

constructed under the stop-bank to connect existing house-drainage, &c., to the river. The stop-bank and road-deviation over the Kauoiti Creek and the three-barrel flood-gates at 3 m. 70 ch. are completed. The removal of the houses that foul the stop-bank line is now in its final stages, only two structures remaining to be dealt with.

Rotokohu Outlet Drain.—This drain has been excavated from the temporary outlet into the Waihou River at Mill Road to the four-barrel flood-gate at 7 m. 45 ch. on Ohinemuri River (left bank). One of the small drag-lines excavated to 0 m. 70 ch., was then removed from the work, underwent overhaul, and was transferred to Tokatoka. The remainder of the work was completed by the dipper dredge in November last, and the by-pass at Mill Road filled in.

Ngahina Bridge.—The structure and approaches have been finally completed by the erection and metalling of the left-bank approach.

Ngahina Wharf.—This structure has received attention by the concreting of the loading-ramp, minor alterations to the shed, and the metalling of the approach road.

General.—Since the beginning of April last the progress of the work has been impeded by four floods. Not only has a certain amount of damage been incurred, but the high state of the rivers has for a time made working-conditions impossible. The opportunity presented by these floods has been grasped to collect a considerable amount of flood data bearing on the scheme.

MARINE.

LIGHTHOUSES.

Three Kings Islands.—In my last report I detailed the investigation which had been made in order to determine the best navigational aid to establish for or on these islands. Full estimates were made of the cost of erecting and equipping two lights, one at either end of the Big King, in order to reduce the blind sector which one light would produce over the Western King and the Princes Isles. Information was obtained regarding the very latest types of fog-signal suitable for this locality, and an estimate prepared for its installation in conjunction with the proposed lights. At the same time an examination was made as to the possibilities of a direction-finding station located at Cape Maria van Diemen or elsewhere. A number of tests were carried out by the Post and Telegraph Department, in collaboration with the officers of the "Tutanekai," with eminently satisfactory results, and these tests effectively demonstrated that the erection of a modern direction-finding station suitably placed in an accessible locality would enable mariners to locate their position accurately whatever the condition of the weather, and thus remove the menace of the Three Kings perhaps more effectively than could be done by means of the lights and fog-signal. It is proposed to carry out a further series of tests in the presence of representatives of the Shipmasters' Guild, and it is anticipated that these tests will demonstrate the advantages of the wireless direction-finder as an aid to navigation, and convince shipmasters of the correctness of the Department's contention that lights and a fog-signal on the Three Kings are not at present justifiable.

Tiritiri.—The apparatus has been ordered and is now to hand for the conversion of this light from a watched light to an automatic. The work of conversion will be put in hand shortly.

Oheua Island.—The erection of an automatic flashing light on a concrete base has been completed, and the light is now in operation.

Matakaoa Point.—Plans and estimates have been prepared and apparatus ordered for an automatic flashing light at this point. The light will be erected at a height of approximately 100 ft., and will have a range of 14 miles, and an arc of visibility of 199° 30'. This light will serve a twofold purpose. Owing to the shifting of the East Coast Lighthouse from the island to the mainland there is a small dark sector to the northward. The new light on Matakaoa Point will be of great assistance to shipmasters coming from the north for turning the Matakaoa Point before they come actually within the range of East Cape Light; secondly, it will act as a port light in connection with the new wharf now being constructed at Hicks Bay by the Hicks Bay Harbour Board.

Kaipara South Head Beacon.—A small automatic acetylene flashing light was installed at this beacon in place of the oil-burning lamps, which required an attendant. The new light is giving satisfactory service.

Somes Island.—This light was converted from a watched oil-burning to an unwatched automatic acetone-acetylene light with a very considerable amount of saving, and handed over to the Wellington Harbour Board.

Stephen Island Lighthouse.—The installation of two oil-engine hauling-winches to take the place of the original horse-operated whims has been completed.

Cape Foulwind.—Surveys have been made and plans prepared for the erection of a new lighthouse at this spot. The existing light-tower, which is of wood, is commencing to deteriorate, and a new concrete tower will be required. The new lighthouse will be an automatic one of the Dalen type, utilizing an incandescent acetylene burner with automatic mantle-exchanger. This is the latest development in the design of automatic lights for the higher-powered stations. No lighthouse-keepers will be required, and there will be a great saving in connection with fuel, as well as attendants, which will pay off the capital cost of the conversion within a very few years.

Chatham Islands.—It is proposed to erect a small electrically operated light on the wireless mast at the Chatham Islands. Details are being prepared and arrangements have been made with the Post and Telegraph Department to allow the use of their mast and electric supply. It is anticipated that this light will be of great assistance to vessels wishing to make Waitangi after nightfall. At present the shipmasters do not care to approach these islands in darkness, owing to the dangerous outlying reefs.