

Marine (1896) Department.

G.O., No. 814 Marine

DATED 24th November 1896.

[Despatch Abstract.]

Condition of the Coombe

G. O. N^o 957 D of 16-11-96 reg: the scheme for improving the — Coombe: to the Chairman Harbour Trust Board, with reference to the preparation of an estimate for that portion of the scheme relating to the proposed boat basin.

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The Chairman H. B.

(1896) Marine Department Current No 1290

IRRIGATION.

Government {1896} of Madras.
PUBLIC WORKS.

Recd. 23rd Nov 96
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Enclosures —

Spare copies

G.O., No. 957 I., 16th November 1896.

NOVEMBER.

Condition of the Cooum

Stating that the scheme for improving the — ordered to be worked out in G.O., No. 415 I., dated 13th May 1896, seems to show faint hope of success, and directing that estimates be prepared as soon as possible for the scheme now proposed by Lieutenant-Colonel Smart, as modified by the Chief Engineer for Irrigation, and that the Harbour Trust Board be addressed with reference to the preparation of an estimate for that portion of the scheme relating to the proposed boat basin.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

G.O., No. 415 I., dated 13th May 1896.

From Lieutenant-Colonel A. W. SMART, R.E., Superintending Engineer on Special Duty, to the Chief Engineer, Public Works Department, dated Tanjore, 21st September 1896; No. 603.

I have the honour to submit a scheme in outline for a Madras harbour canal and purification of the river Cooum and Buckingham canal with map, and to request that you will place it before Government.

2. I should like to submit the scheme complete with plans and estimates, and if Government will permit Mr. Ashpitel (who has expressed to me his willingness to aid) to assist me, and give us an establishment of one Sub-overseer at Rs. 70 and one Draftsman at Rs. 50 for four months, I will do so. This is for the essential part of the scheme as detailed in the note; for the subsidiary works the establishment would probably have to be kept on for an extra six months.

ENCLOSURE.

Scheme for Madras harbour canal and purification of Cooum and Buckingham canal.

The canal to be taken off from the south side of the harbour and to follow the line shown on the plan. It should leave the harbour at the 4½ or 5 fathom contour and be excavated to 27 feet depth for a distance of 1,200 feet between concrete block walls to give room for berthing four steamers. From the end of this, the canal proper would be taken to the Cooum, 10 or 12 feet deep at low water, with a bottom width of 40 feet, and between block walls where necessary.

2. The boat basin, 10 or 12 feet deep at low water, custom-house, &c., to be to the south of the canal entrance as shown on the plan. (In the first instance the opening into the canal may be through the boat basin, if extra room for steamers is, at present, not found necessary).

3. The north branch of the Cooum from the fort bridge to the site of the proposed lock and inlet, to be dredged to 10 or 12 feet depth at low water by means of pump dredgers, and the material pumped into the north branch of the Cooum to the south of the fort bridge. This part of the Cooum to its joining with the south branch of the Cooum to be reclaimed.

4. Construction of a lock and inlet at the west end of north Cooum. These works are required—

(a) to allow of a free flow in and out of tide into the harbour, Cooum and canal, and to pass boats in and out;

(b) to exclude upland fresh water floods from the excavated north Cooum and harbour, and to allow such floods to be forced down the south branch of Cooum into the sea;

(c) as long as sewage is admitted into the Cooum and canal, as at present, the lock and inlet will allow of the tidal water being prevented from running back into the harbour. Till the intercepting sewers have been constructed, and the sooner these are put in hand the better, the tidal water received from the harbour to be run out at the Napier Bridge by cutting the bar twice a month by cooly labour. Eventually, when sewage has been cut off from the Cooum and canal, a tidal flow back into the harbour at ebb tide, will do no damage to the harbour and the deep water canal will act as a long filter.

5. The deepening of the canal within Madras limits to a minimum of 3 feet at low water, so that within these limits there may be a free flow of tide in and out. In this respect, the improvement of the tidal flow from Ennore is of great importance. Another lock and inlet may be found necessary just north of Madras in the canal itself, if it is hereafter determined that there should be a still water canal between Ennore and Madras, with level of water held up, as long as possible, to high tide level.

Subsidiary works which may be spread over a series of years.

1. Deepening of the south branch of the Cooum to 6 feet at low water from Harris' bridge to the Napier bridge. There will be, of course, redeposition of silt during fresh water floods, but not to a greater depth than 1 foot in five years. This must be dealt with by redredging with pump dredgers once in ten years or so.

2. Deepening of the Buckingham canal to 6 feet at low water. The banks would have to be pitched throughout.

3. Fitting Harris' bridge with shutters and pumping sea water, so as to form a stretch of sea water in the river above. This water to be also used for flushing sewers and watering roads.

