared to do is to undertake the execution of any schemes or all schemes sanctioned by Government for construction on behalf of any municipality either under the general rule of a contribution for establishment of 24½ per cent. on the expenditure on works, exclusive of charges for land and stores imported from England, or on the special terms suggested in paragraph 11 of my note of the 8th May 1894, transferred to the Local and Municipal Department with endorsement, No. 119-D, of that date, namely, 12½ per cent. on the total of estimates for water-supply and 20 per cent. upon those for drainage.

4. The work could be carried out by the ordinary staff of the department under the rules governing works executed from funds other than Provincial, and any extra temporary establishment required in any individual case would be provided either by the Chief Engineer in the exercise of his ordinary powers or by a special order of Government in each case.

5. It is exceedingly improbable that any increase to the permanent establishment would be necessary; in this connection see paragraph 5 of my note of the 23rd January 1891, recorded with G.O., No. 1306 M., of 14th August 1891.

6. No action whatever is necessary in this department at present; all that is required is for the Local and Municipal Department to say in any particular case "The execution of this work will be undertaken by the Public Works Department" or to issue a general order that all works of a particular class will be so executed; we will do the rest.

(Signed) J. PENNYCUICK, Col., R.E.,
Secy. to Govt., P.W.D.

ORDER—No. 2073 M., dated 9th December 1895.

Under the circumstances stated by Mr. Jones, the Government is of opinion that the work of the Sanitary Engineer should be confined to investigating water-supply, drainage, &c., projects, and drawing up the necessary plans and estimates, which should be submitted to the Government through the Sanitary Board. The construction of the works, and obtaining the plant, required for the next project of this description to be carried out, will be entrusted to the Public Works Department.

2. With reference to reducing Mr. Minchin's charge, as proposed by the Chief Engineer in his note, dated 7th March 1895, embodied in G.O., No. 566 M., dated 28th March 1895, the Government considers that he cannot possibly be required to do the work of a Mechanical Engineer, but should be kept to his proper duties, which are those of a Civil Engineer.

3. The Government is not prepared to undertake the upkeep of water-works, &c., after they have once been started, but municipal councils must see that they are placed in charge of a competent man, who will be responsible for keeping them in order. The Government will only undertake to provide for their supervision and inspection at stated periods by the Boiler Inspector, as laid down in G.O., No. 1615 M., dated 9th October 1895. Mr. Minchin should therefore be now relieved of his work at Madura where the water-works have already been opened, and of his work at Tanjore

and Dindigul as soon as the works there are completed. As the Sanitary Engineer will then be able to avail himself of Mr. Minchin's services for other work, and as the duties of his establishment will be reduced, as stated in paragraph 1 *supra*, the appointment of an additional Assistant Engineer is unnecessary and cannot be sanctioned.

(True Extract.)

J. F. PRICE,
Chief Secretary.

To the Public Works Department.
„ the Joint Secretary, Sanitary Board (Engineering Branch).
„ the „ „ (Sanitary Branch).
„ the Sanitary Engineer.
„ the Sanitary Commissioner.
„ all Chairmen of Municipal Councils.
„ all Collectors.
„ all Presidents of District Boards.
„ the President, Municipal Commission, Madras.

Exd. C. M. Brisson.

18

Govt. of {1895} Madras.

LOCAL AND MUNICIPAL.

Issued

Recd. *Encl.*

G.O., No. 2073 M., 9th Dec. 1895.

DECEMBER.

Establishment.

Passing orders about the appointment of an additional Assistant Sanitary Engineer and ordering that the execution of the next water-supply and drainage scheme be entrusted to the Public Works Department.

Read also Refg. papers.

19

No. 1725

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Madras, 11th January 1898.

OFFICE NOTE.

From

The Joint Secy, P.W. Dept

To

The Honorable the
Chief Secretary,
Local & Municipal Dept.

With reference to order in the Local & Municipal Dept. No. 2073 M dated 9th December 1895 please let me know whether further orders may be expected on the subject of the contributions payable to the Public Works Department for the execution of sanitary works for Municipali

(48—1,000—11-8-93.)

para 3 of his office
te No: 3268 C dated 2nd
November 1895 Colonel
unyeuch proposed a
cale of charges which
e considered suitable;
ut the order thereon
i the Local & Municipal
Department makes no
eference to this matter.

Lieut. Lumsden Lt. Col. R.E.
Joint Secretary, P.W.D.

CLWS
9/1/96

9/12

2073 & 9-12-95
1704 & 14-12-87 C. Nos. 112 & 9 gain

21

1896.

Public Works Department.

Local & Municipal Dept.
CURRENT No. 112 M

No. 172 C
Dated 11-1-1896
Despatched
Received

UNDER SECRETARY
11 JAN 96
PUBLIC WKS DEPTS.

SUBJECT.

Enquiring whether further orders may be expected on the subject of the contributions payable to the P.W.Dept: for the execution of sanitary works for municipalities.

For orders.

Please see note & orders in G.O. 2073 M. Col. Pennycuick's note referring to the rates to be paid is marked with red tape.

W.W.D
6.ii.96.

(For orders)

Sub
6.2.96.
24/1 a/17 196

No. 734 C

Local & Municipal Dept.
CURRENT No. 499 M

Government of Madras.

PUBLIC WORKS DEPARTMENT.

3

MEMORANDUM.

Dated Madras, 10th February 1896.

Note by the Chief Engineer P.W.D. dated 5th February 1896.

The best manner of dealing with the the organisation of the Sanitary Engineering Department has been under discussion for several years and there are some conflicting orders on the subject: but it was finally decided in G.O. No. 2073-M dated 9th December 1895 that the work of the Sanitary Engineer should be confined to investigating water supply, drainage & projects and drawing up the necessary plans and estimates which should be submitted to Government through the Sanitary Board. The construction of the works and obtaining the plans required for the next project of the description to be carried out was to be entrusted to the P.W. Department.

2. Mr. Jones, the Sanitary Engineer, now requests that Government will be

be pleased to reconsider that order.

3. The reasons that led to the passing of the order objected to by Mr. Jones were that owing to the rapid increase of sanitary works it was found necessary to increase the Engineering Establishment and Col. Pennycuick was of opinion that it was not advisable to lend officers and subordinates from this department to work under the orders of the Sanitary Engineer and that it would be better to put the execution of the works entirely under the P.W. Department. There seems to me to be objections both to lending men to the Sanitary Engineer and also to carrying out the work by the ordinary D.P.W. Establishment and it really amounts to a choice of two evils, both of which are necessitated by financial considerations, and the question is which is the lesser evil of the two. The objections to lending men are that it is doubtful if they could be spared, and, as Colonel Pennycuick states, there would be partial responsibility in giving advice and lending subordinates for work nominally

on G.O. His No. 479-M. of 2nd April 1891.

nominally under the control of another department. The objections to giving the execution of works to the P.W. Department are given in Mr. Jones' letter and with these objections I agree as also did Col. A.C. Smith when he was officiating Chief Engineer. In my opinion the only satisfactory solution of the question is to make the Sanitary Engineering Department entirely independent somewhat on the lines indicated in the note by Col. A.C. Smith and Mr. Jones. The separation of the Department is all the more necessary as Sanitary Engineering is a special branch of the profession.

