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MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No. 1992 Press

~~B.P.~~ No. ~~Mis.~~

Dated 3-8-1876 ~~195~~.

Not to be folded or roughly handled

Proceedings of the Madras Government, Public Works Department, *3rd August* 1876. *No.* 1,992.

Read the following papers :—

No. 88. From R. WOOLLEY, Esq., to the Hon. D. F. CARMICHAEL, Secretary to Government, Revenue Department, dated Wallajah Baugh, Madras, 27th March 1876.

I HAVE the honor to submit the following proposal for the consideration of the Government. I have long desired to make it, but until now I have not had sufficient leisure to justify me in doing so.

2. I am willing to undertake the maintenance of the Northern and Southern Canals for a period of five years from, say, 1st July next (or as may be arranged) upon being paid for so doing a monthly sum equivalent to one-twelfth of the average yearly expenditure of the last five years.

3. I would open the Ennore Bar, or any other barrier of the like kind which it is customary to open, and keep clear all side-channels connecting the canals with the salt-pans on the same terms and for a like period.

4. I would also maintain any portion of canal which has not have been five years opened, or which may be opened within the next five years, upon being paid a monthly mileage rate fair and equitable to the Government and myself.

5. If my proposal be entertained, it would be easy hereafter to add to it if agreeable to the Government—

(1.) The lease of all tolls and ferries in connection with the canals, and

(2.) The carriage, in properly-constructed boats, of all the salt made in connection with the canals which it might be necessary to remove to the depôts.

6. At present, however, owing to the uncertainty which prevails as to the future mode of dealing with the salt, I have confined my proposition to the maintenance of the canals and works connected therewith.

7. In this form I presume the Government may be able and willing to decide upon it now. I suppose the canals will have to be maintained whether the present mode of dealing with the salt be continued or an excise be imposed instead, for there is now a considerable general traffic upon them, and it seems probable that this would largely increase both in passengers and goods if the canals were made a *certain* water-way at all seasons and suitable boats were encouraged or provided.

8. Perhaps I may be permitted to add a few words in explanation of my offer.

9. As to the maintenance of the canals. I mean their efficient maintenance : the preservation of a workable depth of water throughout. It would not become me to describe or pass any opinion upon the mode in which this object is sought to be attained at present. I propose to deepen and clean the canals by means of dredges worked either by manual or steam power or by both, and to place the mud and earth thus raised so that they will not again find their way into the canals. I venture to assert that one Rupee spent now, the water being unusually low, would remove as much mud as five Rupees would a few months later.

10. As to the bars or barriers which it is occasionally necessary to open and keep open, I should consider it part of my duty to render whatever assistance might be required to secure the benefits to the fishermen and the salt-makers which they

depend upon, but do not always now obtain, by the flow of sea water into and out of the backwaters, canals, and lakes along the coast.

No. 88-A. From R. WOOLLEY, Esq., to Major-General G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Wallajah Baugh, 28th March 1876.

In connection with my offer of yesterday's date, addressed to the Revenue Secretary to Government, to maintain the northern and southern canals for a period of five years, I have now the honor to submit, for the consideration of the Government, the following proposal for cleaning out a portion of the Northern Canal (not included in my offer of yesterday) and a portion of the Cooum River laying between the Basin Bridge on the north and the *Harris'* Bridge on the south and round the island to the Napier Bridge near the Marine Villa.

2. After much thought and inquiry, I have arrived at the conclusion that the *best* way of performing this work, having in view the public health, would be to raise the mud, &c., by dredging, beginning at the north end, and removing it in barges to the low-lying land on the banks of the canal north of the Napier Foundry; the *quickest* plan would be, I believe, to remove the mud round the island by ordinary labor and bury it on the island *simultaneously* with the dredging on the north.

3. If the island could not be utilized in this way, the whole of the mud must be dredged and removed three or four miles north and north-west of Madras. In this case I doubt if the work could be got through in less than five years.

4. The Northern Canal north of the Basin Bridge in its present and chronic state would be unable to float the barges which would have to be employed; but, if it were deepened as proposed in my letter of yesterday, it might be used in the mode suggested.

5. The cost would be Rupees 50,000 per mile whichever method of working were agreed upon; this is equivalent to a little over Rupees 28 per yard forward the whole width of the river.

6. If my proposal were accepted, I should not want any advance from the Government, and I would accept payment by monthly instalments.

7. I presume all are agreed as to the advisability, if not the necessity, of thoroughly cleaning out the Cooum River; the advantages of doing so are obvious.

8. I attach a copy of my letter of yesterday for your convenience.

No. 88-B. From Major P. MONTGOMERIE, R.E., Officiating District Engineer, Presidency, to Major-General G. W. WALKER, R.E., Chief Engineer and Secretary to Government, Public Works Department, dated Fort St. George, 10th June 1876, No. 1,338.

Among other improvements to the Government House grounds, Madras, required by His Grace the Governor is a permanent river embankment to the Cooum for the purpose of securing deep water along its edge, and thus prevent the emanation of noxious gases. As such an embankment along the Government House grounds alone would be of little practical utility unless the upper and far more offensive portion of the river be at the same time trained and reduced to moderate dimensions, I have the honor to lay before you the advisability of taking in hand the complete training and conservancy of the whole lower portion of the River Cooum below Harris' Bridge, and in connection with this subject the construction of some permanent work at the mouth of the river to utilize the high tides in scouring and flooding the same.

2. You are probably acquainted with the appearance and the evil effects of this backwater of the Cooum during the cooler months of the year, but it requires an inspection of the locality during the hot weather to form any adequate idea of the intolerable nuisance it then becomes.

3. The training and conservancy of the Cooum must be taken in hand in a thorough manner some day by Government if only for the sake of the public institutions along its banks and which are principally influenced by its effects; and, as this work cannot interfere in any way with the drainage or navigation schemes now before the Government, I would strongly recommend that the project be put in hand forthwith, and that a survey establishment as per margin be sanctioned for six months to enable the District Engineer to prepare the plan and sections on a large scale of the portions of the river to be trained. General maps of the drainage basin, &c., are probably available in the Irrigation Department, but an accurate large scale map of the lower portion of the river is absolutely essential in considering this subject.

Government House.
Body Guard Lines.
Penitentiary.
General Hospital.
Fort St. George.

	Per mensem. Rs.
1 Surveyor	100
1 Lascar	7
4 Lascars, each at	6

No. 88-C. Endorsement of the Officiating District Engineer, Presidency, dated 12th June 1876, No. 1,359.

From L. R. BURROWS, Esq., Acting President of the Municipal Commission, Madras, to Major P. MONTGOMERIE, R.E., Officiating District Engineer, Presidency, dated Madras, 9th June 1876, No. 306.

I have the honor to inquire whether the Government contemplate undertaking within a reasonable period any operations for improving the Cooum conservancy. It is now nearly two years since the bar was opened, and during the whole of that time the sewers of Triplicane, Chintadrepettah, Comaleswaram Covil, and John Pereira's have continued to discharge their contents into the bed of the river. A small establishment is entertained for the purpose of collecting scum and cleaning the banks, throwing down road-dust at the mouths of the sewers as a deodorant. But this establishment is quite insufficient to grapple with the evil. It is no exaggeration to say that the river between Harris' Bridge and Marine Villa is a gigantic cesspool. Unless some radical improvement is effected, the state of the river must become worse and worse in spite of the efforts of the establishment.

2. I would suggest that effect be given to the recommendations of Mr. Clark, the Drainage Engineer. These will be found at the end of his report in the town drainage. The material for the necessary groynes might be taken from the old groynes on the south beach which, in consequence of the retrogression of the sea at that part of the shore, are no longer required.

Submitted to the Chief Engineer and Secretary to Government, Public Works Department, in continuation of this office letter, No. 1,338, dated 10th June 1876.

(Signed) P. MONTGOMERIE, Major, R.E.,
Offg. District Engineer, Presidency.

No. 88-D. Endorsement of the Chief Secretary to Government, dated 26th July 1876, No. 1,141.

From Colonel W. T. F. FAREWELL, Officiating Deputy Chief Engineer, Public Works Department, L. R. BURROWS, Esq., Officiating President of the Madras Municipal Commission, and Surgeon-Major H. KING, M.B. and A.M., Officiating Sanitary Commissioner, to the Hon. W. HUDLESTON, Chief Secretary to Government, Fort St. George, dated — July 1876.

In compliance with G.O., No. 727, dated the 6th of July 1876, we have the honor to report that we have inspected the banks of the Cooum River and found that they have been well conserved and are as clean as possible.

2. We have examined the Triplicane and Chintadrepettah drains, the outfalls of which are in the vicinity of the Government House Bridge; they flow freely into the Cooum, the channels to which are well cleared, and the drains as drains are fairly clean. We found the water in the Cooum, though clear, to be very offensive, which we understand is always the case at this season of the year. The river has for some time past been nothing more or less than a stagnant pool, into which no fewer than thirty-nine sewage drains empty themselves.

Thirty in the Cooum.
Nine in the Canal.

3. Having been called upon to suggest some immediate measures for the speedy abatement of the evils arising from the present condition of the Cooum and being of opinion that the only remedy is to dilute as much as possible its contaminated contents, which, under present circumstances, can only be accomplished by admitting the sea, we beg to recommend that the Cooum bar be cut to mean tide level to a width of 100 feet, and that the cutting be kept open to the depth named until heavy rain falls and the river assumes its monsoon condition. The Presidency District Engineer approximately estimates the cost of the cutting at about Rupees 500, and that of keeping it open at Rupees 15 per diem.

4. We examined the Government House compound along the banks of the Cooum, and in the vicinity of the Marine Villa the banks of the river are well conserved; there, however, exists close to the Marine Villa an unsightly pond with some stagnant water in it; this, we think, should be filled up with sand obtainable from the Cooum Bar.

5. We have been unable to submit this report earlier in consequence of the absence from Madras, on duty, of the Sanitary Commissioner.

Transferred to the Public Works Department for disposal.

(Signed) W. HUDLESTON,
Chief Secretary.

No. 88-E. From Major P. MONTGOMERIE, R.E., Officiating District Engineer, Presidency, to Major-General G. W. WALKER, R.E., Chief Engineer and Secretary to Government, Public Works Department, dated Fort St. George, 13th July 1876, No. 1,921.

1 Register of Heights of Water in Cooum.
1 Original letter from Mr. Pogson.
1 Sketch of Cooum.
1 Statement.
1 Report.

With reference to your memorandum No. 791, dated 1st December 1875, and G.O., No. 43, dated 7th January 1876, in the former of which the District Engineer, Presidency, was directed "to reconstruct one of the dams of the Hospital Bridge so as totally to obstruct the flow of water in the canal from south to north and retain the level of the water of the Cooum as high as possible," and in the latter of which the District Engineer was directed "to take steps to have the banks of the Cooum kept clear of decaying filth and to remove all accumulations of filth from the mouths of the large drains opening into it" and "also to adopt such measures as may be practicable to keep open the mouths of the creeks flowing from Triplicane and Mylapore to the sea," I have the honor to furnish you with the following information on these points, and to request further instructions at an early date.

