The proposal to make a deviation in the railway between Turakina and Okoia Railway-stations was not a new one, for as long ago as 1893–94 a survey of a new route was carried out by Mr. Leslie Reynolds. His plan was largely used for the final route decided on. On 17th October, 1935, the Chief Engineer of the Railways Department asked the Public Works Department for a re-survey of the Turakina–Okoia deviation, indicating that the Employment Board was keenly interested as a means of unemployment relief. A further survey was then made by Mr. R. A. Wilson in 1936. The construction of this deviation was considered to be a sound proposition to the extent that—

(1) Length of line would be shortened by approximately 2½ miles; and
(2) Grades on new line would be much better than on existing line and curvatures very much easier, so that traffic operations on new route would have substantial advantage over those of the existing location.

On the 19th August, 1936, the District Engineer at Stratford was advised by the Assistant Engineer-in-Chief, Wellington, that Cabinet approval, for the commencement of construction work on the Turakina–Okoia railway deviation was available, and instructed him to make arrangements to commence work. Mr. Annand, Temporary Assistant Engineer, was transferred to take over local charge of the project. The necessary Railway Authorization Act for the construction of this deviation was passed by Parliament on 16th October, 1936.

The Fordell Tunnel is 72·45 chains in length. The portal was opened in August, 1937, the tunnel being pierced on 4th May, 1939, and the whole tunnel construction completed in June, 1939. The Turakina Tunnel is 104 chains in length. The portal was opened in September, 1937, the tunnel being pierced on 10th April, 1940, and the whole tunnel construction completed in June, 1940.

The first sign of defect in the Fordell Tunnel was observed on 28th November, 1938, by the Assistant Engineer in Charge, Mr. Annand, who reported to the Resident Engineer at Wanganui that "the concrete lining of the completed portion of the south end showed long cracks roughly parallel to formation level." He expresses the opinion that after thorough inquiry he had come to the conclusion that they were the result of recent earthquakes. He also says that he thoroughly inspected the other tunnel faces at Fordell, and found no signs of cracks. The District Engineer states that no action is being taken meantime, other than to closely watch developments and see if the cracks tend to open. On 6th January, 1939, a further report is forwarded, giving the result of inspection at ten test points. The statement is made that the concrete lining in all other tunnel headings had been inspected and there was no sign of any other disturbance. On 23rd January, 1939, the District Engineer at Stratford sent a further report to his Head Office, showing that the cracks were extending. This embodied two reports from the Assistant Engineer in Charge, dated 11th and 17th January. On 28th June, 1939, the District Engineer forwarded a copy of a report from Mr. Annand, showing that the cracks were getting progressively worse, and suggesting that some action was necessary. The District Engineer suggested that it would be feasible to defer any immediate repairs as the Turakina Tunnel would not be completed for another fourteen months. On 6th July, 1939, the Inspecting Engineer at Head Office, Mr. Sharp, advised the District Engineer at Stratford that it was not desired to take any immediate measures in regard to the cracks at Fordell, as he thought it would be advisable to let the matter stand at present, keeping them under regular observation and to ascertain just how they were developing. This would permit determination of remedial measures which might be required. On 24th July, 1939, the Assistant Engineer expressed the opinion that the cracks were caused by pressure from behind, though as yet bulging was not apparent. On 20th February, 1940, blue-prints and reports from the Assistant Engineer, giving details of tests, were forwarded. Further reports on the cracks and of the tests being taken were submitted to Head Office on 11th September, 1940, and 1st October, 1940, and on 2nd September, 1941, the Acting District Engineer asked whether any decision had been reached regarding remedial measures to be taken after Head Office Inspecting Engineer's recent inspection. There was also a progress report from Fordell to Wanganui on 28th July, 1941. Head Office advised on 23rd September, 1941, that the question was under discussion with the Railways Department, on the subject of minimum clearance as to whether they had any objection to the tunnel being buttressed. Further progress reports were forwarded on 23rd March, 1943, and 17th August, 1943. In the report of 23rd March, 1943, first mention was made of cracking in the Turakina Tunnel. It was stated that cracking had developed in the southern portion of the tunnel, the cracks being horizontal at a height generally of from 4 ft. to 6 ft. above the formation and with a slight projection at the lower edge which could just be felt. Further cracks in the arch of the Turakina Tunnel then developed, and a detailed examination was then made of the defects in both tunnels, which indicated the following results:—

Fordell Tunnel.—From 3 miles 68 chains to 4 miles 7 chains—almost completely free from visible cracking. From 4/7 to 4/24—almost continuous cracking in both walls, at approximately the middle of the vertical wall. From 4/24 to 4/39—no visible cracking. From 4/39 to 4/53—generally cracking in both walls at half-wall height. From 4/54 to 4/57—slight cracks in one wall only. From 4/57 to the portal is free from cracks.

Turakina Tunnel.—From the north portal, 8 miles 43·20 chains to 8 miles 44·90 chains—free from cracks. From 44·90 to 46·00—a fine crown crack. From 46·00 to 46·45—free from