Archives I—10,006—16-8 77.

(1) Number of pages 94
(2) Date of repair 22.12.86
(3) Initials of the Referencer

MIL NADU ARCHIVES

ERNMENT OF TAMIL NADU

PUBLIC WORKS. **DEPARTMENT**

G.O. No. ~~**B.P. No.**~~	2953.W.	**Press.** ~~**Mis.**~~
Dated	28-12-1880	~~197~~.

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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

28th December 1880, No. 2,953 W.

Buildings and Roads.
Civil Works.

Read the following papers :—

No. 104 From Captain A. AWDRY, R.E., Superintendent of Works, Buckingham Canal, to the Chief Engineer, Public Works Department, dated Camp Kristnapatam, 18th September 1880, No. 1,682.

WITH reference to G.O., No. 3,351, of the 27th December 1879, I have the honor to inform you that Mr. Jones intimated to me in the middle of July, a day or two before I went on leave, that his drainage scheme for Black Town was nearly ready, and I accordingly went to his office and examined the plans and design with him.

2. The general plan of the work is the exclusion of sewage from the existing faulty covered sewers which will be utilized for the discharge of storm waters falling into the drains. All streets will be provided with open drains of a V-shaped section—the sides of the V being slightly curved—for the ordinary drainage of the town, of which the conservancy as regards solid refuse of all kinds is on the dry system ; the drains have therefore only to carry away the liquid refuse passing from the backyards, cook-houses, wash-houses, urinals, and cattle-sheds, and arrangements are made by which they can be flushed in many places at pleasure by means of the water-supply of the town.

3. The sewage passing through these open drains will fall into new under-ground sewers constructed along the lowest parts of the valleys running parallel to the line of beach. These sewers will be given a far more considerable fall than was given to the old main drain of the town.

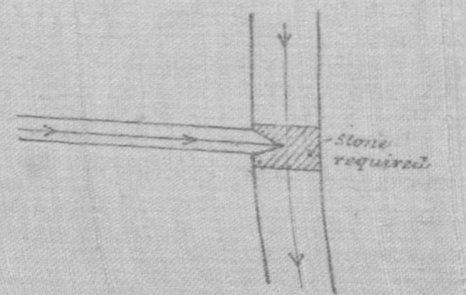
4. These new sewers are not to receive storm water and they are all to lead to a pumping station situated to the north of the town near to the present position of the Harbour Works engines ; from the pumping station the sewage will be forced along closed iron 24-inch piping until it reaches a distance of about a mile to the north of the pumping station, where it will be led by open earthen channels to sewage farms. The site of these farms has been selected with due regard to the observations recorded of prevalent winds so that any offensive odours from them may be carried clear of the present town, but it might be better to take it a mile or more further north before discharging it into the open air without very much enhancing the cost and thus give a larger margin of safety from risk of the farms being offensive to people living at the north end of the town.

5. The section of the sewers as proposed by Mr. Jones is circular as that is the form already adopted for the Harbour intercepting sewer, but it would not be difficult, and would probably be better, to adopt the egg shape in preference as it insures a greater velocity where a small quantity of sewage is passing and therefore of course checks formation of deposit in the sewers.

6. After examining the design with Mr. Jones he took me to see a part of the town on which his system of surface drainage had been tried. It is situated to the

east of the Wall Tax Road at about a quarter of a mile north of the Central Station where there is a net work of narrow lanes. The V-shaped drains are a very great success, liquid sewage running freely in them and not adhering to the sides, while in lanes near not yet improved the old rectangular drains were reeking with stagnant or very sluggishly-flowing sewage. These V-shaped drains had been in use for some weeks and showed no damage whatever, the cement with which the ordinary brick (of which the drains were constructed) was coated being hard and smooth.

7. The points where one line of drain joins another require, I think, a minor alteration by a stone cut to the shape of the receiving drain being utilized instead of cement over brick at the point where the sewage from the one drain continually strikes the side of the other drain into which it falls, as I should doubt the cement standing long in that position where it is constantly receiving a blow, and the brick will wear away as soon as the cement goes.



8. Also where the drains pass under the road-ways they should be made of an enlarged section so that straw and such like rubbish may not choke them, and such crossings should be made in places where there is room to pass a bamboo or other cleaning rod under the road so as to avoid the necessity for tearing up the roadway on each occasion of a stoppage.

9. Mr. Jones has no doubt forwarded a copy of his scheme to you, so I do not send my copy, and I have only reported generally in the matter as you informed me that on your return to Madras you proposed to examine the scheme yourself.

10. The work will, if carried, out be undoubtedly of very great benefit to the town of Madras and will save the Buckingham Canal from getting into the extremely filthy state in which it necessarily is at present between the Basin and the Central Railway Station.

No. 104-A.

From F. N. THOROWGOOD, Esq., M. INST. C. E., Superintendent, Madras Harbour Works, to the Chief Engineer, Public Works Department, dated Madras, 15th October 1880, No. 48 W.

I HAVE the honor to acknowledge receipt this morning of your letter, No. 534, dated 13th October, and hasten to reply as requested.

2. What remarks I have to make upon the paragraphs of Mr. Jones' report on the drainage of Madras mentioned by you I will submit in order of the paragraphs.

PARA. 67.—As you are aware the sewer referred to was completed early in August last and has been working efficiently ever since. I am now in the fifth year of my experience of the sewer at Ráyapuram, and I can fairly say that I do not detect any more unpleasant smell now than formerly. The smell now certainly is not nearly so bad as in 1876-77 before I had (for the Municipality and at their cost) carried the outfall of the Ráyapuram main sewer well into the sea. I therefore do not agree with Mr. Jones that the nuisance would be doubled, for I think it not increased perceptibly.

PARA. 68.—With reference to the size of 24-inch diameter and 1 in 700 as the fall, my present experience tells me that this would not be too large. The Harbour Works Sewer would be better if it were larger, and I make no doubt that in this Mr. Jones would agree, although he, with me, considered the present section sufficient before I had completed the present drain.

PARA. 69.—The portion of Harbour Sewer cut off by the diversion alluded to in paragraph 68 has its outfall 2¼ feet below high water level, and I think on this

account it would not answer as a storm overflow. The whole of the mouth of the discharge pipe is covered at high-water ordinary tides, and this is not what should be the case with an *overflow* channel. If the cut-off portion were converted into an open channel (which would entail a regular arch under the railway lines) over the sides of which the overflow water might run in very heavy storms, I think it might be used for the purpose suggested, but in its present state of being constantly sealed by the sea I do not think the exit of the storm water through the 24-inch pipe would be sufficiently rapid to recommend its use.

PARA. 77.—With regard to this paragraph, I can only wish the surface drainage would be rapidly revised as hinted at by Mr. Jones and as I believed was being done at present. The junctions with existing sewers have been quite easy to accomplish, and the present storm outlets closed with doors answer sufficiently well, but the storm water in heavy rains is perfectly unmanageable, and it rushes down the slope from the beach road and through the drains themselves, threatening to carry all before it. I am of opinion that it is the surface drainage that wants improvement more than the junctions of the Harbour Sewer with the town drains.

PARÁ. 117.—The two 40-horse-power engines now used for stone-crushing and block-making will in about twelve months' time be for disposal if Government approve. They will have been working five years, but will, I can assert, be in excellent condition. I think that Rs. 30,000 is not a fair price for the engines and boilers, chimney shaft, buildings, water pumps, &c., as they stand. But no doubt they would be sold at a valuation.

3. In reply to your paragraph 2 I have no doubt that good Portland cement and sand properly applied and not less than one-fourth of an inch thick will resist all the corroding action of the sewage, and, provided proper tools are used for clearing out the drain, the plaster will be strong enough to stand any ordinary amount of brushing and scouring. If, however, square-nosed shovels or mamoties were constantly used and without care in cleaning out a curved cement channel, I think the corners of the tool would eventually cut through the coating of cement and let the sewage get at the brick.

No. 104-B.

Note by the Chief Engineer.

IN G.O. of 27th October 1879, No. 2,698 W., it was observed that arrangements would be made to place at disposal an officer of this department for investigating Mr. Jones' scheme for the drainage of Black Town, Madras. Captain Awdry, the officer selected, has reported the results of the examination in his letter, No. 1,682, of the 18th September 1880, and, as the detailed report on the scheme itself has now been furnished by the President, Municipal Board, the matter is ripe for the decision of Government.

2. Owing to the inherent difficulties of the question itself involving (1) the removal of sewage over a great area where there is little or no natural fall of the ground and no immediate discharge for the same excepting into an almost tideless sea, and (2) the outlay of a sum of money which the community found it difficult, if not impossible, to provide for unaided by Government, the details of this scheme have been subjected to more prolonged professional investigation and discussion than probably any other of a similar kind in India.

3. The ultimate outcome is the scheme now sent up which confines itself, *first*, to providing for Black Town only, and, *second*, to dealing only with the sewage of this area, leaving out of consideration provision for extraordinary storm waters, thus strictly confining itself to the most essential points as regards area and material to be removed with a view to minimise to the utmost the probable outlay.

4. In doing this and availing himself of the best points of the schemes of his predecessors, especially those of Major Tulloch, R.E., and the late Mr. Clarke, Mr. Jones has shown a wise discretion and has produced a scheme which in its general outlines solves to all appearances the question in the best possible way. He has adopted to its full legitimate extent the system of open drains so much insisted on as essential by His Grace the Governor, and has only resorted to closed sewers where such were unavoidable.