2. From the accompanying register of the heights of water in the River Cooum and Fort Ditch during the months of March, April, May and June, to which is attached an original communication from the Government Astronomer regarding the rainfall and tides at Madras during the same period, you will observe that the level of the water in the Cooum is at present about the mean sea level according to DeHavilands B.M., and that it is now only 6 inches lower than it was in the beginning of March. At the end of June the level of the water in the Cooum was 1½ feet and that of the Fort Ditch 2½ feet higher than the water in Cochrane's Canal, so that the construction of the dam may be said to have fully and successfully accomplished one of the objects for which it was constructed, viz., the retaining of the water of the Cooum at a high level. The Hospital Bridge works are, however, now nearly completed, and as soon as the rough stone apron has been packed there will be no further necessity for the dam so far as the bridge works are concerned. I have, therefore, the honor to solicit your further instructions with reference to this dam—whether I am to make it secure or not against any of the high floods which may now be expected.

3. With regard to the conservancy of the Cooum Banks and the mouths of the Triplicane and Mylapore Creeks, I have the honor to submit a statement of the monthly establishments and their cost which have been employed on this work. The conservancy of the mouths of the smaller creeks is now most successful, although at first the odors from these drains were occasionally rather pungent owing to the cuttings at their mouths having been carried too deep and thus laying bare the whole of the surface of the drains at low water. But by a little judicious management in the removal of the sand so as to allow the fresh sea-water to roll in without permitting the

drain to empty itself except periodically, these most disagreeable portions of the beach are now as fresh and inoffensive as any other part.

4. The perfect conservancy of the banks of the Cooum is, however, not possible with the limited establishment at my disposal; the men have worked diligently, but the removal of filth by manual labor from such a gigantic and foul cesspool as the Cooum has now become is, in my opinion, worse than useless. The bar of this river was last cut on the 17th September 1874 and, as it closed again about January 1875, there has not since that period been any natural means of evacuating the sewage which has been allowed to flow into it, nor has a single drop of sea-water been allowed to enter to dilute the same. The removal of the surface weeds and scum has however been beneficial; but, as the hot whether advances, the growth and production of these is greater than the small establishment at my disposal can satisfactorily contend with, and I would suggest that until next monsoon this establishment be increased as per margin.

Present Establishment.	RS.	A.	P.
1 Cart	16	12	0
1 Peon	7	0	0
6 Coolies at Rs. 4-13-6 ea.	29	1	0
Total..	52	13	0

Proposed Establishment.	RS.	A.	P.
3 Carts at Rs. 16-12-0 ea.	50	4	0
2 Peons at ,, 7- 0-0 ea.	14	0	0
18 Coolies at ,, 4-13-6 ea.	87	3	0
Total ..	151	7	0

(Per month.)

5. As, however, no permanent benefit can possibly be gained by any amount of weeding and skimming the surface-matter of the Cooum unless steps are at the same time taken to secure the thorough evacuation of its contents by natural means into the ocean and which in return could be made to furnish an ample supply of fresh sea-water, I have the honor to draw your special attention to my letter, No. 1,338, dated 10th June 1876, in which I applied for the services of a small survey party to enable the District Engineer to investigate the subject and submit a complete project to Government, and I now beg to submit a sketch of the Cooum basin showing the arrangements I would propose to secure this most desirable effect.

Proposed Improvements for Scouring and Flushing the River Cooum with Tidal Water.

1. THE Cooum proper must be trained uniformly to moderate dimensions as shown by the dotted lines on the plan and the margin revetted with stone.

2. The backwater running north from the mouth of the river towards the Wallajah Bridge to be separated from the main river by means of an embankment with sluices at A.

3. The southernmost groyne C to be extended beyond the shore and the groyne D to be carried out to the sand-bank formed by the surf-action.

4. Scouring sluices to be constructed at B between the two groynes.

5. During the flood-tide all sluices to be kept open and the influx of sea-water to be assisted by manual labor if necessary. At high tide all sluices to be closed until about half an hour before low water when the scouring sluices at B are to be opened and the sluices at A being kept closed. The water in the north portion of the basin will flow round the island towards the Penitentiary and help to augment the volume of water required to scour out the main stream.

6. It is observed from Mr. Clark's report on the drainage of Madras that he has already suggested the construction of these groynes. But it cannot be expected that with such a surf to contend with, and so small a rise and fall of tide (viz., 3 feet) as exists on the Madras coast, these groynes alone can keep the bar of the Cooum open without the assistance of manual labor or some mechanical contrivance, such as sluices, &c.

13th July 1876.

(Signed) P. MONTGOMERIE, Major, R.E.,
Officiating District Engineer, Presidency.

12

From N. R. POGSON, Esq., Government Astronomer and Meteorological Superintendent, to Major P. MONTGOMERIE, R.E., Officiating District Engineer, Presidency, dated Madras Observatory, 23rd June 1876.

IN reply to your letter of the 20th instant, and I suppose to Lieutenant Hamilton's previous one of the 6th also, which I regret to find has not yet been answered, I have the honor to furnish you with the following particulars:—

1. The rainfall up to date this year has been thus recorded. The average due up to date is 5·7 inches. The accompanying table may be of occasional use in your office for reference, and the current returns are regularly published in the Weekly Meteorological Supplements of the *Fort St. George Gazette.*

January	2nd	0·12
April	30th	0·71
May	5th	0·01
,,	9th	0·43
,,	7th	0·01
,,	30th	0·01
,,	31st	0·73
June	1st	0·26
,,	2nd	0·07
,,	3rd	0·04
,,	12th	0·01
,,	13th	1·43
,,	15th	0·43
,,	16th	0·53
,,	17th	0·03
,,	19th	0·05
	Total on 16 days ..	4·87

2. With regard to the tides at Madras, I am of opinion it is high time that some new series of observations was commenced for verification, and probable correction of the very old data now available for their prediction at Madras. The "*establishment of the port*" is given as 7 h. 34 m., and the rise and fall as 35 inches, which I suppose is the difference between MEAN high and low water. Dividing this roughly in the proportion of lunar and solar influence, we should expect 48 inches for the average difference at spring tides and only 22 inches at the neaps, but how far this will hold good I cannot say. Then there are considerable differences between the heights of the springs, agreeably to the position of the moon in her orbit, both as regards her meridian altitude at the time and her distance from the earth. The superior tide is usually greater than the inferior tide, so that at new moon there should be a maximum between 7 and 8 P.M., while at full moon it should occur between 7 and 8 A.M. The springs occur on the new and full moon days, so that for March, April, May, and June we have

1876.		Moon's Phase.	Maximum Superior Tide.	Moon's Declination.	Horizontal Parallax.
				°	′
March 10th	...	Full.	March 10th 7½ A.M.	6 N.	58
,, 26th	...	New.	,, 26th 8 P.M.	8 N.	59
April 9th	...	Full.	April 9th 7½ A.M.	9 S.	56
,, 24th	...	New.	,, 24th 7½ P.M.	18 N.	60
May 8th	...	Full.	May 9th 7½ A.M.	22 S.	55
,, 23rd	...	New.	,, 23rd 7 P.M.	25 N.	61
June 7th	...	Full.	June 7th 7½ A.M.	27 S.	54
,, 22nd	...	New.	,, 22nd 8 P.M.	28 N.	61

The nearer the moon's declination is to 13° N. (the latitude of Madras) and the greater her horizontal parallax, the higher the tide, and the reverse, so that, of the above, April 24th was by far the best when the moon southed only 5° N. of the zenith, her horizontal parallax being 60′; and as decidedly the tide of June 7th, when she southed 40° S. of the zenith, with horizontal parallax only 54′, must have been the worst in the four months.

It must, however, be always borne in mind that the tides are often considerably changed from their normal height by casual winds and currents, so that after all they may be unduly increased or diminished when least expected. The late Mr. Fraser, when engaged some years back in some operations for the Ennore salt works, found the advantage of taking such considerations as the above into account. He was about to cut a channel and let the sea in at an unfavorable time, but, by waiting a fortnight as I advised him, succeeded entirely to his satisfaction.

No. 88-F. MEMORANDUM.

THE condition of the Cooum River has been rendered rather more unsanitary than usual by the failure to open the bar in the north-east monsoon of 1875, the floods never having risen to that height at which there is a standing order to cut it. The accumulation of foul water in its tidal basin will therefore be treble the usual amount by the middle of October 1876. The Chief Engineer does not see that any effectual remedy can be applied to this until next floods admit of the bar being opened and the stagnant matter swept into the sea. The normal state of the Cooum will then be resumed, and meanwhile Government House, Madras, had better not be resorted to, but Guindy made use of instead.

2. In the present deficit of money for public works, which threatens to be permanent in consequence of the determination arrived at by Government to appropriate some four lakhs of the Provincial assignment for public works to other purposes, the Chief Engineer has abstained from recommending any action in the direction of an attempt to keep open the Cooum bar permanently, knowing how precarious the chance of success is and how insufficient the data on which to ground a scientific scheme of operations. He entirely approves of the engineering grounds on which Mr. Clark's proposal of 12th February 1875 is based, but that gentleman's calculations are admittedly rough. And, seeing that his proposals for the drainage of Madras will, if carried out in a few years, effectually prevent the defilement of the Cooum, and that the Government of Madras have not got money to spare in experimenting on improving the river during those few years when its condition may be rendered tolerable by attending to the cutting of the bar annually and to the conservancy of its bed and banks, Major-General Walker has preferred concentrating what little influence he may possess on the advocacy of immediate action in carrying out the drainage scheme, leaving it to be settled hereafter in what proportions its cost should be borne by the Government and the Municipality respectively. There is no rival scheme; Madras must be drained, and there can be no good, but must be great harm, in deferring action against so really gigantic an evil.

3. Should it, however, be deemed necessary, and funds be made available, to attempt something towards keeping the Cooum Bar permanently open on Mr. Clark's scheme, the Chief Engineer would prefer throwing out a northern groyne in a line with the north abutment of the bridge to a length of about 300 feet, and from its end another groyne of about the same length at right angles to it in a southerly direction towards the south groyne, which might be lengthened 100 feet, the groyne running athwart the river-mouth for two-thirds of its length being kept down to low water level. In this manner he considers that the principle of Mr. Clark's scheme will be maintained without decrease of the waterway of the bridge, which is to be deprecated. The cost of this work might be—

	RS.
Northern Groyne	8,000
Lengthening Southern	5,000
Cross Groyne	7,000
Total ..	20,000

But the Chief Engineer would rather see that or double that sum laid out in deepening shoals of the Cooum and training its banks, to do which satisfactorily, and to have a record of its present state for comparison at later dates, it is necessary that sections referred to permanent bench-marks should be taken along the stream, with which view he recommends that action be first taken in providing the Presidency District Engineer with a survey establishment.

OOTACAMUND, (Signed) G. W. WALKER, Major-General, R.E.,
20th July 1876. *Chief Engineer, P.W.D.*

No. 89. ORDER THEREON, 3rd August 1876, No. 1,992.

CIVIL WORKS, No. 10.

IN his letter of the 27th March 1876, Mr. Woolley proposes (1) to undertake the maintenance of the Northern and Southern Canals for five years for a monthly sum equivalent to one-twelfth of the average annual expenditure of the last five years; (2) to open the Ennore and any other bars and keep clear all side-channels connecting the canals with the salt-pans on the same terms and for the same period.

2. Mr. Woolley proposes to use dredges worked either by steam power or manual labor.

3. His Grace the Governor in Council is disposed to entertain favorably the proposals submitted, which he understands as covering the maintenance of the canals to a minimum depth of 3 feet at the lowest tide level, and of a width of 30 feet at the bottom, and of the towing paths in proper condition for use.

