

1920.
NEW ZEALAND.

DEPARTMENT OF LANDS AND SURVEY:

DRAINAGE OPERATIONS IN HAURAKI PLAINS.

REPORT FOR THE YEAR ENDED 31st MARCH, 1920, TOGETHER WITH STATEMENT
OF ACCOUNTS.

Presented to both Houses of the General Assembly pursuant to Section 10 of the Hauraki Plains Act, 1908.

Sir,—

Department of Lands and Survey, Wellington, 7th July, 1920.

I have the honour to submit herewith the report on the drainage operations in the Hauraki Plains for the past year, in accordance with the provisions of the Hauraki Plains Act, 1908.

The total area thrown open for selection to date is 40,391 acres, valued at £281,950. It is hoped to increase these figures at an early date.

The total expenditure under the Act has now been as follows:—

				£	s.	d.
For the year ended 31st March, 1908	...	...	...	5,070	0	0
„ 1909	...	...	...	11,672	5	6
„ 1910	...	...	...	22,235	2	11
„ 1911	...	...	...	32,103	14	0
„ 1912	...	...	...	40,084	13	1
„ 1913	...	...	...	26,608	1	3
„ 1914	...	...	...	21,467	18	2
„ 1915	...	...	...	20,399	10	4
„ 1916	...	...	...	18,331	10	10
„ 1917	...	...	...	18,405	17	10
„ 1918	...	...	...	26,588	19	7
„ 1919	...	...	...	31,575	11	8
„ 1920	...	...	...	74,805	12	4
Total	...	...	...	£349,348	17	6

The detailed report of the Chief Drainage Engineer is attached, together with a statement of accounts and balance-sheet.

I have, &c.,

T. N. BRODRICK, Under-Secretary.

The Hon. D. H. Guthrie, Minister of Lands.

REPORT OF CHIEF DRAINAGE ENGINEER.

Sir,—

I have the honour to submit the annual report on the drainage operations carried out on the Hauraki Plains for the year ended 31st March, 1920.

The concluding year has been generally a most successful season on the plains. Many outside and experienced dairy-farmers have been induced by the exceptional quality of the land to buy farms on the plains, and in consequence a phenomenal advance in the price thereof has been experienced. Recent sales in the central district have recorded up to £115 per acre for improved farms, while in the Tahuna-Patetonga peat country £45 to £65 per acre has been realized.

The effect of these prices will be that closer settlement and more thorough cultivation will be necessary, which should result in a very rapid increase in the productive value of the plains. The value of the stock sold at Ngatea, Patetonga, and Waitakaruru saleyards for the concluding

year amounts to £102,316, which shows an increase of £30,876 on last year's sales. A great deal of stock is also sent by road to the outside freezing-works, and saleyards are also operating at Turua and Hikutaia.

The increased trade to the plains is evidenced by the fact that there are now two steamers running two return trips per week from Auckland to Kerepeehi, in place of one as formerly. The amount of tonnage carried on the river by steamers trading direct to Auckland amounted to approximately 5,719 tons, and in addition some 2,500 tons of cargo was handled by the launches running between Thames and the plains. Every effort is being made to hasten development, and my visit to America for the purpose of purchasing further plant should result in the acquisition of the most modern types of excavators, thus hastening development of waste lands.

The butter-output was valued at £83,850, and the cheese-output at £29,950.

AWAITI DISTRICT.

During the year this district has advanced considerably, and the work completed has resulted in not only the efficient working of the drainage system, but the road access has been considerably improved.

The Pukahu Road—from the Awaitei-Netherton Road to Waihou River stop-bank—was formed for the total distance of 125 chains. A new 8 by 4 by 6 drain was constructed along the south side of this road from the Waitoa stop-bank to the Hauraki Plains boundary, a distance of 90 chains; while on the north side a 4 by 3 by 2 drain was constructed for the whole length of 135 chains. This road allows of much quicker access to Paeroa for settlers on the Awaitei Block.

The main Awaitei-Netherton Road was re-formed, stumped, and graded, and after many efforts a supply of metal was obtained for same. To date 1,182 cubic yards of metal have been put down for a distance of 49 chains. This work will be continued, and the metalling of the whole length of road should be completed towards the end of the coming year.