5. The scheme would no doubt be more perfect if it included disposal of all extraordinary storm waters, but the expense of doing this cannot now be afforded. The inhabitants must make up their minds to occasional floodings, and where the basement floors of houses are now too low the owners must either raise them or be content to accept occasional discomfort. There is nothing however in the scheme to prevent storm water drains being added at any future time the community can pay for them.

6. But, however complete the proposals now put forward are as a whole, too great attention cannot be given to the points of detail upon which their success depends in an equal degree, and in view to this the following observations are submitted for the consideration of Government.

7. The house connections and disposal of the liquid portions of the house refuse are dealt with in paragraphs 21 to 24 and 61 to 64 of Mr. Jones' report, from which it will be seen that by the extremely small outlay of Rs. 2 per tenant he hopes to deal in a sufficiently satisfactory manner with this, which after all is probably by far the most important, as it is certainly the most difficult, portion of any scheme for draining a native town.

8. It is impossible to overlook or disguise the fact that there may be the most perfect system for removing all offensive matter from the point at which such is discharged into the street drains, while there may exist side by side with this complete system a state of house drains that may be little less than poisonous.

9. It is not of course proved that such is really the case in Madras, but if not (and there is nothing to the contrary in the report) the native houses and courtyards must be in a very different state from what they are in all other native towns where away from all view sewage is allowed to sink into the ground of the little backyards and produces a rotten soil the effects of which cannot in any way be remedied by the most scrupulous cleanliness of the street drains outside.

10. If a thoroughly healthy state of things is to be produced in Madras and not merely a palliative, this fact must be looked fairly in the face.

11. The mere adjustment as proposed of an outer nozzle, costing Rs. 2 to each house drain as it now exists, will not, it may be concluded, deal in any adequate way with this matter.

12. From the nature of the case connected as it is more or less intimately with the private concerns of individuals, and not a little with caste prejudices, the question cannot be dealt with entirely as one of mere constructive devices (though of course these must be as perfect as the nature of the case admits), but must go very much further and enlist the co-operation of all concerned; it is thus a matter which, though calling apparently for early and serious attention on the part of the President and Municipal Engineer in connection with this scheme, need not be further remarked on here.

13. The next point in order of importance would seem to be the materials used in, and the form given to, the surface drains, which it is shown by paragraphs 48 to 52 will consist of brick plastered externally with Morgan's cement, and generally to be of the V form with curved surfaces.

14. For all ordinary application this matter of construction appears unobjectionable and even in this exceptional case may be found to answer well for several years, but it must be borne in mind that, notwithstanding every possible precaution, street drains have to undergo an amount of ill-usage that renders it essential to provide for materials which shall be as nearly as possible indestructable.

15. Mr. Jones has it is true, by giving curved surfaces and providing for cleansing with an India rubber tool, done what he could to obviate as far as possible the effects of constant attrition of the surfaces, but these cannot suffice to meet the thousand and one sources of injury to which street drains are exposed.

16. By paragraph 52 the edges of the drains are to consist of unplastered table brick; these, it is thought, will ere long certainly break down.

Captain Awdry in paragraph 7 very properly points to the weak point at all junctions with street drains and considers that a stone cut in the shape of the receiving drain should be introduced at such places, and he might, for equally good reasons, have added that, where house drains empty themselves into the drains, stones to receive the rush which must occur during storms, if not indeed to counteract the effect of the constant ordinary dropping, would appear to be necessary.

17. Even for these few out of many causes likely to injure the description of drain proposed, stones would have to be inserted, and as such combination would in itself, not only lead to expense, but be defective at all the junctions and edges; it would be better to consider whether thoroughly indestructible stone drains would not in the end be more economical.

18. It is not to be supposed that a mere skin of cement one-fourth of an inch in thickness can for a long series of years resist, not only the corroding action of the sewage acids, but the endless sources of injury to which town drains are subjected.

19. Inquiries have been made as to the probable cost of carrying stones (gneiss rock burnt off and dressed in being slabs) of a suitable class from Bangalore with the result that the Railway appear ready to carry the same at the rate of 5 pies per ton per mile or Rs. 5-10-0 per ton for the whole distance, which on slabs four inches in thickness would come to less than 2 annas per square foot.

20. This would admit of V drains entirely of stone being substituted, which, as will be seen from the annexure (A), should not cost more than 25 per cent. in excess of those proposed by Mr. Jones, and proportionably less if the material can be procured from a shorter distance, which seems not improbable.

21. The amount which this would add to the scheme is, as shown by annexure (B), Rs. 1,13,430 based on the abstract given on page 106 of the report.

22. At first sight this excess of over a lakh of rupees may appear heavy, but it must be borne in mind that in any case additional stone slabs must be provided or other suitable measures taken to counteract the weak points of the drains as now designed, and that the cost of these would probably equally swell the estimate.

23. On the other hand, as may be seen any day at Bangalore, a perfectly indestructible drain would not only be secured by adopting the modification suggested, but the materials can at any future time be used over again without any loss should it ever be desirable to take up and relay any drain in a different position or with altered dimensions. These advantages, coupled with almost complete immunity from future repair charges and the use of iron implements for cleansing instead of expensive and short-lived India rubber ones, would, it is thought, much more than compensate for the difference.

24. But, even were it eventually decided to adhere to the cement-plastered drains as proposed in the scheme sent up, it is advisable that flat instead of curved sided polygonal sections should be given as being much easier to construct. In paragraph 113 it is suggested that specially-shaped brick for forming the oval interior surface of each drain may be cheaply moulded, but a little consideration will show that, to derive every advantage from a specially-moulded brick, flat surfaces are essential, to say nothing of the much greater facility with which plaster laid on such can be rendered by the workman. A very slight rounding of the invert would in all cases be desirable.

25. Captain Awdry has drawn attention to the advantages of increasing the section of the drains at the street crossings, and also to the adoption of oviform instead of circular sections for the underground sewers to insure better discharge and lessen the deposit.

26. Mr. Thorowgood also remarks that the Harbour sewer which was designed independently of the Municipality (who declined to contribute to its construction) would be better if larger, and should no doubt be supplanted by another drain in case of the scheme being carried out. For the reasons assigned also it will not answer as a storm overflow.

The price to be offered for the engines, Rs. 30,000, is not again in Mr. Thorowgood's opinion sufficient.

Captain Awdry also thinks that it would be better if the delivery channel north of the town were carried a mile further than proposed.

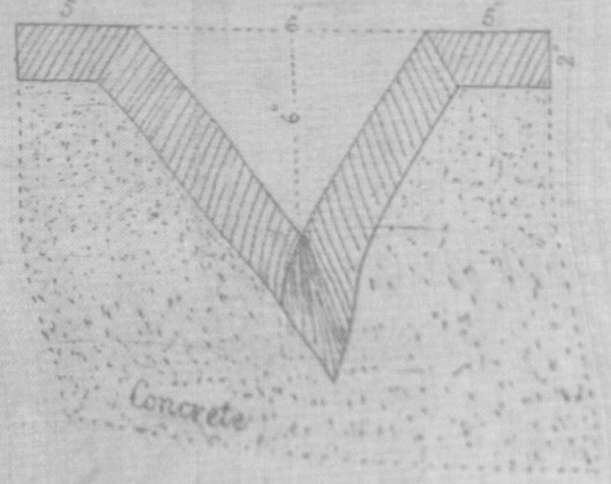
27. All these points seem to merit consideration before the scheme is definitely accepted, but, as it has now assumed a form leaving so little to be desired both as regards general design and economy, it is to be hoped that the modifications still needed to perfect it may not practically lead to any further delay and that the means for carrying out a project that has become so indispensable to the community may be put in execution at the earliest possible moment. Ten or eleven lakhs of rupees would be a small price to pay for the undeniable advantages of a scheme of the kind, and for the removal of a long-standing reproach to a great community like Madras.

(Signed) R. H. SANKEY, Colonel, R.E.,
Chief Engineer, P.W.D.

3rd November 1880.

Annexure A.

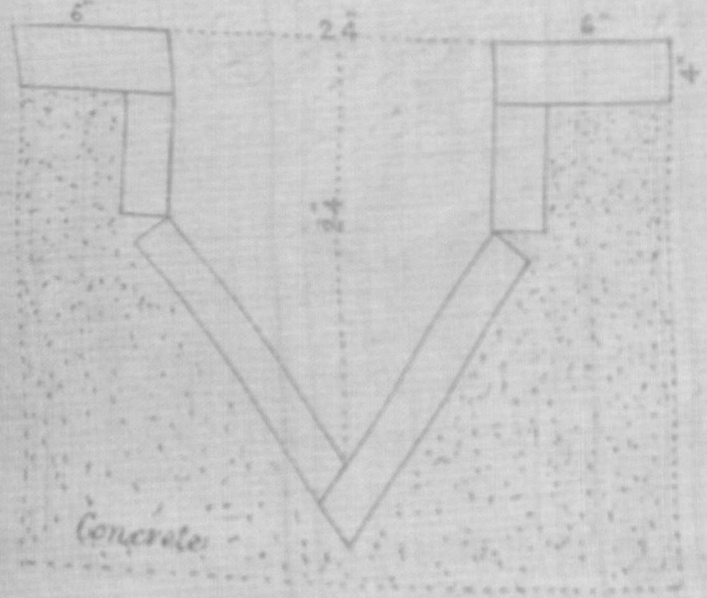
No. I.



Estimate for one Running Foot No. I.

