

All joints, shoulders, and sides of tenons and scarfs to be worked perfectly true, and to fit accurately, and to be covered with red lead before being put together. Tenons generally to be 5 inches long, and to be draw-bored to receive trenails of hard wood made with hollow auger or trenailing machine. All trenails to be well seasoned and kept dry, and to be one-sixteenth of an inch more in diameter than the hole bored for them, and to be covered with red lead before being driven. All capsills and mudsills to be mortised on to posts or piles. All string pieces to be accurately notched down to capsills or floor beams by notching  $\frac{3}{4}$  inch from each, to be scribed and accurately fitted. Diagonal braces, where placed inside the panel, are to be notched together as described for string pieces. Joints.

All piles are to be rung before driving with a three inch by  $\frac{3}{4}$  inch round hoop. The piles are to be shod with a substantial iron shoe weighing not less than 30 lbs., securely fixed; the point of the pile to be cut true, and to be squared off at the end to 3 inches square, and to have true bearing against the shoe. No pile-driving is to be commenced at any bridge, opening, or other work without giving six days' notice previously to the Engineer in charge of the works. Piling.

The Contractor shall provide all proper rods and gauges for setting out and testing the dimensions of bridges and timber openings that the Engineer may require. Contractor to supply rods and gauges.

#### CULVERTS AND DRAINS.

11. Timber culverts shall be erected where shown on longitudinal section. Timber culverts.

The frames shall be accurately mortised, and tenoned, and pinned; the planking to be securely spiked on to the frames, the whole of the timber to be heart of totara or matai; the outer side of the planking need not be reduced to the dimensions given, but there must in every case be the full thickness specified of heart timber; the edges of the planking must fit truly for the whole thickness, and the planks must extend over at least two panels, and break joints as much as possible.

Sufficient catchwater and outfall drains are to be dug at culverts, and all stumps and roots occurring in the line of ditch to be taken out. Drains at culverts.

#### BALLASTING AND PERMANENT WAY.

12. The ballast is to consist of shingle, broken stones, or sand previously approved of, and is to be disposed as shown in Drawing No. 9. In all cases the embankments and cuttings are to be cleared from mud, and brought to an uniform formation level before the ballast is laid on. Ballast.

The permanent way is to consist of a single line of rails laid to a gauge of 3 feet 6 inches, and sidings provided and laid where directed, amounting in all to one mile of sidings. Permanent way.

The Contractor is to provide and have upon the ground at all points when the work is proceeding a sufficient supply of all such templates, tools, gauges, and other implements as are necessary and are usually required in the laying of permanent way, or as may be required by the Engineer. Gauges.

About three thirty-seconds of an inch of space is to be left between the ends of the rails when fixed in place, or such other space as the Engineer may direct, according to the season. Laying of permanent way.

For the curves, the rails will require bending. This, as well as the straightening of all bent rails, must be effected by a press, or by striking with wooden hand-beetles on wooden blocks. In all cases, whether of straightening of bent rails or of bending rails to the necessary curves, the rails must be set permanently to the form required before being laid, and no temporary bending, springing, or straightening, either by dragging with a lever and hook, or by any other means of a like character, will on any account be permitted. Bending rails.

Great care must be taken to lay all the sleepers square to the rails on straights, and as near as may be on curves. Where the line is straight, the rails will be level across the line; but where the line is curved, the rails will be canted, the difference of level between the two rails being such as the Engineer shall order. Laying sleepers.