4. The Chief Engineer will prepare, in communication with the Government Solicitor, a form of contract for approval.

5. The Collector of Chingleput will be requested to submit a statement of actual outlay for each of the last five years in maintenance of the canals and of the branches to the salt-pans, as well as of any outlay that may have been incurred in each year in opening the Ennore and other bars.

6. The proposals made in Mr. Woolley's letter of the 28th March for the conservancy of the Northern Canal south of the Basin Bridge and of portions of the Cooum River cannot at present be entertained.

7. The application of the District Engineer, Presidency, for a Survey Establishment to prepare plans and sections, on a large scale, of the Cooum below Harris' Bridge, and the request from the President of the Madras Municipal Commission that Mr. Clark's proposal for permanently opening the Cooum Bar, recorded with G.O., No. 208, dated 25th February 1875, be at once carried out, are not sanctioned. The Governor in Council, however, resolves to order the immediate execution of the measures recommended by the Committee appointed in G.O., No. 727, dated 6th July 1876 (Public Department), for ameliorating the condition of the river. The Cooum Bar will accordingly be cut down to low-water level for a width of one hundred feet, the cutting being kept open to the depth named until heavy rain falls and the river assumes its monsoon condition. The approximate estimate of the cost of the cutting is given at Rupees 500, and that of keeping it open at Rupees 15 per diem. The filling in of the pond near the Marine Villa with the sand from the bar recommended by the Committee will also be carried out. In addition to those

measures settling tanks are also to be constructed above the mouths of the Mount Road and Chintadrepettah sewers near Government House Bridge to trap sewer contents and intercept them before they reach the Cooum. The settling tanks should be emptied daily and their contents removed by the Municipality.

8. It is satisfactory to observe that the instructions given* to the District Engineer, Presidency, to maintain the level of the Cooum as high as possible by means of one of the dams at the General Hospital Bridge have been so far successful. The dam will continue to be maintained at a height of 20·5 feet above the zero assumed for these calculations which is 20 feet below mean sea level. The results of the measures ordered to be adopted in G.O., No. 43, dated 7th January 1876, for the conservancy of the Cooum banks and the mouths of the Triplicane and Mylapore Creeks have, it is observed with satisfaction, been successful, and have been carried out at a moderate cost.

9. The proposed† increase to the conservancy establishment to admit of the continuance of the operations and of the complete cleaning of the banks from all offensive deposit or accumulations till the setting in of the next monsoon is sanctioned.

10. The District Engineer, Presidency, will in due course submit formal estimates for the outlay authorized in these Proceedings, when specific grants of money will be made.

(True Extract.)

(Signed) G. W. WALKER, Major-General, R.E.,
Secretary to Government.

To the District Engineer, Presidency.
To Mr. R. Woolley.
To the Revenue Department.
" Marine Department.
" Examiner of Public Works Accounts.

Exd. S. T. Austin.
Spare Copies

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* Chief Engineer's Memorandum, No. 791, dated 1st December 1875.

† Paragraph 4 of the District Engineer's letter, No. 1,921, dated 13th July 1876.

Proceedings of the Madras Government, Public Works Department,
5th April 1875.

Read the following Proceedings of the Madras Government in the Financial Department, dated 6th March 1875, No. 519 :—

Abstract.—*Drainage of Madras.*—Proceedings of Government, Public Works Department, transferring Report and Memorandum from the Drainage Engineer on the scheme for draining Madras, and on the River Cooum, communicated to the Municipal Commissioners for the Town of Madras, and to the Sanitary Commissioner, in continuation of G. O., dated 27th January 1875, No. 151.

Order thereon, 5th April 1875, No. 36.

Ordered to be recorded.

(True Extract.)

(Signed) G. W. WALKER, Colonel, R.E.,
Secretary to Government.

To the District Engineer, Presidency.

Exd. S. T. Austin.
Spare C

Proceedings of the Madras Government, Financial Department,
6th March 1875.

Municipal Drainage.

No. 76. Read the following Proceedings of Government in the Public Works Department, dated 25th February 1875, No. 208 :—

Read the following letter from W. CLARK, Esq., C.E., Drainage Engineer, Madras, to Colonel G. W. WALKER, R.E., Secretary to Government, Public Works Department, Fort St. George, dated Mount Road, 12th February 1875.

In continuation of my Memorandum, dated 14th January 1875, I have now the honor to forward a further report of progress made with the scheme for draining Madras, and I take this opportunity of forwarding a Memorandum on the River Cooum for such consideration as you may deem desirable.

DRAINAGE OF MADRAS.

MEMORANDUM.

The levels of those portions of the town area which are likely to be comprised within the drainage scheme are now nearly completed, and two only of the Surveyors are retained to take such further levels as may from time to time be found necessary.

2. With the plans of Major Tulloch's scheme alluded to in my former Memorandum,* I have been able definitively to fix on the position to be given to the main sewers in the various districts of the town, and these very nearly coincide with those adopted by him.

* Dated 14th January 1875.

3. The absence of any reliable plan at a smaller scale† has necessitated my laying out the scheme on the Revenue maps at the large scale of 100 feet to the inch, and in fact the sections then became working drawings by which, when completed, any part of the work can at once be commenced. This is a great advantage, but it involves a considerable extra amount of labor above what the delineation of a scheme absolutely requires, as every sewer will be shown at its inclination and depth to $\frac{1}{01}$th of a foot ; this, I trust, will be satisfactory to the Government, but the time occupied in doing this is very considerable.

† The six-inch plan is too small.

4. The laying out of the sewers for Black Town is now completed on plan, but have not all as yet been transferred to the sections ; this and the inking in of the plans, &c., is a large and very tedious business. I have been compelled to increase considerably the number of Draughtsmen employed, and I hope in the course of the next two weeks to get the entire drainage plans and sections of Black Town and the Fort completed, and good progress made, with the plans of the other divisions.

5. The sections of the remaining and more important sewers will also, I hope, soon follow ; but it is quite evident to me that I shall be unable to complete the whole work in this detailed form within the period of my engagement, with every possible assistance and spending long hours at the work daily. I mention this now not as a difficulty but to prevent disappointment.

6. I may here mention that the site I have fixed on for the pumping station is on the open area of land to the east of the Elephant Gate Bridge, but should any difficulty arise as to the arrangements for obtaining this property, a small spot on the opposite side of the canal in the People's Park will be suitable ; but I would prefer the former.

7. The object in selecting this position is to save about 4 feet of lift for the pumps and the construction of about one mile of the deepest, and, therefore, most expensive portion of the work, as laid down in Major Tulloch's scheme.

8. The out-fall culvert I propose to carry along the ridge of high ground occupied by a portion of Mint Street, from the end of Ramanen Street and along the Trivatoor High Road to the sandy

road shown on the map as Balakistnama Naick Street leading to the sea. That portion of the outfall within the town will have a fall of 5 feet per mile, and can be constructed either of iron or brickwork; estimates will be given for both. The brickwork culvert can be made absolutely impervious by brick-in-cement lining; but should the present price of cast iron in England prevail when the works are executed, it is probable that only a very small increase of expense would be incurred by adopting that material, should it be deemed desirable; but I am quite confident that the brickwork culvert can be satisfactorily completed and be equally efficient at a smaller cost.

(Signed) W. CLARK, C.E.,
Drainage Engineer.

12th February 1875.

THE RIVER COOUM.

The condition of the River Cooum, as the chief receptacle for the surface waters of Madras, is *of the greatest importance.*

2. The area of the city is far too large to permit of any measures for effecting its surface drainage, excepting by the ordinary means of gravitation to a lower level, and as the level of the sea is the lowest that can possibly be obtained, it is evident that, if the River Cooum can be kept down to this, it will be in the best condition for effecting the surface drainage of the city.

3. It is moreover desirable, for many reasons, that fresh supplies of sea water should enter with the daily tidal current; the presence of a stagnant lagoon of sea water closely adjacent to the most populous part of a large city is most undesirable, but when it is made to receive the sewage of the population for weeks and months together, as at present, it becomes a source of nuisance and danger to health. The greatest benefit to the Cooum, undoubtedly, will be the diverting of the sewage into other channels, and to prevent entirely the contamination of its waters; and should the very necessary works of drainage be executed, still in the present condition of the bed of the River Cooum (which has for many years received the greater part of the sewage) the necessity for an improvement in its condition will only be lessened in degree, and therefore I venture to offer, for the consideration of Government, a few remarks on the subject.

4. From a daily observation of the bar since my arrival in December last, and from information with which I have been favored by Colonel Goddard, Colonel Moberly, and others, it is apparent that no regular discharge of upland fresh water throughout the year can be expected, and it is from the tidal influence alone that any power can be obtained towards the keeping of the "bar" open throughout the year; and the case at once resolves itself into the question of quantity and velocity of the current entering and issuing four times in the twenty-four hours.

5. In this view of the matter, the area of the Cooum affected by the tidal influence and regarded as a *reservoir* for the flood-water at high tide, to be discharged as the tide falls, is an important feature. The river when in flood, as during October last, scoured out the entire channel through the bridge, and a clean channel was left; this was the result of an enormous body of water moving at a high velocity.

6. As the quantity diminishes at the cessation of the rains, the water of the flood tide gradually finds its way in, and it becomes a contest between the loose sand thrown up by the surf at the mouth of the river and the entering and issuing tidal water; as this process goes on during the north-eastern monsoon current, the river is forced towards the southern end of the bridge, where there is a short groyne, and the drift sand occupies four-fifths of the water-way of the bridge leaving a narrow channel only, this channel is kept open for several months by the scouring action of the tidal water in passing to and from the *reservoir* of the Cooum.

7. As the river succeeds in forcing for itself a channel through the enormous quantity of loose shifting sand for several months, it may, I think, be expected that, if some comparatively small means of assistance were afforded, it would remain permanently open.

8. Those who have known the river before the rough groyne of granite boulders above alluded to was placed on the sea side of the bridge at its southern end, will be able to say how far, or for what period, the closing of the "bar" has been protracted.

9. My observations during the past two months have shown that the outlet of the channel into the sea shifts towards the north. A quantity of sand accumulates on the "bar" side at the head of the groyne and gradually increases in extent, causing the opposite or north side of the channel to scour away the sand by the action of the waves which break on its face during flood tide and carrying the sand nearer to the bridge, where a very considerable eddy is formed, and a quantity of sand is piled up at the back of the shoal first formed as above; as this action proceeds, the northern side of the channel becomes more and more exposed to the action of the waves, and the silting up of the channel is more and more rapid, until the time when the projecting shoal on the south side will overlap the northern side of the channel completely, (it now extends to a point opposite the seventh arch from the southern end of the bridge and will soon completely overlap the channel; in this condition of things the waves (which break nearly parallel to the shore) will commence to cut the point of the shoal itself and drive it bodily in towards the bridge, and the "bar" will then at once be closed.

10. I am of opinion that, if a channel of suitable width be formed by the construction of groynes on both sides, and the entering and issuing water be confined to this channel during the dry season, that a quantity of water moving at sufficient velocity will be obtained to keep the channel open throughout the year by the scouring action of the tidal water alone. I have roughly estimated the quantity of water which the River Cooum will contain between the South Beach and Harris' Bridges.