	ANNAS.
2·5 square feet stone slabs at 2·5 annas per square feet at Bangalore...	6·25
Carriage of ditto to site of works in Madras at 2·5 annas per square feet...	6·25
1 cubic foot concrete at 2 annas ...	2· 0
Pointing	0· 4
Earthwork	0· 2
Cost per running foot ...	15·1

No. II.



Estimate for one Running Foot No. II.

	ANNAS.
6 square feet stone slabs at 2·5 annas at Bangalore	15· 0
Carriage to site of works, Madras ...	15· 0
3·5 cubic feet concrete at 2	7· 0
Pointing	0·75
Earthwork	0·85
Cost per running foot ...	38· 6

or say average 25 per cent. above Mr. Jones' system.

Annexure B.

Size of Drains.	Total Lenth in Running Feet.	Rate as per Mr. Jones' Estimate.			Total Cost.
		RS.	A.	P.	RS.
6 inches	3,03,571	0	12	6	2,37,165
9 „	69,357	1	0	0	69,356
12 „	49,314	1	3	0	58,560
15 „	19,835	1	6	0	27,275
18 „	17,759	1	12	0	32,178
21 „	4,711	2	0	0	9,422
24 „	7,255	2	4	0	16,324
30 „	887	2	12	0	2,439
					4,52,719
Total cost of surface drains as per Mr. Jones' estimate					
Add 25 per cent.					1,13,430
Total if stone slabs from Bangalore are used					5,66,149

No. 104-C. From Major H. M. VIBART, R.E., Superintendent of Works, Presidency, to the Chief Engineer, Public Works Department, dated Chepauk, 7th December 1880, No. 3,303.

With reference to your Office Note dated 18th ultimo, I have the honor to submit a statement showing the estimated cost according to the local rates of the stone drains Nos. I and II of Cuddapah and Sholinghur stones respectively, and to point out that Cuddapah stone seems very suitable for the work, and will apparently not cost more than the cement drains, which it is supposed will be about 12 annas and 2 rupees per running foot.

Estimate for V-shaped Drains proposed to be built in connection with the Drainage Scheme, Black Town, Madras.

Quantity.	Description.	AS PER MR. CHISHOLM'S RATES.		AS PER LOCAL MARKET RATES.						AS PER MR. CHISHOLM'S RATES.		AS PER LOCAL RATES.		Remarks.
		Cuddapah Slabs, Average Size 5′ × 15″ to 18″ × 1½″.		Cuddapah Slabs, Average Size 2′ to 6′ × 18″ × 1½″ to 2″ to be delivered at Work Spot.		Cuddapah Slabs, Average Size 2′ to 6′ × 18″ × 3″ to be delivered at Work Spot.		Cuddapah Slabs, Average Size 2′ to 6′ × 18″ × 4″ to be delivered at Work-Spot.		Sholinghur Stones.		Sholinghur Stones, Average Size 4′ × 18″ × 4″ to be delivered at Work Spot.		
		Rate.	Amount.	Rate.	Amount.	Rate.	Amount.	Rate.	Amount.	Rate.	Amount.	Rate.	Amount.	
		SQ. FT.	RS. A. P.	SQ. FT.	RS. A. P.	SQ. FT.	RS. A. P.	SQ. FT.	RS. A. P.	SQ. FT.	RS. A. P.	SQ. FT.	RS. A. P.	
	No. I.													
2½ Sq. ft. ..	Slabs ..	0 0 10	0 2 1	} 0 3 7	0 9 0	0 5 3	0 12 1	0 6 7	1 0 6	{ 0 1 8	0 4 2	} 0 8 6	1 5 3	An allowance of 2 annas per sq. ft. should be made for dressing the Sholinghur stones. The Cuddapah slabs may be used as received from the Quarry.
2½ " ..	Carriage to site of work.	0 2 10	0 7 1							0 3 8	0 9 2			
1 C. ft. ..	Concrete ..	0 2 6	0 2 6	0 2 6	0 2 6	0 2 6	0 2 6	0 2 6	0 2 6	C. FT. 0 2 6	0 2 6	0 2 6	0 2 6	
2½ Sq. ft. ..	Pointing with cement ..	0 0 2	0 0 5	0 0 2	0 0 5	0 0 2	0 0 5	0 0 2	0 0 5	SQ. FT. 0 0 2	0 0 5	0 0 2	0 0 5	
	Earthwork for excavation, &c.	..	0 0 2	..	0 0 2	..	0 0 2	..	0 0 2	..	C. FT. 0 0 2	..	0 0 2	
	Cost for 1 Running Foot.	..	0 12 3	..	0 12 1	..	1 0 2	..	1 3 7	..	1 0 5	..	1 8 4	
	No. II.													
6 Sq. ft. ..	Slabs ..	0 0 10	0 5 0	} 0 3 7	1 5 6	0 5 3	1 15 6	0 6 7	2 7 6	{ 0 1 8	0 10 0	} 0 8 6 Including carriage to site of work.	3 3 0	
6 " ..	Carriage to site of work.	0 2 10	1 1 0							0 3 8	1 6 0			
3½ C. ft. ..	Concrete ..	0 2 6	0 8 9	0 2 6	0 8 9	0 2 6	0 8 9	0 2 6	0 8 9	0 2 6	0 8 9	0 2 6	0 8 9	
	Pointing with cement ..	..	0 1 2	..	0 1 2	..	0 1 2	..	0 1 2	..	0 1 2	..	0 1 2	
	Earthwork for excavation.	..	0 0 9	..	0 0 9	..	0 0 9	..	0 0 9	..	0 0 9	..	0 0 9	
	Cost for 1 Running Foot.	..	2 0 8	..	2 0 2	..	2 10 2	..	3 2 2	..	2 10 8	..	3 13 8	

(Signed) S. C. PLUMMER, Lieut.,
Assistant Engineer, Presidency.

(Signed) H. M. VIBART, Major, R.E.,
Supt. of Works, Presidency.

CHEPAUK,
6th December 1880.

No. 105. ORDER THEREON, 28th December 1880, No. 2,953 W.

THESE papers will be communicated to the Madras Municipal Commission, who will be requested to report their decision as speedily as possible.

(True Extract.)

Major, R.E.,
Under Secy. to Govt., P.W.D.,

To the Financial Department, with original file of papers from that department returned.

Exd. J. W. Fischer.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of (1880) Madras.
PUBLIC WORKS

To

THE FINANCIAL DEPARTMENT.

Dated December, 28th.

Issued

Recd. *Encl.*

G. O., 28th December 1880, No. 2,953 W.

DECEMBER.
Nos. 104-105.

Drainage Scheme, Black Town.

To be kept with Drainage file. 16-3-81

GOVERNMENT OF MADRAS.

FINANCIAL DEPARTMENT.

21st February 1881, No. 292.

Municipal—Sanitary.

Read the following paper :—

No. 41. *From Surgeon-Major M. C. FURNELL, M.D., F.R.C.S., Sanitary Commissioner for Madras, to the Chief Secretary to Government, dated Madras, 26th January* 1881, *No.* 67.

I have the honor, in anticipation of a more lengthy report which I am engaged in preparing, to call the attention of Government to the very insanitary state of many parts of Madras. I am induced to do so inasmuch as I see from the public prints that the Municipality of Madras have recently had an interview with His Excellency the Governor and, amongst other things, called attention to the lamentably insufficient allotment in their power to make for executing even the primary duties of sanitary conservancy.

2. I have been engaged during the past and present months from time to time inspecting different parts of Madras, and have on these occasions been accompanied either by Mr. Arundel, the President, or Mr. Jones, the Vice-President, of the Municipality, and it is but justice to these gentlemen I should mention that not only have I received every assistance in being shown the dirtiest and most insanitary parts of the town, but that they are fully alive to the defects existing and only too anxious if they had means at their disposal to remedy them.

3. I will briefly point out a few of these. Madras is divided, for Municipal purposes, into two principal divisions (North and South); each division is sub-divided into four sub-divisions, so that there are eight sub-divisions in Madras.

4. In the First Sub-division, the most northern part of Madras, is a place called the Tinnevelly Settlement, where lives a large collection of people principally engaged in preparing the new paddy for sale in the markets. This Tinnevelly Settlement is a collection of thatched huts as thickly placed on the ground as it is possible for human habitations to be. There is no drainage; no plan of streets or even lanes; you make your way by little narrow passages, more like gutters, around and between the houses. These passages are the places *d'aisances* of the community and thickly strewn with night-soil in every stage. Here and there are shallow wells from which the inhabitants obtain their drinking water. This place is notorious, I am informed, as the head-quarters of cholera and fever.

5. In this sub-division is another place we visited called Nagatha Covil Paracheri, which presents much the same features as the Tinnevelly Settlement, but not quite so pronounced. This place is interesting as being the abode principally of the domestic servants of the European community. Many an obscure case of contagious sickness in the otherwise healthy quarter of the upper classes might easily be accounted for if we knew more of the dwellings of the servants.

6. In the Second Division, which I visited accompanied by Mr. Jones, the Engineer and Vice-President of the Municipality, a portion of the town has been laid down by drains on Mr. Jones' plans. As this scheme is, I am given to understand, before Government, it will be needless for me to make any remarks about it here, more than to observe it seemed to me a vast improvement on anything elsewhere in the town.

7. But parts of this division are in a frightfully filthy condition, and until the people themselves can be made in some sense to understand the insanitary state of their surroundings, all Municipal efforts would seem hopeless. In one house, 20′×12′, I counted ten buffaloes wallowing in their own dung, a small portion of the space being set aside for the human inmates, of whom there were four present. In another part of this sub-division was an open yard in the most filthy condition, in which some six or eight buffaloes were tethered. This yard was so situated that the urine and fluid fæcal matter from it drained away into human habitations below. To my inquiry as to why this sort of thing was not summarily put a stop to, the Assistant Engineer assured me he had no power, and the Municipality could invest him with none.

