

Immediately beyond the No. 1 tunnel there is a large ravine, which is to be filled by the spoil from the tunnels and from a large cutting at 51 m. 58 ch. This ravine was bridged by a trestle 6 ch. long and 80 ft. high, built of bush timber throughout. In order to facilitate the excavation of cutting at 51 m. 58 ch. a double heading was driven and a crater opened up, so that the spoil trucks could be filled by gravity. After tipping, the trucks are hauled back to the crater by means of an air-operated winch.

At No. 2 tunnel (52 m. 10-50 ch.) the western approach has been completed, the portal excavated, and approximately a chain of tunnel driven and lined. In order to start work on this tunnel it was necessary, in the first place, to construct the electrically operated jig-line (mentioned in my last report) over the top of the No. 1 tunnel, build the trestle previously referred to, and construct a tram-line round the cutting at 51 m. 58 ch. At the east end of this tunnel the approach cutting was just completed at the end of the year.

To start the approaches to No. 3 tunnel, the western portion of which is in hand, it was necessary to construct a service road over the No. 2 tunnel ridge to connect with the Mangaone Valley. This road, which commences at 51 m. 70 ch., was graded to the top of the ridge at a 1-in-7 grade for a distance of 50 ch. From there it was graded level for 40 ch., and then down at 1 in 7 for 50 ch. to the Mangaone Valley and opposite 53 m. 5 ch. on the railway chainage. It was necessary to fascine this road in order to allow tractor haulage in the wet weather. The formation was then continued from the end of the service road, crossing the Mangaone Stream by a temporary bridge, and on to the No. 3 tunnel approach, a distance of 45 ch.

In addition to the above work, the general formation was completed up to the No. 1 tunnel, creek-diversions were cut at 51 m. 65 ch. and 51 m. 68 ch. in the Mangatatoke and at 52 m. 79 ch. in a side stream of the Mangaone. Water-drives of the dimensions shown were put in at the following places: 51 m. 50 ch., 10 ft. by 8 ft.; 52 m. 9 ch., 3 ft. diameter; 53 m. 0 ch., 8 ft. by 6 ft.; and at 53 m. 25 ch., 12 ft. by 10 ft.

The platelaying and ballasting of the jig-line was completed, and a service tram laid from the end of the jig-line to the western end of No. 2 tunnel; this tram was operated by one of the electric locomotives. A service tramway was also put in hand in the Mangaone Valley, and the line laid from 53 m. 23 ch. to 53 m. 40 ch. At the main camp a depot comprising a carpenter's shop, stores building, loco-shed, &c., and well-equipped repair and fitting shops was erected to deal with the upkeep of plant incidental to works, and involved the extended use of power and labour-saving machinery. Housing-conditions were well maintained, and a cookhouse and workers' accommodation-house were established at Mangatatoke and Mangaone.

PALMERSTON NORTH RAILWAY DEVIATION.

This work had just started before the beginning of this year. It was commenced primarily to give work to the unemployed in the Palmerston district, and up to last April only an average of thirty men were employed. This number has now been increased to fifty, and a bigger programme of work has been put in hand. The deviation-works include the construction of 6½ m. of double-track railway, as well as large up-to-date goods-yard and passenger-station. These works necessitate a large amount of excavation and banking, which so far has been confined mainly to the opening-up of cuttings for the goods-yard. This has been done so far by manual labour, but two steam-shovels are now to be employed, one of which is at present being assembled, together with a petrol-locomotive for transporting the spoil. The main line is completed from 88 m. 32 ch. to 88 m. 57 ch., and the main goods-siding from 88 m. 36 ch. to 88 m. 64 ch. About 28,000 cub. yd. have so far been excavated. A diversion of the Kawau Stream at 88 m. 36 ch., of 19 ch. in length, has been completed; also 19 ch. of a creek-diversion running through the goods-yard from 89 m. 20 ch. to 88 m. 37 ch. The permanent fencing has been done on one side of the goods-yard, necessitating 68½ ch. of standard fence. A store has been built, also a blacksmith's shop, cement-shed, and explosives-magazine. Only two workmen's huts have so far been found necessary for the workmen's accommodation, as most of the employees live in Palmerston North.

HUTT VALLEY RAILWAY DUPLICATION.

The formation of this line was completed to the 10 m. during the year. A steam-shovel and a drag-line were engaged and did excellent work, particularly towards supplying material for the high ramps required for the overbridges at Cuba Street, Randwick Road, and White's Line. These three overbridges were completed during the year. The remaining eight piers for the Hutt River Bridge were built and the steel girders erected. Platelaying on both tracks was completed between 8 m. and 10 m. The sidings were also laid in the station-yards at Ava, Woburn, and Waterloo Road. Ballasting was completed over the whole section. An industrial line 70 ch. in length branching off this line was constructed during the year. This railway was handed over to the Railway Department for operation on the 25th May of this year.

MIDLAND RAILWAY.

Kawatiri Section (59 m. 17 ch. to 63 m. 10 ch.; length, 3 m. 73 ch.).—This section was practically completed at the end of last period, but owing to heavy slips taking place the opening was delayed somewhat; but the section, with the exception of 2 ch., was handed over to the Railway Department early in the current year. During the year various slips both on the railway and the main-road deviations have been removed, and protective works at the creek-diversion at 62 m. 60 ch. have been completed.