4. Construction of quay walls along the Cooum, which will confine the floods to the width of bed really required and greatly improve the appearance of the town.

Advantages of the Scheme.

1. Removal of all disadvantages of the proposed northern canal.

2. The construction of boat basin, custom-house, &c., on the south foreshore instead of within the harbour as originally proposed. The back lash from walls built within the harbour would still further contract the area and make it necessary to berth ships still further out.

3. The proposed canal can be eventually enlarged and docks for steamers constructed along the whole line, if found necessary down into the Cooum itself.

4. The deepening proposed will altogether prevent the growth of vegetation which is at present so noxious.

5. When sewage has been excluded, the tidal flow into the harbour at the ebb will do away with the necessity of attempting to keep the bar at the Napier Bridge open. The scheme makes absolutely certain what is otherwise only problematical or experimental.

6. The reclamation of part of the north branch of the Cooum and the confining of all flood waters to the south branch only.

7. The use of pump dredgers will allow of work being done at a much less cost than is otherwise possible. The cost of removing sand by cooly labour in the canal to 3 feet depth at low tide is 4 annas; the cost by the dredgers to 12 feet depth will not be greater than 2 annas a cubic yard, exclusive of the cost of the dredgers. In any case such dredgers will be required for use in the harbour itself.

No. 3515 C.

For disposal, with reference to G.O., No. 415 I., dated 13th May 1896.

(Signed) D. McNEIL CAMPBELL, Colonel, R.E.,
5th Oct. 1896. Secretary to Government.

No. 199 I.

Note by the Chief Engineer for Irrigation.

The present state of affairs in regard to schemes for improving the sanitary condition of the Cooum and connecting the Buckingham canal with the harbour is as follows :—

First.—It is understood that the scheme for the drainage of the town has not been definitely decided on as yet and that very urgent portion of it which provides for intercepting the sewage now passed into the Cooum has not been commenced.

Second.—The project of a canal to connect the north-west of the Harbour with the Buckingham Canal basin sanctioned in G.O., No. 1084 I./A., dated 14th December 1895, has been laid aside for financial and other reasons.

Third.—The inlet at Ennore sanctioned in G.O., No. 656 I., dated 10 August 1896, is being built.

2. The only effect to be anticipated from the Ennore inlet is, that when the Coom runs low from any cause, it can be filled up twice a month to a level half to one foot (or probably somewhat higher) above mean sea level, according to the height to which spring tides rise in the Ennore backwater; but this can only occur when the Ennore bar is open. Whether it can be kept open all the year is uncertain, special efforts made to keep it so this year having failed in August. The level to which water can be raised in this way in the Coom is not sufficiently high to keep the bar open, and in fact it is found that when water is below 2½ feet above mean sea, there is little use in opening the bar as it closes again in the first high tide unless there is sufficient flow into the river from the land-side to maintain a good current. The marginally-noted reports from the Executive Engineer are instructive as showing how little is to be expected from the operation of works at Ennore during the dry season even under very favourable circumstances. The flow at best is small and must cease altogether long before the Coom reaches a level at which a flow from it to the sea can be maintained. Temporary arrangements were made this year to pass water down from Ennore, but have had little effect in improving the state of the river.

No. 320C, dated 31st March 1896, to the Chief Engineer for Irrigation.

No. 3215, dated 31st March 1896, to the Superintending Engineer.

3. Two things are necessary,—first, the exclusion of sewage from the river, and second, a canal from the Harbour. Even without the former the latter would be of enormous advantage in keeping up a circulation in the river and in aiding the access of traffic to the harbour. For this reason I cordially advocate that an estimate should be made for such a canal on the alignment roughly indicated by Colonel Smart. It may not be quite as good a line as the Northern canal, in some respects at least, but there are others in which it has an advantage. It would certainly cost far less in such heavy items as compensation, excavation and bridging, and the spoil could moreover be used for filling the Fort ditch and also the northern arm of the Coom if drains have, by that time, been provided to intercept the sewage now discharged into that part of the river.

4. To make any scheme eligible, the following points are essential: (1) it must be adapted to keep up a circulation in the river; (2) it must afford an easy route for traffic between the canal and harbour, in order to stimulate the export trade in salt and other articles; (3) it must not be too costly. I believe the canal now proposed would satisfy all these conditions.