8. In another portion of this division, called Yeddapalium, the houses are crowded with buffaloes, who seem to be the principal inhabitants, the human inmates occupying quite a secondary position as regards accommodation.

9. It would be a movement in the right direction if some large open space could be set aside for stabling cattle and thus freeing the houses. Until this is done all Municipal efforts in the way of drainage and conservancy would seem hopeless.

10. In the Third Division is a place called Vasapamode Paracheri, a collection of houses once, I am told, as densely packed as the Tinnevelly Settlement, but which of late years has been opened up by the Municipality and drained. Its appearance now is in marked contrast to the other, and its reputation for sickness, once as evil as that of the Tinnevelly Settlement, is as much improved as its appearance. I mention this place to point out what can be done.

11. The drains about Vasapamode Paracheri are neatly made and easily kept clean, but in other parts of this sub-division, notably in Armenian Street, the principal business-street of Black Town, where the offices of some of the most important Mercantile Firms are situated, the drains are in a shocking state of disrepair. The black fetid sewage at our visit was stagnant in them, giving forth the most repulsive and nauseating odours. The residents, however, seemed quite unconscious of anything offensive, and the bazaar people, whose shops are most of them situated over these seething sewers, were selling food and sweetmeats as unconcernedly as if in the purest atmosphere—verily habit is second nature. The Assistant Engineer, Mr. Smith, who accompanied me on this occasion, informed me that this state of things was brought about because not one single pie was allowed by the Municipality for drains.

12. The Fourth Division calls for no very special notice. It is not densely inhabited. A large piece of ground near the Powder Magazine is being filled up with the refuse sweepings of the town and the effluvia from this proceeding is occasionally complained of by the people around, but, when the ground has been converted as proposed into vegetable gardens, it would become an ornament instead of any inconvenience to its surroundings.

13. The Fifth Division includes Vepery, Pursewalkum, Egmore, and Choolay, &c. In parts of Vepery the smells from the choked drains, filled with a black sluggishly-oozing fetid fluid, are very bad. Most of the drainage is pumped into D'Mello's farm, and, mixed with water, serves to irrigate the grass lands there, but a portion finds its way into a large open tank near the People's Park, which gives forth a most abominable smell poisoning the surrounding air. Two sides of this tank are densely inhabited, and people may be seen taking home water from it for domestic purposes.

14. Through the old Choolay market was a large open drain, the most offensive thing of the sort I have ever seen. The Municipality have very properly forbidden human food, such as butcher's meat and fish, being sold here any longer. It is marvellous how, for so many years, it was permitted.

15. The Sixth, Seventh, and Eighth Divisions I have not yet officially examined, but two of these are large open places well known to me and containing no very insanitary localities.

16. I have purposely made my letter as brief as possible, omitting all notice of the latrines, wells, public institutions, &c., which will be noticed in the more lengthy report alluded to above.

17. But I have said sufficient, I think, to draw attention to the sad necessity that exists for some active measures being taken for the sanitary conservancy of this large city, unless it is desirous it should maintain its now wide-known reputation of being the most insalubrious city of the world.

18. It would appear to me in the first place very desirable that a special Health Officer should be appointed, as is the case in Calcutta and Bombay, and as has been recommended by the former President of the Municipality and Sanitary Commissioner (*vide* G.O., No. 1618, of 28th November 1877), whose duties it would be diligently and constantly to point out what immediate remedies might be carried out to cope with the existing evil.

No. 42. ORDER THEREON, 21st February 1881, No. 292.

Communicated to the President of the Madras Municipal Commission for his remarks; but before replying the President should consult the Advocate-General, the Inspector-General of Police, and the Commissioner of Police, Madras, as to whether too narrow a view has not hitherto been taken of the powers of the Commissioners and the Police under the existing law with regard to sanitation.

(True Extract.)

Chief Secretary.

To the President of the Municipal Commission, Madras.
" Advocate-General.
" Inspector-General of Police.
" Commissioner of Police.
" Sanitary Commissioner.

Exd. T. O'Connor.

Govt. of (1881) Madras.

FINANCIAL.

To

The PRESIDENT of the
MUNICIPAL COMMISSION,
Madras,
&c., &c., &c.

Dated February, 21st.

Issued

Recd.

Recd.

G.O., 21st February 1881, No. 292.

FEBRUARY.
Nos. 41-42.

Municipal—Sanitary. — Communicating for remarks, with certain Instructions, letter from Sanitary Commissioner submitting preliminary inspection report on the sanitary condition of certain parts of Madras.

13

14

W

ct from a letter from

1058

80.

G. No. 407

8

Municipal Office,
Madras 8th July 1880.

From
A. T. Arundel Esq
Ag *President, Municipal Commission*,

To
The Hon'ble R. Davidson C.S.
Chief Secretary to Government
Ootacamund.

Sir,

I have the honor to inform you that Dr Marlborough, nominated by Government to be Municipal Commissioner of the 6th Division, having failed to attend three consecutive general meetings (viz 17th December 1879, and 26th February & 19th May 1880) has under Section 28, Act V of 1878, ceased to be a Commissioner, and that the Commissioners at the general meeting held on the 7th July did not avail themselves of their discretion under that section to restore him to his office.

Govt. of [1881] M

W

…t from a letter from

… 18th Nov/80.

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18
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I have the honor to be
Sir,
Your most obedt Servt.
A. Z. Arundell
Acting President

14

13

Financial DEPARTMENT. 10

No. *2477*

From *President . M . C . Madras* /

Dated *17th. September /80 No. 569 forwarding the Drainage Scheme, & stating that the Commissioners decline to discuss it under the present financial position of the Municipality.*

FOR ORDERS.

A . Demi Official Note from the President is enclosed.

28/9/80 JGF

[illegible]

Muni Procdg. 19 July 80

R. D. No. 1392

Minutes 1880 Department.

11 JUL 80

From, ~~Muncl. Commr.~~

The Ag. President Munl. Commn. Madras.

To, The Chief Secretary to Government

Dated 8th. July

Received 11th.

No. 1833

G. No. 407

Informing that Dr. Stanbrough, Municipal Commissioner of the 6th. Division ceased to be a Commissioner under Section 28 of Act V of 1878 he having failed to attend three consecutive General Meetings.

Order

197-98

Order 19 July 1880 No. 1397 Recorded

To the President M. C. Madras Dec. No. 2377

Govt. of (1881) M

Madras Municipality

Drainage Scheme

FOR ORDERS.

229/9

13

...w

...rite and

12

My dear Mr Carson —

Can you please get hold of Col ...'s note on the drainage scheme by Mr James — which was drafted & circulated while we were at Ooty — & send up those papers to His Grace ...

15/11

Ott

/12/80

14

...ct from a letter from ... Chisholm dated 18th Nov/80.

... you will take Sholinghur ... in quantities not less than ... can obtain it ... wagons at Sholinghur ... hewn 4 inches ... 8 pie per foot. ... take the same ... ddapah slabs — ... them of average ... d from 15" to 18" inches thick ... wagons at ... pies per Imperial

Govt. of (1881) M

187-98 Meetings

Order

Madras Municipal

Drainage Scheme

Submitted to W.

N.S. 18/11.

129/9

13

CAW

My note and Major Vibart's No 3303 with appended figured ~~Statement~~ had better be printed in extenso with the orders which will be simply to the effect of that directed in the H.M.'s note of the 5th ultimo marked in blue pencil

13/12/80

14

act from a letter from
Chisholm dated 18th Nov/80.

you will take Sholinghur
in quantities not less than
gons. You can obtain it
l into wagons at Sholinghur
roughly hewn 4 inches
r. 1 anna 8 pie per foot.
ou will take the same
ies of Cuddapah slabs-
obtain them of average
f 5 ft. and from 15" to 18"
nd 7 1/2 inches thick
d into wagons at
pah at 10 pies per Imperial

197-98 Gratings. Other

c29/9
R12/11

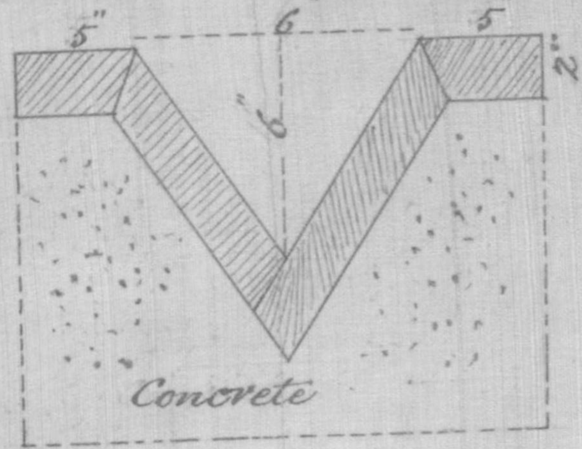
Extract from a letter from
Mr R. Chisholm dated 18th Nov/80.

If you will take Sholinghur Gneiss in quantities not less than 100 wagons you can obtain it delivered into wagons at Sholinghur in slabs roughly hewn 4 inches thick for 1 anna 8 pie per foot.

If you will take the same quantities of Cuddapah slabs you can obtain them of average length of 5 ft. and from 15" to 18" wide and 1 1/2 inches thick delivered into wagons at Cuddapah at 10 pies per Imperial foot.

