

A total of 4 miles 35 chains of 85 lb. rails was laid from Longburn to Rangitikei Line. The ballasting has been completed for the full three lifts for approximately two-thirds of this distance and two lifts for the balance.

Two small steel 14 ft. span bridges were completed at 84 miles 59 chains and 86 miles 24 chains on the Palmerston North Longburn section. The abutments for these bridges had been completed previously.

All the temporary piles for the Mangaone Stream Bridge, which consists of five 20 ft. spans, to carry five lines of track, were driven during the period. A total of seventy-seven 16 in. octagonal reinforced-concrete piles were cast and sixteen piles had been driven at the end of March, the bearing being quite satisfactory. A temporary bridge was also completed at the side of the permanent bridge in order to enable the track to be laid across so that the platelaying work would not be held up. Most of the steel for this bridge was in hand, and a commencement had been made with the bending of same.

A commencement has been made with the excavation of the Kawhau Drain Culvert, which is 750 ft. in length with an 18 ft. clear span. Some of the steel has also come to hand, and 4 tons had been bent at the end of March. All the small culverts on the main deviation had been completely previously.

A total of 63 chains of new fencing was completed on this deviation, and all that remains to be done now are minor adjustments to fences at the sites of all overbridges.

The whole of the drains, which had been cut previously, were cleaned out and trimmed up during the year, some of these being in a very bad state.

Whakarongo Deviation.—No work had previously been carried out on this deviation. The clearing of trees, fences, &c., has been completed throughout. The fencing on both sides has also been completed, a total of 471 chains, concrete posts being used. All the small culverts have been placed, and a large 6 ft. by 5 ft. reinforced culvert at 0 miles 25 chains was also completed. Batter drains have also been cut over the full length of cuttings.

A total of 3,854 cubic yards of clay was excavated by means of carryall scraper on the section from 0 m. 63 ch. to 2 m. 10 ch. This work has since had to be discontinued, partly owing to wet weather and partly due to the fact that the machine was required on the main Palmerston North Deviation.

Both deviations have been completely resurveyed and cross-sectioned and fresh quantities taken out and plans prepared where necessary. Site plans for overbridges have also been prepared for six of the existing level crossings, but to date final plans have not been completed and no work has been carried out. A commencement has been made with the construction of the Longburn Overbridge, which fits in with the new deviation, but this work is being carried out under the control of the Main Highways Board. No plans have yet been finalized for any of the station buildings, goods-sheds, engine-sheds, &c.

PLIMMERTON-PAEKAKARIKI RAILWAY DUPLICATION.

The duplication of the railway between Plimmerton and Paekakariki was commenced approximately three years ago as portion of a scheme to duplicate the whole main line between Wellington and Palmerston North.

This section of line carries very heavy traffic to the capital city. The principal bottle neck causing congestion of trains is that between Plimmerton and Paekakariki, where the line rises from either point to Pukerua Bay.

Under the present arrangements trains gather at Plimmerton on the north run and at Paekakariki for south-bound traffic. The duplication will permit several trains to be on this length at once, thereby relieving time-table restrictions.

Plimmerton to Pukerua Bay Section.—The ruling gradient is approximately 1 in 66, and formerly there were numerous curves of 12 chain radius. When duplication was being carried out opportunity was taken to improve the alignment, and the minimum curvature is now 16 chains and the overall running-speed between Plimmerton and Pukerua Bay increased to 45 miles per hour.

Along this length heavy earthwork was involved. The principal point of engineering interest is probably the effective manner in which the drainage of the very wet cutting near Pukerua Bay has been dealt with by subsoil drainage. It is strange that the highest point of the line should be the wettest and cause most trouble.

The Railways Department has been faced with expensive maintenance over a long period, but the new system appears to have drained the road-bed most effectively.

The excavation has been carried out entirely by returned soldiers, and the progress made is largely attributable to their excellent work.

Pukerua Bay to Paekakariki Section.—From Pukerua Bay towards Paekakariki the line is duplicated by paralleling the existing formation on the east side to within a short distance of the first tunnel (No. 8). The double line here merges into a single track through a high-speed turnout and continues as a single line to the north end of No. 13 Tunnel. From here to Paekakariki a single line branches through another high-speed turnout and continues as a double track to Paekakariki Station. Extremely heavy excavation was encountered along this section.

During the year 605 lineal feet of culverts were placed and approximately 149,000 cubic yards of excavation and 20 chains 70 links of fencing carried out. The average number of men employed was 110.

SOUTH ISLAND MAIN TRUNK RAILWAY, NORTH END.

Clarence Section (56 m. 6 ch. to 76 m. 13 ch. = 20 m. 7 ch.).—With the exception of 30 chains at the Blue Slip, formation work on this section is completed. The earthwork done during the year has been practically confined to formation of station-yards at Kekerangu, Parikawa, and Clarence