

railway-line northward and southward of Wairoa, and the sidings to the wharf and to a ballast-pit site, until January, 1917, when it was found necessary to transfer the Assistant Engineer to more urgent work. Northward of Napier the survey of the centre-line was extended to 10 m. 60 ch., and a land-plan survey from 0 m. to 0 m. 55 ch. and from 8 m. 3 ch. to 10 m. 60 ch. is in hand.

#### TE ROTI—OPUNAKE—MOTUROA RAILWAY.

The permanent-line survey was completed from 46 m. to Moturoa, a distance of 10 miles 74 chains. The plans are in hand.

#### WELLINGTON—WAIRARAPA RAILWAY DEVIATION.

The survey in connection with the proposed deviation between Wellington and the Wairarapa has been entirely suspended, owing to the officers in charge of the survey party having joined the New Zealand Expeditionary Forces.

#### WELLINGTON—PAEKAKARIKI RAILWAY DEVIATION.

This survey is also suspended owing to officers joining the military forces.

#### TUAPEKA MOUTH BRANCH RAILWAY.

During the year trial-line surveys between Hillend and the South Island Main Trunk Railway were completed from Hillend to Crichton (about 11½ miles) and Hillend to Lovell's Flat (about 10 miles). Neither of these lines can be regarded as satisfactory, as the gradients would be steep and the formation expensive. There are at least two alternative lines which seem worthy of investigation. A line was also surveyed from Hillend onward to a junction (at Greenfield) with the surveyed line up the Clutha Valley. This work has been suspended, the Assistant Engineer being now with the military forces.

Generally, the amount of survey work carried out during the year has been much less than usual, owing to the absence of so many of our Engineers on active service.

### ROADS, BRIDGES, ETC.

The construction of roads and bridges has been greatly hampered by, the scarcity of labour, and also to some extent through lack of certain materials. Only the unexpended balances of former votes were available for expenditure, and in some districts works have been deferred owing to the excessive wages demanded by the few workmen available, so that roadwork generally may be said to have been reduced to a minimum as regards both construction and maintenance. The year has been marked by a most extraordinary series of floods in various parts of the country, almost every district having suffered more or less. This has necessitated a considerable expenditure from the flood-damage vote, as well as a great deal of extra work for the Department's staff.

Some of the more important works carried out are mentioned briefly below:—

*Mangamuka to Victoria Valley.*—A considerable amount of work has been done on this important road. Bush has been felled for a distance of 34 chains, road widened 86 chains, dray-road formed 12 chains (11½ chains in rock), road repaired 230 chains, &c.

*Roderick Road.*—There were 72 chains stumped and cleared, 137 chains formed 14 ft. wide, 36 chains bush felled, &c. This road will be a feeder to the railway at Kaikohe.

*Matakana River Bridge.*—A concrete bridge, 37 ft. long, with 12 ft. 6 in. roadway, has been erected by the Rodney County Council to replace an old wooden structure.

*Te Hana River Bridge.*—Piles for this bridge have been made and driven, and work on the superstructure is in progress under the Rodney County Council.

*Omaumau River Bridge.*—The Rodney County Council has also made and driven the piles for this bridge, which will be of reinforced concrete, 30 ft. long and 14 ft. wide.

*Taikata Creek Bridge.*—The Waitemata County Council has completed this bridge, which is situated on the Great North Road Deviation, 2½ miles north of Henderson Railway-station. The structure is of reinforced concrete, one 35 ft. and two 27 ft. 6 in. spans, with 16 ft. roadway. The formation of 36 chains of 16 ft. approach roads is in progress and nearing completion.

*Brooklyn Bridge.*—The Department is constructing a reinforced-concrete bridge of one 35 ft. and two 22 ft. 6 in. spans, with 12 ft. roadway. The piles have been made, and work on the superstructure is being commenced.

*Hingaia and Glasson Creek Bridges.*—These two bridges, in reinforced concrete, the former of seven 50 ft. spans and the latter of six 50 ft. spans, 15 ft. wide, have been erected by the Karaka Road Board.

*Tamaki River Bridge (Panmure).*—This is a reinforced-concrete bridge on the main road from Panmure to Howick. It consists of fourteen 50 ft. and one 20 ft. spans, carried on four rows of concrete columns built up on reinforced-concrete piles. There is a 21 ft. roadway, with footpaths on either side, the width over all being 32 ft. The work was carried out by the Manukau County Council.

*Piako River Bridge (Orchard).*—This bridge will consist of ten stringer spans of 25 ft. each, and a central lifting span of 36 ft. 9 in., all in timber with the exception of the lifting gear, which is of mild steel. The work, which is being carried out by the Thames County Council, is well in hand, nearly all the piles having been driven and the superstructure constructed,