Annexure A

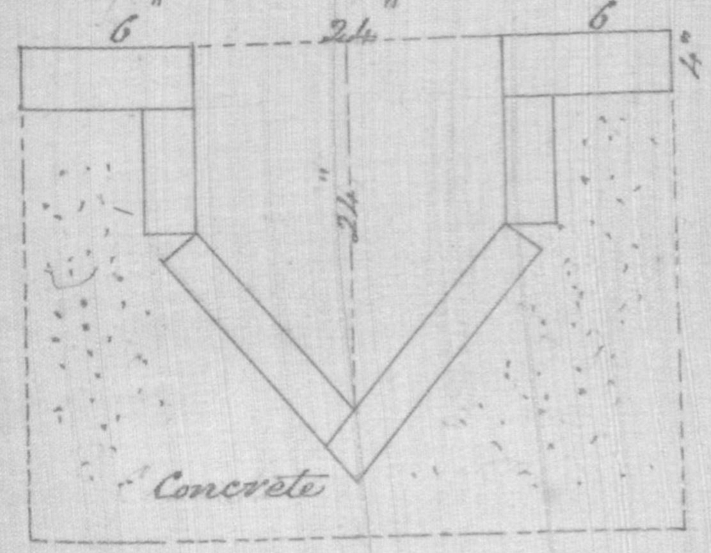
No. 1



Estimate for one running foot No. (I)

	annas
2.5 square feet stone slabs at 2.5 annas per sq: foot at Bangalore —	6.25
Carriage of ditto to site of works in Madras at 2.5 annas per sq: ft. —	6.25
1 C. ft. concrete at 2 annas —	2.0
Pointing ———	0.4
Earthwork ———	0.2
Cost per running foot – annas	15.1

No. II



Estimate for one running foot No. (II)

	annas
6 sq: ft. stone slabs at 2.5 as: at Bangalore —	15.0
Carriage to site of works Madras —	15.0
3.5 C. ft. concrete at 2 —	7.0
Pointing ———	0.75
Earthwork ———	0.85
Cost per running foot – annas	38.6

or say average 25 % above Mr. Jones's system.

17

To the Supdt. of Works
No. 541 Presidency 19-11-80

[illegible]

Memo (Office Note)

In forwarding the annexures herewith the U.S. would be glad if the Supt. of Works would send him at early convenience a revised Estimate for the Section of drains as per paper A using the class of stone suggested by Mr Chisholm or any other available in the local market which he thinks would answer as well

The Enquiry is made with the object of ascertaining the cheapest & at the same time most durable kind of street drain for Black Town in connection with the general drainage scheme now before Government

18/11/80

No. 3071
True copy - forwarded to the Assistant Engineer Presidency with copies of two enclosures for attention -

(Signed) S. C. Plummer Asst.
Asst Engr. for
S W Perry.

22-11-80

Hmd
23/11/80

No. 594

GOVT. OF MADRAS. } 188 . { P. W. DEPT.

SECRETARY.

Chepauk, 9th Decr 1880

OFFICE NOTE.

To The Supt of Wks
Presidency.

Your No. 3303 of 7th Dec. 80

We cannot dispose of this without the office note to which it is a reply. and which should ~~[illegible]~~ been returned.

Dy W.

No. 3353.

Herewith sent

Major R.E.

10-12-80

18

18 Novr 1880

My dear Col. Sankey

I will send to Bruchfield Statement on my return, there are a heap of figures to be verified before I can present the kernel to you.

Rates for Stores

...ble of that ...
...een advanced from
...t. Nothing could
...ble be more

...r 6.12.80. Recd 9.12.80

20

~~Pr W. Ha[illegible]~~

2953W 2489W

For orders

The accompanying letter No 10546 of the 29th Nov: 1880 from the Master Attendant has been transferred to this Dept. "for disposal" and I should be glad to receive the H.E.'s instructions thereon.

Captain Taylor's explanation that "nothing was further more foreign" to his mind than to charge Lemins malversation against this Department I should presume be frankly accepted. [illegible] I admit that some words are [illegible] to [illegible]

No. 594

GOVT. OF MADRAS. } 188 . { P. W. DEPT.

SECRETARY.

Chepauk, 9th Decr. 1880

If you will take Sholinghur Gneiss in quantities not less than 100 wagons - you can obtain it delivered into wagons at Sholinghur in Slabs varying from 4 inches thick for 1 anna 8 pie per foot -

If you will take the [illegible] quantities of Cuddapah slate - you can obtain [illegible] lengths of 5 ft [illegible] of 10 and from 15" to 18" wide and 1½ inches thick delivered into wagons at Cuddapah @ 10 pie per Sqr. ft.

19

Yours faithfully
R. B. Chisholm

Herewith sent

Major R.E.
[illegible] Secy.

10-12-80

[illegible] table of [illegible]
been advanced from
it. Nothing could
[illegible]ble be more

Cer 6.12.80. Recd 9.12.80

20

2983 W 2489 W

For orders

The accompanying letter No 10546 of the 29th Novr 1880 from the Master Attendant has been transferred to this Dept. for disposal and I should be glad to receive the H.E.'s instructions thereon. Captain Taylor's explanation that "nothing was ~~further~~ more foreign" to his mind than to charge [illegible] malversation against this Dept. I should presume be frankly accepted [illegible] I admit [illegible] [illegible] unquestionable to [illegible]

No. 594

GOVT. OF MADRAS. } 188 . {

SECRETARY.

Chepauk, 9th Decr

No 3353.

Herewith sent

10-12-80

20

2953 W 2889 W

For orders

The accompanying letter No 10546 of the 29th Nov: 1880 from the Master Attendant has been transferred to this Dept. for disposal and I should be glad to receive the H.E.'s instructions thereon.

Captain Taylor's explanation that "nothing was further more foreign" to his mind than to charge ~~Senior malversation against this Department I should [illegible] be frankly accepted [illegible] I admit that [illegible] [illegible] to [illegible]~~

The Mr A.T.O. certainly led us to believe that Rs. 3800 "nearly half the estimate for the whole work" had been expended - while no trace of results could be found. While no mention was made of the fact that the Port fund had been credited with the bulk of what had been advanced from it. Nothing could well be more

Cir 6.12.80. [illegible] 9.12.80

-planation unless he had no idea as to the real meaning of credits shown as 'per contra' entries in an account. As the matter stood there was no such thing on his books as an expenditure against the work at the date of his writing as Rs 3861 but only of Rs 1303-10-. That Government understood his call for explanation to imply a serious charge is clear from the peremptory demand made on his Dept. by the Chief Secy in the P. W. D. No 4008 of 13th August 1880

misleading.

Of course we must accept the disclaimer of intention to impute malversation. But I don't think the explanation exonerates the Ex. Offr. from blame for not putting all the facts before Govt. or fully ascertaining them before writing if he was imperfectly informed. 8/12

followed up by the Offg. memo No 1756 of 8th Sept. requiring me to "expedite the submission of the above report &c"

In para 5 of his present letter Capt. Taylor says his "remarks were made purely in a spirit of enquiry" and I can therefore only suggest that in future when feeling in doubt a letter to the Chief Engineer, Examiner or Supdt. Engineer would in all cases ensure accurate information being promptly supplied, instead of having to address Government which I venture to think would not be [illegible] until an Opinion has procured all the available information from other sources

---

Hon W Huddleston

PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the

Read the following :—

Endorsement of the Public Deptt. on letter from the Master Attendant No. 10546 d/ 29th Novr. /80. } (H.E. No. 2302 d/ 3d Decr /80)

For approval

In this letter the Master Attendant requests to be relieved of the censure contained in the Proceedings of Govt of the 8th November 1880 No. 2563 W.

2. Captain Taylor disclaims any intention of imputing malversation of funds on the part of the P.W. Deptt. in connection with the work done to the quay at Masulipatam, and This explanation is ~~frankly~~ accepted. by Govmnt ~~but~~ It is remarked, while ~~however~~, that the Govt were

R.S.

were certainly led to believe that Rs 3,800, "nearly half the estimate for the whole work," had been expended, ~~while~~ although no trace of result could be found— thereupon no mention ~~being~~ ~~been~~ made of the fact that the Port fund had been credited with ~~the~~ ~~bulk of what had been advanced for the~~ ~~Nothing could not have been so misleading~~

4. When addressing Government on the subject, the Master Attendant should have put before them all the facts of the case as known in his own Office ascertaining them by reference to local officers if he was imperfectly informed.

10/12/80

Ent.

Hon. W. Huddleston

(including Rs 777 percentage for Estd. Tools & Plant.)

See letter to M. Attt. of 7th Aug 80 that the M.A.'s Office was the designer.

Rs. 1785:10.3 between April 78. and July 80 [illegible]

From the letter of the Supt. of Works Kistna of 28 Aug. 80 it appears that further recoveries have been or will be made (the [illegible] being [illegible] of timber purchased for the [illegible] construction having been stopped) & that the ultimate loss on [illegible] is estimated at Rs. 408. after the provision of Rs. 607 to cover this item in the revised estimate of Rs. 11350 for a stone jetty.

Marine Dept.
Supt. of Works, Kistna

No. 1682

OFFICE OF THE SUPERINTENDENT OF WORKS,
BUCKINGHAM CANAL,
Camp, Kristnapatam 18th September 1880.

Despd/28

From
THE SUPERINTENDENT OF WORKS,
BUCKINGHAM CANAL.

To
THE CHIEF ENGINEER,
PUBLIC WORKS DEPARTMENT,
Madras.

