

CEYLON.



ADMINISTRATION REPORTS, 1916.

PART V.—PUBLIC WORKS.

PUBLIC WORKS DEPARTMENT.

REPORT OF THE HON. MR. T. H. CHAPMAN, M.I.C.E.,
Director of Public Works.

PART V.—PUBLIC WORKS.

PUBLIC WORKS DEPARTMENT.

REPORT OF THE DIRECTOR OF PUBLIC WORKS FOR 1916.

I HAVE the honour to submit the following report on the operations of the Public Works Department during the year 1916.

EXPENDITURE.

2. The amounts expended under the respective heads of the Supply Bill for the financial period October 1, 1915, to September 30, 1916, are as follows :—

	Rs.	c.
Personal Emoluments (inclusive of Clerical Service) ..	865,864	96
Other Charges (inclusive of stationery, &c.) ..	126,852	54
Public Works Recurrent (inclusive of days' labour) ..	3,942,348	53
Public Works Extraordinary ..	4,529,856	0
Other Departmental Votes, &c. ..	332,749	95
Total ..	9,797,671	98

3. For purposes of comparison the following tabular statement of expenditure for the last twenty-one years is submitted :—

Year.	Recurrent.		Extraordinary.		Miscellaneous, including Loans, &c.	Total.
	Rs.		Rs.		Rs.	Rs.
1895 ..	1,756,001	..	1,286,889	..	—	3,042,890
1896 ..	1,823,558	..	1,219,106	..	—	3,042,664
1897 ..	1,726,669	..	1,838,650	..	—	3,565,319
1898 ..	1,900,307	..	1,510,143	..	369,324	3,779,774
1899 ..	2,040,684	..	1,707,119	..	1,250,125	4,997,928
1900 ..	2,029,279	..	1,610,261	..	1,074,665	4,714,205
1901 ..	2,112,905	..	1,348,032	..	666,028	4,126,965
1902 ..	2,163,394	..	1,448,491	..	572,143	4,184,028
1903 ..	2,240,086	..	1,339,699	..	1,275,968	4,855,753
1904 ..	2,286,812	..	1,858,657	..	619,275	4,764,744
1905 ..	2,324,805	..	1,595,612	..	370,431	4,290,848
1906 ..	2,582,398	..	1,901,588	..	133,083	4,617,069
1907 ..	2,648,741	..	1,929,416	..	227,081	4,805,238
1908 ..	2,684,811	..	1,781,145	..	1,080,706	5,546,662
1909 ..	2,796,779	..	1,637,134	..	1,203,400	5,637,313
1910-11 ..	4,511,611	..	2,313,423	..	3,048,443	9,873,477
(18 months)						
1911-12 ..	3,211,341	..	2,017,577	..	2,022,372	7,251,290
1912-13 ..	3,406,677	..	2,368,184	..	2,471,462	8,216,323
1913-14 ..	4,620,749	..	6,774,607	..	2,090,160	13,485,516
(15 months)						
1914-15 ..	2,746,540	..	2,693,826	..	1,624,499	7,064,865
1915-16 ..	3,942,348	..	4,529,856	..	332,750	8,804,954

4. The total expenditure in the several Provinces was as follows :—

Province.	Public Works Annually Recurrent.		Public Works Extraordinary, including other Departmental Works.		Total.	
	Rs.	c.	Rs.	c.	Rs.	c.
Western ..	1,080,287	63	2,851,639	68	3,931,927	31
Central, North ..	354,362	55	101,694	41	456,056	96
Central, South ..	331,435	47	138,337	49	469,772	96
Southern ..	317,623	91	196,545	20	514,169	11
Northern ..	256,659	54	628,594	47	885,254	1
Eastern ..	260,951	1	85,232	69	346,183	70
North-Western ..	431,648	32	349,690	83	781,339	15
North-Central ..	187,877	53	33,515	18	221,392	71
Uva ..	367,372	81	197,907	20	565,280	1
Sabaragamuwa ..	354,129	76	279,448	80	633,578	56
	3,942,348	53	4,862,605	95	8,804,954	48
			Establishment ..		865,864	96
			Other Charges ..		126,852	54
			Total ..		9,797,671	98

Expenditure incurred at the Government Factory and on the Colombo Lake Development Scheme is included in that of the Western Province, and expenditure in connection with the Cooly Immigration Camp, Mandapam, in that of the Northern Province.

