

through was greywacke and slate, as previously. The total heading driven at both ends during the period is 2 chains 68 links: enlarging and lining completed, 24 chains. The distance between completed portions of the tunnel is 1 mile 6 chains; total length of tunnel, 5 miles 25 chains 18 links. Work on this tunnel has been considerably hampered by the shortage of labour. As more men become available progress will be increased. At the Otira end work is being carried out by day labour, while at the Bealey end work by day labour was carried out only until 29th September, 1918, when the co-operative contract system was adopted and still remains in force.

CULVERDEN-WAIAU RAILWAY.

(Length, 13 miles.)

The third (final) lift of ballast has been placed along the total length of 13 miles. Delay was caused for several months owing to the heavy snowfalls and to the flooding of the ballast-pit. A boulder and earth buffer stop-bank has been completed at 13 m. At Culverden two platelayers' cottages have been built. At Waiau two platelayers' cottages, one Stationmaster's house, two workmen's huts, and a 4-ton crane have been erected. A daily goods service has been run between Culverden and Waiau. This line should be completed by the end of the year.

WAIMATE BRANCH RAILWAY EXTENSION.

(Length, 4 miles 60 chains.)

No further work has been done on this section during the period.

OTAGO CENTRAL RAILWAY.

Cromwell Section (44 m. 52 ch. to 57 m. 6 ch.; length, 12 miles 34 chains).—Cuttings and banks have been widened at 46 m. 40 ch., 47 m. 5 ch., and 47 m. 55 ch. View at level crossing at 48 m. 37 ch. has been improved. Formation of road and railway deviation, 50 m. 65 ch. to 51 m. 7 ch., has been completed, while that from 55 m. 50 ch. to 56 m. 30 ch. is well in hand. The main line has been extended from 57 m. to 57 m. 6 ch., and the sidings from 56 m. 71 ch. to 57 m. The final lift of ballast has been placed from 56 m. 71 ch. to 57 m., and the second lift has been completed through the sidings. Seventeen pipe and culvert outlets have been stone-pitched to prevent scour. A 6 ft. concrete arch culvert at 55 m. 19 ch. has been completed. Bridges at 46 m. 23 ch., 48 m. 38 ch., and 49 m. 71 ch. have been erected, and bridges at 47 m. 19 ch. and 51 m. 23 ch. are well in hand. Four platelayers' cottages, one passenger station building and platform front, a stockyard, two ash-pits, two concrete buffer stops, and a 6,000-gallon water-tank with stand have been completed. A pipe-line for the water-supply of Cromwell Station buildings has been placed in position. Since 1st January of this year a regular passenger and goods service has been maintained between Cromwell and Clyde.

OREPUKI-WAIAU RAILWAY EXTENSION.

Orawia Section (48 m. 23 ch. to 56 m. 40 ch.; length, 8 miles 17 chains).—Work on this line is still suspended owing to the shortage of labour.

SURVEYS OF RAILWAYS UNDER CONSTRUCTION, NEW LINES OF RAILWAY, LAND-PLANS, ETC.

NORTH AUCKLAND MAIN TRUNK RAILWAY.

Plans of the permanent line north of Kaikohe have been completed from 42 m. to 45 m. 40 ch. Plans for a wharf at Te Tio Point near 45 m. 20 ch. have been completed.

EAST COAST MAIN TRUNK RAILWAY.

Waihi to Tauranga.—Trial lines have been run between 16 m. and 20 m. Permanent line has been pegged from 15 m. to 20 m. Permanent-line pegging is in hand between 20 m. and 35 m. Plans have been prepared to 15 m.

Rangitaiki Section.—Permanent pegging has been completed between 91 m. 18 ch. and 96 m. 70 ch. The surveys of the drainage areas of the different drains in the Rangitaiki Swamp have been completed. A traverse has been run along the Rangitaiki River for the purpose of locating stop-banks.

Gisborne-Napier (South End).

From 10 m. 60 ch. onwards a strong survey party has been employed, and 38 miles 40 chains of trial lines have been completed. Trial survey and plans have been completed to 44 m. 60 ch.

STRATFORD—MAIN TRUNK RAILWAY.

West End.—Trial surveys were undertaken to investigate the possibilities of a square crossing over the Tangarakau River at 50 m. 40 ch., also of a more direct route from the Tangarakau to the Mangatatoko. A trial line was also made for a deviation from 54 m. to 57 m. The route for a service road from 50 m. 40 ch. onwards towards the Heao Valley has been surveyed. The permanent line has been pegged from 49 m. to 50 m. 55 ch., the end of Tahora Station being at 47 m. 30 ch.

East End.—Investigations with the object of improving the alignment from 16 m. to 19 m. have been made. Land-plan survey has been completed to 10 m. 23 ch., Matiere Station.

RIVER CONSERVATION.

WAIRAU RIVER SURVEY.

Thirty miles of river traverse, with levels and cross-sections, have been surveyed to enable scheme of flood-prevention works to be prepared.