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MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

(Dy. No. 1295)

G.O. No. 2375 Press
Mis.

3238

Dated 1—12—1857.

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57

Fort Saint George, Public Works Consultation of 15th December 1857.

No. 37. Read the following Extract from the Minutes of Consultation in the Military Department, dated 17th November 1857, No. 4090.

Read the following letter from Captain T. THOMPSON, Town Major, Fort Saint George; to Colonel C. A. BROWNE, Secretary to Government, Military Department, Fort Saint George, dated 10th November 1857, No. 3668.

SIR,

I have the honor to forward to you for submission to Government the accompanying letter from the Civil Architect, Presidency Division, No. 586 of the 23rd October 1857, with the Proceedings of a Committee of which he was President, as also the Plans connected therewith.

The Committee was ordered to assemble by the Right Honorable the Governor to report upon the best means of providing Privies for the Clerks &c., belonging to the various Public Offices in the Garrison and freeing the Fort if possible from foul smells.

Letter from Colonel W. H. ATKINSON, Civil Architect, Presidency Division; to Captain T. THOMPSON, Town Major, Fort Saint George, dated 23rd October 1857, No. 586.

SIR,

In obedience to the orders of His Lordship the Governor as conveyed in your letter of 19th March last, I have the honor to forward the Proceedings of the Committee appointed by His Lordship to report upon providing the needful accommodation of Privies for the Clerks, &c., belonging to the various Public Offices in the Fort as explained in paper marked A. of the accompanying. The second paper marked B. being explanatory of the present system of drainage in the Fort as will be better understood from the Plan herewith sent of the Fort shewing the various drains or the system of sewerage prevailing as far as it could be ascertained in the absence of any description or record of them, for which as President of the Committee I have in vain applied to the Offices of the Chief Engineer, of the late Military Board and of the Garrison Engineer by which much time has unfortunately been lost in the wish to render the report as complete as possible.

1 Plan of the Fort.
1 do of the Privies proposed.
1 Report A.
1 do B.

Extract from Garrison Orders by the Right Honorable the Governor, dated Fort Saint George, 4th March 1857.

General Orders, IV. A Committee composed as follows will assemble at the Town Major's Office to-morrow at 12 o'Clock to take into consideration and report upon a subject that will be laid before it by the Town Major.

PRESIDENT.

Colonel Atkinson, Civil Architect.

MEMBERS.

Brevet Major Worster, Barrack Master.
Captain Rawlins, Acting Garrison Engineer.
W. Vansomeren, Garrison Assistant Surgeon.

(True Extract.)

(Signed) W. J. RIDEOUT, Captain,
Acting Fort Adjutant.

Letter from Captain T. THOMPSON, Town Major, Fort Saint George ; to Lieutenant Colonel ATKINSON, Civil Architect, dated 19th March 1857, No. 890.

SIR,

The Right Honorable the Governor having appointed you President of the Committee, ordered in Garrison orders of the 4th March 1857, I am directed to inform you that His Lordship is anxious the Committee should take into their consideration the most suitable site for the erection of a sufficiency of Privies for the use of the Garrison, as well as the best method of cleaning them. Attention must be paid to their being so situated as to be of as little annoyance as possible to the Inhabitants and Officers within the walls.

The Committee will also examine the present system of drainage with a view to their offering any suggestions they may think likely to improve the cleanliness and healthiness of the Fort, the smells that at present exist at times being considered prejudicial to health as well as comfort.

Report A, of a Committee convened for the purpose of considering the subject of a communication from the Town Major relative to providing private accommodation for the Clerks of Public Office and for the better drainage and cleansing of the Fortress.

Lieutenant Colonel W. H. Atkinson, Engineers, President.

Captain W. K. Worster, Artillery.....
Captain H. W. Rawlins, Garrison Engineer..... } Members.
Assistant Surgeon Vansomeren,.....

The Committee while fully recognising the importance of providing for the wants of the large daily influx into the Garrison, and improving its sanitary condition, must express their regret that their avocations have recently been such, as to preclude the possibility of their bestowing such continuous attention to the subject as they could have desired ; delay has therefore necessarily occurred, while their investigations have been still further retarded by the recent changes in the offices of two of the principal Members of the Committee, which for a time excluded the subject matter of this report from their consideration.

