

*Dewatering Method.*—This method is recommended by Messrs. Hay and Rochfort, who, in May, 1926, reported to the Harbour Board on the subject of reclamation. Their recommendation has been adopted, and this method was put forward by the Harbour Board as its scheme for dealing with the Awatoto, Richmond, and eventually with the McDonald Block. It proposes to start with the Awatoto Block and, utilizing embankments that at the present time exist around a large proportion of the boundary of this block, to construct levees to a height of about 2 ft. above expected flood levels, and then to establish a pumping-station at the lowest point somewhere near the High School, and drain the block to that point, pumping the water over the eastern levee into the sea. The Board would next take the Richmond Block, complete the levees and erect the pumping-station, and then, as land is required, subdivide and road it to borough requirements. In the meantime, and to the extent to which these blocks are not subdivided, it is proposed to let them for grazing, agricultural, and small-farm purposes. The arguments in favour of this method are that, firstly, it is quicker, and secondly, that it is much cheaper, than the method of filling by suction dredging, and both of these advantages may be considered as having being proved to exist. It is, however, only fair to Messrs. Hay and Rochfort to point out that they qualify their recommendation of the dewatering method in the following words: "It is obvious that the most businesslike way to remove the flood risk from the Harbour Board endowments and the whole of the district is to carry out the comprehensive scheme of river-control for the Tutaekuri first mentioned; but if there is no hope of getting relief from the operations of the River Board, the third [*i.e.*, dewatering] method would be justifiable."

The views of the Borough Council on this aspect of the matter were put forward by its Engineer, Mr. G. F. Clapcott, who in relation to the reclamation of areas for residential purposes favours the method of raising the level of the ground by suction dredging, discharging the dredged material through pipes on to the land, and thus building it up. Furthermore, the Borough Council is strongly convinced that the portions of the Richmond Block contiguous to Napier South should be made available for residential purposes before any portion of the Awatoto Block is so treated. Mr. Clapcott prepared a plan of a proposed subdivisional scheme relating to a block that would be approached by a bridge across the Tutaekuri at the point where Kennedy Road in Napier South runs into St. George's Drive, and entering on the Richmond Block at the point marked "Thornton's Boat-shed." The arguments adduced by Mr. Clapcott and other opponents of the dewatering scheme may be summarized as follows: (1) Under the dewatering scheme the land is left at so low a level that subsoil-water will be continually present at about 1 ft. below the surface, and that it will be impossible satisfactorily to drain residential areas under these conditions. (2) The area will be dependent for all time for the efficiency of its surface-draining on the pumping-plant, and that it is just when a combination of abnormal circumstances, such as flood, storms, and high seas, make the maintenance of this pumping most essential that it is likely to be put out of action by those very same natural forces. This aspect of the matter was referred to by Mr. C. D. Kennedy, a qualified engineer with a great deal of experience of this problem in the Napier district. He is an advocate of the dewatering system. He says (see page 342, Notes of Evidence), "With regard to the dewatering scheme I agree that it is the best practicable scheme, but there is one possible drawback which must not be overlooked that would arise in heavy spring tides in easterly weather with seas piling up on the beach. There would in such circumstances be a considerable amount of seepage, and this would have to be coped with. It would mean a little extra pumping-power. The drain suggested would probably catch it and hold it, but the extra pumping-power would be necessary. It would be wise to consider that such a storm and heavy rain coming at once, there would be a combination of adverse conditions." (3) There is always the danger of the levees breaking and swamping the lands on which people have been enticed to erect their homes. (4) The levees erected to keep out flood-waters must be continually raised, as the river tends to raise its own bed by the deposit of silt (see pages 9, 19 of this report, under heading "Physical Features of District and Natural Forces arising therefrom.") There are now places in the district where this process has gone on until the bed of the river is actually some feet higher than the surrounding ground. (5) From a consideration of the foregoing reasons, and also from sentimental reasons, there will always be a prejudice by residents of the district against erecting their residences on a dewatered area. (6) In view of the existence and powers of the Hawke's Bay River Board, it is probable that in the not-distant future the waters of the Tutaekuri will be wholly diverted to the sea at a point south of the Awatoto and Richmond Blocks, and that when this is done the erection of the levees will represent a useless expenditure, and that therefore it would be better to take a more comprehensive view of the whole problem and work with the Rivers Board in procuring an early diversion of the river. Conversely, (7) areas raised by deposition of silt and spoil, being higher, are more easily and effectively drained, and are therefore healthier. (8) Cost of pumping leaves a perennial charge against the land, whereas under the other method—when the original loan is wiped out by sinking fund—the land is free of reclamation charges.

*Raising Land by Deposit of Spoil.*—This method is preferred by Mr. O. N. Campbell, whose report (Exhibit No. 42) we have already referred to. He says on the first page of that report (dated 1925), "As the total area of Harbour Board endowment lands is only 2,045 acres, the Board need not consider the question of development of these lands for any other than residential purposes. Land for this purpose must obviously be freed from all danger of serious flooding, and it is therefore preferable that it should be elevated to a point above the maximum flood level." Later on he says, "The reclamation should be carried out by suction dredging, for which the area is an ideal one. The sandy silt deposits would be excellent material for economical removal by this method."

Mr. G. F. Clapcott, the Borough Council's Engineer, strongly advocated, in relation to residential areas, the adoption of this method of raising by depositing spoil, and he gave details, which will later appear in our estimates and conclusions, of his methods and estimated cost of reclamation by this method.