5. The first point involves the consideration whether a flow can be maintained at all seasons from the Coom to the sea at or near Napier Bridge. This has been a good deal discussed, with the result that, while most of the Engineers who have recorded an opinion believe that, one way or other, the flow can be maintained, there has not been any general agreement as to the means of securing it. The estimate for the Northern canal contains a provision of about 1¼ lakhs for a bridge, with regulating shutters in lieu of Napier Bridge. I hesitate to express an opinion opposed to that of Colonel Pennycuik, who had so many opportunities of observation and enquiry, but I feel bound to say that I can see no reason for expecting this work to have the effect intended. A harbour canal would enable the Coom to be raised daily to a level 1 to 2 feet above mean sea, but the Executive Engineer reports that even when the river is at the higher level it has not hitherto been found possible to get more than a mere trickle through the bar. It would appear, therefore, that if the regulator be built, there would still be required some powerful machine for clearing a passage through the bar and keeping it open. Mr. Cousins' proposal to pass water to the sea by a culvert of 132 square feet area as far as the sea margin and six 3-foot pipes

extending to deep water, has been very adversely criticised (*vide* pages 38 and 39 of papers printed with G.O., No. 1651 M., dated 7th November 1894), on the ground that the pipes and their supports would arrest the littoral drift of sand and finally get covered up. The criticism is based on the assumption that the conditions surrounding this work would be the same as those of the works cited as examples by Mr. Jones. There is, however, the very important difference that the work proposed by Mr. Cousins would be alongside the mouth of the river, and the annual floods would probably scour away any accumulation near the mouth of the pipes. The work designed by Mr. Cousins, if it could be kept efficient, would give as much circulation as would be required, if sewage were excluded (*vide* calculations on page 40 of papers as would be required, if sewage were excluded (*vide* calculations on page 40 of papers printed with G.O., No. 1651 M., dated 7th November 1894)). It is in fact not altogether to be desired that the river should be lowered more than half a foot below mean sea, as when this takes place, not only an offensive mud banks uncovered, but navigation is stopped; and if this occurred frequently it would be necessary to deepen the canals and river between Adyar and Ennore as provided in the Northern canal estimate. It would be safest to give Mr. Cousins' plan an experimental trial which could be done without much loss in case of failure as the land part of the work might at first be made an open channel lined with concrete blocks or stone with two pipes under the road and the same number extending into the sea. In case of failure all the materials, except perhaps the piles could be used for other works.

6. The scheme which it is now proposed to estimate for consists of the following works with, perhaps, some small subsidiary works:—

- (1) Boat basin, which presumably would be built from Harbour funds—The site suggested is the foreshore at the south-west corner of the Harbour.
- (2) Canal 60 to 100 feet bed width as may be decided, and level 5½ feet below mean sea, from the boat basin to the Coom near the General Hospital with a lock at junction with Coom and bridges at important road crossings.
- (3) Inlet to the sea near Napier Bridge.

7. With regard to Colonel Smart's proposals it is outside the duty of this department to estimate for docks for shipping. If the boat basin is also to be a harbour charge, the Board would probably prefer to have the designs prepared in accordance with their own views, and before this department does anything in the matter, the Board will have to be consulted. The proposal to make the canal 10 or 12 feet deep at low water is not supported by reasons sufficiently good to justify the great expense the work would involve, and the deepening of part of the Coom to the same level and pouring the excavated material into another part of the river would possibly be extremely detrimental to the health of the town. The subsidiary works proposed by Colonel Smart would be very expensive, and their execution would probably have to be deferred to so distant a time that it may well be considered premature to estimate for them now. If the views expressed in this note are approved, there will be no need to employ a special officer on the investigation of the scheme. The estimate can be prepared by the ordinary establishment with, perhaps, some assistance.

(Signed) W. HUGHES,
MADRAS,
16th October 1896.
Chief Engineer for Irrigation.

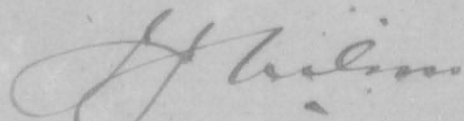
ORDER—No. 957 I., dated 16th November 1896.

The scheme for improving the condition of the Coom ordered to be worked out in detail in G.O., No. 415 I., dated 13th May 1896, seems to show faint hope of success.

2. Estimates for the scheme now proposed by Lieutenant-Colonel Smart, as modified by the Chief Engineer for Irrigation in his note read above, will be prepared as soon as possible by the Superintending Engineer, II Circle.

3. The Harbour Trust Board will be addressed in the Marine Department, with reference to the preparation of an estimate for that portion of the scheme relating to the proposed boat basin.

(True Extract.)



Under Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, II Circle.
„ Executive Engineer, Buckingham Canal Division.
„ Superintending Engineer on Special Duty, Tanjore.
„ Examiner, Public Works Accounts.
„ Revenue Department.
„ Marine Department. ✓