The Committee believe, that it has long been a ground of just and unavailing complaint by the residents in the Fort, that they are subject to annoyances ; from the absence of private accommodation for the large number of people daily frequenting it, from the prevalence of an obnoxious system of hand sewage, and the general state of the drains both within and without its walls, which materially affects their comfort, and may be prejudicial to health. The difficulties however attending the removal of an evil which cannot but be regarded as one of considerable magnitude, can only in the opinion of the Committee be effectually met by the adoption of combined sewage and water works, which has been fully acknowledged to be the most sure, and efficacious mode of removing refuse, and freeing drains from decomposing matter; thus preventing the diffusion of noxious emanations. Palliative measures on existing arrangements or partial attempts to improve the present drainage, will ultimately fail in their object.

The Committee would on these grounds strongly recommend that the subject should be considered as a whole, as it appears to them, that it will be both injudicious and expensive if the mere provision for the daily influx of Clerks and others, is considered apart from that of the general sewage and drainage of the Fortress.

At present however, from the general tenor of their instructions, they can only offer suggestions for the adoption of subsidiary measures to meet the objects contemplated.

On a reference to the Plan of the Fort accompanying, it will be observed that the drainage is effected by a series of closed channels with cesses at intervals to receive the surface waters. Of these channels, six have their exit in the ditch, while one partly open where it crosses the ditch, discharges itself on the beach near the north blind, from whence the accumulated contents ultimately run into the sea, on a channel being cut to permit their escape.

The aggregate length of these drains is about 13,600 feet and experience has shewn that their size and inclination are ample to ensure the discharge of the surface waters flowing into them.

Independent of mere surface drainage, the contributions from house drains and improper sources are discharged into these main drains, they are thus the receptacles of much matter that is liable to decompose, and scarcely any one of them can be said to be free from noxious exhalations, while the drain intersecting the area in the vicinity of the Barracks before alluded to, as having its discharge towards the sea, can only be viewed in the light of a common sewer.

To remove this evil it is necessary that the channel should be continued to some distance into the sea, and the portion traversing the ditch completely closed, but it would be preferable to lay an iron pipe within this drain communicating with cesses near the Barracks, and by a daily flushing by the Lascars of the Engineer's Department, the contents with all refuse matter would be carried away in suspension.

In the vicinity of this drain, is the only space in the outworks towards the Sea face, adapted for the erection of Privies, of which the Garrison Engineer has availed himself in the design No. 2.

That Officer proposes to bridge the ditch between the berm of the north-east Bastion and the blind, and to erect thereon public accommodation for 36 persons, divided by inner screens, into three compartments for the East Indians, Bramins, and Sudras. The proposed site is hid from view and the entrance from within is through a sally port at the north-east corner of the Fort. The drains will be flushed from a cistern filled daily as often as required, from the ditch and will be connected with the present large main drain which empties itself into the Sea. The cistern is to contain 228 cubic feet of water, and to be in size $9\frac{1}{2}' \times 8' \times 3'$. It will be necessary to remodel this drain, and to carry it out underneath the road into deep water on strong wooden piles. The cost of the construction is roughly estimated at

	Rs.
For Public Privy.....	4,000
For repairing present Main Drain.....	3,000
Total...	7,000

The last item however should not be included in the cost of the Privy, for the drain is now so utterly ineffective that it must be reformed under any circumstances.

Considering the limited space in the outworks towards the Sea face, this is probably the best means of providing the desired accommodation, and although there are larger areas on the land side, from the general character of the levels, which decrease in height in that direction above the mean tide, there would be serious objections to allot any of the berms for the purpose, as only increasing the difficulties of sewage, and retarding the removal of refuse matter which should be in unceasing movement until its final exit into the Sea.

The Committee are at a loss to suggest any other palliative measure than that proposed by Captain Rawlins for removing the nuisance now complained of, from the beach to the blind, but it is questionable, whether the concentration of numbers in this spot will not rather add to, than mitigate the evil. It is certain however that so eligible a site cannot be found elsewhere in proximity to the Sea, into which the drainage will be direct and immediate.

In addition to the Public Privies now proposed, it is by no means intended that those attached to Public Offices should be closed, as the Committee believe there will be scarcely sufficient accommodation in the blind for the Members likely otherwise to resort to them, but it will be advisable that properly constructed vessels should be used, both as receptacles, and carriers, which when hermetically closed, can be conveyed to the beach without occasioning annoyance ; this recommendation is equally applicable to every one of the Privies in the Garrison.

Iron cylinders (divided in halves) in which Linseed Oil is now received from England if supplied from the Arsenal would lessen the actual outlay. As a top and iron loops are merely required to adapt them for the purpose, common clay would be a sufficient seal for the top.

The cost of such vessels the Committee believe would not exceed 10 Rupees each for Offices, and 18 for Barracks, but as the system now adopted for the latter is under contract for a

period of years, it would remain with the contracting parties to alter existing arrangements and therefore need not be entered into further by the Committee. It is simply the "fosse Mobiles" system of Paris which is here recommended, and wherever it can be adopted in Public Offices, the Officer in charge should be instructed to carry out the suggestion as completely as possible on the vessels being duly supplied.