A new drain was constructed along the northern boundary of the block from the Awaitei-Netherton Road to the Awaitei Stream, a distance of 147 chains; while new drains from the western boundary of the block were opened up to the Awaitei Stream at West Road (north and south sides) and Pukahu Road (north side). The Awaitei-Netherton Road drains were deepened to new grades, and all other drains in the area kept in a good state of efficiency. Two 2 ft. Monier culverts were also constructed.

TAHUNA DISTRICT.

The work during the year has been principally the maintenance of existing drains and the repairing and re-forming of roads. Three old sill bridges were removed and replaced with concrete culverts. The difficulty of obtaining labour has prevented the carrying-out of the road-improvement on a sufficiently large scale, but arrangements have now been made for a large contract plant to undertake same. Another contract which has been arranged is for the widening and deepening of the Whakahoro Road drain from the Piako River to the No. 7 Road. This drain will be considerably deepened, and when completed will cut off from the Tahuna area the water that comes down from the Waitoa district, and which previously hampered to a certain extent the drainage operations within this area.

PATETONGA DISTRICT.

The principal feature in connection with the work in this district was the opening by ballot, for returned soldiers, of twenty-four sections ranging in size from 62 acres to 175 acres and a total area of 2,526 acres. This country consists of a good loamy peat on clay, and on the very reasonable rentals at which they were opened the successful settlers should have a prosperous future. It was necessary to construct thirteen miles of new drains in addition to two and a quarter miles of new road-formation in connection with the opening-up of these sections.

Very good progress has been made with the construction of the Ngarua Road from the metalled portion near the flax-mill towards the canal leading from the Piako River. This work was commenced last year, and work has been continuous on same with the exception of about three months in the winter, when work had to cease. Altogether 9,199 cubic yards of spoil was carted for this road during the year, making the total distance completed 220 chains. This road, with the exception of a few chains, is now linked up with the stop-bank road along the Ngarua Canal, providing access for motors, &c., to the Patetonga district from the northern portion of the plains. Although a liberal thickness of clay has been laid down, it will be necessary to further increase this owing to the consolidation of the peat. The Patetonga South Road has received like attention, 11,345 cubic yards of clay having been put on. This road was originally formed very narrow, and has been widened to a minimum width of 18 ft., while the crown of the road has been built up several feet in height.

The Mangawhero Road has been pushed on with, some 3,399 cubic yards having been carted for same, a distance of 50 chains being completed for the year. A considerable amount of shingle has been lifted from the creeks and drains and placed on adjacent roads. Most of the above work has been carried out by contract, while the day-labour men have been engaged on the construction of new drains, and deepening and cleaning of the existing ones.

The Patetonga tram-line has been in course of reconstruction, but this work was considerably delayed owing to inability to procure materials. An oil-engine was procured for this line, and a passenger-car and goods-truck built for same.

Several concrete culverts were installed, in addition to a large bridge culvert which replaced the old wooden bridge over Patetonga Stream near the flax-mill. A new hardwood bridge was also constructed over the Waikaka outlet on the Patetonga South Road.

CENTRAL DISTRICT.

An exceptionally large amount of new work has been completed in this district. Five sections were opened to returned soldiers by ballot—a total area of 1,414 acres; while a considerable amount of preparatory work in the shape of new drains, &c., was done, which will shortly result in the opening-up of further areas for soldiers.

The central area having a large amount of already settled land, the maintenance of the existing works has been a heavy item, but, fortunately, enough labour was on hand to cope with same.

As will be seen by detailed statement, the renewal of the old wooden flood-gates in reinforced concrete has been steadily pushed on. Building-work has also been extensively carried on, and several new wharves, staff quarters and huts, storage-sheds, &c., have been erected.

The work on the roads has been advanced by the acquisition of two hauling tractors, while a "White-Good road tractor" is on order. Metalling was carried out at several landings, details of which are shown hereafter. The grading, rolling, and repairing of roads was kept well up to the mark, and this district is now in a good state of efficiency generally.

The manufacture of Monier reinforced-concrete pipes has been continued at Hopai with very satisfactory results, the pipes being made in sizes ranging from 18 in. to 36 in. in diameter.

The blacksmith and shoeing shop at Hopai has seen a very busy year, and has been fitted up with several new machines and an engine, which has greatly increased the scope of work.

WAITAKARURU DISTRICT.

There has been a very large expenditure in this block for the year, mainly in connection with the preparation of areas for discharged soldiers. In Block IV, Piako Survey District, thirty sections are now ready for ballot, ranging in size from 70 to 110 acres, of a total area of 2,944 acres.

