

Bridge Gradients.—The former Commission set a standard of 1 in 20 on both sides of the central span for the bridge and its approaches. Having regard to the improved efficiency of modern transport, some steepening of the gradient may be considered allowable, with consequent reduction in the length and cost of the structure. This, however, would tend to slow down the heavier commercial vehicles and affect the ultimate traffic-carrying capacity of the bridge. We therefore see no reason to depart from the original gradient of 1 in 20, or 5 per cent., though we fully considered the effect of increasing it to as steep as 1 in 18·18, or 5½ per cent., which would have the effect of shortening the bridge considerably. While on the subject of grades, we cite examples of well-known Auckland streets, details of which were supplied at our request by the City Council. These indicate that gradients of the order we propose, and some very much steeper, are by no means uncommon, though generally they apply over shorter distances :—

(1) Victoria Street East, between High and Kitchener Streets :	
Gradient for a distance of 2½ chains	1 in 7·8
(2) Wyndham Street—a short length between Queen and Albert streets : Gradient for a distance of 1½ chains	1 in 8·6
(3) Parnell rise, between Augustus Terrace and Bedford Street :	
Gradient for a distance of 6 chains	1 in 8·7
(4) Victoria Street West, between Albert and Elliott Streets :	
Gradient for a distance of 3 chains	1 in 9·5
(5) Wakefield Street, for a short length between Queen Street and St. Paul's Street : Gradient for a distance of 3 chains	1 in 9·8
(6) Upper Queen Street, between Turner Street and City Road :	
Gradient for a distance of 10 chains	1 in 11·05
(7) Wellesley Street West, between Albert and Federal Streets :	
Gradient for a distance of 2 chains	1 in 11·5
(8) College Hill : General gradient	1 in 11·7
(9) Wellesley Street West, between Queen and Lorne Streets : Gradient for a distance of 2 chains	1 in 13
(10) West End Road : Gradient for a length of 8 chains immediately west of the tennis-courts	1 in 14·8
(11) Union Street, from Napier Street to Wellington Street	1 in 16
(12) Great North Road, for a length of 4 chains flanking northern boundary of Auckland City Council property	1 in 17·2
(13) Princes Street, Bowen Avenue to Shortland Street	1 in 20·7
(14) Lower Symonds Street, Alten Road to Grafton Road	1 in 22
(15) Anzac Avenue, Beach Road to Eden Street	1 in 22
(16) Anzac Avenue, below Alten Road	1 in 22
(17) Pitt Street, Grey's Avenue to Wellington Street	1 in 24

The gradients tabulated above may be compared with those of two streets which would be traversed by traffic proceeding to the higher levels of the city from the southern bridge head, viz.—

(18) Curran Street : General gradient	1 in 11·7
(19) Sarsfield Street (regraded) and Shelly Beach Road (alternative route for heavy vehicles)	1 in 18·6

Width of Bridge.—The width of carriage-way set by the former Commission was 40 ft. In the statement put forward on behalf of M. R. Hornibrook (Proprietary), Ltd., it was recommended that the width be 60 ft. Examples of fairly recent American practice brought to our notice provide 27 ft. carriage-way. After taking into account the estimated population of the North Shore area in 1965, its ultimate population, and the resultant volume of traffic, we consider that a minimum of four traffic lanes should be provided, which, according to modern standards, will require 44 ft. between kerbs.