

wages since the break, and we are no further ahead than we were then. We have at present stopped work, as the ground is all on the move and unsafe to work. We will not make a start again pending your reply, which we sincerely hope will be favourable.

We have, &c.,

JOHN MCLEAN AND SON,

Contractors, Makarau Contract, Helensville Northwards Railway.

C. R. Vickerman, Esq., Resident Engineer, Public Works, Auckland.

EXHIBIT No. 22.

MEMORANDUM for the ENGINEER-IN-CHIEF.

MAKARAU TUNNEL.—The contractors, Messrs. J. McLean and Son, have written to me asking my approval and consent to stop the driving of the tunnel for six or seven months, to enable the ground round the present "creep" to consolidate, and give them a chance to pick up the length that has caved in, as already reported. They have to fight a very bad pressure at present, as the water is more or less all through the material, and the pressure is very bad, both on top and at the sides. The material runs like porridge, and is certainly very bad indeed to contend with. It is not the top pressure, which is also very great, so much as the side pressure they complain of. In putting the drive in, they cannot (see "A" on the sketch) open the face to advance, as the stuff starts and runs and drives them out. This has occurred several times, and contractor has now come to the conclusion to try and let the ground settle. I do not quite agree with this, as the break in the ground up to the surface has cut all the water-leads, and the water will always come down here; and as long as the water gets at this material it will maintain this soft state. Probably by driving heavier slabs well ahead this might be stopped, but the contractor seems to have lost heart about it, and has written this letter, copy of which I attach. Overseer Witheridge does not seem to think there would be any improvement by waiting, and also thinks it can be done with heavier slabs. I attach a rough sketch. Contractors were increasing the size of the bottom-heading, and would then have to drive a top-heading on top of it.

I should be glad to see you, or be instructed what to do.

CHAS. R. VICKERMAN, Resident Engineer.

Public Works Office, Auckland, 5th June, 1893.

EXHIBIT No. 23.

MEMORANDUM for the ENGINEER-IN-CHIEF.

MAKARAU TUNNEL.—The contractors, J. McLean and Son, have not attempted to make a further start at this tunnel since you saw it early in the month of June. I forwarded a copy of their letter to you of the 2nd June, 1893, with my memorandum, 43/118, of the 5th June. The weather here still continues unusually wet, but, still, there is nothing to prevent the work going on. Do you wish me to take any further action in the matter?

CHAS. R. VICKERMAN, Resident Engineer.

Public Works Office, Auckland, 1st July, 1893.

EXHIBIT No. 24.

MEMORANDUM for the ENGINEER-IN-CHIEF.

MAKARAU TUNNEL.—In further connection with my memorandums of the 5th June and 1st July, I have to report that nothing has been done at the tunnel, which stands just as you saw it. I have not instructed contractors in the matter pending your reply.

CHAS. R. VICKERMAN, Resident Engineer.

Public Works Office, Auckland, 5th August, 1893.

EXHIBIT No. 25.

MEMORANDUM for the UNDER-SECRETARY for PUBLIC WORKS.

MAKARAU TUNNEL.—I feel sure that delay is endangering the chance of getting this tunnel put through. There is no doubt that the effect of the water and air is not improving the ground at the heading and shaft, and that steps ought to be taken at once to have the tunnel carried on for at least $1\frac{1}{2}$ chains. Contractors do not seem able to cope with the difficulty, and it would be advisable to have more experience and instruction as to what is considered the best way of excavating this class of ground. If you have an experienced tunnel hand in timbering and driving in what is more like porridge 110 ft. deep than anything else it would be well to have his opinion on it.

CHAS. R. VICKERMAN, Resident Engineer.

Public Works Office, Auckland, 27th January, 1894.

EXHIBIT No. 26.

MEMORANDUM for the UNDER-SECRETARY for PUBLIC WORKS.

MAKARAU TUNNEL.—Since writing to you memorandum No. 44/398, of the 27th January last, contractors have endeavoured to get a bottom heading driven through the creep. At first it seemed very bad, and a lot of water and slurry was met with; but as they have got a little further in, better