

(3) If so, what should be the nature of this direct access, and where should it be located—

(a) If by a bridge, what should be the minimum navigational clearances, and what should be the provisions for traffic on the bridge and its approaches?

(b) If by a tunnel or tunnels, what should be the number of such tunnels and what provisions for traffic should be made in each?

(c) In either of cases (a) and (b) above, what will be the approximate cost of the proposed access, including the necessary approaches?

(d) If any other alternatives are investigated, what are they and what would be the approximate cost of each?

We recommend that direct access should be by means of a bridge, located as follows : north abutment on Stokes Point, Northcote ; south abutment on reclaimed land at the western end of St. Mary's Bay Boat Harbour, adjacent to Point Erin Park. Direction of axis of bridge, 207° true.

(a) *Navigational Clearances* :—

*Horizontal Clearance* : Main span, 800 ft., centre to centre of piers, allowing a net horizontal clearance (between fenders) of approximately 750 ft.

*Vertical Clearance* : At mid-point of main span, 137 ft. above the level of high-water ordinary spring tides, which for this purpose is defined as 5 ft. above mean sea-level. Over the central 500 ft. of the main 800 ft. span, clearance 132 ft. minimum.

*Provision for Traffic* :—

(i) On bridge, four-lane carriageway, 44 ft. between kerbs, plus two 6 ft. footpaths.

(ii) On south approach, four-lane carriageway, 48 ft. between kerbs, plus cycle-track and footpath, 12 ft. : total width, 60 ft. The irregular space between the formed inner edge of the roadway and the foot of the cliffs, varying in width but with a minimum of 10 ft., to be formed and metal-surfaced for parking.

(iii) On north approach, 60 ft. formation, designed for ultimate four-lane carriageway as on the south approach, but bituminous-surfaced in the first instance as for two vehicular lanes only, the other two to be provided when traffic warrants. Footpath and cycle-track to be formed during first phase of construction, and provision for convenient parking-spaces to be made as required.

(iv) Approach roadway adjacent to southern abutment to be widened to provide space for toll-collection facilities and traffic safeguards.

(v) Surface of roadway on main 800 ft. span to be on vertical curve allowing sight distance of 500 ft.

(vi) Loading to be in accordance with the Main Highways Board's "first-class standard," regard being had to the desirability of providing for heavy military vehicles. We agree, however, with the view of the 1929 Commission that the transport of exceptionally heavy loads could be better and more cheaply provided for by the use of the Harbour Board's floating crane, and that it would not be economical to construct a bridge of the length proposed to a standard that would permit very unusual and infrequent loads to be carried over it.

(vii) Lighting of bridge and approaches to be in accordance with latest modern standard.

(viii) Provision to be made also for the carrying of water-mains, gas-mains, and electric light and telephone wires, preferably under footpaths, and for overhead wires and fittings for trolley-bus operation. The cost of installation of these services has not been provided for in our estimate. Consideration should be given also to making provision for facilitating the possible future installation of electric-power cables.