

As the work advances fences have been dismantled and re-erected on the new boundaries. To date 81 ch. has been permanently erected and 10 ch. of temporary fencing has been put up to keep stock from the permanent way.

78 chains of batter drains has been constructed to protect all banks.

As it is possible to use the permanent-way, temporary crossings have been put in, thereby allowing for speedy delivery to all parts of the work.

Nine lorries are engaged, and these have practically taken the place of hand trucks for excavation work.

An average of 118 men were employed during the year.

MIDLAND RAILWAY.

No construction work has been carried out on this line during the year.

A trial line survey of the section of line from Murchison to Inangahua Junction was put in hand during February, 1937. The old trial line was picked up at 94 m., and the survey is in hand up to 104 m. 50 ch. Very heavy country is being encountered on this section. Approximately 7 m. remains to be surveyed.

SOUTH ISLAND MAIN TRUNK RAILWAY: NORTH END.

(56 m. to 104 m. 70 ch.).

Clarence Section (56 m. to 76 m. 13 ch.).—The principal formation work on this section during the period has comprised the finalization of the various unfinished portions throughout the section and extensive excavation on the Blue Slip at 61 m. With the exception of the Blue Slip, the formation work on this section is now complete to the north end of the Clarence Station Yard at 75 m. 50 ch. The Blue Slip, which has presented the major difficulty on this section of construction, is now well in hand. It has been tackled very vigorously with Diesel shovels, and although there is still a lot of work to be carried out in the cutting of open drains in the affected area and in draining the sub-grade it may be reasonably anticipated that the main portion has been stabilized and that it should be completed during the next year.

Approximately 132,000 cubic yards of material have been removed from this slip since the reopening of the works.

The sub-structure of all the railway bridges has been completed. The girders are on the site and an erection gang is now starting to assemble and place them. Plans for the overbridges are being prepared, and this work will shortly be put in hand.

Permanent fencing has been completed up to 60 m. 21 ch., and all material for the completion of fencing throughout has been arranged for, and the fencing itself will shortly be completed.

Formation of the station-yards is well in hand, and a start has been made with the completion of platelaying.

All old 55 lb. material has been lifted and replaced with 70 lb. material. The party have been equipped with pneumatic tools, and it is expected that the railhead will be at the Clarence Station Yard by next November.

Reballasting has been carried out over the old section of the line, and the track is completely ballasted to 67 m. 40 ch. The equivalent of 7 m., or 16,000 cubic yards, of ballasting having been placed to date.

A large portion of this section is subject to sand-drift, and this has been successfully dealt with by means of extensive marram-grass planting.

Kaikoura Section (76 m. 13 ch. to 104 m. 70 ch.).—Excavation: The formation work on the length between the Clarence Station Yard (76 m. 13 ch.) and the Hapuka River at 92 m. 48 ch. is well in hand. Approximately 400,000 cubic yards of railway and road excavation have been shifted since the re-opening of the works, of which 260,000 cubic yards have been excavated in the period under review. A commencement has also been made on formation work south of the Hapuka River.

The bulk of the excavation is in difficult country consisting of clay and boulders in talus slopes. This has resulted in very high batters. Much of this work has been done by Diesel shovels, especially where hand-excavation would have been costly, slow, and dangerous. The easier cuttings have been excavated by hand on the co-operative contract system.

Between 87 m. 68 ch. and 89 m. 32 ch., owing to the extremely high and unstable batters involved in the original alignment, it has been found advisable to adopt a new route. The new alignment introduces two additional short tunnels, but results in a much safer and slightly cheaper route.

Road-deviation work is well advanced, and a start has been made on the placing of rock for heavy-sea protection where the railway formation and road deviations are exposed to erosion by heavy seas.

Random rubble walls are in course of erection at the toe of unstable batters.

Tunnels: There are six tunnels on the section, totalling 4,664 lineal feet. One tunnel is complete, another will be finished in two months, and a third is half completed, making a total of 1,876 lineal feet of completed tunnel to date.

Tunnelling has been carried out on the co-operative contract system, three shifts being worked. Except in bad country, where it has been necessary to explore the ground by means of a heading, the full-face method of working with American timber is in vogue. Mechanical equipment is in use wherever the nature of the ground permits. Mucking-scrapers are used for loading the excavated material into trucks, which are hauled out by Diesel locomotives equipped with exhaust-gas purifiers for use underground. The concrete-gun is in use in the two larger tunnels, and the concrete is blown in place behind steel profiles by compressed air. The steel profiles are carried on travelling gantries, which straddle the muck-trucks and which, if necessary, permit of an 8 ft. 6 in. length of lining being