The Ngarua 5A Block, which was acquired from the Natives, has also been prepared for settlement, there being nine sections, of an average of 77 acres, and aggregating 698 acres. Several reinforced-concrete culverts and tide-gates have been installed, some being of large size.

A contract was let for the construction of the unfinished portion of the deviation road through McDonald's property at Torehape, and 19 chains has been completed to date.

The construction of the Puketotara Road deviation was undertaken and is now completed. This road forms a short-cut from the Waitakaruru-Maramarua Road to the junction of North, South, and Cross Roads. Two bridges were erected on same in addition to pipe culverts. The grades on the hill portions of the Maramarua Road were also reduced. New double drains were constructed across the unopened peat country to the Waitakaruru-Maukoro Canal from the western end of Rawerawe and Ngatea West Roads, which will greatly facilitate the opening-up of this large peat area.

The maintenance work in connection with the roads and drains has been kept well in hand.

PRIESTMAN DREDGES.

The No. 1 dredge has continued the canal from the Piako River junction along the Waitoa River, the distance completed for the year being 34 chains, making a total length of 167 chains. This dredge has not had a very successful year. Some trouble was experienced in procuring a suitable dredgemaster, and, owing to the difficult nature of the country passed through, progress was slow, while the amount of delays owing to breakdowns was much above the average. The dredge has also been taking a full cut practically for the whole distance. The progress at the present time is, however, very satisfactory, and the next year should show a marked improvement. The work ahead will allow of more of the Waitoa Stream being utilized in the canal and thus quicken up the work considerably. The portion of the canal already completed has had a very appreciable effect on the discharge of flood-waters in this district.

The No. 2 dredge has been employed on the continuation of the Waitakaruru Canal, and for the year has completed 56 chains. This completes the canal, and the dredge will now work back on line, removing a few slips, &c. The total length of the canal is 2 miles 37 chains. Several heavy freshes occurred during the course of this work, causing damage to the holding-dams and slowing up work to some extent. It is expected to have this dredge employed on the continuation of Waitakaruru-Maukoro Canal by next June, unless the overhaul, which is necessary, proves a larger job than anticipated.

The No. 6 dredge which was constructing the Awaiti Canal from the junction at Kerepechi proved incapable of carrying on without considerable repairs being effected and overhauling generally. This work occupied some months, owing to scarcity of materials. A change was made in the dredgemaster, and the dredge is now doing excellent work. The distance dredged for the year was 31 chains, making a total of 37 chains. It must be remembered, however, that the dredge has only been in good working-order for a portion of the year.

The following table shows the amount of spoil dredged and cost per cubic yard for the past eight years:—

					Cubic Yards.	Cost per Cubic Yard.
1912-13	...	...	...	...	131,902	3·25d.
1913-14	...	...	...	...	147,740	3·20d.
1914-15	...	...	...	...	176,196	2·67d.
1915-16	...	...	...	...	146,905	3·35d.
1916-17	...	...	...	...	161,674	3·40d.
1917-18	...	...	...	...	130,664	2·53d.
1918-19	...	...	...	...	125,196	4·87d.
1919-20	...	...	...	...	138,310	6·90d.