With attention, to the removal of the vessels and continued flushing of the proposed iron pipe drain, leading from the vicinity of the Barracks, more especially at its junction with the contemplated building on the blind, there would probably be an amelioration in the arrangements, which would prove conducive to the comfort of the occupants of the Fort, but the success of the experimental Privies will depend entirely on an ample, and continuous discharge of water through the drain, together with profuse sprinkling of chunam quicklime over the floor to deodorise the air within the partitions as far as possible.

The adoption of the experiment will necessarily be attended with an annual expense for a permanent Establishment of Picottah men, and Sweepers, and it may perhaps be deemed advisable to divert the waste water from the men's baths near the Barracks entirely into the main drain towards the Sea, which would somewhat increase the estimate for the general improvement of the drainage in this direction.

In connection with the general drainage of the Fort, it has already been stated that for the surface waters the channels are ample both in size and inclination, but that they are tainted by the admission from house drains, of matter that is liable to decomposition. Both the atmosphere and the waters in the ditch—the general receptacle—are thus contaminated, and there is every reason to apprehend that in some instances disease may be traced to the disengagement of fetid gases in the vicinity of the Barracks and smaller tenements, which have acted with deadly virulence.

In some measure this evil has been mitigated by trapping the formerly open cesses within the Fort, and keeping the cisterns of the traps filled with water, though from the gulley holes of the house drains being open, the gases are still liable to be driven back.

The Committee would therefore recommend that every house drain should be trapped, either with a syphon drain, or self acting valve, which should be carefully attended to and kept close to its bearings, the discharge of garbage and refuse matter into the drains being strictly prohibited; and it should be incumbent on the occupants to enforce a complete cleaning and washing of the channels at least twice a day, garbage and refuse matter being set aside for removal by the Scavengers.

A small flap valve has been placed at the mouth of a drain in the yard of the Town Major's Office, which at times was peculiarly offensive, since which, the gases from the main drain in the vicinity have been completely excluded, and although the valve is merely a rough piece of board it affords evidence that the method is quite sufficient to protect the occupants from annoyance, while it recommends itself on the score of economy. For house drains, the discharge into which can scarcely be controlled, the Committee would rather recommend syphon drains (easily accessible in case of their becoming choked) with a grating to prevent as far as possible refuse matter lodging in them.

These syphons probably could be readily prepared at the School of Arts, and should be glazed to prevent their absorption of foul water.

The main drains being thus kept as free, as far as possible, from refuse matter liable to decomposition, and receiving the daily washing from the house drains, it may be anticipated that the waters of the ditch, though still subject, but in a less degree, to contamination, would be retained longer in a wholesome condition than they are at present.

To attempt to alter the direction or improve the general arrangements for surface drainage, the Committee consider totally unnecessary; they would merely insist on the necessity of preventing the ingress of refuse matter, which should be removed by hand both morning and evening, in common with other debris, by the Scavenger's Department.

The Committee however would recommend at some future period, that the floors and sides of the drains should be laid with cement, as it cannot be doubted, that the masonry generally must have suffered injury, especially in the joints, thereby permitting the percolation of foul water into the ground adjoining.

In thus offering their suggestions for improving the cleanliness of the Fortress, the Committee must repeat their conviction that they can only be considered as partial remedies for an existing evil, and that the only efficacious method for entirely removing it, will be to adopt the system of combined water works and sewage, which is more necessary in this country than in Europe, from the rapid decomposition which all refuse matter undergoes in a moist and heated atmosphere.

The details of this system; or the expedients above suggested, may be safely left to the Executive Officer who may be entrusted with the duty of carrying them out. The Committee have therefore only prepared the plans accompanying, from which the general levels and direction of the drains can be gathered, as well as the arrangements for the Privies on the blind, to assist in the preparation of complete estimates in the event of measures being adopted to improve the sanitary condition of the Garrison.

(Signed) W. H. ATKINSON, Colonel,
and President.

Fort Saint George,
23rd Oct. 1857.

(„) W. K. WORSTER, Captain, *Brevet Major.*
(„) H. W, RAWLINS, Captain.
(„) W. J. VANSOMEREN, M. D., *Garrison Assistant Surgeon.*

Members.

B.

Drains of Fort Saint George, abstracted from Colonel W. H. ATKINSON'S Memorandum.

