

TUNNEL.

14. A tunnel is to be excavated through the Chain Hill Range. Its lengths Tunnel. and levels are defined in Sheet 2 of the General Plan, and sections and dimensions and forms on Drawing No. 2.

The tunnel is all to be taken out to the section represented by the outside of Section. the brick lining, but the lining is only to be put in for 33 feet at each end, and 450 feet at such other places as the Engineer may consider unsafe. The excavation shall be taken out so that half of the section can be got clear on each side of the centre line; beyond this nothing is to be excavated except what is absolutely necessary for the security of the work.

Two recesses, 8 feet square and 4 feet deep, shall be made at intervals in the Recesses. side for the accommodation of workmen and tools.

A drain shall be carried down the centre of the tunnel as shown, and led to Drain. the formation ditches at end. It is to be covered with 4-inch rough blue stone or schist covers, 2 feet long, or a tile drain, 12 inches diameter, may be substituted.

The lining shall consist of 14-inch brick work set in Portland cement mortar. Lining. The longitudinal courses are to be laid perfectly straight, and parallel in every direction with the line and level of the tunnel. The sides shall be laid in English bond, and the arch turned in three rings with one key-brick the full depth of the point. All spaces between the outside of the lining and the excavation are to be filled up with stone shivers or shingle, firmly rammed in.

The tunnel fronts shall be constructed of masonry set in cement mortar. The Fronts. stone is to be of the best quality of Port Chalmers, Sawyers Bay, or blue stone, but the whole of each front must be of one material. The quoins, arch stones, and coping, shall be ashlar picked, dressed on beds, and joints, and rock faced with a chisel draft round the margin. In addition to which the quoins and arch stones are to be chamfered in front, as shown. The remainder of the front shall be substantial squared rubble work, well bonded together, levelled in regular courses not less than 9 inches thick, the beds and joints being pointed and keyed.

BRIDGES.

15. Bridges, as per Drawings, shall be erected under this Contract, as Bridges. follows:—

1. Abbot's Creek,	near $\frac{5}{63}$	1 span of 30 feet.
2. Creek,	„ $\frac{2}{31}$	2 spans of 13 „
3. Creek,	„ $\frac{1}{10}$	2 „ 13 „
4. Taieri River,	„ $\frac{13}{10}$	4 „ 80 „
5. Waiholā River,	„ $\frac{2}{11}$	5 „ 80 „
6. Coghill's Creek,	„ $\frac{2}{7}$	2 „ 13 „
7. Creek,	„ $\frac{2}{3}$	2 „ 13 „
8. Creek,	„ $\frac{2}{5}$	2 „ 13 „
9. Salmon Creek,	„ $\frac{2}{7}$	4 „ 13 „
10. Mill Level,	„ $\frac{2}{7}$	2 „ 13 „
11. Mill Level,	„ $\frac{2}{5}$	2 „ 13 „
12. North Tokomairiro River,	„ $\frac{2}{5}$	4 „ 13 „
13. South Tokomairiro River,	„ $\frac{2}{3}$	2 „ 30 „
and	6	„ 13 „

The excavations from the foundations of the Abbot's Creek Bridge shall be Excavations from foundations. carried down to the depths shown, or such additional depth as shall be necessary to insure a solid bearing for the structure; when the masonry is finished to the surface of the ground the trenches shall be filled in layers and well rammed.

The masonry shall be set in cement mortar throughout. The beds and joints Masonry. above ground are to be neatly pointed, and the tops of all walls shall receive a coat of cement plaster.

The piers of the Taieri and Waiholā Bridges shall consist of cast-iron cylinders Piers of Taieri and Waiholā Bridges. as shown on Drawing No. 4. The cylinders shall be cast in three segments for each ring; the metal in the cutting and tapering plates is to be $1\frac{1}{8}$ inch thick, and in all others 1 inch thick. The flanges shall all be $1\frac{1}{8}$ inch thick. All joints shall be turned or planed to a smooth surface, and shall be made air and water-tight before being erected.