

Report on the
Backbay Reclamation Scheme

1926

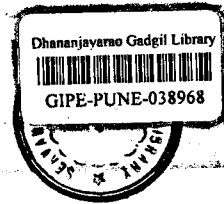
(Chairman, Alexander Gibb.)

BOMBAY DEVELOPMENT DIRECTORATE

REPORT

ON THE

BACK BAY RECLAMATION SCHEME



FEBRUARY, 1926

BOMBAY
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To

**The Director of Development,
Bombay**

Sir,

BACK BAY RECLAMATION SCHEME.

In accordance with the instructions contained in your letter dated the 11th January 1926, I have the honour to submit for your consideration my report on the Back Bay Reclamation Scheme.

2. The terms of reference contained in your instructions were :—

“To consider and report upon the present situation of the work in connection with the Back Bay Reclamation Scheme, and, where possible, to submit for the consideration of Government any suggestions for its more efficient, expeditious and economical completion.”

3. The report being desired by the middle of February 1926, I have given the subject the fullest possible consideration within the limited time at my disposal. Such documents, drawings and figures as are pertinent to the matters under consideration have been placed at my disposal; I have visited the sites of the works and quarries, have inspected the Dredgers at work and have interviewed and cross-examined those in charge of the various sections of the works and machinery. I have also seen the Chief Accountant of the Development Directorate and have generally examined the methods by which the accounts are kept and the money is paid.

4. I have read the documents and reports dealing with the past history of the Scheme and have examined the drawings and estimates for the work, past, present and future. It has not been possible on account of the restricted time available to check the quantities or to verify the prices supplied by the Engineers in detail and I have therefore assumed these as being generally correct for the purposes of my report. Where it has been possible I have compared them with prices for work in similar situations with satisfactory results.

5. The position which presents itself today is as follows :—The Consulting Engineer's original estimate for the Scheme in September 1919 was 367.61 lakhs of rupees. Work in the field was started in January 1921. Towards the end of the same year the late Chief Engineer revised this estimate and increased it to 702.43 lakhs of rupees: neither of these amounts include interest. On the same basis the present Chief Engineer now estimates that, with the present programme, about 1,100 lakhs of rupees may be taken as the approximate sum for completing the whole scheme as originally designed, exclusive of interest. The accounts show that up to the end of December 1925, 550.74 lakhs of Rupees have been spent leaving about 650 lakhs of Rupees still to be expended on engineering works alone but exclusive of interest.

6. The matter of most vital importance is that of deciding how far the work should be carried on to bring into effect the best economical and commercial situation and after due consideration, I am faced with the following conclusions :—

(a) That in deciding how far the work should be carried on to arrive at the best economical and commercial situation, future expenditure only can be considered. The money expended up to the present time does not and cannot enter into the calculations.

(b) That provided the land reclaimed on the whole or any part of the area be let within an economical time, at a price exceeding the actual cost from now onwards with interest, the Government must be placed in a better financial position by completing the whole or part of such area than they will be in if the work is not proceeded with.

(c) That the results of the dredging up to the present are most unsatisfactory and although they may at times show some improvement, I am of opinion that, even though the restrictions by the Indian Marine and the Bombay Port Trust Authorities were removed, they are not ever likely to be economical. That the reason for this is the unsuitability of the dredging plant for dealing with the material as it exists both in the Harbour and in Back Bay. Although I am informed that the borings have been found substantially correct in so far as hard and soft materials are concerned, the nature of these materials is, in the main, either too hard to obtain an economical output for the dredger or too soft to provide *satisfactory filling* for the purpose of reclamation. Added to this a very large portion of the material is situated at too great a distance from the site of the Reclamation to be pumped economically with the dredging plant as specified and delivered.

(d) That there is however soft clay available in the harbour within working distance of the Reclamation Block No. 8, which could be pumped with the assistance of the floating shore dredging plant in sufficient quantities to complete this area. That this material, though I could not recommend it generally for the reclamation of land which it is intended to build over, would nevertheless be suitable for Block No. 8 which I understand is to be utilised for parade purposes and into which a substantial depth of hard clay has already been pumped. The dredging plant will probably sell for a better value if the dredger has proved herself by dredging in Bombay more approximately to the quantity of material for which she was designed.