SIR,

no Enclosure.

With reference to Government Order No ~~3317~~ 3351 of the 27th December 1879 I have the honor to inform you that Mr Jones intimated to me in the middle of July a day or two before I went on leave that his Drainage Scheme for Black Town was nearly ready and I accordingly went to his Office and examined the plans and design with him.

2. The general plan of the work is the exclusion of Sewage from the existing faulty covered Sewers which will be utilized for the discharge of storm waters falling into the drains. All streets will be provided with open drains of a V shaped section— the sides of the V being slightly curved—

for the ordinary drainage of the Town of which the conservancy as regards solid refuse of all kinds is on the dry system: the drains have therefore only to carry away the liquid refuse passing from the backyards cook-houses wash-houses urinals and cattlesheds, and arrangements are made by which they can be flushed in many places at pleasure by means of the water supply of the Town.

3 The sewage passing through these open drains will fall into new underground sewers constructed along the lowest parts of the valleys running parallel to the line of Beach. These sewers will be given a far more considerable fall than was given to the old main drain of the Town.

4. These new sewers are not to receive storm water and they are all to lead ~~[illegible]~~ to a Pumping station situated to the North of the Town near to the present position ~~[illegible]~~ of the Harbour works engines; from the Pumping station the sewage will be forced along closed iron 24 inch piping until it reaches a distance of about a mile to the North of the Pumping station where it will be led by open earthen channels to Sewage Farms. The site of these Farms has been selected with due regard to the observations recorded of prevalent winds so that any offensive odours from them may be carried clear of the present Town, but it might be better to take it a mile or more further north before discharging it into the open air without very much enhancing the cost and thus give a larger margin of safety from risk of the Farms being offensive to people living at the North end of the Town.

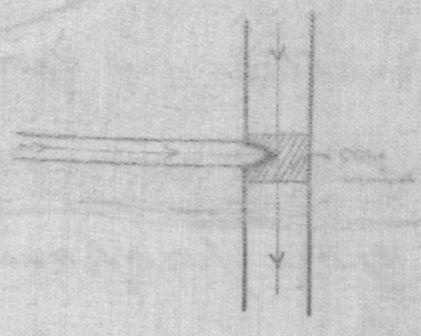
5. The section of the Sewers as proposed by Mr Jones is circular as that is the form already adopted for the Harbour intercepting Sewer, but it would not be difficult and would probably be better to adopt the Egg shape in preference as it insures

a greater velocity where a small quantity of sewage is passing and therefore of course checks formation of deposit in the sewers.

6. After examining the design with Mr Jones he took me to see a part of the Town on which his system of surface drainage had been tried. It is situated to the east of the Wall Tax Road at about a quarter of a mile North of the Central Station where there is a net work of narrow lanes. The V shaped drains are a very great success liquid sewage running freely in them and not adhering to the sides, while in lanes near not yet improved the old rectangular drains were reeking with stagnant or very sluggishly flowing sewage. These V shaped drains had been in use for some weeks and showed no damage whatever, the cement with which the ordinary brick

(of which the drains were constructed) was coated beig hard and smooth.

7. The points where one line of drain joins another require I think a minor alteration by a stone cut to the shape of the receiving drain being utilized instead of cement over brick at the point where the sewage from the one drain continually strikes the side of the other drain into which it falls as I should doubt the cement standing long in that position where it is constantly receiving a blow and the brick will wear away as soon as the cement goes.



8. Also where the drains pass under the road-ways they should be made of an enlarged section so that straw and such like rubbish may not choke them, and

such crossings should be made in places where there is room to pass a bamboo or other cleaning rod under the road so as to avoid the necessity for tearing up the roadway on each occasion of a stoppage.

9. Mr Jones has no doubt forwarded a copy of his scheme to you so I do not send my copy, and I have only reported generally in the matter as you informed me that on your return to Madras you proposed to examine the scheme yourself.

10. The work will if carried out be undoubtedly of very great benefit to the Town of Madras and will save the Buckingham Canal from getting into the extremely filthy state in which it necessarily is at present between the Basin and the Central Railway Station.

I.

I have the honor to be
Sir
Your Most Obedient Servant
A. Awdry Captain. R. E.
Superintendent of Works
Buckingham Canal.

MeN
#6

G.O. 27-10-79 No 2698 W. ol
1 0. notes &c—

Mis No 3351 W d/27th Decr/79.

From

The Superintendent of Works,
Buckingham Canal,

P.W.D.
29SEP80
No. 6165

To

The Chief Engineer,
Public Works Department,
Madras.

Dated 18th September 1880.
Despd 28th do—

No. 1682.

Enclosure. nil

Mis No 5515th

Drainage scheme for
Black Town. Madras—
Reports on the—

W

8/

O.1.10.80

No. 48 W

From

The SUPERINTENDENT,
MADRAS HARBOUR WORKS,

To

Colonel R. H. Sankey C.B. R.E.
Chief Engineer P.W.D.
Ootacamund
Madras, 15th October 1880

Sir,

I have the honor to acknowledge receipt this morning of your letter No 534 dated October 13th and hasten to reply as requested.

2. What remarks I have to make upon the paragraphs of Mr Jones's report on the drainage of Madras mentioned by you I will submit in order of the paragraphs.

Para 67.

As you are aware the sewer referred to was completed early in August last and has been working efficiently ever since. I am now in the fifth year of my experience of the sewer at Royapuram and I can fairly say that I do not detect any more unpleasant smell now than formerly. The smell now certainly is not nearly so bad as in 1876-77 before I had (for the Municipality and at their cost) carried the outfall of the Royapooram main sewer well into the sea - I therefore do not agree with Mr Jones that the nuisance would be doubled for I think it not increased perceptibly. -

Para: 68.

With reference to the size of 24 inches diameter and 1 in 700 as the fall my present experience tells me that this would not be too large. The Harbour Works Sewer would be better if it were larger and I make no doubt that in this Mr Jones would agree, although he, with me, considered the present section sufficient before I had completed the present drain.

Para

Para 69.

The portion of Harbour Sewer cut off by the diversion alluded to in Para 68 has its outfall 2½ feet below High Wate Level, and I think on this account it would not answer as a Storm Overflow. The whole of the mouth of the discharge pipe is covered at High Water ordinary tides, and this is not what should be the case with an overflow channel.- If the cut off portion were converted into an open channel (which would entail a regular arch under the railway lines) over the sides of which the overflow wate might run in very heavy storms I think it might be used for the purpose suggested, but in its present state of being constantly sealed by the sea I do not think the exit of the storm water through the 24" pipe would be sufficiently rapid to recommend its use.

Para 77.

With regard to this paragraph I can only wish the surface drainage would be rapidly revised as hinted at by Mr. Jones, and as I believed was being done at present. The junctions with existing sewers have been quite easy to accomplish and the present Storm outlets closed with doors answer sufficiently well, but the Storm water in heavy rains is perfectly unmanageable, and it rushes down the slope from the beach road and through the drains themselves threatening to carry all before it. I am of opinion that it is the surface drainage that wants improvement more than the junctions of the Harbour Sewer with the town drains.

Para 117.

The two 40 H. P. Engines now used for stone crushing and block-making will in about twelve months time will be for disposal if Government approve. They will have been working 5 years, but will, I can assert be in excellent condition. I think that Rs 30,000 is not a fair price for the Engines and boilers, chimney shaft, buildings, water pumps &c &c as they stand. But no doubt they would be sold at a valuation.

3 In reply to your paragraph 2 I have no doubt that good Portland Cement and sand properly applied, and not less than ¼ inch thick will resist all the corroding action

of the sewage, and provided proper tools are used for clearing out the drain the plaster will be strong enough to stand any ordinary amount of brushing and scouring. If, however, square nosed shovels or mamooties were constantly used and without care in cleaning out a curved cement channel I think the corners of the tool would eventually cut through the coating of cement and let the sewage get at the brick:—

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

F.W. Arrowgood. M. Inst. C.E.
Superintendent, Madras Harbor Works.

[illegible]

G.O. 2698 W. 27-10-79
Cir. 513. 5-10-80.

P.W.D.
11 NOV 80
No 7154

Buildings & Roads

From
The Superintendent
Madras Harbour Works.

No. 48 W.

Dated 15th October 1880.

Ref 1 book

Drainage of Madras.

Submits remarks on Mr. Jones' report on—

Cir 16.11.80. Retd 18.11.80.
Cir 4-11-80 Retd 5-11-80.
O.L. Shil. 44 Octr

P.E.

I think these remarks shd be commund. to the Municl. Comrs. with such opinion as the Govt. may arrive at. For my own part I am in favor of the substn. of stone slabs for brick.

H.G. the Govr. shd. of course see the papers.

I wd. request the M.Crs to report their decision as speedily as possible.

E.K. 5/11

Cir 15-11-80. Retd 18-11-80.
Cir 4-11-80. Retd 5-11-80.
O.L. 44 Octr

---

n. P.W.D.