4. Col. Pennycuick says himself that this would be the most satisfactory arrangement but is of opinion that it is altogether out of the question on financial grounds and no doubt it would be if sanitary works are to be carried out as at present, that is all over the Presidency from Ganjam to Cape Comorin and Malabar: but I see no reason why sanitary works should not be carried out by areas that is suppose each

of

of the D. P. W. circles were taken up in turns and the water supply and drainage projects in each completed before those in the next were begun. The establishment required would then be very small. Mr. Jones would be the Supdg. Engineer of the circle as regards sanitary works and with one Executive Engineer and 3 Assistant Engineers and some subordinates he should be able to carry out all the required works and I don't think the cost would be more than at present. While the works in one circle were under execution Mr. Jones could be preparing plans and estimates for the works required in the next. I believe that the works would be much better supervised than at present when they are scattered all over the Presidency and it must be remembered that there are few works that require such close supervision as water works and I am doubtful if members of the P. W. Establishment could spare time to attend to sanitary works in addition to their present duties.

5. Of course the division into corresponding to the Public Works circles is only a suggestion as the extend of the circles will have to depend on the amount of work and the maximum establishment that can be employed - all these details will have to be worked out should the general suggestions be approved.

6. From a list of works in the Sanitary Engineer's Department submitted with Mr. Jones' letter dated 3rd April 1895 No. 929 to the Chief Secretary to Govt it would appear that if the work is divided according to P. W. Circles there would be work in I circle only, in Vizagapatam and Vizianagaram.

7. In II circle Bezwada, Masulipatam, Guntur, Ellore, Ongole, so that I and II P. W. Circles might form one circle for sanitary works and so on.

8. But if my proposals are to be adopted it would be better to deal with all the towns in one circle requiring water supply and drainage before taking up the next. It may be argued as a reason against my proposals that urgent works outside

the

the circle of operations might have to be postponed till the works in the circle were completed. But as the towns have gone for hundreds of years without a water supply and drainage scheme there will seldom be any case in which the work is really urgent and if such a case does occur a special establishment can be employed for the time being. As regards the works actually in progress I think they should be carried on as at present extra assistance being given to the Sanitary Engineer if required.

9. Should my proposals not be approved and it be still deemed advisable to entrust the execution of all sanitary works to the P.W.D. the questions put by Mr. Jones in para 18 can be answered as follows:—

(1) The specifications and schedules for schemes should be prepared by the Sanitary Engineer who is to draw up the schemes.

(2) Trifling alterations in design can be sanctioned by the Supdg. Engineer of the circle, material alterations proposed

proposed should be submitted by the Supdg. Engineer to the Chief Engineer who if he thinks advisable will refer to the Sanitary Engineer for opinion.

(3) The Sanitary Engineer will not be required to visit and report on schemes under execution, the Supdg. Engineer and Executive Engineer will do that duty.

(4) As the works will be under the P.W. Department the rules in force in that Department regarding tenders for English supplies will be adhered to.

10. Mr. Jones further raises the question of the maintenance of completed schemes and I must say that I agree with him that it will be a fatal mistake to hand over the care of completed schemes to the Municipalities concerned: but I doubt if it would be possible to carry out his suggestions. The question of improving the status and efficiency of the Local Fund Engineers is now under consideration and it is possible that these officers might be made to look after completed water supply and

and drainage works, a contribution for this purpose being made by the Municipalities who benefit thereby.

(Sd) D. McN. Campbell
Col. R.E.
Chief Engineer P.W.D.

Transferred to the Local and Municipal Department.

J. McN. Campbell Col. R.E.
A. Secy to Govt. P.W.D.

To.
The Local & Municipal Dept
with letter No 261 d/ 29-1-95
from the Sanitary Engineer to
Govt. returned.

30

1896.

Public Works Department.

Local and Municipal Dept.

CURRENT No. 479 M

CHIEF SECRETARY'S GOVERNMENT OF MADRAS 10 FEB 1896

No. 734 C

Dated 10-2-1896

Despatched

Received

SUBJECT.

Transferring note by the Chief Engineer P.W.D. regarding the organisation of the Sanitary Engineering Department.

50—2,000—21-12-94.

11/2

6 6-9-95—1,000.

No. 261

GOVERNMENT OF MADRAS.

OFFICE OF SANITARY ENGINEER,

Fort St. George, 29 January 1896.

Endorsed

784

From

J. A. JONES, ESQ., MEM. INST. C.E., F.R.S.E.,

SANITARY ENGINEER TO GOVERNMENT,

To

The Chief Secretary to Government
Local and Municipal Department,
Thro' The Chief Engineer, Public Works Department

SIR,

× N 17208 4.1.96

With reference to G.O., No. 2073 M., dated 9th December 1895, I have the honor to request that Government will be pleased to consider the following remarks which I venture to submit after careful consideration of the consequences that, I fear, will follow the changes ordered and because the interests involved are such that I consider Government should be in possession of the following views — views which I have not hitherto had an opportunity of laying before Government. I regret that Col: Pennycuick has retired, because had he still been here I feel sure he would have given them his earnest consideration.

2 It might be understood from the tenor of the Government order under reference that I had desired and advocated the changes but it will be seen from a perusal of my

letter embodied in the G.O., in question, that I have never advocated that the work of the Sanitary Engineer should be limited in the manner lately sanctioned. At the same time it is right to say that I as a member of the Sanitary Board acquiesced in a proposal made by the Sanitary Board that the work should be so limited but this was because I saw it was hopeless under the then existing regime of the Public Works Department to obtain assistance from that department by method of temporary transfers. Whether other Counsels prevail now I am not in a position to say but I suggest that the policy is possible of reversal or modification and thus many of Col: Pennycuick's objections to the existing system would be met.

3. In fact this was the original intention of Government as may be seen by a perusal of G.O., No 1838 M., dated 26 "October 1891, wherein* it is ordered that "Supervisors and overseers required for the permanent staff referred to by the Sanitary Engineer as Class(A) should, if possible be obtained from the Public Works Department".

