

have been ascertained by surveys, but much remains to be done to ascertain the balance of the irrigable ground to Alexandra and Clyde, and in many cases trial distributaries must be run to ascertain what areas can be conveniently commanded.

Trial surveys have been made for a race from Chatto Creek to command Galloway Flat as far as the junction of the Manorburn with the Manuherikia.

A survey of a deviation of the Orlig race was made where this race interferes with the proposed irrigation race, but it may be possible to arrange for the two to be combined.

Some levels were taken in connection with a possible dam-site in the Manuherikia River below Lauder. The site appears very favourable, and there is another suitable site farther up. Contours will have to be taken to ascertain the amount of water that can be impounded with dams.

The approximate total length of surveys, longitudinal and cross sections, contours, traverses, distributary lines, &c., done during the year is 350 miles.

#### *Earnscliffe Flat.*

In connection with the irrigation of Earnscliffe Flat a suggested dam-site in the Fraser River was surveyed, but found to be of little value, the valley being steep and narrow, and requiring a long and high dam-wall.

#### *General.*

During the year the Department has had to oppose various applications for water which would, if granted, have been detrimental to the Department's interests. In all cases the applications were either refused or withdrawn.

#### SEACLIFF MENTAL HOSPITAL WATER-SUPPLY.

This work was completed during the year. It comprises a concrete dam in Waitiripaka Creek, over 7 miles of pipe-line, and a reinforced-concrete fire service taken at the Hospital, with the necessary piping and hydrants.

#### WAITATI MENTAL HOSPITAL.

A reservoir to hold 75,000 gallons of water has been excavated, and a drainage system, with septic tank, installed at this institution.

#### WAIHOU AND OHINEMURI RIVERS IMPROVEMENT.

*Ngararahi and Koutou Cuts.*—In July, 1913, the Ngararahi portion of this work was completed, and on the 22nd idem was discharging approximately 1,400 cubic feet per second. The excavation of the Koutou cut was completed in February, 1914. The Ngararahi cut is 62 chains long and 165 ft. wide, and the Koutou cut 9½ chains long and 225 ft. wide. Two flood-gates were constructed to drain adjacent land, and the whole of the canal reserve was fenced.

*Paeroa Stop-bank Contract.*—This work was completed in May, 1914. It comprises a substantial earthen bank, 53 chains long and from 10 ft. to 18 ft. wide on top, along the waterfront at Paeroa, and is intended to prevent the periodic overflow of the Ohinemuri River into Paeroa Township.

*Pereniki's Bend Cut and Lower Paeroa Stop-bank.*—Complete plans have been prepared in connection with this work. The length of cut proposed is 25 chains, and the width 100 ft. The construction of this work will greatly relieve the Ohinemuri River, and only extremely high floods could thereafter overtop its banks.

*Flood-gates.*—Flood-gates are being erected at Cassrell's drain and at Cooper's drain, the former being about finished.

*Willow-destruction.*—The destruction of willows along the Waihou and Ohinemuri Rivers has been continued, with highly beneficial results. The effects of floods are now lessened over many hundreds of acres, and farmers are extending their cultivation along the river-banks.

*Dredge.*—The suction dredge which is under construction at Port Chalmers is nearing completion. The pontoons for use in connection with the dredge are being constructed, six hulls being complete. A slipway is being constructed, under contract, for use of the dredge.

*Surveys.*—Extensive surveys have been carried out in accordance with the recommendations of the Commissioners, and part of the work has been plotted. Cross-sections are being taken from time to time to ascertain the extent of the silting going on in the rivers.

#### TRAMWAYS.

*Napier.*—The line was completed and opened for traffic on the 8th September, 1913.

*Wanganui.*—Plans have been received for the Aramoho and Wanganui East extensions, and in connection with the latter the rails have been laid across the new bridge at Dublin Street.

*New Plymouth.*—Plans of the proposed tramway have been submitted for approval.

*Wellington.*—The duplication of the Brooklyn line from Nairn Street to the top of the hill was completed.

Short extensions, with "balloon" loops, have been laid at Newtown and Lyall Bay.

Several new cars have been inspected and passed, also a number of "converted" cars.

*Dunedin.*—The duplications of the lines in North-east Valley and St. Kilda were finished and passed. Alternative lines for the Caversham duplication were examined, also suggested alterations to sharp curves to suit the proposed bogie cars.

New combination cars, Nos. 44 to 49, were tested and passed for traffic, and a number of cars "converted" to comply with the Tramways Amendment Act, 1913, have also been inspected.

*Christchurch.*—The removal of centre-poles on various routes is proceeding. Proposals to use electric power on the Burwood - New Brighton line were approved, and poles have been erected from Burwood to the Trotting Club grounds. The St. Martin's extension, 1 mile 64 chains in length, was