

McNamara's Corner to Waitaki River, Surfacing.—This section is 12 miles in length and was metalled in preparation for ordinary sealing. During crushing-operations for chips, &c., a considerable quantity of quarry waste had accumulated. The grading of this waste was found suitable for a plant-mix aggregate, and at the request of the local authority this type of surfacing was adopted. The thickness of the pavement on the primed surface is 1 in., and the cost including the priming was £750 per mile.

Dunedin District.

Christchurch—Dunedin Main Highway: Waitaki River to Oamaru.—As a result of the excellent riding qualities of the section in Waimate County described above, the neighbouring Waitaki County also requested this plant-mix drag type of surface on $7\frac{3}{4}$ miles of new first-coat seal and on $4\frac{1}{2}$ miles of old, uneven sealing. The work was carried out at a cost of £488 per mile, the thickness of surfacing being $\frac{5}{8}$ in.

Oamaru—Dunedin.—Considerable progress was made on this section. Fairly heavy earthwork has been undertaken by employment camps between Hillgrove and Shag Point over a length of 6 miles. On this section the road passes under the railway at two points, by subways with sharp approaches. The subways are being eliminated by a deviation skirting the sea coast.

On this section 8 miles of two-coat sealing were carried out. The sealing only, cost £600 per mile.

Southland District.

Gore—Te Anau—Milford Main Highway.—The last section of this highway between Hollyford and Milford, is now under construction. The route is entirely scenic, and opens up one of New Zealand's national parks. It presents to the visitor or tourist something which is calculated to excel almost anything in the world. Approaching the Park along the floor of the Eglinton Valley, glorious vistas of lake and mountain scenery open up in the birch forests through which the route has been formed. Flanked on either hand are towering cliffs and mountains 5,000 ft. to 8,000 ft. high, rising almost perpendicularly from the floor of the valley to well above the snow line.

Approaching the Hollyford Valley the country becomes more rugged and the grandeur increases. Construction is here more difficult till the portal of the Homer Tunnel is reached. The tunnel, which was recently commenced, will be some three-quarters of a mile in length and is being built double lane on a 1 in 10 grade. The eastern portal is sited at an elevation of 3,100 ft., and the western portal at 2,700 ft., above sea-level. From the higher elevations of the route on the western side there will be exposed magnificent views of Milford Sound, hundreds of feet below. Mirrored on its surface will be seen the high rock-walls and tumbling waters with depth of colour and tone unsurpassed.

BRIDGES.

During the period a very heavy bridge programme was undertaken. Proposals were submitted for examination at the rate of twenty per month, and involved considerable checking and requisitions for improvement in the design.

Apart from the examination of the plans, considerable preliminary information is required, as the Board insists on a thorough investigation of foundations by way of test pits, bores, or test piles, so that in each case the cost of the substructure can be correlated with the cost of the superstructure, and the most economical design obtained.

In spite of the substantial progress recorded, there is still much leeway to make up. Many large structures have been given extended life at the expense of high maintenance-cost, but it is not economical to continue this process indefinitely, and the reconstruction of these bridges will have to be faced in the near future. For many of them plans are already in hand. The policy of building in reinforced concrete has been continued.

During the period 232 bridges were put in hand, and of these 164 were completed.

Among the most important structures at various stages of completion the following may be particularly mentioned:—

Waitangi Washout Bridge, on the Napier—Wellington via Wairarapa Main Highway, about 3 miles south of Napier, has a roadway 24 ft. wide and is 800 ft. long. It is built entirely of reinforced concrete and consists of twenty 40 ft. spans supported on pile piers and abutments. The total cost was approximately £11,500, equal to 12s. per square foot of deck.

Waitangi Bridge, also on the Napier—Wellington via Wairarapa Main Highway, is about half a mile southwards from the Waitangi Washout Bridge, and is of similar width and construction, and is 600 ft. long. The cost will be approximately £9,700, or 13s. 6d. per square foot of deck. The new bridge replaces an old timber one-way bridge, which was a frequent cause of delay on this heavily trafficked highway.

The lengths of both the Waitangi Washout and Waitangi Bridges were fixed by the widths of the flood-channels required for the Hawke's Bay River Board's flood-control scheme now under construction. The construction of these two bridges eliminates two level crossings over the railway.

Tangahoe Bridge is on the Auckland—Wellington Main Highway about 4 miles south of Hawera. The main span in the new bridge is a reinforced concrete, open spandrel, hingeless arch, having two parabolic arch ribs with a span of 90 ft. and a rise of 41 ft. There are two 26 ft. girder approach spans at the Hawera end, and two 35 ft. spans at the other end. The width of roadway is 20 ft., and the total length is 217 ft. The deck-level of the bridge is 80 ft. above the bed of the stream. The bridge replaces an old low-level timber bridge over the Tangahoe stream, and with a deviation of the highway 56 chains long, the through distance by road is reduced by about 24 chains, and the alignment is greatly improved. The cost of the bridge was about £6,010, while the formation of the deviation, apart from the bridge, cost £10,000.