~~Hon. W. H. West~~

His Grace the Governor 17/11

Note by the Chief Engineer

In G.O. of 27th October 1879 No. 2698 W it was observed that arrangements would be made to place at disposal an Officer of this Department for investigating Mr. Jones's scheme for the drainage of Black Town Madras. Captain Hoskyns, the Officer selected, has reported the results of the examination in his letter No. 1682 of the 16th September 1880, and as the detailed report on

W 18.11

the scheme itself has now been furnished by the President Municipal Board the matter is ripe for the decision of Government.-

2.- Owing to the inherent difficulties of the question itself involving (1) the removal of sewage over a great area where there is little or no natural fall of the ground, and no immediate discharge for the same excepting into an almost tideless sea, and (2) the outlay of a sum of money which the community found it difficult if not impossible to provide for unaided by Government, the details of this

this scheme have been subjecte
to more prolonged professional
investigation and discussion tha
probably any other of a simila
Kind in India.-

3. The ultimate outcome i
the scheme now sent up whi
confines itself **first** to provi
for Black Town only, and
second to dealing only with
sewage of this area, leaving o
of consideration provision for
extraordinary storm waters
thus strictly confining itsel
to the most essential points
as regards area & material
to be removed with a view
minimise to the utmost
the probable outlay-

4 In doing this and
availing

availing himself of the best points of the schemes of his predecessors, especially those of Major Tulloch R.E. and the late Mr. Clarke, Mr. Jones has shown a wise discretion, and has produced a scheme which in its general outlines solves to all appearances the question in the best possible way. He has adopted to its full legitimate extent the system of open drains so much insisted on as essential by His Grace the Governor, and has only resorted to closed sewers where such were unavoidable.

5. The scheme would no doubt be more perfect if it included disposal of all

extraordinary

extraordinary storm waters, but the expense of doing this cannot now be afforded. The inhabitants must make up their minds to occasional floodings, and where the basement floors of houses are now too low the owners must either raise them or be content to accept occasional discomfort. There is nothing however in the scheme to prevent storm water drains being added at any future time the community can pay for them.

6. But however complete the proposals now put forward are as a whole, too great attention cannot be given to the points of detail upon

which their success depends in an equal degree, and in view to this the following observations are submitted for the consideration of Government.

7. The house connections and disposal of the liquid portions of the house refuse, are dealt with in paragraphs 21 to 24 and 61 to 64 of Mr Jones's report, from which it will be seen that by the extremely small outlay of Rs 2 per ten~~t~~ant he hopes to deal in a sufficiently satisfactory manner with this which after all is probably by far the most important as it is certainly the most difficult portion of any scheme

for

for draining a native town.

8. It is impossible to overlook or disguise the fact that there may be the most perfect systems for removing all offensive matter from the point at which such is discharged into the street drains, while there may exist side by side with this complete system a state of house drains that may be little less than poisonous.

9. It is not of course proved that such is really the case in Madras, but if not (and there is nothing to the contrary in the Report) the native houses and court yards must be in a very different state from what they are in all other

native towns where away from all view sewage is allowed to sink into the ground of the little back yards and produce a rotten soil the effects of which cannot in any way be remedied by the most scrupulous cleanliness of the street drains outside -

10. If a thoroughly healthy state of things is to be produced in Madras and not merely a palliative "~~[illegible]~~" ~~[illegible]~~ ~~[illegible]~~ ~~[illegible]~~ this fact must be looked at fairly ~~fairly~~ in the face -

11. The mere adjustment as proposed of an outer nozzle costing Rs 2 to each house drain as it now exists will not it may be concluded deal in any adequate way with this matter -

12. From the nature of the case connected as it is ~~conti-~~ ~~[illegible]~~ more or less intimately with the private concerns of individuals, and not a little with caste prejudices, the question cannot be dealt with entirely as one of mere constructive devices (though of course these must be as perfect as the nature of the case admits) but must go very much further, and enlist the co-operation of all concerned; it is thus a matter which

though calling apparently for early and serious attention on the part of the Resident and Municipal Engineer in connection with this scheme need not be further remarked on here.

13. The next point in order of importance would seem to be the materials used, in and the form given to the surface drains, which it is shown by paragraphs 48 to 52 will consist of brick plastered externally with Morgan's Cement, and generally to be of the V form with curved surfaces.

14. For all ordinary application this matter of construction appears unobjectionable and

and even in this exceptional case may be found to answer well for several years, but it must be borne in mind that notwithstanding every possible precaution street drains have to undergo an amount of ill usage that renders it essential to provide for materials which shall be as nearly as possible indestructable.

15. Mr. Jones has it is true, by giving curved surfaces and providing for cleansing with an indian rubber tool, done what he could to obviate as far as possible the effects of ~~constant attrition~~ of the surfaces ~~attention~~, but these cannot suffice to meet the thousand and one ~~[illegible]~~ sources of injury to which street drains are exposed.

By

16. By para: 52 the edges of the drains are to consist of unplastered table brick; these it is thought will ere long certainly break down -

Captain Awdry in para: 7 very properly points to the weak point at all junctions with street drains, and considers that a stone cut in the shape of the receiving drain should be introduced at such places; and he might for equally good reasons have added that where house drains empty themselves into the drains, stones to receive the rush which must occur during storms, if not indeed to counteract the effect of the constant ordinary dropping, would appear to be necessary -

17. Even for these few out of many causes likely to injure the description of drain proposed, stones would have to be inserted, and as such combination would in itself not only lead to expense, but be defective at all the junctions and edges, it would be better to consider whether thoroughly indestructable stone drains would not in the end be more economical -

18. It is not to be supposed that a mere skin of Cement 1/4 of an inch in thickness can for a long series of years resist not only the corroding action of the sewage

acids but the endless sources of injury to which town drains are subjected.

19. Enquiries have been made as to the probable cost of carrying stones (gneiss rock burnt off and dressed in big slabs) of a suitable class from Bangalore, with the result that the Railway appear ready to carry the same at the rate of 5 pies per ton per mile or Rs 5-10-" per ton for the whole distance which on slabs 4 inches in thickness would come to less than 2 annas per square foot.

20. This would admit of V drains entirely of stone being substituted which as will

will be seen from the annexure (A) should not cost more than 25% ~~[illegible]~~ in excess of those proposed by Mr Jones, and proportionably less if the material can be procured from ~~a less~~ shorter distance, which seems not improbable.

21. The amount which this would add to the scheme is as shown by Annexure (B) Rs 113,430 based on the abstract given on page 106 of the Report.

22. At first sight this excess of over a lakh of Rupees may appear heavy, but it must be borne in mind that in ~~every~~ any case additional stone slabs must be provided or other suitable measures taken to counteract the weak points of the drains as now designed, and that the cost of these would probably equally swell the Estimate.

On

acids but the endless sources of injury to which town drains are subjected.

19. Enquiries have been made as to the probable cost of carrying stones (gneiss rock burnt off and dressed in bay slabs) of a suitable class from Bangalore, with the result that the Railway appear ready to carry the same at the rate of 5 pies per ton per mile or Rs 5-10-" per ton for the whole distance which on slabs 4 inches in thickness would come to less than 2 annas per square foot.

20. This would admit of V drains entirely of stone being substituted which as

will

will be seen from the annexure (A) should not cost more than 25% in excess of ~~[illegible]~~ those proposed by Mr Jones, and proportionably less if the material can be procured from ~~a less~~ shorter distance, which seems not improbable.

21. The amount which this would add to the scheme is as shown by Annexure (B) Rs 1,13,430 based on the abstract given in page 106 of the Report.

22. At first sight this excess of over a lakh of Rupees may appear heavy, but it must be borne in mind that in ~~every~~ any case additional stone slabs must be provided or other suitable measures taken to counteract the weak points of the drains as now designed, and that the cost of these would probably equally swell the Estimate.

On

23. On the other hand as may be seen any day at Bangalore a perfectly indestructible drain would not only be secured by adopting the modification suggested ~~[illegible]~~, but the materials can at any future time be used over again without any loss should it ever be desirable to take up, and relay any drain in a different position or with altered dimensions. These advantages coupled with almost complete immunity from future repair charges and the use of iron implements for cleansing instead of expensive and short lived indian rubber ones, would it is thought,

much

more than compensate for the difference.

24. But even were it ~~co~~ eventually ~~tinually~~ decided to adhere to the cement plastered drains as proposed in the scheme sent up it is advisable that flat instead of curved sided polygonal sections should be given as being much easier to construct. In para: 113 it is suggested that specially shaped brick for forming the oval interior surface of each drain may be cheaply moulded, but a little consideration will show that to derive every advantage from a specially moulded brick, flat surfaces are essential, to say nothing

"of the much greater facility with which plaster laid on such can be rendered by the workman - A very slight rounding of the inverts would in all cases be desirable -

25. Captain Awdry has drawn attention to the advantages of increasing the section of the drains at the street crossings, and also to the adoption of oviform instead of ~~the~~ circular sections for the underground sewers to insure better discharge and lessen the deposit -

26. Mr. Thorowgood also remarks that the Harbour sewer which was designed independently of the

Municipality

Municipality (who declined to contribute to its construction) would be better if larger, and should no doubt be supplanted by another drain in case of the scheme being carried out - For the reasons assigned also it will not answer as a storm overflow -

The price to be offered for the Engines Rs 30,000 is not again in Mr. Thorowgood's opinion sufficient.