4. Government will learn from a perusal of past correspondence that I have never asked to be relieved of any portion of the duties until lately appertaining to me but that I have on the other hand merely desired to carry out these duties in an efficient manner, which could be done only by an

* B.N. 30301 dt 12.11.91

an increase in staff

5. I beg to submit to Government that 883
refusal to grant this extra staff cannot have
on financial grounds, because the cost of any
staff granted is recouped from the body for wh
the works are being carried out as will still
the case in the proposed arrangement for the Pu
Works Department to execute works. I further
submit that if the works already executed had
been so by the Public Works Department the foll
ing would have been the financial result - that
is that the acceptance of Col: Pennycuick's term
or proposals will for a similar amount of
work in the future entail on the Local Bodie
concerned an increased contribution amount
to Rs 88,000 under one alternative or Rs 1,15,00
under the other. This our say about five years
actual expenditure is Rs 23,000 a year and that
is an amount which would pay for three more
Assistant Engineers than that at present:-

No.	Town	Actual cost of Work	Actual cost of Pipes, Making and Laying	Estimated cost of work as per the estimate submitted by the P.W.D. on 24th Feb. 1909	Contribution required by the P.W.D. on the estimated cost of work - Col. 5	Estimated cost of work as per the estimate submitted by the Sanitary Engineer	Difference between Columns 6 and 10	Contribution required by the Sanitary Engineer - Col. 11	Difference between Columns 9 and 12
				Per-centage					
1	2	3	4	5	6	7	8	9	10
		Rs	Rs		Rs	Rs	Rs	Rs	Rs
1	Adoni	1,58,119	87,325	12½ %	20,250	8,259	9,085	12	11,991
2	Bellary	41,840	"	20 %	9,600	5,017	5,233	11	4,583
3	Cuddalore	17,556	9,347	12½ %	2,423	2,194	-183	12	229.
4	Kumbakonam	1,12,134	35,521	20 %	22,000	17,591	1,179	8	4,409
5	Madura	3,94,485	219,162	12½ %	48,875	21,870	21,088	8	27,005
6	Tanjore	4,23,953	227,542	12½ %	55,927	24,135	23,985	8	31,792
7	Trichinopoly	*5,20,000	284,664	12½ %	65,000	29,760	27,897	8	35,240
		16,68,087	8,63,557		2,24,075	1,08,828	88,282		1,15,249.
							1,97,108		16,97,805

*: Approximate — Work in progress.

6. Therefore the transfer to the Public Works Department of the execution of works does not find justification on financial grounds.

7. Col: Pennycuick's strongest point for the transfer is that the Sanitary Engineer cannot give the proper supervision. I am unaware on what grounds he came to this conclusion, but I can conscientiously say that none of the works up to date have lacked proper supervision nor have suffered from want of proper supervision.

8. The next point to which I wish to request the attention of Government is that while the Public Works Department have never been able or more properly I might say willing to lend the services of officers to this department it is proposed to give the work to the officers of that department. From this it can be deduced that unwillingness to afford the assistance asked on several occasions and not inability to do so was the cause of refusal. If now the work can be undertaken without extra staff which is a matter of doubt (even by Col: Pennycuick himself) the officers of the Public Works Department must either have not enough work at present, a premise unlikely to be agreed to, or else the work of executing the Sanitary Engineering schemes will not have that care and attention

they require and this is more likely to be the case. But there is the likelihood that extra staff (under the powers of the Chief Engineer) will be engaged from time to time, so that it comes to this, that extra staff will be used by the Public Works Department while the execution of works has been taken away from the Sanitary Engineer because extra staff is required.

9. It is not consistent with Col. Pennycuick's objection against the employment of temporary staff in the Sanitary Engineer's department to propose to employ temporary men in Public Works Department for the same purpose and if these proposals mean that those temporary men would be put in permanent posts of the Public Works Department and thus allow of the alienation of the services of higher grade officers to Sanitary schemes, the same plan was possible of adoption when the Sanitary Engineer wanted the services of members of Public work Department staff. Such an arrangement can be made now and all objection to the existing state of things would then disappear while the work would be much more cheaply done and [illegible] to add efficiently done & supervised than under the proposal recently sanctioned.

The economy of a large staff for the P.W. Dept. cannot be [illegible] to the Sanitary [illegible]

I would quote here from a report to Government by Col: A. C. Smith, Ag: Chief Engr. and myself, a portion, which could only have been written on Col: Smith's authority:

"It is thought that the proposal that the works when designed and estimated by the Sanitary Engineer and duly approved by Government should be carried out by Executive Engineers of Divisions will not be at all a satisfactory arrangement, for

Works of this class require constant, if not continuous supervision and it will be impossible for an Executive Engineer of the Public Works Department, who now a days has so large a charge that it takes him a year to see the whole of it, to devote sufficient time for this purpose.

It is always very difficult in this class of work to carry out, without constant reference, the plans and estimates made by others.

There would be a dual control - no man can serve two masters - on the one hand the Superintending Engineer of the Circle would have just cause for complaint if the Executive Engineer neglected, as he would be obliged to do, his own proper work in order to supervise

work for the Sanitary Engineer, and the latter would undoubtedly grumble if his work was either not carried on expeditiously or scamped in the absence of proper supervision.

Then again the Sanitary Engineer would be quite justified in declining all responsibility in the results of his designs if he were not placed in the position of a superintending officer with powers to alter or modify such designs, for in these kind of works it is impossible to foresee all requirements.

Then as regards the position of the Chief Engineer, Public Works Department, with regard to the Sanitary department, if he is to scrutinise or revise the designs and lend his officers to the Sanitary department to carry them out in case of failure or misadventure, the Public Works Department would be held to blame, though, as is above shown, it will be impossible for it to undertake such works satisfactorily.

Taking all these things into consideration, it is thought advisable to make the Sanitary Engineer and his department totally independent of the Public Works Department as far as designing and execution of work is concerned, except, of course, that the Chief Engineer, Public Works Department should

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should act as adviser to the Government on all schemes they may wish to consult him about."

11. In these sentences will be found, I venture to say, an endorsement of the views I have already set forth and they also include what is to my mind a very potent argument against the possibility of the arrangements ordered being in any way a success. I refer to the question of dual responsibility

12. Under the new arrangement the plans framed by the Sanitary Engineer will have the approval of the Sanitary Board which at present includes the Chief Engineer. So long as the Chief Engineer is the President of the Board there is an incidental security that the designs &c passed will be carried out to a greater or less extent. But in no Engineer's experience and certainly not in mine is it the case that the designs of one Engineer will be completely accepted or satisfactorily carried out by another. The Public Works Department have already experience of this in regard to the Tank maintenance scheme. Any Engineer receiving the design of another to carry out would

have his first thoughts directed to amendment whether an improvement or not would remain to be seen, such amendments under present order of Government could not be sent back to the Sanitary Engineer for approval or the Sanitary Engineer would be in the relation of a Superintending Engineer to an Executive Officer of the Public Works Department, and therefore the Superintending Engineer, Public Works Department would have to approve or otherwise of such amendments or they would eventually reach the Chief Engineer who might or might not have approved of the original plans. For any amendments or alteration the Sanitary Engineer could in no way be held responsible and therefore in no way for the success or failure of any scheme.

13. In addition to this there will be a considerable additional and continuous correspondence, under when the design of one Engineer is carried out by another and this point and that point must come back for elucidation &c. Such correspondence would be of the most unsatisfactory character and the Sanitary Engineer would not be in a position to suggest alterations himself in the design as his experience does suggest as work proceeds because it is a

a portion of his duty which Government has determined to relieve him. No work has ever been carried out exactly as designed. Therefore every scheme will be more or less amended by other persons than its author — by persons having less interest and less skill in that particular class of work and the result must be such that the Sanitary Engineer can have no dependence that his schemes will be in any case carried out as designed and approved.

14. It may be brought forward as an argument that the designs of the Consulting Architect to Government are so carried out; but any that are so are works of a less technical nature and of a character allied to those which a Public Works Department Officer usually executes.