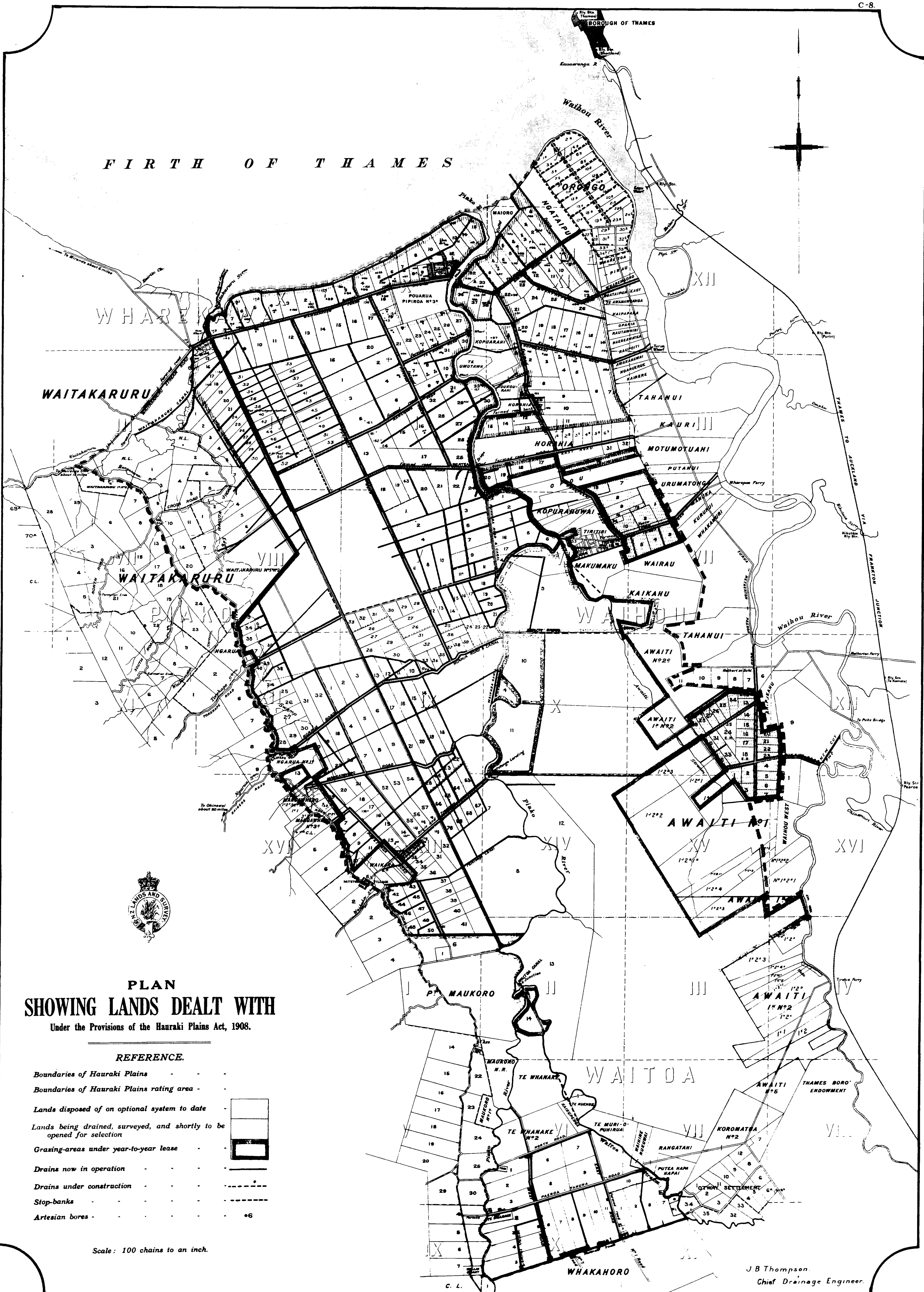
This apparently large increase in cost is attributable to increased price of materials, wages, &c., and also this year 5 per cent. has been allowed on cost of dredges for depreciation.

WORKS PERFORMED DURING THE YEAR.