11. The ordinary rise of the tide I learn is about 3 feet; for purposes of calculation I have taken 2 feet 6 inches as spread over the area of the Cooum between the above points, and I find the quantity to be about 16½ millions of cubic feet which must enter through the channel at the "bar in six hours; this quantity in a channel, having a sectional area of 300 square feet, would give an average velocity of 2½ feet per second—of course this velocity is not uniform, it is greatest about half tide of both flood and ebb; and at extreme high or low water the velocity for a brief period is *nil*, but for a very considerable portion of the six hours the velocity will be much higher—from 4 to 5 feet per second—and I consider quite sufficient to keep the channel, with a capacity such as I have mentioned, open if the loose sand at the mouth be so far confined and controlled as to admit of the scouring action of the water being concentrated on its sectional area only, and in a direction at right angles to the general shore line.

12. I have repeatedly observed the water entering with a velocity at the surface of 4 feet per second (and the channel I take to be about the size I have indicated) under the present condition of things, but the mass of sand it has to contend with on both sides along its whole length is too great to be overcome by the small stream opposed to it.

13. I am unable to say whether the water-way of the bridge is sufficiently ample to admit of 50 feet out of its 500 feet to be appropriated to the construction of a groyne on the north side of the channel; but judging from the other bridges higher up where the water-way is very considerably less, I should think 50 feet might be spared—in that case I should appropriate the 3rd arch (from the south end of the bridge) to the construction of the groyne, which, with the existing one on the south side, should be extended about 200 feet further seaward and to a depth which experience has proved to be the lowest point of scour under the bridge.

14. Should it be inadmissible to construct a groyne in that position then an independent opening further to the north would be necessary at a considerable increase of expense.

15. The river in its shoal portion should be deepened so as to be from 1 to 2 feet of depth at low water.

16. It would also be necessary, on the approach of the monsoon season, to keep the sand at the bar down to a level which would easily admit of the flood water topping and scouring it away, so as to avoid any undue strain on the permanent channel.

17. The upper reaches of the river may be immensely improved by training walls at intervals to confine the stream during the dry season to a defined channel—the general bed being levelled—

Proceedings of the Madras Government, Financial Department, 6th March 1875.

and it is, I believe, sufficiently high for grass to grow upon. Not only would the general appearance of the river then be improved, but its discharging power would, I consider, be improved also.

(Signed) W. CLARK, C.E.,
Drainage Engineer.

12th February 1875.

Transferred to the Financial Department.

2. His Excellency the Governor in Council thanks Mr. Clark for his suggestion on the subject of the Cooum River. The project may more conveniently be discussed when Mr. Clark's Drainage proposals shall have been decided on.

(True Extract.)

(Signed) G. W. WALKER, Colonel, R.E.,
Secretary to Government, P.W.D.

No. 77. ORDER THEREON, 6th March 1875, No. 519.

Communicated to the Municipal Commissioners for the Town of Madras and to the Sanitary Commissioner, in continuation of G.O., dated 27th January 1875, No. 151.

(True Extract.)

Chief Secretary.

To the President of the Madras Municipal Commission.
" Sanitary Commissioner.
" Public Works Department.

Exd. T. O'Connor.

No. 1338.

From

The District Engineer,
Presidency

To

The Chief Engineer and
Secretary to Government

Sir,

Among other improvements to the Govt House Grounds, Madras, required by His Grace the Governor is a Permanent River Embankment to the Cooum for the purpose of securing deep water along its edge and thus prevent the emanation of noxious gasses: as such an embankment along the Govt House Grounds alone would be of little practical utility unless the upper and far more offensive portion of the river be at the same time trained and reduced to moderate dimensions, I have the honor to lay before you the advisability of taking in hand the complete training and conservancy of the whole lower portion of the River Cooum below Harris' Bridge; and in connection with this subject the construction of some permanent work at the mouth of the River to utilise the high tides in scouring and flooding the same.

2. You are probably acquainted with the appearance and the evil effects of this back water of the Cooum during the cooler months of the year but it requires an inspection of the locality during the hot weather to form any adequate idea of the intolerable nuisance it then becomes.

Govt. House
Body Guard Lines
Penitentiary
General Hospital
Fort St. George

3. The training and conservancy of the Cooum must be taken in hand in a thorough manner some day by Government - if only for the sake of the Public Institutions along its banks and which are principally influenced by its effects; and as this work cannot interfere in any way with the Drainage or Navigation schemes now before the Government, I would strongly recommend that the project be put in hand forthwith, and

that

	per mensem Rs
1 Surveyor	100
1 Lascar	7.
4 — do —	@ 6. Rs each.

that a Survey Establishment as per margin be sanctioned for 6 months to enable the District Engineer to prepare the plan and sections on a large scale of the portions of the River to be trained. General Maps of the drainage basin &c: are probably available in the Irrigation Department - but an accurate large scale map of the lower portion of the River is absolutely essential in considering this subject.

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

R. Montg. Moir Major R.E.
Offg. District Engineer
Presidency

Fort Saint George
10th June 1876.

G.O. 26th July 75 No 2153
" 6th Octr " " 2847
" 19 " " " 2979
" 7 Jany 76 " 43
" 2nd Febr " " 289

P.W. 1876 Dec
No. 41

Procd August 1876.

The District Engineer
Presidency

To
The Chief Engineer
D.P.W.

Dated 10th
Recd 12th June 1876

No. 1338

Requests that a Survey Establishment may be sanctioned to enable the Dist. Engr to prepare plans & sections on a large scale of the portions of the River to be trained &c.

No 88B.
Recd 27.7.76 Retd 3.8.76
Gi 4.7.76 Retd 27.7.76
Despd ... 12.6.76

No. 306
Municipal Commissr office
Madras 9th June 1876

From
The Acting President
Municipal Commission

To
The District Engineer of the
Presidency

Sir

I have the honour to enquire whether the Government contemplate undertaking within a reasonable period any operations for improving the Cooum [illegible]. It is now nearly two years since the bar was opened, and during the whole of that time the sewers of Triplicane, Chintadripettah, Comaleeswaren Koil, & John Pereiras have continued to discharge their contents into the bed of the river. A small establishment is entertained for the purposes of collecting scum and cleaning the banks, throwing down road dust at the mouths of the sewers as a deodorant. But this establishment is quite insufficient to grapple with the evil. It is no exaggeration to say that the river between Harris' bridge & Marine villa is a gigantic cesspool. Unless some radical improvement is effected, the state of the river must become worse & worse in spite of the efforts of the establishment.

I would suggest that effect be given to the recommendations of Mr Clark the drainage Engineer. These will be found at the end of his report on the Town drainage. The material for the necessary groynes might be taken from the old groynes on the South Beach which

in

P. W. 1876 Sepr
No. 4233

in consequence of the retrogression of the sea at that part of the shore are no longer required.—

I have the honour to be
Sir
Your most obedient Servant
L. R. Burrows
Acting President M. C.

No. 1359
Submitted to the Chief Engineer and Secretary to Govt. P.W.D. in continuation of this Office letter No. 1338 of 10th June/76
Chas. [illegible]
for Superintg.
Offg. Dist. Engr. Presidency

12 June/76
21

From
The Ag. President
Ml. Comm.
Dated 9 }
Recd. 10 } June/76

Board Concurring
enquires whether the
Govt. contemplate
undertaking any ope-
rations for improving

P. W. 1876 Department

Former Cases.

Current No. of 187
" "
" "
" "
" "

M. Works Form No. 3.

Current No. 4233.

From

The District Engr. Presidency

Pros. 3 August /76.

No. 1359
Dated 12th } June 1876
Recd. 13th

Subject:— Submitting a letter from the President of the Madras Municipal Commission enquiring whether the Govt. contemplate undertaking any operations for improving Madras Conservancy.

Later Cases.

Current No. of 187
" "
" "
" "

Enclosures.

From to
" "
" "
" "
" "

Orders and Proceedings in file.

Department.	No.	Date.	Endorsements.		
			Department.	No.	Dated.
P.W.	2233	6.11.63			
	619	1.3.64			
	647	8.3.65			
	36	5.4.75			
	63	7.1.76			
	189	2.2.76			
Public	727	6.7.76			

N° 886 -
N° 886

Public 24.7.76 Pubd 3.8.76
[illegible] 27.7.76 Pubd 27.7.76
[illegible]

Public Department,

No. 855.

From The Sanitary Commr., Coll. Farewell, and the President of the Madras Municipality.

Dated – July 1876.

FOR ORDERS.

Report on state of Conservancy at Madras

G. W. 1876 Depar

FORMER CASES.
Current No. of 187

M. WORKS FORM No. 3.
Current No. 4233.

From
Colonel R. P. F. Firewell,
Officiating Dy. Chief Engr.,
Public Works Deptt.,

" L. Burrows Esqr. B.A.
C.S.
Officiating President of
the Municipality.
" H. King Esqr. B.M. & A.M.
Officiating Sanitary Commr.

To The Chief Secretary
to Government.

Sir,

In compliance with G. O. No. 727, dated the 6th of July 1876, we have the honor to report that we have inspected the banks of the Cooum River, and found that they have been well conserved and are as clean as possible.

2. We have examined the Triplicane and Chintadrepettah

drains, the outfalls of which are in the vicinity of the Government house Bridge; they flow freely into the Cooum, the channels to which are well cleared and the drains as drains are fairly clean — We found the water in the Cooum, though clear, to be very offensive, which we understand is always the case at this season of the year. The river has for some time past been nothing more or less than a stagnant pool, into which no fewer than 39 sewage drains empty themselves —

30 in the Coou
9 in the Cana

3 Having been called upon to suggest some immediate measures for the speedy abatement of the evils arising from the present condition of the Cooum, being of opinion that the only remedy is to dilute as much as possible its contaminated contents, which under present circumstances can only be accomplished by admitting the sea; we beg to recommend that the Cooum bar be cut to mean-tide-level, to a width of one hundred feet, and that the cutting be kept open to the depth named until heavy rain falls, and the river assumes its monsoon condition; the Presidency District Engr. approximately estimates the cost of the cutting at about Rs. 500 = and that of keeping it open at 1½ Rs. per diem —

We

4. We examined the Government house compound along the banks of the Cooum, and in the vicinity of the Marine Villa — the banks of the River are well conserved; there, however, exists close to the Marine Villa an unsightly pond, with some stagnant water in it; this, we think, should be filled up with sand obtainable from the Cooum bar —

5. We have been unable to submit this Report earlier in consequence of the absence from Madras, on duty, of the Sanitary Commissioner —

We have the honor, &c.

Coll

C. R. Dunn
Ag. Presᵗ Mun. Comⁿ
Henry King, A.M., M.B.
Actg. Sanʸ Commʳ

No 1141.

Transferred to the Public Works De-
:partment for disposal -

Chief Secretary

To the Public Works Department
26th July /76.

No 88 D.—
cir-27.7.76 Pub 4.8.76
Oh Sheet 49 Sale

Public Works (1876) DEPARTMENT
(Sanitary)

From Pres. & Actg. H.
The Sanitary Comm
Colt Hammerk. with
Bowers.

No.

Dated —
Received 17 } July /76.

