

37. Well, has any viaduct of the same character been constructed by the department?—Yes, except in the matter of detail.

38. Will you specify where?—There is the Waititi viaduct and the Wingatui viaduct, on the Otago Central line.

39. Can you state the general height and length of the Waititi viaduct?—It is about 140ft. high, and about 700ft. long.

40. Then, what are the dimensions of the Wingatui viaduct?—It is about the same height, but it has a longer bridge.

41. The height of the Makohine viaduct is at least 240ft.?—It is 249ft. in height.

42. *Mr. Blake.*] But is it not as long?—It is about 700ft. long.

43. Will you furnish the Committee with the actual cost of the Waititi and Wingatui viaducts?—Yes. Of course the framework of the piers is of the same style, only it is carried higher. The spans are longer, and there are not so many of them.

44. *Mr. Duncan.*] Would not the material require to be stronger in consequence of the extra height?—Yes; we have allowed for that.

45. *The Chairman.*] Can you say what engineer was responsible for the design of the viaducts you have mentioned?—The late Mr. Blair.

46. Were they his own design or the design of some officer in his department?—I cannot say.

47. You are not able to answer that question?—No.

48. Are you now prepared with the information which was asked for in reference to the alteration of the grades on the line between Marton and Eltham, on the New Plymouth line?—Yes, as far as obtainable.

49. Will you be good enough to state to the Committee what length of grade would require alteration in order to bring them all up to the standard of 1 in 50, and what would be the approximate cost?—There are altogether fourteen miles of the line with grades steeper than 1 in 50, these grades ranging from 1 in 32 to 1 in 49.

50. And the cost that will be incurred in reducing these grades to 1 in 50?—I may explain that the line between Marton and Eltham is generally over table-lands, about 450ft. general height. This is cut up by several broad and deep river-valleys, over which the line is taken. These steep grades are at the approaches to these rivers. They are the Turakina, Wangaehu, Wanganui, Kai Iwi, Okahu, and Waitotara Rivers. The line approaches these rivers after being graded along short branch valleys, consequently it would be difficult to alter the grades by deviating the line to any great extent.

51. You mean by deviating the line within narrow limits?—Yes.

52. But is it not practicable, by considerable deviation, to reduce these grades?—I do not think so; the country is so near the same level on both sides of the line for long distances. It would mean making a new line.

53. For how many miles?—For eighty miles.*

54. You feel quite justified in making that statement?—Yes; that is, if deviation is thought of. If you once get off the line in making deviations, it would be difficult to get back to it again. There would have to be a new line constructed.

55. And you make that statement from your own knowledge of the country?—I have been all over that country. The grades can be flattened by simply lowering the level from the bottom to the top of the inclines on the present line, which would involve very heavy cuttings or tunnelling at the summits.

56. Now we are coming to the practical information which we wanted. Can you form any estimate of the cost of the alteration by heavy cuttings and tunnels?—I may explain a little further. In the bottoms of these valleys are the principal stations and centres of traffic, therefore the levels of the line cannot be raised at these points. There are no long lateral valleys running into these main valleys in the direction of the railway-line.

57. You would therefore be confined to the present line?—And it would also disarrange the traffic arrangement somewhat by making cuttings or tunnels at the tops of these inclines, for the reason that there are stations at nearly every one of them.

58. Then, as to the cost?—I should say £300,000.

59. Now, in the evidence you gave about the state of the work north of Marton—the work under construction—there appears to be a discrepancy between your figures and those of Mr. Holmes. I would like you to state again how many miles are open for traffic?—18 miles and 53 chains.

60. What is the length of the portion under contract?—3 miles and 70 chains. I think I gave this estimate before.

61. Then, as to the extent of the line in progress beyond Makohine, is the distance previously stated correct?—Speaking from memory, I could not say that it was exactly right for a mile or two.

62. Will it be 9 miles or 11 miles?—I make it 9 miles and 40 chains.

63. Does this distance include the tunnel on the south bank of the Makohine?—Yes.

64. Then, if the plan before us is correct, the work must now have advanced inside the limits of the Awarua Block?—I am not quite certain as to the boundary. [Consults the plan.] The works are now within the boundary.

65. Has the country westward of the Rangitikei been so thoroughly explored as to enable you to say that the proposed viaduct over the Makohine Gorge cannot be dispensed with, or, at least, that it would be more costly to divert the line at this stage of the work than to build the viaduct?—Yes; there has been thorough exploration, and every possible route for the railway has been examined and tested. The line cannot be diverted so as to dispense with the viaduct over the Makohine Gorge.

* Witness, in correction, wishes to say forty miles.