Within the body of the place there are altogether about 13,602 running feet of underground drainage, of which 4,600 are parallel to the ramparts, 4,900 feet in a direction from north to south, and 1,692 from east to west. In addition to the above; are 1,260 feet of branch drains communicating with the main drains, from cesses on both sides for subsidiary drainage; 1,156 feet pass through the ramparts to the ditch; into which all the principal drains, except one near the European Barracks, have their exit at a depth of a few feet above mean sea level indicated on a cut stone on the escarp wall near the North Ravelin gate.

On the assumption that the average section of the drains is $1 \times 1\frac{1}{4}$ the cubic contents as estimated at 15,533-434 cubic feet for the drainage of surface waters, from an area of 38-64 acres inclusive of public buildings.

The heaviest rain fall in 24 hours from 16 to 17 inches, which has occurred at Madras within the last 12 years, would give about 1,600 cubic feet per minute for the area of the Fort; hence it may be concluded that as regards the drains, their capacity is far more than is necessary for carrying off the water under extraordinary rain falls. Some portion of the outworks and casemates are occasionally flooded, but this is due to the overflowing of the ditch from the general levels being so little above mean tide, and the waters being pent up by the Cooum river.

The six outlets of these drains into the ditch are indicated in the Plan; the drains in the vicinity of the European Barracks has its outlet near the north-east angle of the works on to the beach and is more particularly referred to in the report as a common sewer, this drain is flushed daily to carry off refuse matter from a cistern in the Barrack square.

The levels indicated in the Plan were taken by Students of the Survey School under Mr. O'Hara; a bare inspection of the differences of level "shew that there is a general inclination of the ground towards the land side of the Fortress, and is so small that it would be neither judicious nor expedient to divert the waters into the Sea, so long as they are kept free from contamination as suggested in the Report.

The cost of 100 running feet of similar drain would now be about 70 Rupees and for a cesspool about 20 Rupees.

(Signed) W. H. ATKINSON, Colonel,
President for Committee.

The Plan submitted for Privies for the use of the Clerks of the Office Establishments in the Fort is approved.

Estimates should be prepared and forwarded, in which may be included the probable expense of arrangements for flushing all the drains in the Fort by the use of steam power or otherwise.

(Signed) R. HAMILTON Major,
Ag. Dy. Secretary to Government.

No. 38. ORDER THEREON, No. 2305; dated 11th December 1857.

Ordered to be communicated to the Chief Engineer with a request that he will prepare and submit the necessary Estimates, for constructing the Privies referred to in the above Minutes of Consultation.

(Signed) H. FORBES,
Acting Secretary to Government.

Military Department

No. 090.

Extract from the Minutes of Consultation
Under date the 17th November 1857.

Read the following letter.

No. 2668.

Town Major's Office.

From

The Town Major

Fort St. George.

To The Secretary to Government

Military Department

Fort St. George.

Sir,

I have the honor to forward to you for submission to Government the accompanying letter from the Civil Architect P. D. No. 586 of the 23d October 1857 with the Proceedings

Proceedings of a Committee of which he was President and also the Plans connected therewith.

The Committee was ordered to assemble by the Right Honorable the Governor to report upon the best means of providing Privies for the Clerks &c belonging to the Various Public Offices in the Garrison and freeing the Fort if possible from foul smells.

Fort St George
10th November 1859

Signed Thos Thompson
Town Major

The Plans submitted for Privies for the use of the Clerks of the Office Establishments in the Fort is approved.

Estimates should be prepared

prepared and forwarded, in connection with which may be included the probable expense of arrangements for flushing all the drains in the Fort by the use of Steam power or otherwise.

Signed A. Hamilton Gray
Sy. Dy. Secy to Govt

To
The Superintendent Public Works &c
with Enclosure & 2 Plans.

Town Major &c

By
Edward Smith

Public Works 1857 Dep.t
Do Ency.e 15th Decr.
No. 2346.

Extract from the Minutes of Coms. in the Military Department.

Dated 17th
Recvd 25th } Nov.r 1857.

No. 4090

Encls 3. Returned
From the Town Major Fort St. George
of 12 March 55 Ct. No 534 in Cons.
Approving the Plans submitted for Quarters for the Clerks of the Office Establishment in the Fort.

Write an order
No. 2305. 11th Decr.

Copy to the Ft. Engr.
India — 50 Guns 1859
No 3744 —
No 37 of 38.

Ca 28th Nov.r

No. 2305.

Related to be communicated to the Chief Engineer with a Request that he will prepare and submit the necessary Estimates for constructing the Quarters referred to in the above Minutes of Consultation.

Fort St. George
11th Decr. 1857

1 Copy to the Chief Engr. with 2 Plans. Dis.d 12