5. The expenditure in the Provinces under the different sub-heads of the Annual Estimates, excluding Personal Emoluments and Other Charges, is shown in tabular form on page 3.

MAINTENANCE OF ROADS.

6. The roads of the Colony are classified as metalled, track metalled, gravelled, and natural. The total length maintained during the year is as follows :—

Province.	Metalled. Miles.	Track Metalled. Miles.	Gravelled. Miles.	Natural. Miles.	Total. Miles.
Western ..	408·51	6·00	11·90	—	426·41
Central, North ..	280·06	—	51·97	30·75	362·78
Central, South ..	341·45	—	4·49	25·63	371·57
Southern ..	300·35	—	23·99	—	324·34
Northern ..	274·72	102·08	67·67	69·81	514·28
Eastern ..	104·92	159·75	82·73	26·50	373·90
North-Western ..	335·60	55·75	110·37	29·00	530·72
North-Central ..	138·38	133·00	55·34	—	326·72
Uva ..	315·18	—	31·32	80·39	426·89
Sabaragamuwa ..	323·99	1·65	25·96	17·00	368·60
Total ..	2,823·16	458·23	465·74	279·08	4,026·21

7. The total mileage is in excess of that of last year by 22·91 miles, due to the addition of 16·41 miles of new road and 6·50 miles of minor road taken over for improvement and maintenance.

8. The average cost of road maintenance per mile in the several Provinces is as follows :—

Province.	Metalled.		Track Metalled.		Gravelled.		Natural.		General Average.	
	Rs.	c.	Rs.	c.	Rs.	c.	Rs.	c.	Rs.	c.
Western ..	1,296	92	766	18	489	25	—	—	1,190	27
Central, North ..	1,001	8	—	—	295	13	68	35	820	88
Central, South ..	727	62	—	—	163	71	49	20	674	1
Southern ..	924	94	—	—	330	9	—	—	879	60
Northern ..	443	89	527	81	307	8	41	69	387	95
Eastern ..	920	4	560	70	351	85	54	77	579	47
North-Western ..	856	0	768	17	350	52	12	71	695	57
North-Central ..	567	95	626	99	213	98	—	—	534	91
Uva ..	977	36	—	—	472	71	87	81	772	82
Sabaragamuwa ..	972	96	722	93	359	4	125	82	889	53
General Average ..	889	32	601	13	333	95	61	96	734	93

9. The following is a comparison of the general average cost of road maintenance per mile for all classes of roads for the years 1913-14, 1914-15, and 1915-16 :—

Province.	1913-14.			1914-15.			1915-16.		
	Cost per Mile.			Cost per Mile.			Cost per Mile.		
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Western ..	1,030	876	1,190	704	821	821	518	407	535
Central, North ..	660	588	674	704	821	821	711	606	773
Central, South ..									
Southern ..									
Northern ..	682	635	880	588	674	674	774	678	890
Eastern ..	318	269	388	588	674	674	774	678	890
North-Western ..	507	466	579	588	674	674	774	678	890
General Average ..	580	505	696	642	564	735	642	564	735

10. With certain exceptions, the roads of the Colony have, on the whole, been maintained in a reasonably satisfactory condition and state of repair, but the traffic conditions now obtaining demand a more liberal expenditure on the main thoroughfares generally. The failure of the north-east monsoon in 1915 and the severe drought in the early months of 1916 were followed by heavy rains and floods throughout the seaboard, from Chilaw to Matara, in May. Much damage was done to bridges, culverts, and embankments, as well as to road surfaces. In the Chilaw, Negombo, Colombo, and Kalutara Districts the roads were cut up badly under traffic, as the result of the saturated condition of the soil underlying the metalled crust, which in many cases is very thin and without foundation of any sort. Extra supplies of metal were hurried out and road surfaces put into passable condition as quickly as possible, but a recurrence of this state of affairs will be always probable under like conditions, and particularly so as the traffic is rapidly increasing on most of these roads with the development of the country under coconuts and rubber. Most of the roads in the above-named districts were poorly constructed at the start, and have gradually evolved in the course of years to the status of metalled roads, without sufficient attention being paid or money spent to render them suitable for the traffic they have now to carry. The only cure is to widen these roads and foundation and metal them thoroughly, an awkward and expensive undertaking in the face of heavy traffic, but one which must be faced.