15. Again with the plant and materials being ordered by each individual officer unless it is ordered that the type designs of the Sanitary Engineer are to be adhered to in all cases the works will not have that uniformity of design and in the class of materials used such as valves, fountains, pipes &c. as are now maintained throughout the Presidency so that such materials are interchangeable

and

and one Municipality may in times of emergency borrow from another nor are Public Works Officers who do not devote special attention to such works likely to be acquainted with the best class of materials and design such as it is the special duty of this department to keep itself acquainted with. Nor will individual Public Works Department Officers have the same facility or opportunity of borrowing and using plant and stores of one Municipality by another simply because they cannot have the knowledge of the plant already used and which maybe used by another offices. In short there will be a loss of centralization to a great extent.

16. One reason for the proposal to create the office of Sanitary Engineer was because the Public Works Officers could not find time to get up schemes (and therefore it may be reasonably supposed they had not time to devote to their execution). This has not been found to be the case in other Presidencies and where the Public Works Department executes schemes as in Bombay they also draw them up and the duty of the Sanitary Engineer and Sanitary Board is only to review and amend such schemes so that the design and execution of the schemes are not divided from each other as is now ordered to be done in this Presidency. It is a well known axiom that the best person to carry out a scheme is its designer and that he alone can do it justice.

17. I venture to place these remarks before Government. They are disinterested as far as I am personally concerned because the result of the order under reference is to lessen my work and therefore only because I very strongly believe that the proposal and its acceptance has been made without a consideration of the facts which I have now placed before Government, do I send them forward.

18. I am sending this letter through the Chief Engineer, Public Works Department for his remarks thereon and should Government still consider that the order already issued should not be modified I beg to ask that the following points may be decided:-

(1) By whom the specification and schedule for schemes should be prepared, by this office or by the Public Works Department.

(2) To whom proposals for amendments of

of schemes framed by the Sanitary Engineer and approved by the Sanitary Board and sanctioned by Government should be made and whether reference is to be made to the Sanitary Engineer in reference to such proposed amendments.

(3) Whether the Sanitary Engineer should visit and report on the schemes under execution and make suggestion to the officer in charge for alteration admissible &c.

(4) Whether this department or the Public Works Department are to obtain tenders for Engish materials and if so through the Secretary of State or through the Sanitary Engineer's Agents (Messrs Henry S. King & Co.) or by tender in India.

19. Government have also decided in the order under reference that no aid can be given to Municipalities to maintain schemes in working order, and as to this also I ask permission to make a few remarks.

20. Government are aware that no Mofussil Municipality has an Engineer and I venture to submit that without professional supervision none of the works in operation can be maintained even with the best endeavour of Municipal Councils, in the order they ought to be. The necessity for proper supervision of

Already decided
We must desirable
that Tenders +
recommendations
English firms to
be with Engineers
8/x

of Engineering works is one that has never been disputed and in England no water or drainage works on which the health of the people so materially depends are without the attendence of a duly qualified Engineer.

21. In the resolution of the Government of India recently issued in regard to a reorganization of the Sanitary Department, it is proposed that there should be a Health Officer for a group of towns to aid committies in proposing sanitary improvements. But these could be carried out only by professional agency. The principle therefore of a group of Municipalities having the services of an Engineer is one that finds its analogy in that proposal and I cannot but think that an Assistant Sanitary Engineer is no less necessary than a Health Officer in any improvement of the Sanitary Department.

22. It is a proposal made to Government some years ago and the proposal of the Government of India as to Health Officers would seem almost to carry with it the necessity for an Engineering Officer who would as a colleague control the same areas. The cost of a staff say of three Assistant Sanitary Engineers who would look after the execution of not only

the major but all the minor works would cost very little even if Government made no provision from Provincial Funds. Three Assistant Sanitary Engineers at an average of Rs 700 + 100 Travelling allowance monthly would amount to 12 X 800 X 3 = 28,800 annually and this divided over 56 Municipalities would be under Rs 500/. a year. A sum of Rs 1000 might be payable by some Municipalities and others only Rs 100 or so but the benefit obtained would be large in proportion to the assistance which would be rendered, and I am also of opinion that the financial result to Municipalities by having their schemes properly carried out would more than cover the cost of the staff.

23. I need not say that I have already taken steps to hand over the completed water works to the care of the Municipal Councils concerned but I have done so with much regret and with little doubt as to the ultimate result of their being taken away from our care. It is as if when a Railway line was complete the Traffic Branch of a Railway were left to not only work the line but maintain it. The Engines and Pumps of water works &c. it is true, will receive two inspections annually, but Reservoir, Head works, Filters, Pipes and Valves &c. are left in the hands of persons with no professional knowledge whatever nor has provision been made for annual inspection of the work or for provisions against additions or alterations to a system being made without the previous sanction of this department which alone has the knowledge to decide whether and where extension &c. can be made without detriment to the original and existing system. These perhaps ~~are~~ are points in which Government may now desire to pass further orders should no reconsideration of the method of supervising works in operation be deemed necessary or feasible

24. Government have, while not granting an Assistant Engineer rendered it possible for Mr. Minchin's services to be availed of to a greater and greater extent as the works now under construction are completed; and this arrangement is one that, under present orders, meets the request made for extra assistance.

25. At present as Government are aware the pay and travelling allowance of Assistant Sanitary Engineers are recouped eventually from the Councils for whom the works

be

being executed but when Mr Minchin is employed on investigation &c there will be no estimates from which his pay can be provided for. Some schemes may never be executed, others not so for many years and there will be intervals between his services on one scheme and another which it will be difficult to debit to any Municipality. This is brought to notice because the expenditure and receipts for staff will not balance eventually as they would do under existing arrangements and I, therefore, request to be informed if this is understood and approved of by Government.

I have the honor to be,
Sir,
Your most obedient Servant

J. Lynch

Sanitary Engineer to Govt

S. E. 6 6-9-95—1,000.

S.E. 25-5-94-500.

49

P. W. CURR... No. 934

Recd: 30.1.96

1896.

From

The Sanitary Engineer

to Government,

To

The Chief Secretary to Govt

Local and Municipal Dept.

thro' The Chief Engineer, Public

Works Department

No. 261

Dated 29th
Despd. 29th } January 1896.
Recd.

Enc.—

Subject.

Submitting his remarks on the order of Government intrusting in future the execution of water supply and drainage schemes to the Public works Department.

1/499 supply

In orders.

C.W.B.E. 3/96

S. E. 6 6-9-95—1,000.

GOVERNMENT.

No. 463

OFFICE OF SANITARY ENGINEER,

Fort St. George, 14th July 1896.

168

From

J. A. JONES, Esq., MEM. INST. C.E., F.R.S.E.,

SANITARY ENGINEER TO GOVERNMENT,

To

The Chief Secretary to Government

Local & Municipal Department

Through The Chief Engineer, P.W. Department

SIR,

In continuation of my letter No. 261 of the 29th ultimo I have the honor to forward herewith an extract from the Report on the Sanitary Works of the N.W. Provinces and Punjab by The Sanitary Engineer to Government of Bombay, and Member of the Sanitary Board of that Presidency. The opinion of this very senior officer of the P.W. Department of that Presidency emphasizes very strongly the opinion expressed in my letter above quoted.

