

increases in costs would be entailed, however, and, should settlers have to provide the funds for maintenance, it appears doubtful whether the comparative luxury of cleaning twice a year as against cleaning once each year can be afforded at present. Prices recently tendered for autumn cleaning on certain drains are not appreciably less than was previously paid. The work is lightened by spring cleaning, but it appears prices submitted by public tender are not proportionately reduced. 36 miles 65 chains of drain was cleaned in the late autumn of 1929, of which 7 miles 5 chains was cleaned again in the spring of 1930. Some 2 miles 40 chains of drain in the Tangonge basin was cleaned during the dry summer months, and the autumn cleaning for this season had been completed on 5 miles by the end of the period under review. 5 miles 12 chains of drain was widened and deepened, and 50 chains of new drain dug.

Stop-banks.—The maintenance of 13 miles of stop-bank and drain was carried out, and 35 flood-gate outlets kept in operation. 140 chains of bank thrown up by drag-line was hand-shaped and kikuyu-grass planted over a stretch of 80 chains. A 20-chain deviation of bank was constructed at Unahi to avoid encroachment, and 10 chains of new bank thrown up connecting Whangatane spillway bank and Kareponia Creek. Five flood-gate outlets and two open culverts were placed in position.

Summary of Work done.—Hereunder is a summary of the principal work carried out during the year: Drains cleaned, 39 miles 25 chains; drains widened and deepened, 5 miles 12 chains; new drains constructed, 60 chains. Stop-banks constructed, 30 chains; stop-banks raised and strengthened, 1 mile 60 chains; stop-banks maintained, 13 miles. Dredge cuts enlarged—20 ft. bottom to 50 ft. bottom, 2 miles 30 chains; 40 ft. bottom to 60 ft. bottom, 1 mile 24 chains. Levels taken, 8 miles. Traverses run, 2 miles. Flood-gates built, 5. Pile bridges erected, 7 (1, 120 ft.; 1, 95 ft.; 3, 100 ft.; 2, 110 ft.). Sill bridges erected, 2, 14 ft. Spoil excavated by dredges, 221,500 cubic yards.

Proposals for ensuing Year.—Excavation and bridging of the Whangatane spillway will be completed early in the year, and drag-lines employed on School Cut and enlargement of Kaitaia River from spillway intake up-stream. Twenty chains of stop-banking are still required along the Kareponia Creek, which will be enlarged in order to provide spoil for the above purpose. Ten flood-gates remain to be installed on the Whangatane spillway, and the filling of “munga” crossings, construction of drain behind bank to take surface water into the main channel, and certain work at the intake will complete work on this channel as planned. Work remaining for completion of the scheme as contemplated are the removal of willows from Kaitaia River, and improvement and extension of existing drains and stop-banks.

Works Expenditure.—The sum of £16,139 17s. 8d. was expended during the year, of which day labour absorbed £9,080 12s. 3d. Some thirteen piecework contracts were let, entailing an expenditure of £1,263 15s. 2d.

HIKURANGI DRAINAGE AREA (50,000 ACRES), WHANGAREI COUNTY.

Rainfall.—Almost continuous rainfall was experienced during the first nine months of the year, with two periods of heavy precipitation—viz., April and May. In April 7·98 in. of rain was recorded at Ruatangata, with 2·35 in. on the 5th April, 1929; whilst in May rain fell on twenty-three days for a total of 15·66 in. with a maximum of 4·32 in. on the 11th May, 1929. The total fall at Ruatangata for the year was 62·74 in., spread over 172 days. In the upper reaches of the Wairua catchment the rainfall for the year exceeded 80 in. A graph is attached showing rainfall and run-off data for the year.

Floods.—Fairly serious flooding of the main swamp area occurred following the heavy rainfalls of April and May, particularly during the latter month, when a maximum flood-height of 34 ft. was experienced at the Jordan Bridge, Wairua River.

Data.—Data for precipitation at various stations, gauging of run-off, water stage heights, &c., has been collected consistently throughout the year and graphically recorded herein.

Construction Work.—Construction work on the Wairua River and subsidiary channels with excavators, and hand-dug drain-outlets where desirable, have been carried on as expeditiously as general working-conditions allowed.

Excavator Work.

Wairua River.—Main Diversions.—These were practically completed last year, and the only work done this year was the construction of a ford-crossing for a settler (Mr. Worsnop) at the lower end of G-H diversion. A big slip at the mouth of D-E diversion still remains, but it now seems hardly necessary to remove same.

Main Diversion Spillways.—Work proceeded throughout the year on the long D-B spillway, which has been constructed on a bottom width of 35 ft., at a grade-level of 7·00 ft. This is now completed except for a 50 ft. length of soft country in which the shovel could not work, and some large stone that could not be placed in the dump-trucks for removal. This spillway should be completed before the winter. A total of 21,088 cubic yards of rock was excavated at a total cost of £8,715 2s. 11d., or at the rate of 8s. 3·2d. per cubic yard.

River Bars.—Improvement to the river at 1 m. 14 ch. was carried out by the removal of stone by the drag-line and the cost of shifting 1,100 cubic yards was at the rate of 3s. 7·7d. per cubic yard.

River-improvement.—From 6 m. 40 ch. to 4 m. 50 ch. the river has been improved by the removal of timber, rock, and silt bars, the work proceeding continuously down-stream. Neglecting the timber removed, a total yardage of 38,500 cubic yards—of which 7,500 cubic yards would be rubble and rock—has been shifted at a total cost of £1,925 11s. 2d., or at a rate of 1s. per cubic yard. On the left bank, from 9 m. 50 ch. to 10 m. 25 ch., the work of removing timber, battering back of bank, to at least a 2-to-1 batter, and easing bad bends was carried out with the drag-line. The actual yardage of spoil moved was 10,000 cubic yards, at a total cost of £366 19s. 6d., making the cost of excavation at the rate of 7·65d. per cubic yard.