

The large filling at 51 m. 50 ch. has been brought up to formation-level for a width of 9 ft., and is being completed with spoil from the adjacent cutting at 51 m. 60 ch. This filling, containing 70,000 cub. yd., was built from a large trestle, the formation-level being 90 ft. above the bottom of the ravine, and the stream has been by-passed through a large water-drive.

The formation between No. 1 and No. 2 tunnel and between No. 2 and No. 3 is, with the exception of a few points, practically completed.

A good outcrop of rock was discovered in the Mangaone Valley a short distance from the centre-line at 53 m. 40 ch., and a quarry has been opened up there, with a connecting tram to crushing plant, which is electrically driven. Bins have been provided, and the crushed metal obtained is being used for tunnel-lining and other concrete-works in the valley. This plant saves the heavy transport costs of bringing metal in from the Te Wera quarry and haulage by motor-lorry over the Mangaone Saddle.

The difficulties of transport from one part of the section to another are much increased by the fact that the line traverses a number of huge ridges which have to be pierced by tunnels, and in order to enable work to be prosecuted ahead construction material has to be hauled over these ridges. Now that the No. 1 tunnel has been completed, material for works ahead can go through the tunnel. Previously everything had to be hauled over the top of this tunnel by means of an electrically operated jig-line, and a total of 9,408 tons of construction material has been hauled over this jig-line.

To reach the eastern face of No. 2 tunnel and the western end of No. 3 it has been necessary to form a service road on a very steep grade over the ridge pierced by the No. 2 tunnel, between the Mangatatoke and Mangaone Valleys. Haulage over this road was at first carried out by tractors, but later a light coat of metal was laid down on corduroy and the service is being adequately carried on by means of motor-lorries.

Power for all activities has been supplied by the steam power-house at Tangarakau, and this met all demands satisfactorily during the year, supplying electric power to all tunnels for lighting, haulage, and operation of plant generally. It also supplied compressed air for the pneumatic plant in all tunnels. In order to generate the necessary power at a reasonable figure, the Department some time ago acquired rights over a coal area in the Tangarakau Gorge, and made arrangements with a local syndicate to take up and mine these areas on the condition that they supplied a specified amount of coal per annum for our purposes at a reasonable figure. During the period, 1,161 tons of coal were supplied under this arrangement. This coal has proved to be a very fair steam coal, and it is anticipated that its use will reduce the generating-costs at the power-station, in addition to assisting in the development of a coal area which should, owing to its proximity, be of benefit to the Taranaki consumer.

Te Wera Quarry. (21 m. 60 ch.).—This quarry has been in operation throughout the year, 14,449 cub. yd. of stone being quarried and crushed during the period. 8,263 cub. yd. of this was used for railway-construction and 6,186 cub. yd. was supplied to various local bodies for roadwork and other purposes.

The Department's ballast-train maintained a tri-weekly service running crushed metal from Te Wera to Tahora for railway-construction until April last. It has since been running a daily service between Te Wera and Pohokura with road-metal for the Ohura Main Highway.

PALMERSTON NORTH RAILWAY DEVIATION.

It has been possible to carry on this work on a considerably larger scale than during the previous year, and steady progress has been made on its construction, which includes the building of 6½ m. of double-track railway and of a large up-to-date goods-yard, and passenger-station.

The clearing of the railway reserve is practically complete, this work involving the removal of a number of houses and large farm buildings. Nine miles of fencing has been erected. The drainage and culverting work completed has been of a substantial character, and has comprised the cutting of 350 ch. of drains, and the building of the following concrete culverts: One 6 ft. arched, 200 ft. long; three flat-topped culverts, 4 ft., 3 ft. 6 in., and 3 ft. square in section, totalling 1,347 lin. ft.; one 3 ft. arched, 95 ft. long; one 24 in. circular, 180 ft. long, and one 18 in. circular, 120 ft. long.

A feature of this railway-deviation will be the extensive road-overbridge construction. These structures, seven in number, will be of heavy concrete and steel construction, and necessarily involve expensive earthwork approaches, as the country is flat. The largest of these, that on Milson's Line, is in hand and nearing completion. It makes provision for eleven railway-tracks passing under it. The approach ramps are nearing completion. Several temporary bridges over streams have been erected for service purposes. The formation work is well suited to power-shovel and earthwork-train operations. Three steam-shovels and six construction locomotives are in use, and the earthwork on the deviation is now one-fourth completed, the excavation done amounting to 125,000 cub. yd. Formation is almost complete from Longburn Railway-station for a distance of 3½ m., and the goods-yard formation is also well advanced. A heavy service track connecting with the main line at Longburn has been laid into the goods-yard site, involving 5½ m. of track. This greatly facilitates transport and construction work generally. The average number of men employed on this work for the year has been 147.

WELLINGTON—TAWA FLAT RAILWAY DEVIATION.

(1 m. 70 ch., to 9 m. 30 ch.; total length, 7 m. 40 ch.)

Work was commenced on this railway during the year. Tenders were called, in the first place, for stone for a sea-wall to protect a reclamation for the line from 1 m. 70 ch., to 2 m. 39 ch. All tenders were considered too high, and were declined. The Department decided to do the work itself. Great difficulty was experienced in obtaining a suitable quarry, but eventually good stone was located on the Horokiwi Road, about a mile off the Hutt Road. A big blast was fired, and the stone was