I have the honor to be

Sir

Your most obedt Servt

WMJ JWJ

C&K

K&L for Sanitary Engineer to Govt

In

1896

Local dept.

626/M

Cus 4996 Enclo

Encl 1

Recd: 15. 2. 96

From

The Sanitary Engineer
to Government

To

The Chief Secretary
to Government
Local & Municipal Dept.

The Chief Engineer
Public Works Dept.

No. 463

Dated 14.
Despd 14. } February 1896.
Received

Encl-1

Subject

Forwarding an extract
on the Report on the Sanita-
y Works of the North-West
rovinces & Punjab in con-
nation of this office
261 of 29. January 1896.

No. 941 Cal/18 February 1896

Forwarded to the
Local and Municipal
Department, in
continuation of this
office endorsement
No. 734 Cal/10. February
1896.

E. H. H. Campbell Col. RE.
Offg. Secy. to Govt
N.W.P.

Copy
15.2.96

CHIEF SECRETARY
10 FEB 1896
GOVERNMENT OF MADRAS

2/2

Extract from the Report on the Sanitary Works in the N. W. Provinces and Punjab.

* * * *

Up to the time that Sir Auckland Colvin became Lieut.-Governor of the N. W. Provinces in 1887, all sanitary works had been carried out by the Public Works Department as they are still elsewhere in India except in Madras. The difficulties and delays of this system caused by want of the special knowledge on the part of most of the Executive Engineers and the difficulty for them to spare sufficient time from their ordinary duties, and also the apathy and obstruction of the Municipalities, which are still apparent elsewhere caused him to appoint a special officer for superintending all such works and he also passed the Water Works Act of 1891.

* * * *

The Water Works of the larger towns were carried out in the following order:- Agra, Allahabad, Benares, Cawnpore and Lucknow. Agra, Allahabad and Benares are now carrying out Drainage

In

1896

[illegible] for [illegible] was only about two years although the cost varied from 12 to 25 lakhs. All the works were carried out by large contractors which accounts for the rapidity of construction to a great extent. The Punjab works of a similar nature done under the old system present a most striking contrast. In the few cases where water has been supplied i.e. Umballa Canton-ment, Delhi, Lahore and Peshawar the designs were altered and realtered during construction the works extended over many years and in the cases of Umballa Cantonment and Delhi they are a decided failure. Umballa City is now having its Water Works made and as an Engineer who has been specially trained in that branch is in charge it will probably be a success. In all the Punjab works the neglected and <u>unfinished</u> look of the Head Works is most striking: whilst in the case of the N.W. Provinces they compare favourably with similar works in England in neatness and finish; and there has been none of the subsequent complaint or trouble that has attended every one of the Punjab Works.

Part I is well on towards completion but it is impossible to say when the various independent estimates for the different bazars of Part II can be done. Under the system in force in the Punjab, the Local Executive Engineer is supposed to do all Sanitary works in addition to his own proper work; and if this is adhered to as regards Part II, the 20th century will be far advanced before the project is completed if indeed it ever is. It is I think, quite impossible that any Executive Engineer with a large district could possibly give up the time required for such a work for such a city; and the getting up of the project must drag on wearily from one Executive Engineer to another as transfers occur, involving loss of con-tinuity of thought and design and if ever finished the result must be an unsatisfactory patchwork. It will be interesting to note the difference of results in Cawnpore where the drainage is being worked out and carried out by a special Public Works Depart-ment Engineer who has had a special training in this branch and who is working direct under the Sanitary Engineer.

Ins

(True extract)

Asst. Sanitary Engineer to Govt.

Ref

Local and Municipal Department.

Again G.O., dated 9.12.95 1895, No. 2073/M

Current No. 112 M. of 1896, dated 11th January 96 from the P. W. D. No 172

Current No. 499 M. of 1896, dated 10th February 96 from the do No 734

626 M of 1896 14th February from Sanitary Engineer forwarded with endorsement by P. W. D. No 469

Subject

FOR ORDERS.

Organisation of the Sanitary Engineering Dept.

In the first of these current the P. W. D. asks for orders as to the rates at which contributions are to be paid by Municipalities for the execution of sanitary works entrusted to that Dept. Col. Penny quick suggested certain rates in his note (in G.O. 2073/M 9.12.95 marked with red tape) but no orders were passed on that point.

The second current is from the P. W. D. forwarding with a note by C.E. an objection to the orders conveyed in G.O. 2073/M 9.12.95 raised by the Sanitary Engineer. His first objection is that if the rates proposed by Col Penny quick are approved, the execution of drainage & water supply schemes will be much more costly than they have been hitherto. Applying these rates to the works carried out in the last five years, he shows that there has been a saving of Rs 23,000 a year by the

I know, so far as I recollect, was thought & said that if funds were obtained, it would be best to have a Sanitary Engr Dept complete in itself & strong enough to carry out all works as well as to design them. But we cannot afford this; after much discussion & consideration decided on the plan laid down in G.O. 2073/M 9.12.95 that while the Sanit. Engr designs works, the para 3 of note D 2.11.95 abstr. 5 of the G.O. & para 11 of note 18 May 94 Sanitary Engr

ordinary Exec. of the P. W. D. should carry them out. This plan is open to many objections, but it was deliberately determined on & should be adhered to until it is proved to be a failure.

As to the rates which should be charged by the P. W. D. for supervision of the execution of the works, in one place Col. Pennyquick proposed 12½% on the totals of estimates for water supply & 20% upon estimates for drainage works (para 11 of his letter of May 1894, in G.O. 2380-I. 16.11.94) and in another place 24½% on the expenditure on works, exclusive of charges for land and

I.R. 17/12/96

execution of these works by his own Dept. It would appear from these figures that the rates proposed by Col. Pennycuick are too high. (The proposed rates are 12½% on the total estimates for water supply & 20% on those for drainage, whereas the ordinary P.W.D. rate of 24½% of expenditure on works, excluding cost of land & stores imported from England).

2. The following are the main reasons for which the S.E. wishes G.O. 2073M 9.12.95 to be reconsidered:

In the first place he considers that unless the P.W.D. is undermanned at present, it will have to employ extra hands for the execution of Sanitary works; & therefore there is no reason why these extra hands should not be given to the S.E.'s Dept instead of to the P.W.D.

The next point he takes objection to is "dual control". The plans are to be prepared by the San. Engr & carried out by the P.W.D. In support of this he quotes a note by Col. A. Smith (G.O. No 1306M 14.8.91) which is strongly in favour of leaving the execution of the works to the San. Engr; for if the S.E.'s designs are carried out by the Exec Engr,

Stores imported from England (para 3 of his note on p 5 of G.O. 2073M 9.12.95).

In the former case, the charge of 12½ or 20% (I may here note that I don't know why the rates for water & drainage works should have differed, unless it be that more English stores, in proportion, were used in water works) was to cover all charges for preparation of estimates and supervision of work; in the latter case, Col. Pennycuick did not state that charges were to be recovered. But as it has been arranged that the San. Engr is to prepare designs & estimates, & also in any case to supervise the P.W.D. should make any extra charge on this account. He did charge only for supervision of work. What change it should make on it.