No. ______ No 1085

Submitting re-
-port on the state
of the Cooum Ri-
ver, in compliance
with G.O. 6th July
No 727

Transferred

Actg. Secy. C

Proposed Improvements

For Scouring & Flushing the River Cooum
with
Tidal water

1 The Cooum proper must be trained uniformly to moderate dimensions as shewn by the dotted lines on the plan and the margin rivetted with stone.

2. The back water running north from the mouth of the river towards the Wallajah Bridge to be separated from the main river by means of an embankment with sluices at A

3. The Southernmost groyne C to be extended beyond the slope and the groyne D to be carried out to the sand bank C formed by the surf action.

4. Scouring sluices to be constructed at B between the two groynes.

5 During the flood tide all sluices to be kept open and the influx of sea water to be assisted by manual labor if neceſsary. At high tide all sluices to be closed until about ½ an hour before low water

when

when the scouring sluices at B are to be opened and the sluices at A being kept closed. The water in the North portion of the Basin will flow round the Island towards the Penitentiary and help to augment the volume of water required to scour out the main stream.

6. It is observed from Mr Clarke's report on the drainage of Madras that he has already suggested the construction of these groynes. But it cannot be

expected that with such a surf to contend with, and so small a rise & fall of Tide (viz 3 feet) as exists on the Madras coast. these groynes alone can keep the Bar of the Cooum open without the assistance of manual labor or some mechanical contrivance such as sluices &c.

P.W. 5066/1/76

P. Montgomerie
Major R.E.
Off. District Engr. Py.

13th July 1876

Mf

Madras Observatory, June 23rd 1876

From
N. R. Pogson, Esq.,
Government Astronomer and Meteorological Superintendent.

To
Major P. Montgomerie R.E.
District Engineer — Presidency

Sir,

In reply to your letter of the 20th instant, and I suppose to Lieut. Hamilton's previous one of the 6th also, which I regret to find has not yet been answered, I have the honor to furnish you with the following particulars.—

1. — The rainfall up to date this year has been thus recorded:

Jan.	2	0.12
April	30	0.71
May	5	0.01
"	6	0.43
"	7	0.01
"	30	0.01
"	31	0.73
June	1	0.26
"	2	0.07
"	3	0.04
"	12	0.01
"	13	1.43
"	15	0.43
"	16	0.53
"	17	0.03
"	19	0.05
Total in 16 days		4.87

The average due up to date is 5.7 inches. The accompanying table may be of occasional use in your Office for reference and the current returns are regularly published in the weekly Meteorological Supplement of the Fort St. George Gazette.—

2. — With regard to the tides at Madras I am of opinion it is high time that some new series of observations was commenced, for verification and probable correction of the very old data now available for their prediction at Madras. — The "Establishment of the Port" is given as 7h 34m and the Rise and Fall as 35 inches which I suppose is the difference between mean high and low water. Dividing this roughly in the proportion of lunar and solar influence we should expect 48 inches for the average difference at spring tides and only 22 inches at the neaps, but how far this will hold good I cannot say. Then there are considerable differences between the heights of the springs, agreeably to the position of the Moon in her orbit, both as regards her meridian altitude at the time and her distance from the earth. — The superior tide is usually greater than the inferior tide; so that at New Moon there should be a maximum between 7 & 8 p.m. while at Full Moon it should occur between 7 & 8 a.m. — The Springs occur on the New and Full Moon days, so that for March, April, May & June we have

1876	Moon's Phase	Maximum Superior Tide	Moon's Declination	Horizontal Parallax
March 10	Full	March 10 7½ a.m.	6° N	58′
— " — 26	New	— " — 26 8 p.m.	8 N	59

1876	Moon's Phase	Maximum Perigean Tide	Moon's Declination	Horizontal Parallax
			°	′
April 9	Full	April 9 7½ a m	9 S	56
24	New	24 7½ p m	19 N	60
May 8	Full	May 9 7½ a m	22 S	55
23	New	23 7 p m	25 N	61
June 7	Full	June 7 7½ a m	27 S	54
22	New	22 8 p m	28 N	61

P.W. 5066/78
3

The nearer the Moon's declination is to 13 N (the latitude of Madras) and the greater her Horizontal Parallax, the higher the tide, and the reverse; so that of the above, April 24th was by far the best, when the Moon southed only 5° N of the Zenith, and H. P. being 60′; and as decidedly the tide of June 7th, when she southed 40° S of the zenith, with H. P. only 54, must have been the worst in the four months.—

It must however be always borne in mind that the tides are often considerably changed from their normal height by casual winds and currents, so that after all they may be unduly increased or diminished when least expected.— The late Mr Mason when engaged some years back in some operations for the Ennore Salt works, found the advantage of taking such considerations as the above into account. He was about to cut a channel and let the sea in at an unfavorable time, but by waiting a fortnight as I advised him, succeeded entirely to his satisfaction.—

I have the honor to be
Sir
Your most obedient Servant
N R Pogson
Government Astronomer.—

R Montgomerie Major RE
13/7/76 Offg Dy Secy

Register of the heights of water in the River Cooum at the Wallajah Bridge and in the Fort Ditch, at Wallajah Lunette Bridge—

During the months of March, April May and June 1876.

N.B. The Zero to which these heights refer is 20 feet below Mean Sea Level, according to De Havilland's B. M.

Month and Date	Cooum	Fort Ditch	State of tides and rain fall in inches	Remarks
1876			Rain	
March 7	20.50	20.44		
8	20.48	20.41		
9	20.46	20.39		
10	20.45	20.36	× ● Max. tide 7½ am.	
11	20.43	20.35		
12	20.42	20.35		
13	20.41	20.35		The water in both Cooum and Fort Ditch fell regularly and uniformly, and do not appear to have been influenced by the Max. tides of the 10th and 26th. The Sluice from the Fort Ditch to the Cooum was closed on the 7 March and not opened since.
14	20.41	20.35		
15	20.38	20.33		
16	20.37	20.37		
17	20.36	20.28		
18	20.35	20.27		
19	20.33	20.25	No rain fell	
20	20.30	20.22		
21	20.28	20.22		
22	20.22	20.22		
23	20.25	20.21		
24	20.23	20.20		
25	20.21	20.20		
26	20.22	20.19	× ● Max. tide 8 pm	
27	20.20	20.19		
28	20.19	20.18		
29	20.18	20.17		
30	20.17	20.17		
31	20.16	20.17		

Month and Date. 1870.	Covum	Fort Ditch	State of tides and Rainfall in inches (Rain fall)	Remarks
1	20.15	20.16		
2	20.15	20.16		
3	20.14	20.15.		
4	20.13	20.15.		
5	20.11	20.15		
6	20.09	20.15		
7	20.08	20.14		
8	20.06	20.14		
9	20.05	20.11	× ● Max tide 7 a.m.	× Although there was a Max tide on this day, the level of the water in the Fort Ditch was the lowest recorded. The unusual winds and currents referred to by Mr Payson may have had some influence on this, but they have not been registered.
10	20.04	20.13		
11	20.03	20.15		
12	20.02	20.16		
13	20.01	20.17		
14	20.00	20.18		
15	19.99	20.20		
16	19.98	20.22		
April 17	19.98	20.24		
18	19.94	20.26		
19	19.93	20.28		
20	19.92	20.33		
21	19.90	20.33		
22	19.89	20.34		
23	19.88	20.37		
24	19.87	20.42	× ● Max: tide 7½ a.m.	× According to Mr Payson this was the last spring tide, and the water in ditch rose from — 20.37 on the 23d to 20.51 on the 26th or .14 feet without any rain having fallen.
25	19.86	20.48		
26	19.85	20.51		
27	19.84	20.51		
28	19.84	20.51		
29	19.83	20.51		
30	19.84	20.76	0.71	

fall in ditch

Rain fell

Evaporation

N.B. The level of the Covum on 7 March was - 20.45
—— do —— 29 April was - 19.78
No rain fell in the interim. The Diff - .67 feet
.67 of a foot in 54 days = .0124 of a foot per diem.

Month and Date. 1870.	Covum	Fort Ditch	State of tides and rain fall in inches.	Remarks.
1	20.02	20.75		
2	20.02	20.78		
3	19.99	20.81.		
4	19.98	20.81.		
5	19.98	20.81.	0.01	
6	19.99	20.82.	0.43.	
7	20.02	20.82.	0.01	
8	20.04	20.82	× ● Max tide 7½ a.m.	This continued rise of water in the Fort Ditch while the Covum subsided again might be accounted for by the springs which feed it having been replenished by the rains & high tides?
9	20.02	20.86		
10	20.04	20.93		
12	20.02	20.99		
12	20.00	21.04		
14	19.99	21.07		
15	19.97	21.08		
16	19.98	21.06		
17	19.97	21.04		
18	19.94	21.00		
May 19	19.92	20.97		
20	19.90	20.96		
21	19.89	20.96		
22	19.87	20.96		
23	19.85	20.94	× ● Max tide 7 a.m.	
24	19.84	20.94		
25	19.86	20.94		
26	19.84	20.93		
27	19.83	20.90		
28	19.83	20.89		
29	19.81	20.88		
30	19.78	20.89	0.01	
31	19.78	20.93	0.73.	

[illegible]

Month and Date		Coovum	Fort Ditch	State of tides and rain fall in inches		Remarks
					rain	
1876 June	1	19.83	21.02		0.26	
	2	19.84	21.18		0.07	
	3	19.88	21.18		0.04	
	4	19.87	21.22			
	5	19.87	21.25			P. W. 5066/76 4
	6	19.88	21.22			
	7	19.88	21.24	× ○ Max: tide 7½ A.M.		During this period the Coovum evidently rises with the fall of rain which however is not sufficient to influence the high state of water in the Fort Ditch and which is about one foot above mean sea level according to De Havilland's B.M.
	8	19.88	21.24			
	9	19.87	21.22			
	10	19.55	21.20			
	11	19.86	21.09			
	12	19.85	21.08		0.01	
	13	19.83	21.05		0.43	
	14	19.82	21.13			
	15	20.19	21.08		0.23	
	16	20.28	21.18		0.53	
	17	20.26	21.10		0.03	
	18	20.24	21.00			
	19	20.21	20.98		0.05	
	20	20.19	20.92			
	21	20.17	20.88		0.02	
	22	20.16	20.88	× ● Max: tide 8 P.M.		
	23	20.15	20.88			On the 24th water in Coovum is 1.54 feet above that in Cochrane's Canal.
	24	20.11	20.87		0.01	
	25	20.11	20.94		0.15	
	26	20.11	20.95		0.01	
	27	20.10	20.98		0.05	
	28	20.08	21.01			Register of rain not known.
	29	20.07	21.03			
	30	20.04	21.05			

N.B. The present standing order regarding the cutting of the Coovum Bar is that it shall be done when the water reaches 23.30 according to De Havilland's B.M.

Mason R.E.

