

MATERIALS.

11. Except where otherwise specified, all the materials used under this contract shall be of the following kinds and descriptions :—

Concrete shall be composed of three parts, by measure, of broken stone, two parts of sharp sand, and one part of fresh Portland cement; or, two parts of broken stone, two parts of gravel, and one part of sand, and one part of fresh Portland cement. The stone may consist of scoria, volcanic rock, or hard sandstone, broken to $2\frac{1}{2}$ inch gauge. The cement shall be of approved brands, and subject to such tests as the Engineer may from time to time direct. The concrete shall be laid in 12-inch layers, and well rammed as the work progresses. Concrete.

Cement mortar shall consist of three parts, by measurement, of sharp clean sand, to one part of Portland cement. Cement mortar.

Lime mortar shall consist of two parts of sharp clean sand, to one part of lime, mixed and prepared as may be directed. Lime mortar.

Bricks shall be of the best quality of hard-burned kiln bricks, and approved by the Engineer. Brick work.

All masonry, except archwork, coping, and string courses, to be of rubble laid in cement mortar. Bond stones, 2 feet long, to be put in every square yard of both face and back of work. All spalls are to be set in mortar, and not laid dry, and afterwards grouted. Facework must have no stone containing less than one-quarter of a cubic foot. The work shall be grouted every foot in height; archwork shall be of brick, set in cement mortar; but where flat-bedded stone exists, approved by the Engineer, the Contractor may use it for arches, but he must in that case increase the thickness of the arches 25 per cent. beyond that shown on drawings. All wingwalls, parapets, and abutments shall be finished with a coping of brick on edge, one brick wide, set in cement. The coping is not generally shown on drawings. The whole of the masonry is to be neatly pointed. Masonry.

A layer of puddle, nine inches thick, to be put over the arches of culverts. Puddle.

All timber shall be of kauri or totara, or other timber specially approved; it shall be heart-wood, except as shown on Drawing No. 36, and shall be straight and sound, free from shakes, large knots, and other imperfections. Timber.

The whole of the straps and bolts shall be made of B.B. crown iron, or other iron of equal quality, of the dimensions shown; the whole to be finished and fixed in a workmanlike manner. Malleable iron.

Bolts shown or specified shall have a square head, of which the thickness shall be equal to the diameter of the bolt, and the width twice the diameter of the bolt. They are to be tapped with a good clean thread, and shall have a nut equal in size to the head of the bolt, and shall be provided with one or more washers 3 inches diameter. Bolts and nuts.

BRIDGES AND TIMBER OPENINGS.

12. Bridges, as per detail drawings, shall be erected where shown on longitudinal section. Bridges, &c.

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.