

Gobt. of {1896} Madras.
LOCAL AND MUNICIPAL.

Issued

Recd.

Encl.

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

MAY.

172 c d/11-196

941 c d/18-2-96

1268 c d/2-11-95

3030 W d/12-11-91

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.

Ch E for Dr
Suptg Engrs
Suptg Engrs
Suptg Engrs
Suptg Engrs

(note - the St. Thomas
donated on Aug 5/96)
14/11/96
12/11/96
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145-c
Acad: 16-6-96

Current No 133 4
5-4-96
No 1931 W, d/2nd July 1896
communicated
officers of the P.W. Dept
for information and
guidance.

18/6/96

19.6.96

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 Pennycuik 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 Pennycuik 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 Pennycuik 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 Pennycuik 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 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.

(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 Pennycuik 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 Pennycuik'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 Pennycuik'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
1	Adóni	RS. 1,58,119	RS. 87,325	RS. 70,794	RS. 17,344	RS. 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	Kumbakonam	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
1	Adóni	12½	RS. 20,250	RS. 8,259	RS. 9,985	RS. 11,991
2	Coonoor	20	9,600	5,017	5,233	4,583
3	Cuddapah	12½	2,423	2,194	183	229
4	Kumbakonam	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	24,185	23,985	31,792
7	Trichinopoly	12½	65,006	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 Pennycuik'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 Pennycuik 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 Pennycuik'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, &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 interchangeable 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 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.

10th 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.

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.

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 Pennycuik, 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.)

W. W. Phillips

Under Secretary, P.W.D.,
for 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.
 „ ~~all~~ President, Municipal Commission, Madras.
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