11. The difficulty of supplying metal to the roads in the Chilaw District, where the local quarries are practically exhausted, has been partially met once more by transport from Ragama by rail, the necessary metal being provided from the Railway quarry there through the courtesy of the General Manager and the Chief Construction Engineer, Railway Extensions. To put this supply on a satisfactory footing, 20 special wagons have been built and supplied to this Department during the year under review, and land for a large quarry and railway connection thereto acquired at Mahara. Arrangements for this rail connection are now in hand, and depôts and sidings at stations on the Chilaw line have already been provided. The quarry at Mahara is adjacent to the prison, and will be worked by prison labour.

12. Various experiments with asphaltum, a waste product from the Californian petroleum wells, and much used in parts of America for road surfacing and painting, were made during the year, and will be continued this year. The results so far have been disappointing, and for road painting it seems probable that a preparation of tar and pitch and a patent preparation named "Tarco," which have also been tried, will give better results in this climate.

The experiments in carpeting with asphaltum where a layer of a finely graded mixture of metal and sand with asphaltum is laid at a temperature of 325°F. on the existing road surface appear to be standing well, but the time has been too short to give a definite opinion. The cost, however, works out at Rs. 13,000 a mile, which is prohibitive, unless the life of the carpeting is of extraordinary long duration.

The tendency nowadays for all roads in England, except in the special cases of town and suburban roads, is to adopt painting as the most economical method of surface preservation and dust prevention. Practically all special pavements, whether of bituminous compounds, graded stone, tarmac, wood blocks, or stone setts, require a special foundation, generally of concrete, and the cost of such roadways renders their adoption impracticable over any considerable mileage.

The cost of road painting with "Tarco" is approximately Rs. 1,250 a mile, and of painting with a tar and pitch mixture approximately Rs. 1,350 a mile for one coat on roads of the average width obtaining in the Colony. On busy roads two or more coatings a year may be necessary, but the subsequent ones will cost less than the first. It is probable that the life of a metal coating is increased 20 per cent. by regular painting. It is regrettable that the locally produced tar is of little or no use for this work, as imported tar is necessarily more expensive and just now difficult to procure.

13. The number of steam rollers remains the same as last year, viz., 78. Orders for 4 were placed towards the end of 1915 and for 3 in 1916, but so far none of them have been delivered, and it is doubtful when delivery will be made. The price per roller has increased from £352 in 1915 to £600 in 1916. The beneficial results of steam rolling are manifest on all roads where they are in use, and in course of time the bullock roller will be a thing of the past, but before this is possible the number of steam rollers will have to be doubled. As pointed out in my last annual report, it is desirable that a foreman experienced in the construction of steam rollers should be engaged when opportunity offers to supervise the repairs and rebuilding of these rollers, which has become a large item in the work of the Government Factory.

14. The widening and improvement of roads, more particularly of those in the hilly districts, has been proceeded with and good progress made. The chief fault of most up-country roads and, indeed, of most Ceylon roads is that they are too narrow, and this fault has in not a few instances been accentuated by cultivation being carried on right up to the roadside. The constant weeding and scraping has in the course of years so narrowed some roads that it is often difficult to find a place for cars to pass in safety, and space for metal piling has to be found among the tea bushes. The damage is not apparent when the land is first cleared and planted, the erosion being gradual takes time to show its results; but to this in no small measure is attributable the large sums that have to be annually expended in the repair of slips and other road damage, which in former years were of comparatively infrequent occurrence. Reservations for the protection of roads should be provided.

15. The line accommodation for coolies working on our roads is insufficient. A considerable sum is annually spent in renting houses and rooms, and in the erection and repair of temporary buildings to supplement this, but this method of providing accommodation is unsatisfactory and in the long run expensive.