(e) That all reasonable care and skill has been exercised by those in charge of the work to secure the best results out of the dredging plant and in addition that the working costs of the dredging plant per annum are less than the original estimates provided for. The abnormally high cost of the dredged filling has been entirely due to deficiency in output.

(f) That the present cost of the filling with moorum compares favourably with the dredging cost up to date. That if the quantity of moorum now being brought on to the work is increased it is reasonable to expect that the cost per unit may be reduced, as more favourable Railway rates should be obtainable. That the moorum filling is better suited for the present reclamation purposes in every respect than the dredged filling and the use of it will save considerable money when the development of the land takes place. That, unlike dredging, the rate of reclamation by moorum filling can be increased, diminished or suspended if and when necessary without substantial extra cost and as much or as little of it can be deposited as is desired at a time. From investigations I am satisfied that sufficient moorum can be economically obtained for any purposes of the reclamation.

(g) That apart from the dredging the works comprised in the reclamation have been designed efficiently and carried on economically and in some cases the costs have been less than the estimates. The standard of work and the rate of progress both compare favourably with those of similar works in other parts of the world. I further consider that the scale of establishment charges is a reasonable one for works of this nature.

(h) With regard to the sea wall I have not had an opportunity of witnessing the effect of a monsoon sea at the site but my experience would lead me to the conclusion that the design is sufficient for what may be expected when the reclamation is completed with the protection afforded by the configuration of the Bay and the position of the reefs. It is advisable to call attention to the fact that, until such time as the reclamation is eventually completed, there will always be a possibility of the sea wall being damaged

and requiring a certain amount of repairs after heavy monsoon seas. This could be minimised by the tipping of sufficient filling behind the wall after the maximum of silting referred to hereafter has taken place. The bank thus formed might be utilised for a marine drive and there are possibilities in this connection.

7. Having given due consideration to these conclusions, I have the honour recommend the following for your consideration :—

(a) That the dredging operations in Back Bay shall be stopped after the close of the present dredging season and the plant in use there disposed of on the most favourable terms. I estimate an approximate value of the plant at 9·50 lakhs of Rupees though the prices will entirely depend on obtaining a market, and this is an uncertain factor.

(b) That as soon as the intermediate floating pumping station is repaired, which I understand will be in about a fortnight's time, the Sir George Lloyd Dredger should be moved to a point S. E. of its present position and should pump soft clay into Block No. 8. A small retaining bank of moorum should be deposited round this area of a sufficient height to allow the material to be pumped to the specified level with the necessary allowance for shrinkage. Accurate quantities required for this area are not at present available, but I am satisfied that the work can be completed by not later than the end of the next dredging season, i.e., April 1927. The cost of completing this Block with the addition of the surfacing at present rates will amount approximately to 27·50 lakhs of Rupees. There is a possibility that this figure may be improved upon.

(c) That on the completion of Block No. 8 by pumping, the Dredger in the Harbour should be stopped forthwith and the remainder of the dredging plant should be disposed of at the best possible terms. On the same lines as before I estimate the approximate value of the plant at 14·50 lakhs of Rupees.

(d) That provided moorum filling can be obtained at a reasonable price, Block Nos. 1 and 2 should be reclaimed by means of this material and completed by a date which would be most likely to give an advantageous sale. At present rates this would cost approximately 45·50 lakhs of Rupees, but again I anticipate there should be a reduction in this cost.

(e) That the timber gantry should be continued and completed over the site of the sea wall not at present constructed, that the rubble bank should be tipped from this gantry to about half tide level and that the inside slope of this bank together with the remainder of the bank enclosing Blocks 3, 4, 5, 6 and 7 should be made watertight with moorum backing for half its height. As the site of the reclamation within the bank silts up during the monsoons the level of the stone bank and the moorum backing should be gradually raised. I have no sample of the sand and silt laden water which obtains in the Back Bay during the monsoon and am therefore unable to predict as to the amount of accretions from silting which may be expected. From a description of the water, however, this should be considerable and I recommend that samples should be taken during the next monsoon. The estimates for the cost of this item of work including the final completion of the wall will amount approximately to 20·50 lakhs of Rupees.