E. Montgomerie
Offg. District Engineer

d. 13: July 1876

Statement shewing the cost of Establishment employed in the conservancy of the Coum Bank-

	Particulars of Estt.		March 1876			April 1876			May 1876			June 1876			Total			Remarks
1	Peon	at 7 " " per mth	7	"	"	7	"	"	7	"	"	7	"	"	28	"	"	
6	Coolies	at 4-13-6 "	29	1	"	29	1	"	29	1	"	29	1	"	116	4	"	
1	Cart		16	12	"	16	12	"	16	12	"	16	12	"	67	"	"	The cart was supplied by the Municipality & the amount paid by them-
	Total Rs.		52	13	"	52	13	"	52	13	"	52	13	"	211	4	"	

Statement shewing the cost of cutting the river along the Beach-

	January 1876			February 76			March 76			April 76			May 1876			June 1876			Total			Remarks
	Men	Boys	Amount	Men	Boys	Amount	Men	Boys	amount	Men	Boys	amount	Men	Boys	amount	Men	Boys	amount	Men	Boys	amount	
Ice House creek	108	10	28 4 "	93	82	33 8 "	99	99	37 2 "	120	120	45 " "	124	124	46 8 "	120	120	45 " "	664	555	235 6 "	
Triplicane creek	157	10	40 8 "	134	114	47 12 "	115	115	43 2 "	120	120	45 " "	134	134	50 4 "	180	180	67 8 "	840	673	294 2 "	
Saint Thome creek	181	23	48 2 "	188	181	69 10 "	148	148	55 8 "	180	180	67 8 "	196	196	73 8 "	246	243	91 14 "	1139	971	406 2 "	
Total	446	43	116 14 "	415	377	150 14 "	362	362	135 12 "	420	420	157 8 "	454	454	170 4 "	546	543	204 6 "	2643	2149	935 10 "	

Major R.E.
Offg District Engr Cy

Cy Dist Engrs Office
Fort St George
15 July 1876

P. W. 5066/76
2

Presidency District Engineer's Office,
Fort Saint George,
13th July 1876.

No. 1921

From

The DISTRICT ENGINEER,
PRESIDENCY,

To

The Chief Engineer & Secretary
to Government
P.W. Departt

Sir

With reference to your Memo No 99, dated 1st December 1875 and G.O. No 43 dated 7th Jany/76 in the former of which the District Engineer Presidency was directed "to reconstruct "one of the dams of the Hospital "Bridge so as totally to obstruct "the flow of water in the canal "from South to North and "retain the level of the water "of the Cooum as high as possible"; and in the latter of which the District Engineer was directed "to take steps to have "the banks of the Cooum kept "clear of decaying filth and "to remove all accumulations "of filth from the mouths of "the large drains opening into "it" and "also to adopt such "measures as may be practicable "to keep open the mouths of "the creeks flowing from "Triplicane & Mylapore to "the sea". I have the honor to furnish you with the following information on these points and to request further instructions at an early date.

2. From the accompanying Register of the heights of water in the river Cooum & Fort ditch during the months of March, April, May and June to which is attached an original communication from the Govt. Astronomer regarding the rain fall and tides at Madras during the same period you will observe that the level of the water in the Cooum is at present about the mean sea level according to De Havilands B.M. and that it is now only 6 inches lower than it was in the beginning of March. At the end of June the level of the water in the Cooum was 1½ feet and that of the Fort ditch 2½ feet higher than the water

in Cochranes canal, so that the construction of the dam may be said to have fully and successfully accomplished, one of the objects for which it was constructed viz: the retaining of the water of the Cooum at a high level. The Hospital Bridge works are however now nearly completed and as soon as the rough stone apron has been packed, there will be no further neceſsity for the dam so far as the Bridge works are concerned. I have therefore the honor to solicit

your

your further instructions with reference to this dam whether I am to make it secure or not against any of the high floods which may now be expected.

3. With regard to the conservancy of the Cooum Banks and the mouths of the Triplicane and Mylapore creeks, I have the honor to submit a statement of the monthly establishments and their costs which have been employed on this work. The conservancy of the mouths of the smaller

creeks is now most successful; although at first the odours from these drains were occasionally rather pungent owing to the cuttings at their mouths having been carried too deep and thus laying bare the whole of the surface of the drains at low water. But by a little judicious management in the removal of the sand so as to allow the fresh sea water to roll in without permitting the drain to empty itself except periodically these most disagreeable

portions

portions of the Beach are now as fresh and inoffensive as any other part.

The perfect conservancy of the Banks of the Coom is however not possible with the limited establishment at my disposal, the men have worked diligently but the removal of filth by manual labor from such a gigantic and foul cesspool as the Coom has now become is in my opinion worse than useless. The bar of this river was last cut on the 17th September 1874 and as it closed again about January 1875, there has not since that period been any natural means of evacuating the sewage which has been allowed to flow into it, nor has a single drop of sea water been allowed to enter to dilute the same. The removal of the surface weeds and scum has however been beneficial, but as the hot weather advances the growth and production of these is greater than the small establishment at my disposal can satisfactorily contend with and I would suggest that until next monsoon this Establishment be increased as per margin.

Present Establishment		Proposed Establishment	Rs. A. P.
1 Cart at Rs	16-12-0 per month	3 Carts at Rs 16-12-0	50-4-0
1 Peon at "	7-0-0	2 Peons " 7-0-0	14-0-0
6 Coolies at 4-13-6 each	29-1-0	18 Coolies " 4-13-6	87-3-0
Rs.	52-13-0		Rs 151-7-0

5. As however no permanent benefit can possibly be gained by any amount of weeding and skimming the surface matter of the Coom, unless steps are at the same time taken to secure the thorough evacuation of its contents by natural means into the ocean and which in return could be made to furnish an ample supply of fresh sea

water, I have the honor to draw your special attention to my letter No 1338 dated 10 June 1876 in which I applied for the services of a small survey party to enable the District Engineer to investigate the subject and submit a complete Project to Government and I now beg to submit a sketch of the Cooum basin shewing the arrangements I would propose to secure this most desirable effect.

I have the honor to be
Sir
Your most obedt. Servt.

R. Montgomerie Major R.E.

sd W. Offg District Engr

G.O. 7-1-76 No. 43.

P. W. 1876 Department

No. 5066
Recd 3rd August/76.
No. 1921.

From

The District Engineer
Presidency

To

The Chief Engineer
& Secretary to Govt.
D.P.W.

Dated 13th
Recd ~~[illegible]~~ } July 1876

Encl. 5 ... 5 E.

+ 1 Plan given to
Librarian

1 Plan put up for
G.O. No. 550 [illegible]

Submits a report
on the Conservancy of
Cooum.

88 E.

No. 88 E.

[illegible] 27-7-76 Rtd 3-8-76
Despd. [illegible] 15-7-76.

Memorandum

The condition of the Cooum River has been rendered rather more unsanitary than usual by the failure to open the Bar in the North East Monsoon of 1875, the floods never having risen to that height at which there is a Standing Order to cut it. The accumulation of foul water in its tidal basin will therefore be treble the usual amount by the middle of October 1876. The Chief Engineer does not see that any effectual remedy can be applied to this, until the next floods admit of the bar being opened: and the stagnant matter swept into the sea. The normal state of the Cooum will then be resumed; and meanwhile Government House Madras had better not be resorted to, but Guindy made use of instead.

In the present deficit of money for public works, which threatens to be permanent in consequence of the determination arrived at by Government to appropriate some 4 Lakhs of the Provincial assignment for Public Works to other purposes, the Chief Engineer has

abstained

abstained from recommending any action in the direction of an attempt to keep open the Cooum Bar permanently; knowing how precarious the chance of success is, and how insufficient the data on which to ground a scientific scheme of operations. He entirely approves of the Engineering grounds on which Mr. Clarke's proposal of 12th February 1875 is based; but that gentleman's calculations are admittedly rough. And seeing that his proposals for the drainage of Madras will, if carried out in a few years effectually prevent the defilement of the Cooum, and that the Government of Madras have not got money to spare in experimenting on improving the River during those few years, when its condition may be rendered tolerable by attending to the cutting of the Bar annually, and to the conservancy of its bed and banks Major General Walker has preferred concentrating what little influence he may possess on the advocacy of immediate action in carrying out the Drainage Scheme; leaving it to be settled hereafter in what proportions its

cost

cost should be borne by the Government and the Municipality respectively. There is no rival scheme; Madras must be drained, and there can be no good, but must be great harm, in deferring action against so really gigantic an evil.

Should it however be deemed necessary and funds be made available, to attempt something towards keeping the Cooum Bar permanently open on Mr. Clarke's scheme, the Chief Engineer would prefer throwing out a Northern Groyne in a line with the North Abutment of the Bridge to a

length of about 300 feet,
and from its end
another Groyne of about
the same length at right
angles to it in a southerly
direction towards the
South Groyne which
might be lengthened
100 feet. The Groyne
running athwart
the River Mouth for
two thirds of its length
being kept down to
Low Water Level.
In this manner he
considers that the
principle of Mr Clarke's
scheme will be main=
=tained, without
decrease of the water=
way of the Bridge
which is to be depre=
=cated. The cost of

this

---

this work might be

Northern Groyne	Rs 8000
lengthening Southern	.. 5000
Cross Groyne	.. 7000
Total	Rs 20000

But the Chief Engineer
would rather see that,
or double that sum
laid out in deepening
shoals of the Cooum
and training its banks
to do which satisfac=
torily, and to have a
record of its present
state for comparison
at later dates, it is
necessary that sections
referred to permanent
bench marks should
be taken along the
Stream. With which
view he recommends
that action be first
taken

Public Works 1876 Dept

taken in providing the Presidency District Engineer with a Survey Establishment.

Memorandum

Major Genl. R.E.
Chief Engineer D.P.W.

Government
July 1876

D/10 Sep 1876 —

Recd Augt/76 —

No 887.

No 887 —

(District Engr Presidency to [illegible] /

R.L.
1/10

D.E. Presidency has been requested to at once submit the plans in question —

W.K.
11.10.

1st Attd

Paper submitted
Thursday 25th Nov. to Major
Montgomerie's plans
and returned to the

N° 887

Letter from District Engineer Presidency No. 1921 of 13th July —

It is suggested that, the ~~present~~ height of the Cooum being 20.04 on 30th June, and 23.30 the height at which the Cooum Bar is to be cut, the existing Dam be maintained — Unless the Bar is cut at once & kept ~~[illegible]~~ open; in which case the Canal should also be opened to Tidal influence; care being taken first to realise how far that influence extends up the Cooum, with the moderate section ~~that~~ for influx of Sea Water, that can probably be maintained —

The Conservancy Expen
may well be increased;

and a temporary Survey
being granted to allow
of accurate knowledge
of the River being ob-
:tained -

But the construction of
Sluices at A and B is
considered worse than
useless - The Dam and
Sluices at A would ob-
:struct free passage of
Tide Water & cause deposit -
Sluices at B would ob-
:struct the deep channel
by which flood water
scours its way out to sea,
and lessen the waterway
of the Bridge, endanger-
:ing it, and aggravating
the height of floods -

In another paper it has
been suggested what ac-
:tion if any should be
taken on Mr Clark's proposal -

But it is deemed that even
Major Montgomerie, while
recommending cutting
of 1 Lakh on it and sub-
:sidiary works, doubts
whether manual labour
may not after all have
to be resorted to, to keep
the Bar open to tidal
influence, if sluices
cannot be used -

G. W. Walker Major Genl
Secy to Govt P.W.D.

21.7.76

With reference to Chief Secretary's Memo. No. 1137 of 17th Inst., the Chief Engineer has the honour to submit a Memorandum on the subject of keeping the mouth of the Cooum permanently open, prepared in a marginal note by Mr. Fraser the Surveyor on a Memo. for Orders on certain papers.