Captain Awdry also thinks that it would be better if the delivery channel north of the town were carried a mile further than proposed -

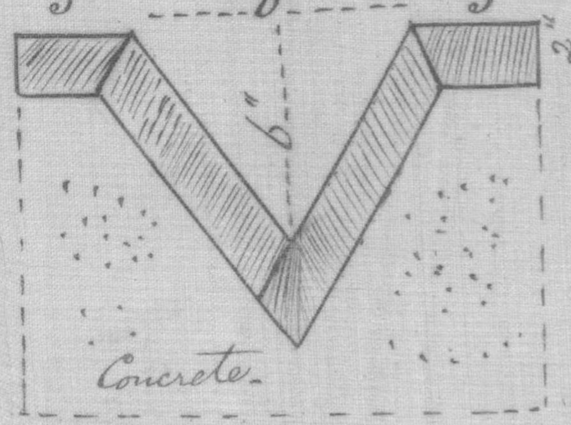
27 - All these points seem to merit consideration before the scheme is definitely

accepted, but as it not only has now assumed a form leaving so little to be desired both as regards general design and economy it is to be hoped that the modifications still needed to perfect it may not practically lead to any further delay, and that the means for carrying out a project that has become so indispensable to the community may be put in execution at the earliest possible moment. 10 or 11 Lakhs of Rupees would be a small price to pay for the undeniable advantages of a scheme of the kind, and for the removal of a long-standing reproach to a great community like Madras.

Read 3/11/80

Annexure A

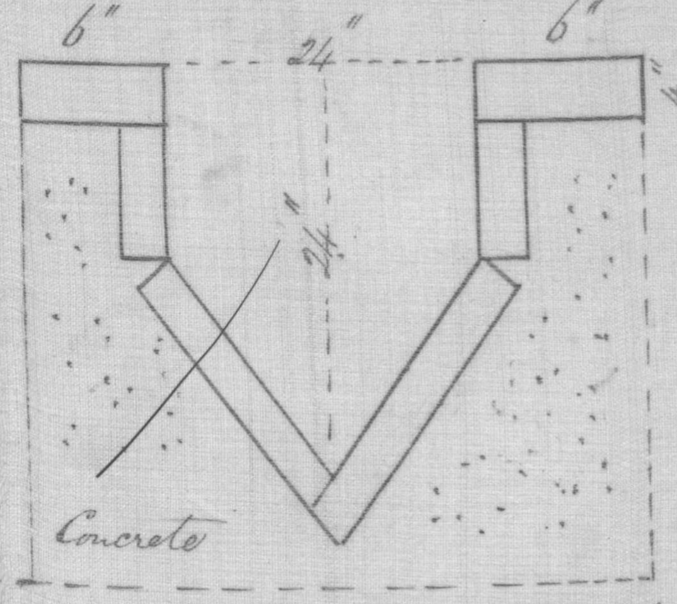
No. I.



Estimate for one running foot No. (1)

	annas
2.5 square feet stone slabs at 2.5 annas per square feet at Bangalore	6.25
Carriage of ditto to site of works in Madras at 2.5 annas per square ft.	6.25
1 C. ft. concrete @ 2 as.	2.0
Pointing	0.4
Earthwork	0.2
Cost per ~~feet~~ running foot annas	15.1

No. II



Estimate for one running foot No. II

	annas
6 square feet stone slabs @ 2.5 as. at Bangalore	15.0
Carriage to site of works Madras	15.0
3.5 C. ft. concrete at 2	7.0
Pointing	0.75
Earthwork	0.85
cost per running foot annas	38.6

or say average 25 % above Mr. Jones's system.

Annexure B

Size of drains	Total length in running feet	Rate as per Mr Jones's Estimate Rs	a	p	Total cost Rs
6 inches	3,03,571	"	12	6	2,37,165
9 "	69,357	1	"	"	69,356
12 "	49,314	1	3	"	58,560
15 "	19,835	1	6	"	27,275
18 "	17,759	1	12	"	32,178
21 "	4,711	2	"	"	9,422
24 "	7,255	2	4	"	16,324
30 "	887	2	12	"	2,439

Total cost of surface drains as per Mr Jones's estimate	Rs	4,52,719
Add 25 per cent	Rs	1,13,430
Total if stone slabs from Bangalore are used	Rs	5,66,149

No. 3303.

MADRAS,
Chepauk, 7 Decr. 1880.

From

THE SUPERINTENDENT OF WORKS,
PRESIDENCY,

To

THE Chief Engineer,
P.W. Deptt.

SIR,

Enclosures.

1. Statement.

With reference to your Office Note dated 18th ultimo, I have the honor to submit a Statement showing the estimated cost according to the local rates of the stone drains No. I and II of Cuddapah & Sholinghur stones respectively, and to point out that Cuddapah stone seems very suitable for the work, and will apparently not cost more than the cement drains, which it is supposed will be about 12 Annas and 2 Rupees per running foot.

I

I have the honor to be
Sir,
Your most obedient servant
[illegible] Major R.E.
Supt of Works
reby.

W.Y./6.

P.W.– C. No 7787 A. | x

From

The Supt. of Works
Presidency.

No. 5303.

Dated 7th }
Recd. 8 } Decr. 1880.

Enc: 1.

Drainage Scheme, Black Town.–

Submits a statement showing showing estimated cost according to local rates of the stone drains No. I & II.

Cir. 17-12.80

Estimate for V shaped drains proposed to be built in connection with the Drainage Scheme - Black Town, Madras.

Quantity	Description	As per Mr. Chisholm's rates. Cuddapah Slabs. Average size 5' x 15" to 18" x 1½" Rate	Amount	As per Local Market rates: Cuddapah Slabs Average size 2' to 6' x 18" x 1½" to 2" to be delivered at work spot. Rate	Amount	Cuddapah Slabs Average size 2' to 6' x 18" x 3" to be delivered at work spot. Rate	Amount	Cuddapah Slabs Average size 2' to 6' x 18" x 4" to be delivered at work spot. Rate	Amount	As per Mr. Chisholm's rates Sholingur Stones Rate	Amount	As per Local rates. Sholingur Stones, Average size 4' x 18" x 4" to be delivered at work spot. Rate	Amount	Remarks
	No. I	s.ft.		s.ft.						s.ft.		s.ft.		
2·5 sq.ft.	Slabs	„ „ 10.	„ 2 1	„ 3 7	„ 9 „	„ 5 3	„ 13 1	„ 6 7	1 „ 6	„ 1 8	„ 4 2	„ 8 6	1 5 3	An allowance of 2 Annas per sq.ft. should be made for dressing the Sholingur stones. The Cuddapah Slabs may be used as received from the Quarry.
2·5 s.ft.	Carriage to site of work.	„ 2 10	„ 7 1							„ 3 8	„ 9 2			
1 cft.	Concrete.	„ 2 6	„ 2 6	„ 2 6	„ 2 6	„ 2 6	„ 2 6	„ 2 6	„ 2 6	„ 2 6 c.ft.	„ 2 6	„ 2 6	„ 2 6	
2½ s.ft	Pointing with Cement	„ „ 2	„ „ 5	„ „ 2	„ „ 5	„ „ 2	„ „ 5	„ „ 2	„ „ 5	„ „ 2 s.ft.	„ „ 5	„ „ 2	„ „ 5	
	Earth work for excavation &c.	„ „ „	„ „ 2	„ „ „	„ „ 2	„ „ „	„ „ 2	„ „ „	„ „ 2	„ „	c.ft. „ 2	„ „ „	„ „ 2	
	Cost for 1 Running foot.	„ „ „	„ 12 3	„ „ „	„ 12 1	„ „	1 „ 2	„ „ „	1 3 7	„ „ „	1 „ 5	„ „ „	1 8 4	
	No. II	s.ft.												
6. s.ft.	Slabs	„ „ 10	„ 5 „	„ 3 7	1 5 6	„ 5 3	1 15 6	„ 6 7	2 7 6	„ 1 8	„ 10 „	„ 8 6	3 3 „	Including Carriage to site of work.
6. s.ft	Carriage to site of work	„ 2 10	1 1 „							„ 3 8	1 6 „			
3½. cft.	Concrete	„ 2 6	„ 8 9	„ 2 6	„ 8 9	„ 2 6	„ 8 9	„ 2 6	„ 8 9	„ 2 6	„ 8 9	„ 2 6	„ 8 9	
	Pointing with Cement	„ „ „	„ 1 2	„ „ „	„ 1 2	„ „ „	„ 1 2	„ „ „	„ 1 2	„ „ „	„ 1 2	„ „ „	„ 1 2	
	Earth work for Excavation.	„ „ „	„ „ 9	„ „ „	„ „ 9	„ „ „	„ „ 9	„ „ „	„ „ 9	„ „ „	„ „ 9	„ „ „	„ „ 9	
	Cost for 1 Running foot.	„ „ „	2 „ 8	„ „ „	2 „ 2	„ „ „	2 10 2	„ „ „	3 2 2	„ „ „	2 10 8	„ „ „	3 13 8	

(Sd) S. C. Plummer Lieutt.
Asstt. Engr. Presidency

Major R.E.
Superintendent of Works
Presy.

Chepauk,
6th Decr. 1880.

[illegible] A

X Cir

No. 2953 W

Pt. II
Works

PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 28th Decr. 1880

Read the following :—

From

The Supdt. of Works, Buckingham Canal	(H.E. No. 1682 d/ 18th Septr./80)
" Supdt. M. H. Works	(" " 48 W. d/ 15th Octr./80)
Note by the Chief Engineer with annexures A and B	(" — " 3d Novr./80)
Supdt. of Works, Presidency	(" " 3303 d/ 7th Decr./80)

These papers will be communicated to the Madras Municipal Commission who will be requested to report their decision as speedily as possible.

14/12/80

Financial Depart. with original file of papers from that Dept. returned.

17-1-81

R. S.

Cir 17.12.80

(48)

7782 A

Govt. of (~~1879~~ 1880) Madras.

PUBLIC WORKS.

To

Dated

Issued

Recd.

Encl.

G.O. 25 Decr ~~1879~~ 1880 No. 295

Nos. 104 & 105

Drainage Scheme
Black Town.

34/3