Drains.									
By piecework contract :—						M.	ch.	M.	ch.
Cleaning drains	...	...	...	...	...	101	6		
Widening and deepening	...	...	...	...	...	47	34		
Constructing new drains	...	...	...	...	...	59	0		
						<hr/>		207	40
By day labour :—									
Cleaning drains	...	...	...	...	...	104	26		
Widening and deepening	...	...	...	...	...	56	32		
Constructing new drains	...	...	...	...	...	20	25		
						<hr/>		181	3
Roads.									
By piecework contract and day labour :—									
Carting spoil and forming roads (33,954 cubic yards)	...	...	...	...	...	4	10		
New roads formed (graded)	...	...	...	...	...	5	8		
Grading roads	...	...	...	...	...	11	60		
Gravelling roads	...	...	...	...	...	0	16		
Regravelling roads	...	...	...	...	...	1	10		
Metalling roads	...	...	...	...	...	4	18		
Disking roads	...	...	...	...	...	7	20		
Erecting fences	...	...	...	...	...	2	1		
						<hr/>		35	63
Stop-banks.									
New stop-banks	...	...	...	...	...	1	74		
Repairs to stop-banks	...	...	...	...	...	2	55	4	49
						<hr/>			
Total distance covered								428	75
Fascines procured, 7,440 bundles; sleepers, 3,700.									
Metal-supply.									
Metal procured by Department's plant from Kauaeranga									Cubic Yards.
Metal supplied by scows									2,449
									5,229
Total									7,678
Dredges.									
Spoil excavated by No. 1 dredge									Cubic Yards.
,, No. 2 „									33,251
,, No. 6 „									74,915
									30,144
Total									138,310
Reinforced-concrete Flood-gates and Culverts.									
FLOOD-GATES.									
Size.					Number.	Length.			
5 ft. by 4 ft. 6 in.	..	..	..	..	1	Gate and wing walls.			
4 ft. 6 in. by 4 ft. 6 in.	..	..	..	..	2	32 ft.			
4 ft. 6 in. by 4 ft.	..	..	..	..	1	30 ft.			
3 ft. diameter (Monier pipes)	..	..	..	..	5	204 ft.			
1 ft. 6 in. diameter (Monier pipes)	..	..	..	..	1	24 ft.			
					<hr/>	<hr/>			
					10	290 ft.			
ROAD-CULVERTS.									
9 ft. by 7 ft. 6 in.	..	..	..	..	1	27 ft.			
6 ft. by 4 ft. 6 in.	..	..	..	..	1	26 ft.			
5 ft. by 4 ft.	..	..	..	..	3	94 ft.			
4 ft. 6 in. by 4 ft.	..	..	..	..	2	58 ft.			
4 ft. square	..	..	..	..	1	25 ft.			
3 ft. diameter (Monier pipes)	..	..	..	..	12	344 ft.			
2 ft. 6 in. diameter (Monier pipes)	..	..	..	..	8	230 ft.			
2 ft.	..	..	..	..	9	288 ft.			
1 ft. 6 in.	..	..	..	..	2	124 ft.			
					<hr/>	<hr/>			
					39	1,216 ft.			
EARTHENWARE CULVERTS.									
1 ft. 3 in. diameter	..	..	..	..	1	10 ft.			
9 in. diameter	..	..	..	..	1	50 ft.			
					<hr/>	<hr/>			
					2	60 ft.			
					<hr/>	<hr/>			
Grand total					51	1,566 ft.			

All of the above work was carried out by day labour. The total number of concrete flood-gates is now eighteen, and road-culverts sixty-six, the total length being 2,722 lineal feet.

FIRTH OF THAMES



METALLING ROADS.

The quantity of metal received during the year shows an increase of about 1,000 cubic yards over last year's figures. The several lengths of road metalled amount to 4 miles 18 chains, and with 21 chains gravelled makes a total of 40 miles 25 chains of metalled, gravelled, or shelled roads to date. About one mile of old work has been regravelled.

The following is a schedule of roads metalled during the year:—

	M.	ch.
Pipiroa-Waitakaruru Road	2	57
Horahia Road	0	48
Netherton-Awaiti Road	0	49
Kerepeehi-Wharepoa Road	0	24
Total	4	18

The coming year's operations will be as follows: Horahia Road (continuation), Netherton-Awaiti Road (continuation), Waitakaruru-Pipiroa Road (continuation), Kerepeehi Road, Stop-bank Road, Ngatea.

ARTESIAN BORING PLANT.

The number of bores sunk during the year was twenty-three, making a total of 165 put down to date. The value of the year's operations was £718 11s., giving a total expenditure to date of £4,366 5s. 6d., practically the whole of which amount is recoverable, some £573 2s. 6d. being received by the Receiver of Land Revenue during the year. A schedule of bores sunk during the year is attached hereto.

FLOATING PLANT.

This plant remains practically the same as formerly with the exception of one large pontoon which was dismantled as being beyond repair. One coal-pontoon for dredge was built at the carpenter's shop. The list of plant now stands at three large, one medium size, and three small pontoons, in addition to one steamer and six oil-launches.

BUILDINGS.

During the year the following wharves and buildings have been erected: Launch and steamer wharf, 17 ft. by 70 ft., with 30 ft. by 40 ft. shed, and concrete water-tank of 4,500 gallons capacity, at Kerepeehi; wharf, 50 ft. by 10 ft., and shed, 30 ft. by 20 ft., at Ngarua; and wharf, 20 ft. by 10 ft., with shed, 10 ft. by 8 ft., at Puhanga Canal. In addition cottages of five rooms and four rooms respectively were erected at Kerepeehi, one cottage of four rooms at Ngatea, one hut of two rooms each at Hopai and Patetonga, and one hut, 12 ft. by 10 ft., at Patetonga Wharf; also one concrete-and-iron feed-shed at Ngatea, one blacksmith's shop at Waitakaruru, and one tool-shed at Kauaeranga.