16. The roads now open to motor lorry traffic with the gross weights admissible are as follows:—

(a) Roads on which there is no objection to Motor Lorries being run under the Regulations (Maximum weight 6 tons).

Western Province.

Colombo-Kandy road.
Horana-Alutgama road (with the exception of the Anguruwatota ferry and Welipenne bridge on 22nd mile).
Katukurunda-Nagoda-Kalawellawa road.
Colombo-Kalutara-Bentota road (with the exception of the Digarolla bridge).
Colombo-Avissawella road (*viâ* Urugodawatta).

Central Province.

Talawakele-Agrapattana road.
Gampola-Pussellawa road (with the exception of Gampola bridge).
Pupuressa road.
Tispane road.
Kandy-Deltota road.
Kandy-Rangala road *viâ* Dumbara Valley, Rajawella, and Teldeniya.
Nawalapitiya-Kotmale road.
Dotale road.
Wattegama *viâ* Teldeniya to Nugatenna Gap.
Wattegama Railway Station *viâ* Madulkele to Bambara-ela.
Talawakele to Watagoda up to the turn off to Watagoda factory.
Gampola-Nawalapitiya road.
Nawalapitiya-Hatton road up to the 5th mile.
Hatton-Talawakele road.
Hatton-Norwood bridge road.

Bathford Valley road.
Annfield road.

Southern Province.

Matara-Deniyya road.
Deniyaya-Hayes road.
Colombo-Matara road (within the Municipal limits of Galle).
Galle-Udugama road.

Province of Uva.

Bandarawela-Badulla road.
Badulla-Passara road.
Spring Valley road.
Bandarawela-Haputale road.
Kumbalwella-Passara road.
Bandarawela-Liyanghawela road.
Dikwella-Madulla road.
Haldummulla-Haputale road.
Koslanda-Haldummulla road.
Passara-Madulsima road.

Province of Sabaragamuwa.

Colombo-Kandy road.
Ratnapura-Karawita road (*viâ* Esplanade road and Cross street, excluding Main street from 56 to 56½ mileposts).
Pelmadulla-Rakwana road.
Ratnapura-Balangoda road (*viâ* Esplanade road and Cross street, excluding Main street from 56 to 56½ mileposts).
Polgahawela-Kegalla road.

(b) Roads on which there is no objection to Motor Lorries being run under modified conditions as to Total Weights stated.

	Weight allowed. Tons.		Weight allowed. Tons.
<i>Western Province.</i>			
Nambapana road ..	3	Pussellawa-Ramboda road up to the 33rd mile ..	4½
Nagoda-Neboda road ..	3	Wattegama-Katugastota road ..	4½
Tebuwana-Anguruwatota road ..	3	Katugastota-Galagedara road ..	4½
Labugama road ..	4½	Nawalapitiya-Hatton road from the 5th mile to Hatton ..	3
Horawala-Moragala road ..	4½	Wanarajah branch road up to Castlereagh bridge, but not over the same ..	4½
Veyangoda-Ruanwella road ..	4½	Madulkele-Kabaragala road ..	4½
<i>Central Province.</i>			
Kandy-Matale road ..	3	<i>Southern Province.</i>	
Matale-Dambulla road ..	3	Muppene-Hambantota road ..	3
Nawalapitiya-Dolosbage road ..	3	<i>Eastern Province.</i>	
Craighead-Somerset road ..	3	Bibile-Batticaloa road ..	3
Tawalantenne-Pundaluoya-Watagoda road ..	3	<i>North-Western Province.</i>	
Lindula-Nanuoya road ..	3	Mallowapitiya-Rambodagala road ..	4½
Deltota-Hewaheta-Rikiligasgoda road ..	4½	Galagedara-Kurunegala road ..	4½
Glenugie-Upeot road ..	3	<i>Province of Uva.</i>	
Maskeliya road : Norwood bridge to Moray ..	3	Muppene-Hambantota road ..	3
Maskeliya road : Maskeliya to Cruden ..	3	Bibile-Batticaloa road ..	3
Dikoya road : Norwood bridge to Campion ..	3	<i>Province of Sabaragamuwa.</i>	
Dimbula-Dikoya road ..	3	Avissawella-Ratnapura road ..	4½
Gorge Valley road up to the bridge on Henford estate ..	4½	Yatiantota-Kitulgala road ..	4½
Wallaha road ..	3	Karawanella-Glenalla road up to the 52nd milepost ..	3
Iriyagama-Aladeniya road, 2nd to 6th mile ..	3	Yatiantota-Polatagama road ..	3
Kandy-Padiyapelella-Mulhalkele road (with the exception of Mulhalkele bridge) ..	4½	Yatiantota-Ardross road ..	3
Rattota road ..	3	Kegalla-Bulatkohupitiya road ..	3
Nanuoya station to Nuwara Eliya ..	4½	Rambukkana-Aranayaka road ..	3
Nuwara Eliya to Ramboda ..	4½	Avissawella-Yatiantota road, except bridge on 41st mile ..	4½
Nuwara Eliya to Hakgala ..	4½	Veyangoda-Ruanwella road ..	4½
Nuwara Eliya-Uda Pussellawa road ..	4½		
Talawakele-Nanuoya road ..	4½		
Glenlyon-Preston road (at a speed of not more than 3 miles per hour over Torrington bridge) ..	4½		