With reference to the proposal of the Committee recommended in Pub. Dept. Order No. 927 of 8th July, the Chief Engineer has the honour to observe that from a paper by the District Engineer Presidency which he is about to circulate with observations, it appears that the water of the Cooum is now at mean Sea Level, as calculated by Colonel De Havilland — And that the Bar, if cut at all should be cut, and kept open, to Low Tide Level to make this palliative expedient at all effective. This will add to the expense of the first cutting, and to that of the maintenance of the work — After all, it will be only surface water, that will be changed; there will be no deep scour sweeping all impurities into the Sea — And it has to be considered whether the simple admission of sea water, and possible emission of some impure foul water, during the next 3 months be-

-fore the Monsoon is worth the £ 2000 estimated by the Committee, is one which the Chief Engineer feels disposed to doubt.

[illegible]
Chief Engr

[illegible]

Public Works Dept.

Letter from Mr. Woolley to Secy. to Govt. Rev: Dept. of 27th March
Do P.W. Dept. of 28th March

From Civil Engineer Presidency
Letter No. 1330 of 10th June
Endorsement No. 1354 of 12th June

For Orders.

In Mr. Woolley's 1st letter he proposes (1) To undertake the maintenance of the Northern and Southern Canals, for 5 years, for a monthly sum equivalent to 1/12th of the average Annual Expenditure of the last 5 years. To

I agree with the Memo: that we should deal only with Mr. Woolley's first offer, as described by General Walker.
I would sanction the survey of the portion of the town indicated —
It might be well to let Mr. Clark know that the new Municipal Bill

(2) To open the Ennore and any other Bars and keep clear all side channels connecting the Canals with the Salt Pans, on the same terms and for the same period.

Mr. Woolley proposes to use Dredges worked either by Steam Power or Manual labor

It is suggested that Mr. Woolley's offer be accepted if made in more precise terms, such as engaging to maintain a channel with bottom width of not less than 30 feet, and depth of 3 feet at Lowest Tide Level, throughout. Monthly payments to commence from date of his having such number of Dredges as he may consider necessary, ready to start work on each Canal. The Collector of Chingleput meanwhile to submit statements of actual outlay for each of the last 5 years on maintenance of the Canals, and of the branches to Salt Pans and of any outlay that may have been incurred in each year in opening the Ennore & other Bars.

In his 2nd letter Mr. Woolley offers to clear out those portions of

will become Law about November and that under the new Act, one of the first subjects to be taken up will be the Drainage scheme. In his own interests he will probably wish to be at Madras. But it is not certain that the Municipality will accept Mr. Clark's scheme and it is doubtful whether the Govt can make them. All that the Govt can do is to insist that they take the Drainage of the City in hand on some scheme which is feasible & reasonably rapid. WH. 11/7

I agree with Mr. Ellis as to Woolley's offer. Let him make a formal offer specifying depth & width — & including towing path of Canal & I sh'd be disposed to accept it at once

---

Govt. have no power I think to decide upon the particular drainage scheme of the Northern Canal and Cooum River lying between the Basin Bridge on the former and the Harris Bridge on the latter, and the Napier Bridge at the Cooum Bar, for Rs 5,000 per mile. The sand dredged from the Canal and Cooum River above the Island being removed to the low lying land North of the Napier Foundry. That dredged from the Cooum Round the Island to be buried in the Island or conveyed 3 or 4 miles North or North West of Madras.

The

The District Engineer Presidency solicits sanction for a Survey Establishment for 6 months, at a cost of Rs 786, to prepare Plans and Sections of the Cooum below the Harris Bridge on a large scale, with a view to the training and conservancy of the River being systematically undertaken, and in connection with some permanent work to keep open the Cooum Bar and utilize tide water for scouring of the River.

His endorsement submits a request from the President of the Municipal Commission that Mr. Clarke's proposal for permanently opening the Cooum Bar recorded with G. O. No: 208 of 25th February 1875, be at once carried out.

It is submitted that Mr. Mosley's proposal is too indefinite & costly to be entertained. But that the proposal to survey the Cooum be acceded to, and a grant of Rs 786 made from Provincial Funds.

With reference to Mr. Clarke's proposal it

Min. No. 579 of 6th March

The proposal is a large one but there is no doubt that the filth now accumulated in the Cooum must be removed — Why not obtain tenders for removal by dredges of this matter? at a price per yard of stuff removed. measured at the place of deposit — or for cleaning a specific portion to a specified depth

I see no necessity for the proposed survey — the maps are sufficient for all practical purposes —

is thought that the carrying out of the proposed Drainage Works, which will intercept all sewage and prevent its flowing into the Cooum, will entirely obviate all occasion for interfering with the natural state of the Cooum Bar, beyond assisting it as now to open in high floods, and so save unnecessary outlay with a doubtful result. His proposal to take up one span of the Napier Bridge with a stone groyne seems to involve danger with reference to the information regarding possible maximum discharge of flood water shewn in the papers recorded with G.O. No. 619 of 1st March 1865 and 647 of 8th March 1865

It would apparently be more to the purpose to get Mr. Clark out by October as that would be best to start his Drainage Works.

Major Genl. R.E.

Secretary to Govt. D.P.W.

If the groin be not higher than ~~H.W.L.~~ — this danger does not appear to arise — but it would probably be necessary with the higher one to provide sluices to keep water up in Cooum until low tide so as to allow it to rush out with force —

I see little use in this as regards the Cooum. 6 years hence the drainage may prevent further pollution. but the accumulation will then be greater than it is now — unless some steps are immediately taken it is very probable that Gov. House will remain unoccupied — there is a gigantic evil to be promptly dealt with and I think the Engineers of the Govt. shd. report distinctly what should be done to remove it

---

P. W. Dept

Proceedings of the Madras Govt.

Under date the

Read the following:-

From Mr. R. Woolley (Actg. Secy to Govt. Rev. Dept)	H.E. dated 27th March 1876)
" Mr. R. Woolley	" — " 28 — do)
" District Engr. Presidency	" No 1338 of 10th June 1876)
" Do. Do.	" No 1359 of 12th — do)
Report of the Committee, appointed in Pub. Dept. G.O. No. 727 dated 6th July 1876	— July 1876.
From the District Engineer, Presidency	" No 1921 of 13th July 1876)

In his letter of the 27th March 1876 Mr. Woolley proposes (1) to undertake the maintenance of the Northern and Southern Canals for 5 years for a monthly sum equivalent to 1/12th of the average annual expenditure of the last 5 years -

(2) To open the Ennore and any other Bars and keep clear all side channels connecting the Canals with the Salt Pans on the same terms and for the same period.

Mr. Woolley proposes to use dredges worked either by steam power or manual labor.

His Grace the Governor in Council is disposed to entertain favorably the proposals submitted; but before according final sanction, desires to receive a formal offer in more precise terms, specifying the depth and width (upper [illegible] 6 ft [illegible] 30 ft bottom) to be maintained [illegible] spring Tide level throughout, and including provision for towing paths.

The Collector of Chingleput will meanwhile submit a statement of actual outlay for each of the last five years on maintenance of the Canals, and of the branches to the Salt Pans, as well as of any outlay that may have been incurred in each year in opening the Ennore and other Bars.

The proposals made in Mr. Woolley's letter of the 28th March for the conservancy of the Northern Canal South of the Basin Bridge and of portions of the Cooum River cannot at present be entertained.

In his letter of the 10th June No. 1338, the

District Engineer, Presidency, solicits sanction for a Survey Establishment to prepare plans and sections, on a large scale, of the Cooum below Harris' bridge, with a view to the training and Conservancy of the river in connection with some permanent work to keep open the Bar and utilize tide water for scouring the river. And with his endorsement No. 1359, dated 12th June, Major Montgomerie submits a request from the President of the Madras Municipal Commission that Mr. Clark's proposal for permanently opening the Cooum Bar recorded with G.O. No. 208, dated 25th February 1875, be

at once carried out. His Grace in Council is not disposed to entertain either of these proposals. He however resolves to order the immediate execution of the measures recommended by the Committee appointed in G.O. No. 727, dated 6th July 1876, (Public Department) for ameliorating the condition of the river. The Cooum Bar will accordingly be cut down to Low Water Level to a width of one hundred feet; the cutting being kept open to the depth named until heavy rain falls, and the river assumes its monsoon condition. The approximate estimate of the cost of the cutting is given at Rs 500 and that of keeping it open at Rs. 15 per diem. The filling in of the pond near the Marine Villa recommended by the Committee should also be carried out. In addition to these measures, settling tanks should be constructed above the mouths of the Mount Road and Chintadrapettah Sewers near Government House bridge, to trap [illegible]wer contents and intercept them before they reach the Cooum. The settling tanks should be emptied daily and their contents removed by the Municipality.

Chief Engr's Memo No 791, dated 1st December 1875

It is satisfactory to observe that the instructions given to the District Engineer, Presidency, to maintain the level of the Cooum as high as possible by means of one of the dams at the General Hospital Bridge have been so far successful. The dam will continue to be maintained at a height of 20.5 feet above the zero assumed for these calculations, which is 20 feet below Mean Sea level. The results of the measures ordered to be adopted in G.O. No. 43, dated 7th January 1876, for the Conservancy of the Cooum banks and the mouths of the Triplicane and Mylapore Creeks have, it is observed with satisfaction, been successful, and have been carried out at a moderate cost.

The proposed+ increase to the Conservancy Establishment to admit of the continuance of operations till the setting in of the next monsoon is sanctioned.

+ Para 4 of the D.E.Engr's letter No 1921 dated 13th July 1876.

The District Engineer, Presidency, will in due course submit formal estimates for the outlay authorized in these Proceedings when specific grants of money will be made.

D.E. Presidency
Mr R. Woolley
Rev. Dept.
Public Dept.
Ex P.W.A.

No 1992

Public Works Department.

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the 3 Aug/76

Read the following:—

From Mr R. Woolley to the Secy to Govt Rev Dept } (Ro. dated 27th March 1876)
Mr R. Woolley — " — " 28th — do —
District Engr Presidency — " No 1338 d/ 10th June 1876
Do — Do — " No 1359 d/ 12 — do —
Report of the Committee appointed in Public Dept G.O. No 727 d/ 16th July 1876. } — " — July 1876.
From the District Engineer Presidency } — " No 1921 d/ 13th July 1876.
Chief Engineer Memo: — No — d/ 20th do

In his letter of the 27th March 1876 Mr R. Woolley proposes (1) to undertake the maintenance of the Northern and Southern Canals for 5 years for a monthly sum equivalent to 1/12th of the average annual expenditure of the last 5 years

(2) To open the Ennore: and any other Bars and keep clear all side Channels connecting the Canals with the Salt Pans on the same terms and for the same period.

Mr Woolley proposes to use dredges worked either by steam power or manual labor.

His Grace the Governor in Council is disposed to entertain favorably the proposals submitted which he understands as covering the maintenance of the Canals to a minimum depth of 3 feet at the lowest tide level and of a width of 30 feet at the bottom, and of the towing paths in proper condition for use.

The Chief Engineer will prepare in communication with the Government Solicitor a form of Contract for approval.

The Collector of Chingleput will be requested to submit a statement of actual outlay for each of the last five years on maintenance of the Canals, and of the branches to the Salt Pans, as well as of any outlay that may have been incurred in each year in opening the Ennore and other Bars.

