

RAETIHI BRANCH RAILWAY.

Work on this railway was interrupted and disorganized during May, 1916, by the lamentable accident at the Ohakune ballast-quarry, whereby the Engineer in charge of the works, his assistant, the overseer, and three workmen lost their lives. During the remaining nine months of the year the work has been pushed on as vigorously as circumstances permitted. Earthworks and platelaying are practically completed throughout ($8\frac{3}{4}$ miles), also first lift of ballast; second lift and boxing-in for about three-fourths of the length. Fencing was erected for a distance of 140 chains, and sundry cattle-stops were constructed. Bridges at 1 m. 12 ch., 1 m. 61 ch., and 2 m. 6 ch. were completed. A water-service, comprising a dam opposite 8 m. 10 ch. and 12 chains of pipe-line was completed to supply the Raetihi Station. Goods traffic has been handled by the Department between Ohakune and Makaranui (4 m. 53 ch.) since August last, amounting to about 10,400 tons, mostly timber.

OPUNAKE BRANCH RAILWAY.

Kapuni Section (0 m. to 7 m.).—Earthwork is in hand at various places up to 6 m. 38 ch., a steam-navvy being employed with satisfactory results, in addition to several co-operative parties. A considerable quantity of earthwork remains to be done on this section. All culverts and drains were completed last year, and the fencing is also practically completed. No work has been done on the Mangatoki and Kapuni Bridges. At the Waingongoro River (0 m. 25 ch.) piers are being constructed for a concrete arch bridge, a total of 582 cubic yards of concrete having been placed in two piers and two abutments. The foundation for one of the remaining piers appears unsatisfactory, and the design will require to be amended to suit. At 2 m. 4 ch. a private-crossing overbridge, consisting of one concrete arch, has been completed, with approaches.

Auroa Section (7 m. to 12 m.).—Practically nothing has been done on this section during the year. Culverts had already been constructed up to 8 m. 46 ch. Shingle has been carted to the various culvert-sites up to 11 m., and a settler's house and outbuildings were removed from the railway reserve to a new site.

Manaiā Branch (0 m. to 5 m. 50 ch.).—Clearing has been completed to 1 m. 62 ch., and fencing has been erected to 2 m. 59 ch., except a few gaps. Twelve culverts have been constructed between 0 m. and 3 m. 50 ch. Two deviations of the Kapuni-Manaiā Road, totalling 34 chains in length, have been formed and metalled.

SOUTH ISLAND MAIN TRUNK RAILWAY (NORTH END).

Kekerangu Section (56 m. 5 ch. to 63 m. 6 ch.).—Very little work has been done on this section during the year. Ballasting is complete to the rail-head at 59 m. 25 ch. Some earthwork, fencing, &c., have been in hand up to 60 m. 44 ch., and three culverts have been laid. Piers have been constructed for a bridge over Woodside Creek (56 m. 50 ch.), but the steel superstructure is unobtainable at present.

MIDLAND RAILWAY.

Nelson-Westland (North End).

Kawatiri Section (59 m. 17 ch. to 63 m. 10 ch.).—The number of men employed here has been very small. Earthworks have been in hand up to 61 m. 60 ch., and not very much remains to be done to complete this length. At 61 m. 35 ch. four concrete piers were erected for a bridge, but steel for the superstructure is not available. A concrete retaining-wall at 61 m. 87 ch. was completed, and another at 61 m. 9 ch. nearly so. Owing to scarcity of labour the work on this section was closed down at the end of February, 1917.

Arthur's Pass Tunnel.

At the Otira end all work in the tunnel has been carried out by day labour. The rock through which the bottom heading has been driven is mostly slate; some parts stood badly, and nearly all had to be timbered either at time of excavating or shortly after. Seventy per cent. of the shifts worked were on "wet time." All the enlargement has been timbered. At the Bealey end the work was carried out by co-operative contract up to the 11th May, 1916; since then it has been done by day labour. The heading has been driven through greywacke, and has been wet in the face practically all the time, drying up about a chain back from the face. Little progress has been made with the lining, owing to shortage of men. During the year the bottom heading has been driven a total distance of 47 chains 63 links (both ends), and the tunnel has been completed for a distance of 21 chains 8 links. The total length of heading driven to date is 4 miles 45 chains 66 links; lining completed, 3 miles 59 chains 90 links. The distance between the headings is 59 chains 52 links, or just under $\frac{3}{4}$ mile. Distance between completed portions of tunnel, 1 mile 45 chains 28 links. Total length of tunnel, 5 miles 25 chains 18 links. The works have been undermanned throughout the year, a large number of our best tunnel workers being on active service with the New Zealand Tunnelling Company and other units.

The conditions affecting the electrification of the Arthur's Pass Tunnel have been investigated, and the characteristics of the service have been ascertained in considerable detail. The Railway Department has provided particulars of the traffic anticipated and a service time-table corresponding thereto. Inquiries have been directed to different manufacturers regarding the locomotive equipment and the maximum power which can be accommodated per axle. The weight of the locomotive and the principal features of the same have been determined. Several sources of power have been investigated and the extent of electrification discussed. No final conclusions have been reached in regard to any of these points, nor has the system of traction been finally determined. Further work is being conducted with a view to reaching finality on these points, and further information obtained which will enable a decision to be reached.