Perhaps there is no doubt room for doubt in the way of subordinates: but the point is that the Exec Engr & Superintending establishment will be able to look after the carrying out of the works, without general increase in strength.

See note below

This account seems to be a matter on which there is room for any amount of doubt & dispute: & which a decision satisfactory to all parties will be 'most impossible'. This may be clearly seen from Mrs Jones' own statement. He makes out an average saving of some 4 per cent, as compared with Col. Pennycuick's two rates of 24½ and 12½ or 20%, in favour of his own plan; but he has made no allowance for the cost, or any part of the cost, of himself & his office for the 5 years in question. If that were added in, there would be a different tale to tell. Whatever may be the rate charged, inasmuch as in practically every case half the cost of the works is borne by Govt, half of the sum recovered will merely be transferred from one side of the Govt account to the other, from, that is, 45, Civil works, Misc: public improvements, to XXXII, Civil works. Under these circs, it seems clear that the Govt will be the losers on the whole, & will be no gainers on account of the supervision by the P.W.D. of the execution of water supply & drainage works. The P.W.D. establishment will thereby be slightly reduced, but we can also be slightly reduced, if we find it convenient to do so, giving slightly smaller grants to Municipalities for the above objects. Whether the adoption of this course would have a great deal of trouble & give general satisfaction, if it be allowable to adopt it, which I do not know.

I quite agree with the Hon Mr. Bliss. The circumstances under which we make it imperative on us

then are sure to be some alterations required, for which the former cannot be held responsible. Again it would be very hard for the Exec. Engr to carry out his ordinary work, or also the Sanitary work, & would probably have to neglect one for the other, thus giving either the Supt. Engr. or the San. Engr. just cause for complaint because his works are not carried out.

The question raised as to the responsibility for alterations in designs is met to a great extent by the fact that the Ch. C.E. is to be Pres. of the San. Bd., which has to approve of the designs in the first instance.

(c) In para 15 the S.E. says that if different works are to be carried out by different Exec. Engrs. there is no guarantee that the same patterns, designs of machinery, plant &c will be used for all projects, which is most desirable so as to allow of their being interchangeable: and also that the Supt. will not know what plant has been used in another scheme & may be available for use by him. But as these Exec. Engrs all belong to the P.W.D., the C.E. as head of the Dept will see to these requirements just as well as the S.E.

3. The C.E. Col. Campbell, generally supports Mr. Jones' objections to the works being entrusted to the D.W.D. & states that Col. Scott-Moncrieff also disapproved of it, but chose it as the lesser of two evils. (Those being (1) Leaving D.W.D. officers to the S.E. & (2) Entrusting execution of works to D.W.D.) as for financial reasons a properly Constituted San. Engg. Dept. was impossible.

4. Last of all Mr. Jones objects to the works being entrusted to Municipalities after completion, as he says that it is absolutely essential that they should be superintended by a properly qualified engineer. He proposes to appoint such an engineer to be utilized by groups of municipalities. At present however very few municipalities are in a position to incur this expenditure.

5. In the event of Govt not reconsidering their orders, Mr. Jones propounds certain questions in para 18 of his letter, to which answers are given by Col. Campbell, which may be accepted.

6. The C.E. admits the objections to entrusting the work to the D.W.D. & thinks that the financial difficulty in the way of constituting a properly constituted San. Engineering Dept. may be got over. His proposal is to concentrate the work

Organisation of the Sanitary Engineering

FOR ORDERS.

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to adopt any scheme that will be free from objection.

16/12/96

says that not only will D.W.D. officers not have time to properly supervise sanitary works, as they shd. be supervised, but also that nowadays Sanitary Engineering is quite a special branch, which is not studied by [illegible] requiring special study.

But the sanitary works being carried out in Lakes. at present are simple drainage & waterworks systems — not the difficult [illegible] sanitation that

[5c]
600—7-5-95.

DEPARTMENT.

60

C. No.

3P

England has become a separate profession. G.B.

FOR ORDERS.

This scheme would be quite impracticable

W.S.

This would be to take up municipal works not in the order of the importance of the towns but in the order of their local distribution on the face of the globe.

G.B.

* please see over para 8.

In order to do this he suggests that municipalities should be grouped together in circles, & that works should only be undertaken in one circle at a time. While works are being executed in one circle, plans etc might be got ready for the next circle, which would be executed in their turn. * For this the only estt. necessary wd. be Mr. Jones as Supt. Engr., one Ex. Engr. & 3 assistants with a few subordinates. He agrees with Mr. Jones that the upkeep of works should not be entrusted to municipalities, but does not consider this suggestion feasible, & suggests that might D.W.D. Engineers should undertake the work.

7. In the last current the S.E. forwards a report on Sanitary works in the Deputy N.W.D., in which the two provinces are compared, greatly to the benefit of the latter, where they are carried on

under the supervision of a special officer, whereas in the former they are carried out by the P.W.D. The report is by the San. Insp. to Govt, Bombay, & supports Mr Jones' views.

8. The objection to the grouping of municipalities for the execution of works, is that at present there are not a sufficient number of municipalities in one circle, who have the money to carry out these works. In most cases it is only with great care that the money can be scraped together to carry out major schemes, & very likely at the time when one circle was being undertaken, municipalities in it would not have sufficient funds, which they might raise subsequently, when work had been transferred to another circle.

Lt Col Hellspe
27. ii. 96

H.M.

As soon as Col. Pennycuick's back is turned, Mr Jones takes the first available opportunity to attack the policy embodied in G. of I. Dept Circular no 2073 M., letter dated 9 Dec 1895 no 2073 M., letter and surreptitiously obtaining permission to put his views before Govt, I think, whatever the merits of the case may be, the course

Organization of the San. Engineering Dept

112-499+626m

FOR ORDERS.

H.M.

F.D. no 2073 M
9.12.95

H.B. M

48
82

he has taken is in rather questionable taste. He virtually agitates the whole of the issues that Govt settled after full & careful deliberation.

As I understand the position created by Govt by the G.O. of Dec. Circular was to place the S. Supt in the relation to the D.P.W. executive somewhat similar to that occupied by the Consulting Architect. In the case of the latter we do not hear of all the difficulties & friction which Mr Jones conjures up under the shaped a "dual control". Moreover as the A.S. points out alterations in designs will be made by the or in the name of the San. Bd of which the Civil Surgeon is President.

With regard to Mr Jones

queries in para. 8 of this letter, the C.E's proposed answers seem to be generally right but the following points require consd:-

WS HB.

No.(2) as to amendments of design, C.E. proposes that material alterations shd be submtd. by the L.Bs. to the C.E. who may consult the San. Engineer but perhaps material alterations shd be submitted to the Sanitary Board appd. by the C.E & L.Bs all members.

I think the C.E. might help to consult the San. Bd. if ordered he thought fit to do so WS HB.

No.(3) seems right. The L.Bs. is responsible that the design is right. If he could intermeddle with the execution he wd. be tempted to raise difficulties to create the necessity for the particular mode of execution he favors. If he is dissatisfied he shd report to the San. Board. But the works are simple. If the executive dept. however push difficulties they shd freely consult the San. Board, who may get a report from the San. E. if necessary.