A considerable amount of general repair work and painting has been done in connection with buildings.

The number of buildings, excluding wharf-sheds, is now—Houses and small cottages, 13; double huts, 16; single huts, 19; sheds, &c., 17; total, 65.

WHARVES.

The number of wharves now in existence is fifteen, while a new wharf, 12 ft. by 50 ft., with shed, 24 ft. by 18 ft., is in course of construction at Ngatea (western side).

DRAINS IN OPERATION.

The length of new drains constructed for the year is 79 miles 25 chains, which shows a very large increase and brings the total of drains constructed on the Hauraki Plains to 443 miles 64 chains.

FORMED ROADS.

New road formation during the year comprised 9 miles 18 chains, but a large amount of work was done in grading and re-forming existing roads, some 11 miles 60 chains being so treated. In addition, 7 miles 20 chains of road was disked and 2 miles 1 chain of road-line fenced.

FLAX LEASES.

The total revenue received during the year was £447 4s. 7d. Areas have now been surveyed in order to allow millers specified areas on which to work.

WORKS EXPENDITURE FOR THE YEAR.

The total amount expended during the year, including wages, supplies, repairs, &c., amounted to £68,859 12s. 8d. The sum of £81,257 19s. 10d. was paid out of local imprest in payment of Hauraki Plains expenditure and the special votes for maintenance and metalling. Day labour absorbed £26,246 9s. 11d., piecework contracts £22,599 16s. 8d., and team hire £523 8s. 2d.

VALUATIONS.

The total area to date thrown open for selection is 40,391 acres, valued at £281,950. The land to be opened in the near future will show an increase on these figures.

AREA THROWN OPEN DURING YEAR.

Some twenty-nine sections, comprising a total area of 2,940 acres, and valued at £52,290, were thrown open and selected by discharged soldiers.

It is expected that some seventy-one sections, totalling 5,300 acres, will be available from time to time during the coming financial year. In addition some twenty-nine sections, totalling 25 acres, will be auctioned in Kerepechi Township Extension. Development is being steadily carried on, and it should be noted that the class of country being dealt with is very difficult. Subsidence takes place, and outfalls have to be deepened accordingly.

PRINCIPAL WORKS PROPOSED.

The principal works (apart from road-metalling) to be carried out in the future are as follows:—

- (1.) Continuation of Waitoa River dredging.
- (2.) Continuation of Waitakaruru-Maukoro Canal.
- (3.) Continuation of Awaiti Canal.
- (4.) Establishment of works depot, Ongarehu Block, Kerepechi.
- (5.) New areas for settlement.
- (6.) Concrete bridges, flood-gates, and culverts.
- (7.) New wharves and repairs to existing ones.
- (8.) General development work.

GENERAL.

The books in connection with the works are kept in Auckland, where vouchers for wages, contracts, supplies, and general purposes are prepared.

The officer in local charge is Mr. R. S. Logan, Land Drainage Engineer, and I have again to commend him on having so capably carried out the supervision of operations and development work.

I have, &c.,

J. B. THOMPSON,

Chief Drainage Engineer.

The Under-Secretary for Lands, Wellington.

SCHEDULE OF ARTESIAN BORES SUNK DURING YEAR, 1919-20.

Artesian Bore No.	Section.	Block.	Survey District.	Total Depth. (Feet.)	Running Flow. (Gallons per Hour.)
143	Government Reserve	Waitakaruru	.. ..	322	200
144	14	IV	Piako	304	90
145	19	X	Thames	286	400
146	7	X	Wharekawa	298	900
147	6	X	"	306	200
148	5	X	"	367	60
149	17	IV	Piako	393	40
150	17	IV	"	187	900
151	Near Kerepechi Wharf	..	"	177	900
152	"	..	"	247	300
153	"	..	"	396	Flow by pumping.
154	19	X	Thames	335	600
155	19	X	"	92	400, by pumping.
156*	17	X	"	303	1,000
157	33	I	"	306	No flow.
158	4	X	"	300	1,200
159	1	X	Wharekawa	250	600
160	2	X	"	266	130
161	14	I	Waihou	231	400
162	14	I	"	332	No flow.
163	5	I	"	231	200
164	2	I	"	214	600
165	33	I	"	214	200

* Road corner.

