

shrinking of the material requires, to avoid as far as practicable the necessity for making subsequent additions either to the heights or widths of the embankments, to bring them to the correct levels and dimensions.

Whenever the foundation of an embankment is on sloping ground, the Contractor, if required, must at his own expense cut steps and benches under the base of the embankment.

The top of embankment at formation level is to be 10 feet wide; the slopes to be trimmed off to an inclination of one and a half horizontal to one vertical, and be maintained full and true until the completion of the contract.

Drainage not to be interrupted.

The Contractor shall, unless otherwise directed by the Engineer, take care not in any way to interfere with or divert the existing drainage areas, and shall leave such stops or stanks in the side cuttings, and take such other precautions, as the Engineer shall think necessary for that purpose.

Punning.

Behind and around culverts and abutments and wing walls, the embankments shall be wheeled in and carefully rammed to an extent not exceeding 10,000 cubic yards.

Rock embankment.

The rock embankment at Chain Hills shall be made to the form and dimensions shown in Drawing No. 1.

Embankments through swamps.

The materials for the embankments through the Taieri swamps is to be taken out along the line in the form of large ditches. Unless otherwise directed, each of these ditches is to be of a uniform width at bottom throughout its entire length, and with gradients as will be set out. The sides of the ditches shall be battered at the rate of three-quarters to one, and shall be neatly trimmed off from top to bottom. The minimum distance from the foot of the embankment to the ditch shall be 10 feet on the east and 20 feet on the west side. The Contractor will only be allowed to take two-thirds of the materials required in the embankment from the ditch on the east side.

Planting willows.

From $\frac{1}{2}$ miles to $\frac{3}{4}$ a row of willow cuttings or seedlings shall be planted on the west side of the line. The plants are not to be more than five feet apart.

RETAINING WALLS.

Retaining walls.

7. Retaining walls (the form shown on Drawing No. 1) shall be built on the outside of the embankments from $\frac{1}{2}$ to $\frac{3}{4}$; they shall be twenty-one inches broad at the top, vertical on the inside, and battered at the rate of a quarter to one on the outside. The formation shall be taken out to a uniform plan at right angles to the face of the wall, and the first course firmly bedded on the solid.

The masonry shall consist of substantial dry rubble work, to the satisfaction of the Engineer, well packed and bonded together with bond stones three feet long, where the thickness of the wall permits, to every superficial yard of face, and where the wall exceed five feet thick of back also.

Coping.

A rough coping of the dimensions shown is to be placed on the wall. It shall be constructed of thin stones set on edge and well pinned. The coping is to be laid in mortar composed of two parts of clean sharp sand, and one part of the best Provincial lime, mixed and prepared as shall be directed. The stones used for these walls shall be schist, blue stone, or other building stone of equal quality.

Contractor may dispense with retaining wall.

The Contractor will have the option of dispensing with the retaining wall, but should he do so the outside slopes of the rock embankment shall be flattened to $1\frac{1}{4}$ to 1, and he will be required to lengthen the culverts and drains at his own cost.

PITCHING.

Pitching.

8. The outer slopes of all embankments outside the water line from $\frac{1}{2}$ to $\frac{3}{4}$ shall be protected with pitching of blue stone, or other hard stone of equal quality, placed as shown on Drawing No. 1. The pitchers shall be at least 6 inches deep. The first row is to be laid one foot below the ground, the trench being carefully filled in and rammed when the stone work has reached the surface.

DITCHES AND DRAINS.

Ditches and drains.

9. Ditches for the accommodation of the various small creeks and other water-courses interfered with shall be cut in the positions shown in the general plan. They shall be at least 2 feet wide at bottom, 3 feet wide at top, and 2 feet deep,