Most decidedly - Hitherto Mr. Jones has had the control of the spending of large sums of money without anyone to supervise him. In fact, I don't know who audits the accounts of his expenditure. The position is one extremely improper one & shd. not be allowed to continue.

WS HB.

As to (4) - this raises, quite needlessly apparently, the q. of tenders for English materials. At present the L.Bs. freely recommend English firms to Municipal & Local Boards. The decision of Govt. to keep this power officially with the D.W.S. & discard the "Sanitary Engineer's Agents" shd be firmly maintained.

As to the maintenance of schemes in working order, the Govt. has distinctly resolved that for the present Cities must make their own arrangements. Mr Jones puts forward no new arguments. At the same time there shd be provision for periodical inspections. I do not see why the Exec. Engr.

Organization of San. Supt. Dept

H.E. 1 encl

This might be endorsed
WS

x vide para. 24:

112-499+626 M

RA
7/3/96
A.B.

qu of the district 2h. last do there
sta once every half year: & the
to Dr. himself or his Ass. (Mr Nunclan) once
Wh a year at least. There are
Ir very few Water. with a regular
de. system of waterworks. In
In a few years other arrange-
ments will have to be
w made. I understand that
b Govt quite recognized this
with regard to the whole
scheme sanctd in the Dec!
G.O.. It is meant to be
a scheme to meet requirements
as they at present are & it
is also limited by financial
exigencies.

As to the contributions due
paid by Mates. see para. 3 of
note of 2.11.95 at p. 5 of
G.O. 9.12.95. & for orders

R. Forbes
8.2.96

[5]
1,000—17-11-93.

LOCAL AND MUNICIPAL DEPARTMENT

Papers to be read in Proceedings:—

Again G.O., dated 9th December 1895, No. 2073 M
Current No 112 M of 1896 dated 11th January 96 from the P.W.D.
Current No. 499 M of 1896, dated 10th Feby 96 from the do.
Current No 626 M of 1896 dated 6th February 96 from the Sanitary Engineer forwarded with endorsement by P.W.D.

Order. No 847 M dt 15-5-96.
draft order

In the first of his letters read above the Sanitary Engineer asks for a reconsideration of the orders conveyed in G.O., 2073 M., dated 9th December 1895, defining the duties of his Department. It has never been denied that if funds were ~~available~~ abundant, the best plan would be to ~~form~~ create a Sanitary Engineering Department complete in itself and strong enough not only to design works but also to carry them out ~~itself~~. But unfortunately this plan being not it was decided feasible on financial grounds, after much discussion and consideration ~~it was decided to adopt~~ the plan laid down in G.O. No. 2073 M. dated 9th Dec. 1895 ~~was decided on~~, and the execution of the works being entrusted to the Public Works Department, ~~leaving~~ and the duty of designing them to the Sanitary Engineer. The ~~While admitting that this plan~~ scheme is ~~by~~ not ~~means~~ but has been free from objections, ~~it was~~ determined by financial limitations after due deliberation and must be adhered to ~~unless and~~ until it shall ~~is~~ proved to be ~~a failure~~ impracticable inadequate.

2. In forwarding Mr. Jones' letter the Chief Engineer has suggested a means of considerably reducing the cost of a separate ~~Sanitary Engineering~~ Department. This is

Please return to page 71

Please put the order with the portions in [ ] enclosed in brackets & write the letters A & B with his remarks in the margin to facilitate the framing of the orders

This draft correctly expresses my views in which the Hon Mr Forbes has concurred - But as the matter is of importance & has long been the subject of more or less controversy & as difficulties may in future arise in working it I think it will be expedient that H.E. the Governor should see the draft before issue

RA [6/5]
4/4/96

~~I do not propose that this scheme should be altered, but it is only meant to meet requirements, as they~~ also ~~at present, & it is necessarily limited by financial exigencies of the present time~~

by what the Govt considers to be sufficient for the actual requirements of sanitary projects at the present time. It was settled

is to group municipalities into circles and to centralize all the works being carried on at one time in one circle, so that their supervision could be ~~adequately~~ undertaken ~~carried out~~ by a very small staff. While these works ~~are~~ were being ~~carried out~~ executed, designs and estimates for works in the next circle ~~might~~ would be prepared, and the works ~~executed~~ taken up on completion of those in the first circle.

If the Government considers ~~, however,~~ that ~~there are many objections to this scheme,~~ and ~~it must be considered~~ the proposal is impracticable.

3. Mr.Jones further submits certain questions arising out of the orders in G.O No. 2073 M., dated 9th December 1895, and requests that he may be favoured with orders on them in the event of Government being unwilling to reconsider that G.O. The questions, four in number, ~~and the answers~~ are dealt with in para. 9 of the C.S's Memorandum, with whose conclusions for the ~~not given~~ by Government are as follows:-

(1) By whom should the specification and schedules for schemes ~~should~~ be prepared, by this office or by the Public Works Department?

They should be prepared by the Sanitary Engineer, who is to draw up the schemes.

(2) To whom should proposals for amendments of ~~the~~ schemes framed by the Sanitary Engineer and approved by the Sanitary Board and sanctioned by Government ~~should be made~~ and ~~whether~~ should reference ~~is to~~ be made to the Sanitary Engineer in reference to such proposed amendments?

Trifling alterations in design may be sanctioned by the Superintending Engineer of the circle, but material alterations should be submitted by the

The execution of sanitary projects cannot however follow any such procrustean order of distribution; & for this & other reasons

agrees generally with slight modifications. The points as answered

Superintending Engineer for the circle, who will consult the Chief Engineer, who will consult the Sanitary Board if and when he thinks it to do so.

(3) ~~Whether~~ Should the Sanitary Engineer ~~should~~ visit and report on the schemes under execution and make suggestions to the officer in charge for alterations admissible etc?

The Sanitary Engineer will not be required to visit and report on schemes ~~under~~ in course of execution.

If the executive dept. entrusted with the work meets with difficulties it may freely consult the Sanitary Board who may if necessary obtain a report from the Sanitary Engineer.

(4) ~~Whether~~ Should the ~~Public Works~~ Sanitary Engineer ~~Department~~ or the Public Works Department ~~are to~~ obtain tenders for English materials, and if through the Secretary of State or through the Sanitary Engineer's Agents (Messrs. Henry S.King and Co.), or by tender in India?

It has already been distinctly decided that the plant should be obtained by the Public Works Department, and therefore the rules in force in that Department regarding tender for English supplies will be ~~adhered to~~ followed.

4. The last point brought forward by the Sanitary Engineer is the question of maintenance of existing water-supply and drainage schemes. Government has decided that this must be left to Municipalities as in the course of a few years the increasing number of schemes would preclude the possibility of their maintenance by Government. As, however, (municipal schemes ~~have~~ have been largely assisted ~~the cost of the schemes has in great part been met~~ by Government, it is advisable that some control should be exercised over Municipalities in their upkeep, and this can

can best be secured by periodical inspec-tions. The Sanitary Engineer himself or his assistant, ~~Mr.Winchin~~ will therefore be requested to inspect each work once a year at least, and bring to the notice of Government any defects that may be found and the remedies suggested. The Public Works Department will also be requested to arrange for a half yearly inspection of these works by the Executive Engineer of the Division, in which they are ~~situal~~ situated. This course together with the two annual inspections of engines, pumps etc. by the Boiler Inspector will, it is hoped, be sufficient to ensure the machinery & plant ~~etc.~~ being maintained in proper order by the local authorities.