(f) That, if it is considered at a later date that all or any of Blocks Nos. 3, 4, 5, 6 and 7 can be disposed of advantageously at any time, then the reclamation above the level of the sand or silt deposited should be completed as and when required with moorum dry filling. As soon as the whole area is reclaimed the sea wall should be completed. The cost of filling this area with moorum and making no allowance for silting, at the present rates, would amount approximately to 204 lakhs of Rupees, but again this sum must be taken as an approximation only. The cost of the work would be reduced by any silting which might have been deposited before the moorum filling was commenced. Owing to the levels of the reclamation

and the height of the tides, it is not probable that the silting would amount to more than 33 per cent. of the total filling, but, if this figure was attained there would be a saving of 68 lakhs of Rupees at the rates on which these estimates are framed.

(g) That in the event of the suggested or any modified programme being adopted, it is essential that a revised working scheme carefully thought out and a reliable detailed estimate of the work proposed be prepared, submitted to and approved by Government at the earliest possible moment. Further that accurate progress in money diagrams should be kept throughout the construction of the work so that it may be possible at any time to see how matters stand and whether the approved programme is being worked to as regards quantities, money and time.

(h) If it is possible to obtain experienced, efficient and substantial contractors, I advocate the general employment of these rather than departmental labour for the completion of the work. By having firm contracts the Government will be in a position to know with more certainty what their liabilities are before the work carried on in the manner advocated is commenced. In the event of adopting this procedure, however, it is essential that the contract particulars and documents should be carefully drawn up by persons experienced in the letting of contracts, otherwise the results may be disappointing.

8. In arriving at the conclusions enumerated, and submitting the recommendations given above, I have considered the best means for dealing only with the situation as it presents itself today. I have purposely avoided the past except where it is irrevocably bound up with the future.

9. As I have already stated it has not been possible in the time available for me to check the accuracy of the figures which have been given for the costs of the work. I have the greatest reluctance in putting forward figures which I have not been able to check throughout and I suggest that it would be expedient to have a concise and reliable scheme drawn up on the lines decided upon with the estimates carefully checked before definitely concluding what the costs will be.

10. The foregoing recommendations are submitted with a view to completing the work in the most efficient, expeditious and economical manner possible and the summary below may serve as a guide as to the cost of carrying them out. The figures do not include the extra amount required for the development of the reclaimed land, nor has consideration been given, when estimating the prices per square yard, to the land reserved for open spaces and roads. In addition nothing has been included in respect of interest as this amount will vary with the time at which it is decided to complete the various Blocks and also will be dependent on the dates of the sales of the land.

SUMMARY.

Completion of reclamation in Block 8 ..	27.50	Lakhs	Rupees.
Completion of reclamation in Blocks 1 & 2..	45.50	"	"
Completion of reclamation in Blocks 3 to 7 .	204.00	"	"
Completion of Sea Wall, etc. ..	20.50	"	"
Contingencies 10 per cent. ..	29.76	"	"
Establishment charges, etc., 10 per cent. ..	32.74	"	"
	<hr/>		
	360.00	"	"
Amount estimated to be realised for the Dredging Plant	24.00	"	"
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	336.00	Lakhs	Rupees.

Dividing the sum of 336 lakhs of Rupees by 1,145 acres gives a cost of 6.06 Rupees per square yard, which is the extra price which it will cost from now on to carry the scheme to completion for undeveloped land. To this amount must

be added a charge for interest and for the development of the land into building blocks. I have abstained from commenting on the value which may be obtained from the land sold or the probable rate of absorption of the land, as these are matters which you are better able to give an opinion on than I am.

11. In framing this report I have had the advantages of the experiences and collaboration of my partner Mr. Rustat Blake, who prior to joining me was a partner in the late Sir John Wolfe Barry's firm and of the Chief Engineer of our Bombay Office, Mr. Cyril G. Stileman, who was in charge of the Sewri-Mazagon Reclamation whilst he was Deputy Chief Engineer of the Bombay Port Trust and whose local knowledge has been of great service. I would also tender my thanks to you and the members of your staff for the valuable assistance you have rendered to me in so readily placing at my disposal all available documents.

I have the honour to be,

Sir,

Your most obedient servant,

ALEXANDER GIBB.

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