The proposals made in Mr Woolley's letter of the 28th March for the Conservancy of the Northern Canal near the Marine Villa with the sand from the bar as recommended by the Committee will also be carried out. In addition to these measures settling tanks are also to be constructed above the mouths of the Mount Road and Chintadrepettah sewers near Government House bridge, to trap sewer contents and intercept them before they reach the Cooum. The settling tanks should be emptied daily and their contents removed by the Municipality.

It is satisfactory to observe that the instructions given× to District Engineer, Presidency to maintain the level of the Cooum as high as possible by means of one of the dams at the General Hospital Bridge have been so far successful. The dam will continue to be maintained at a height of 20.5 feet above the zero assumed for these calculations, which is 20 feet below mean sea level. The results of the measures ordered to be adopted in G. O. No. 43 dated 7th January 1876 for the Conservancy of the Cooum banks and the mouths of the Triplicane and Mylapore Creeks have, it is observed with+ satisfaction, been successful, and have been carried out at a moderate cost.

The proposed increase

× Chief Engineer's Memo. No. 791 dated 1st Decr 1875

+ Para 4 of the District Engineer's letter No. 1721 dated 13th July 1876.

to the Conservancy Establishment to admit of the continuance of the operations and of the complete cleansing of the banks from all offensive deposit or accumulations till the setting in of the next monsoon is sanctioned.

The District Engineer, Presidency, will in due course submit formal estimates for the outlay authorized in these Proceedings when specific grants of money will be made.

Ins to D.E. Presy 3/8/76

Dist. Engr. Presidency
Mr. Woolley
Rev Department
Marine Department
Ex. of P.W. Accounts

Despd 26/8/76

to the Conservancy Establish=
=ment to admit of the con=
=tinuance of the operations
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=ing of the banks from
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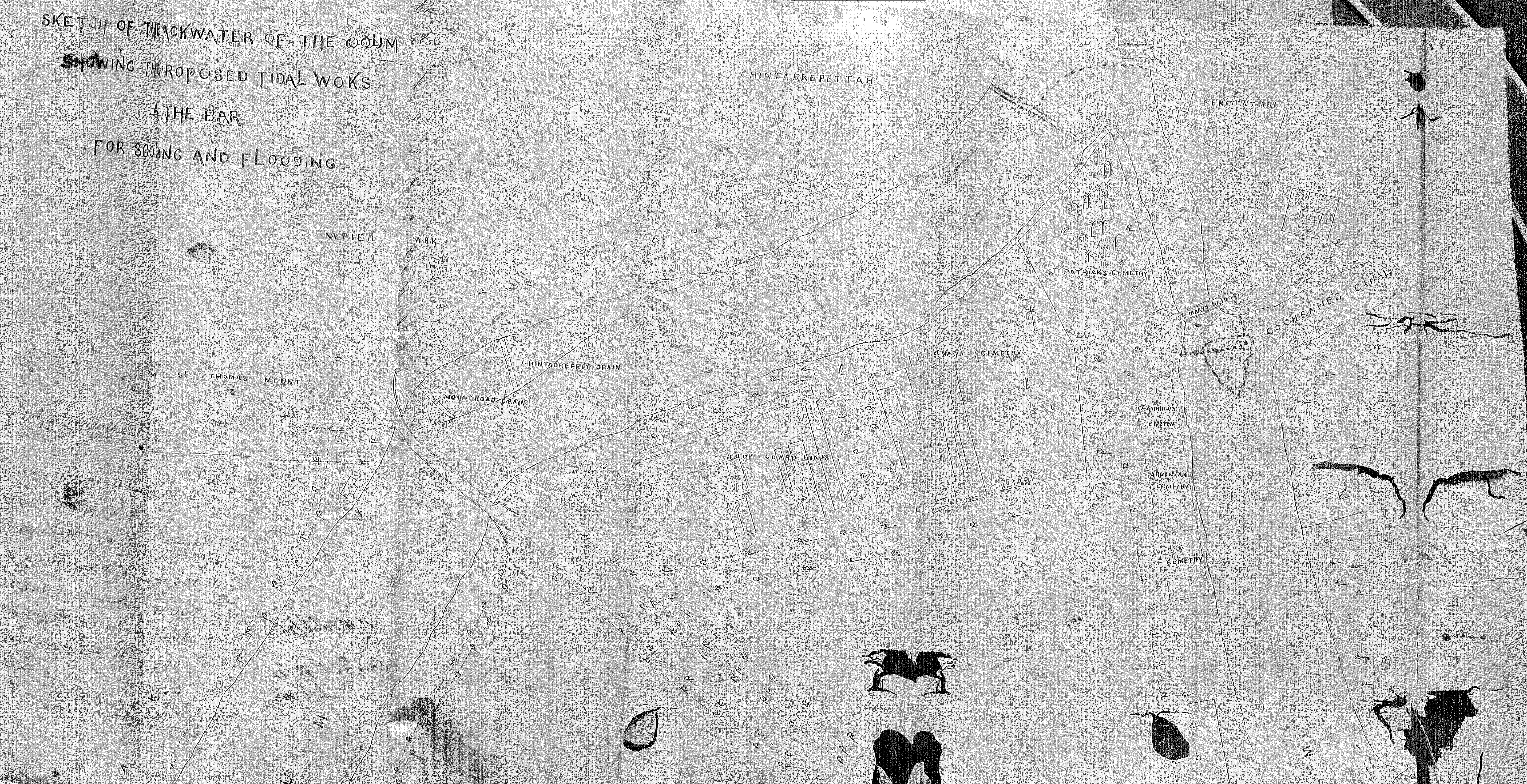
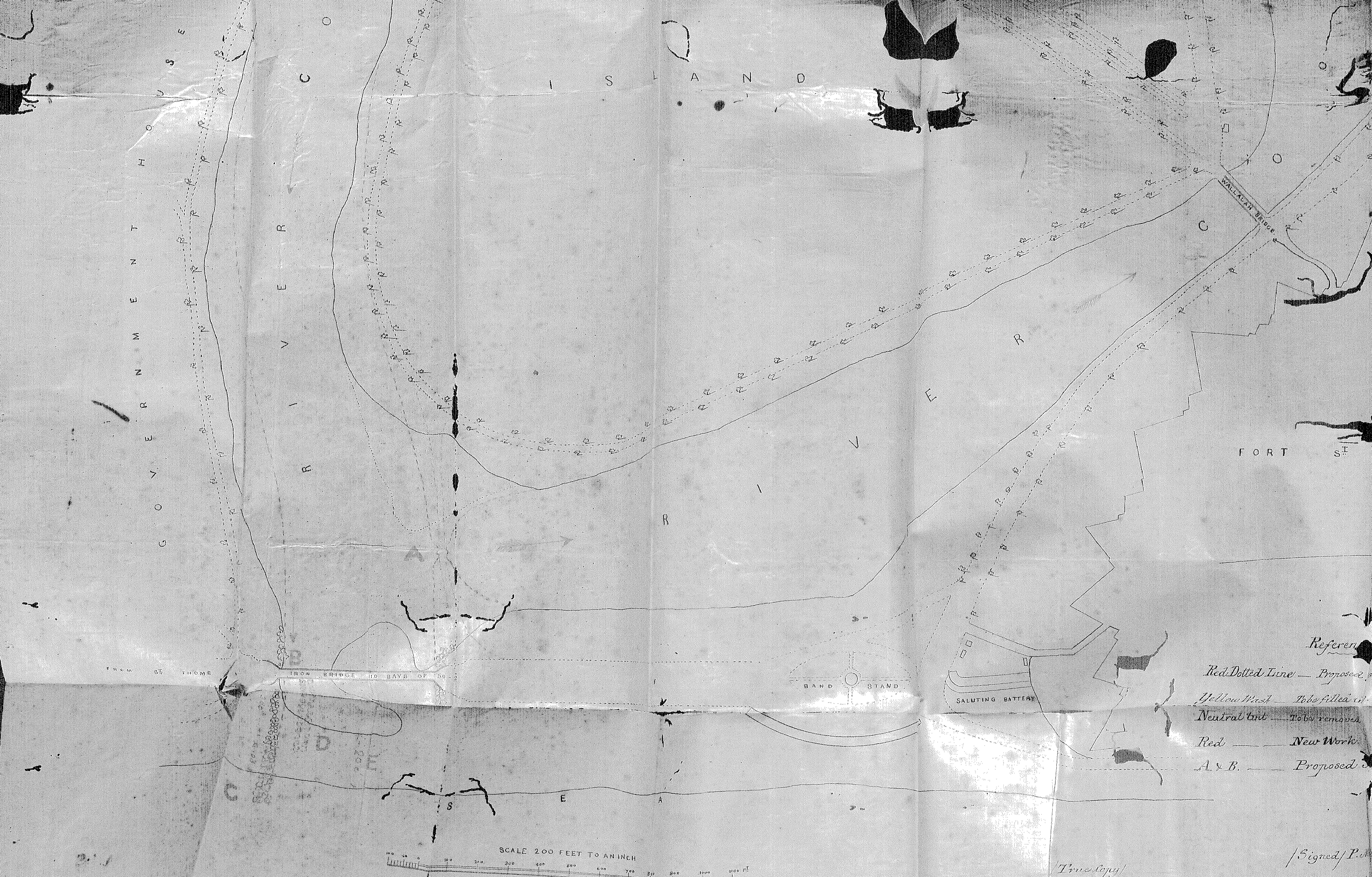


SKETCH OF THEACKWATER OF THE OOUM
SHOWING THEROPOSED TIDAL WOKS
ATHE BAR
FOR SCOUING AND FLOODING

CHINTADREPETTAH
PENITENTIARY
ST PATRICKS CEMETRY
ST MARYS BRIDGE
COCHRANE'S CANAL
ST MARY'S CEMETRY
ST ANDREWS' CEMETRY
ARMENIAN CEMETRY
R.C. CEMETRY
BODY GUARD LINES
NPIER
ARK
CHINTADREPETT DRAIN
MOUNT ROAD DRAIN.
M ST THOMAS' MOUNT
A
U
M
M

Approximate Cost

ouring Yards of training walls	
luding Boxing in	
ouring Projections at	Rupees 40,000.
ouring Sluices at B	20,000.
uices at A	15,000.
ducing Groin C	5000.
truding Groin D	8000.
orks	2000.
Total Rupees	,000.


GOVERNMENT HOUSE
RIVER COOUM
ISLAND
RIVER
COOUM
FORT St
WALLAJAH BRIDGE
FROM St THOME
IRON BRIDGE 10 BAYS OF 50
BAND STAND
SALUTING BATTERY
SEA
A
B
C
D
E
SCALE 200 FEET TO AN INCH
100 50 0 100 200 300 400 500 600 700 800 900 1000 1100 Ft

Referen

Red Dotted Line — Proposed

Yellow Wash — To be filled

Neutral tint — To be removed

Red — New Work

A & B. — Proposed

/Signed/ P.

Offic

13

/True Copy/

Major R. E.

District Engineer Presidency.

Fort Saint George
July 1877.

C.W. 3066/76

Pros 3d Augt/76

£ 2 808.—

2287

270 4233 5006

R. A. E.

1692

No. 88 - 89

Proceedings of the

Council 7th 7

Pursuing orders in the

of Set the measures

be taken for effecting

— for the proposals

Mr. Volley for maintaining

order the bottom

the Canaro -