

During the past year most of the engineers' time in the interior has been taken up in surveying and making roads to facilitate future work, but two parties have recently been started to run trial-gradients from the Waimarino Plateau to the Upper Wanganui Valley. The works on this section are not expected to be very heavy, but it will possibly be necessary to adopt a somewhat steeper gradient than on the portions of the line now under construction: There is a fall of about 2,000ft. in one drop, so it is difficult to find suitable ground on which to run out the incline, and a steeper gradient will give less work. It was at first expected that a ruling gradient of 1 in 70 could be got all the way from Marton to Te Awamutu; but for the reason just given it may become necessary to increase it to 1 in 50, as on the Main Trunk Railway of the Middle Island. By confining the steeper gradient to one locality, and that near the centre of the island, where the traffic will always be lightest, the carrying-capacity of the railway will be but little impaired.

FOXTON-NEW PLYMOUTH RAILWAY.

Works on Open Lines.—The works executed under this head during the past year consist chiefly of fencing and minor additions to sidings and station-buildings.

Moturoa Contract.—This contract was for the construction of a branch railway from New Plymouth Station to the Breakwater, 2 miles 35 chains. The works were finished at the end of April, 1886, and the line opened for public traffic on the 28th April, 1886.

NAPIER-PALMERSTON RAILWAY.

Open Lines.—The Spit Station is being remodelled, and a few unimportant additions and improvements have been carried out at wayside stations and other places.

Tahoraite-Woodville Section.—This section, which includes the Tamaki and Woodville contracts, was opened for public traffic on the 22nd March, 1887. Its length is 15 miles 10 chains, and the total length of railway now open from the Spit to Woodville is 96 miles 65 chains.

The Tamaki and Woodville contracts included formation, bridges, and platelaying. They were respectively 13 miles 43 chains and 1 mile 47 chains long. There were also separate contracts for station-buildings and fencing. With the exception of some fencing and a few minor details to stations, all the works were finished when the line was opened.

Manawatu Gorge Section.—This section, which is 4 miles 32 chains, was contracted for on the 23rd October, 1886, and the works have since been carried on in the most energetic manner, about three hundred men being employed. The contract extends over the whole of the Gorge proper, and includes the heaviest works on the Woodville-Palmerston section. There is a large amount of rock-cutting and earth-work, 35½ chains of tunnelling, and 26 iron and masonry bridges of various sizes. So far there have been no slips in the slopes of the Gorge, the ground having turned out more solid than was expected.

Surveys.—The remainder of the line between Woodville and Palmerston has been set out for contract. The distance between Woodville and the Gorge is 3 miles 3 chains, two miles over flat ground, and one along a steep sidling in limestone rock.

The link between the Gorge and Palmerston is 8 miles 11 chains. The two miles next the Gorge contain heavy earthworks and a large bridge over the Pohangina River, but the works on the remainder of the section are comparatively light.

The total length of railway to finish and make from the present terminus of the Napier line at Woodville to the Terrace-end Station on the Foxton-New Plymouth Railway is 15 miles 46 chains.

The land-plan survey of the Tahoraite-Woodville section has been completed, and the continuation to the Gorge is in progress.

WELLINGTON-WOODVILLE RAILWAY.

Open Lines.—The usual minor improvements and additions to works, buildings, and plant have been carried out during the year.

Opaki and Kopuaranga Section.—The Opaki section, and part of the Kopuaranga one, as far as Mauriceville, was opened for traffic on the 14th June, 1886, the distance from Masterton being 12 miles 8 chains. The remainder of the Kopuaranga section, to Mangamahoe, 4 miles 7 chains, was opened on the 10th January. This makes a continuous length of railway from Wellington to Mangamahoe of 81 miles 75 chains.

The works on the Kopuaranga section were greatly retarded by slips in the porous calcareous strata through which the line passes. The slips have, however, been removed or stopped, and it is not anticipated that they will give much trouble in future.

Wiwaka Section.—A contract for formation, bridges, and permanent-way, on the Wiwaka section was entered into on the 23rd August, 1886. The length of the section is 6 miles 15 chains: it brings the railway to the Village of Eketahuna. This section, which is the heaviest between the Rimutaka and Woodville, comprises very heavy earthwork and rock-cuttings, five bridges and large culverts, and a tunnel 7½ chains long. The works have been carried on with great vigour, upwards of two hundred men being constantly employed.

Awapurua Bridge.—The bottom and banks of the Manawatu River, at the site of this bridge, are composed of light shingle and alluvium, easily washed away by floods. The extra scour engendered by the erection of the bridge tends to damage the foundations and approaches. Five of the piers have been strengthened by concrete blocks, and the embankments have been protected by groins. These measures have so far been successful; but further protection will be required at other places.

Surveys.—In view of the early settlement of the adjoining lands, the remaining portion of the Wellington-Woodville Railway—the Eketahuna and Woodville section—has been set out for contract. The line follows generally the western margin of the Mangatainoko and Makakihi valleys, the Manawatu River being crossed by the Awapurua Bridge. As far as possible the railway is located