5. There remains ~~now~~ the question of the rate at which the Municipalities should contribute to the Public Works Department for the cost of supervision. Two rates appear to have been proposed by Colonel Pennycuick, ~~either~~ the ordinary Public Works Department charge of 24½ per cent on the expenditure on works, exclusive of charges for land and stores imported from England, ~~or~~ 12½ per cent on the total of estimates for water supply and 20 per cent on those for drainage. In the former case it is not stated what charges are ~~were~~ to be covered by the rate proposed, ~~but~~ Rule in the latter the 12½ and 20 per cent respectively, ~~were~~ are to cover all charges for supervision of work and also preparation of estimates. As this ~~latter~~ the last-mentioned work is to be carried out by the Sanitary Enginee

there

in one place (para 7 of Note in Gen. 2073 d. 2.9.1895), and in another place (para 11 of Note in Gen. 2380 d. 2.16.11.94)

there does not seem to be any reason why any charge should be made by the Public Works Department on this account. What charge should be made for supervision of work is a question open to ~~dispute~~ doubt, of which it would be extremely difficult to find a settlement satisfactory to all parties ~~concerned~~. This may be clearly seen from Mr.Jones' own statement for he calculates that there has been a saving of Rs.23,000 a year in schemes ~~already~~ during the last five years completed by comparing the actual cost of supervision with the rates proposed by Col. Pennycuick, but as these rates include the preparation of estimates, ~~he~~ Mr Jones should have included the cost, or part of the cost of himself and his office establishment by whom ~~concerned~~ all the schemes were investi-gated and the plans and ~~estimates prepared~~. However, inasmuch as in practically every case half the cost of the works is met from Provincial funds, whatever may be the rate that is determined on, half of the sum recovered will merely be transferred from one side of the Provincial account to the other i.e. from 45.Civil works, Miscellaneous Public improvements, to ~~that~~ slat Civil works. Under these circumstances the Government considers that the best way to settle the question will be to make no charge on Municipalities for supervision of the works executed, ~~but~~ this plan will accordingly be adopted in future. The slight reduction thereby caused in the receipts of the Public Works Department may be balanced, if necessary, by the reduction of the grants given by Provincial

I would insert the passage between brackets. A SH 14.4.96

As he has omitted all consideration of this item his prices are not ~~much~~ comparable with those he criticises.

XXXII not 32 = Receipt Romanfigures heads are numbered 32 DD Verby

× Vide page 689 Vol II. of the Civil Account Code A

I cannot reconcile passage marked A with that marked B. If A. is seriously intended, I would leave out B.

B

A SH 14.4.96

Organization of the Sanitary Engineering Department.

E

112.699+626 Pt

(From orders) pc

The P.W. Department 15
" Jt. Secy. Sanitary Bd. (Eng. branch) 16
" " " " (Sanitary branch)
" San. Engr. 19
" San. Comr. 19
" all chairmen of Mul. Councils
" all Collrs.
" all Dists. P.O.'s &c. 15/6/96
" Resident. Mul. Comr. Madras. 16 Sept. 18/6/96

Early

To the P.W.D. for favour of comments of initials with especial reference to s of the order.

W.S. Phillips 21.3.96.

To be read with the Hon'ble Mr's notes.

S. Forbes 21.3.96

D. McN. Campbell 2.4.96

2/4/96

H.O.

Dept. for approval. It has been initialled by the Secy. in the D.O.

S. Forbes 2/4/96

Provincial in furtherance of the water supply etc. schemes, so that the ultimate ~~(Para orders)~~ net expenditure by Govt. under this head will remain the same, the necessity for fixing the charge for ~~Extension~~ will be obviated

(From orders)

W.S. Phillips 21-3-96

S. Forbes

1/6P

++ Submitted to Hon. Mr. Bliss with ref. to H.E. the Governor's remarks

W.S. Phillips 17.4.96

L.O. 7. Price 17/4/96

H.E. has noted on two passages on the preceding page. In the first case, I think we should retain the passage proposed to be omitted. If not, it will be equivalent to admitting the accuracy of Mr. Jones' calculations, which we cannot do. As to the passage marked B (i.e. from "The slight reduction" to the end of the para) that may be omitted if H.E. wishes, though I should prefer to retain it, as I think it makes the position clearer.

B. Bliss 20/4/96

Resubmitted to H.E. the Governor with reference to the above note of Hon. Mr. Bliss

W.S. Phillips 22.4.96

L.O. 7 Price 27/4/96.

1. I am directed to request that it may not

9P

Mr. Jones compared his actual cost (cl 10 of this statt) with Col. P's suggested rates of charge, i.e., (1) at 4½% on cost of works, deducting cost of hire of survey stand (cl 6 of statt), and (2) 12½ (or 20)% (cls 8 & 9 of statt). As I did not know exactly what the 4½% included, I omitted that from consideration, & dealt only with the 12½ (or 20)% rate - which includes cost of preparation of estimates, which Mr. J's actuals do not. I see no remark, which I still think correct. However, it really does not much matter whether the remark stands or not - The same may be said of the passage marked B. Let them both be omitted

H.E. wishes.

B. Bliss [Miss] 8/5/96

To be printed in Contractor's Manual

8P

not Mr. Jones's figures that are wrong, but Colonel Pennycuick's. No allowance was made by Colonel Pennycuick for the fact that the plans and estimates would be prepared by the Sanitary Engineer and his Staff, and in consequence of this oversight, his charges for supervision and inspection is too high. If this error is corrected and a lower rate adopted, the total charges which would have been made for the works executed during the last five years, if they had been carried out by the P. Works Officers, would be less than the figures given by Mr. Jones, and the saving he refers to, would also be less. As Mr. Jones and his Staff prepare the Estimates under both systems, the cost of this establishment, if included on all in the comparison he makes, should be included in both sides of the account and this would not alter the difference he brings out. But, as it has been decided to make no charge for supervision, it seemed to me on reading the draft that the passage marked between brackets, was in reality superfluous, and as I had a doubt if it necessary, - I suggested its omission.

2. As regards the passage marked B, it seemed

seemed to me to involve an inconsistency. The draft similarly states that the government proposes to make no charge for supervision. If there goes on to say that the slight reduction in receipts caused by making no charge, could be balanced by the reduction of the grants given to the Municipalities. This appears to me to be giving with one hand and taking away with the other. As I suppose the fact. do not wish to do this, I suggested the omission of the passage marked B.

3. I should be obliged if the Hon. Mr. Bliss would run again look over the draft with the other remarks.

Yrs [Havelock]
3.5.96

I resubmitted to Hon. W. Bliss with ref. to H.E. the Governor's note of 3.5.96
W.S. Phillips
4.5.96

Yr 7 Price
7/5/96

Remarks after Amble
Mr Bliss the Premier
here

[Yr 847 m
15/5/96]

Hon. N. Bliss C.I.S.

847 M