

sets; one Diesel locomotive; nine steam-locomotives; ten concrete-mixers; twelve sets of steel profiling for tunnel-lining; fifteen pumping-plants; two Diesel Crawler tractors and carry-alls; three oil-winchies; two scraper-winchies, slides, and hoes. Workshop equipment, lathes, drilling-machine, shaping and grinding machines, tool-sharpeners, oil furnaces, welding-plant, and large numbers of trucks of all description, rails, sleepers, &c., have also been provided.

TURAKINA—OKOIA RAILWAY DEVIATION.

This deviation, 10 m. 20 ch. in length, is designed to eliminate the heavy grades on the existing line between Turakina and Fordell, and to shorten the distance by approximately $3\frac{1}{2}$ miles.

A start was first made with the actual construction of this deviation in October, 1936, but owing to a last-minute alteration in the finally adopted route there was still a considerable amount of survey work to be carried out before the complete section could be manned.

The first work was the establishment of camps for the construction forces, the provision of the necessary workshops and plant depots, as well as store buildings, offices, &c. This work involved the employment of some fifty artisans and skilled labourers and the purchase of large quantities of timber and building materials generally.

While this work was being carried out the necessary plant for the economical and expeditious prosecution of the formation work proper was ordered from overseas for urgent delivery.

The most important work on this deviation is the construction of two tunnels, $61\frac{1}{2}$ ch. and $103\frac{1}{2}$ ch. in length respectively, so that the adoption of suitable machinery for piercing these tunnels quickly and economically was of paramount importance.

It was decided to use the Canadian method of timbering with the latest type of scraper mucking, steel profiling for the concrete lining, and electrical operation of scraper-winchies and air-compressors for drilling, while the transport of material is done by electric-battery locomotives. Concrete for the internal lining of the tunnel will be mixed by electrically-driven concrete-mixers and conveyed and deposited by the latest type of pneumatically operated "concrete guns."

The rest of the formation work consisting of cut and fill generally is being carried out by a combination of machine and hand labour.

The labour used on the work, as far as possible, is recruited from registered unemployed in Wanganui, consequently the accommodation provided has been limited, as it was considered preferable that the men should continue to live with their wives and families in Wanganui and travel out to their work daily, or else live in camp during the week and go home for the week-end.

The position to-day is that less than nine months after the route was finally decided on the following work has been completed:—

Accommodation.—The main camp at Fordell consisting of forty-four married men's camps, fourteen staff cottages, office, store, plant-repair depot, carpenter's shop, plumber's shop, blacksmith's shop, &c., has been built and occupied.

Two tunnel camps at Fordell, and one at Turakina containing accommodation for 130 men, together with completely equipped cookhouses and bathhouses, &c., are finished and in use.

Two large size Y.M.C.A. huts with reading-room, social hall, billiard-room, and picture equipment have been provided at Fordell and Turakina respectively.

Earthwork.—Service roads to both portals of the Turakina and Fordell tunnels have been formed and metalled, and the first three miles of the open formation have been practically completed. Five miles of permanent fencing has been erected, and over 400 ft. of culverting built.

The earthwork generally has been considerably hampered by the very wet winter experienced, especially since the service roads were quite new and in the early stages unmetalled, and the first three miles of railway formation follow the bed of the Okoa Valley, which was very soft under winter conditions. Still in spite of these difficulties good progress was been made.

Tunnels.—The approaches to the Fordell Tunnel, the short tunnel at 5 m., and the southern end of the Turakina Tunnel are well in hand.

The bins for the concrete aggregate and the mixing-plant generally have been erected at Fordell, the tunnel machinery is being assembled, and a start has been made with the underground work.

Plant.—All construction plant is either on the ground or is due to arrive very shortly. Among the principal items are: One oil-shovel and drag-line; one Crawler-type Diesel shovel and drag-line; one Diesel Crawler tractor and carry-all; four air-operated scraper-winchies with hoes and slides; six 200 ft. portable compressors; one 800 ft. compressor; five ventilating-fans; four pumping-plants; four concrete-guns; one tractor-winch; five concrete-mixers; eleven sets of steel profiling for tunnel-lining; eight electric-battery locomotives; two Diesel-engined locomotives; a large supply of earth-wagons, rails, air-drills, and the necessary machine equipment for a modern plant-repair depot, including lathe, drills, shaper, planer, band and circular saws, metal bending and rolling equipment, &c.

Number of Men employed.—The average number of men employed since the commencement of the work, including all grades, has been 219, and the number at present engaged is 300.

IRRIGATION.

CENTRAL OTAGO.

OPERATION AND MAINTENANCE OF IRRIGATION SCHEMES.

No new irrigation schemes were brought into operation during the past year, and the number of schemes operating on a trading basis stands at thirteen. Excluding the Omakau scheme, where no irrigation agreements are in force, and water is purchased as it is required, the area irrigated during