17. The pace at which lorries are run on some routes still causes undue wear to road surfaces, and is a source of danger to the public. The co-operation of owners and users of these vehicles in keeping down speeds to the legal limit is again invited.

INLAND NAVIGATION.

18. With the exception of certain portions of the Toppu-Puttalam canal, where the accumulation of silt gave trouble, the canals and channels were kept in a fair state of repair.

MAINTENANCE OF BUILDINGS.

19. The number of buildings in charge of the Department and the cost of maintenance for the year is as follows :—

Class of Building.	Number of Buildings.	Average Cost. Rs. c.
Government buildings, excluding King's Houses ..	729 ..	199 17
Hospitals and dispensaries ..	227 ..	309 10
Police buildings ..	80 ..	250 12

ADDITIONS AND IMPROVEMENTS TO BUILDINGS.

20. Numerous minor additions were effected to various buildings at a total expenditure of Rs. 15,797·66, the distribution being as follows :—

	Number of Buildings.	Cost. Rs. c.
Government buildings ..	25 ..	6,731 52
Hospitals and dispensaries ..	17 ..	4,319 99
Police buildings ..	13 ..	2,397 95
Postal buildings ..	9 ..	1,587 86
Prison buildings ..	5 ..	732 52
Customs buildings ..	1 ..	27 82

MAINTENANCE OF BRIDGES.

21. The bridges of 50 feet span and over, which number 322, were kept in an efficient state of repair, with the exception of Gin-ganga bridge, Galle District, which was damaged by flood and is under repair, and the Gin-oya bridge, Chilaw District, and the Digarolla bridge, Panadura district, where the loads have had to be strictly limited owing to corrosion of the steel trestles. In both cases new bridges are in course of construction. During the period under review 3,364 lineal feet of timber or other weak bridges were reconstructed or in course of reconstruction.

PUBLIC WORKS EXTRAORDINARY.

22. The expenditure incurred under this head of the Estimates was as follows :—

	Rs.	c.
New works and buildings ..	1,783,240	14
Additions and improvements to buildings ..	173,356	8
New bridges ..	113,953	23
Repair of bridges ..	221,622	94
Lands and buildings acquired ..	37	85
Miscellaneous ..	1,742,522	18
New roads ..	158,108	55
Additions and improvements to roads ..	337,015	3
Total ..	4,529,856	0

The distribution of this expenditure was as follows :—

Province.	New Works and Buildings.		Additions and Improvements to Buildings.		New Bridges.		Repair of Bridges.		Lands and Buildings acquired.		Miscellaneous.		New Roads.		Additions and Improvements to Roads.	
	Rs.	c.	Rs.	c.	Rs.	c.	Rs.	c.	Rs.	c.	Rs.	c.	Rs.	c.	Rs.	c.
Western ..	1,297,551	97	73,789	6	48,298	94	21,003	52	—	—	1,011,545	98	—	—	37,909	86
Central, North ..	13,363	65	7,697	60	—	—	48,817	33	—	—	6,748	70	—	—	25,067	13
Central, South ..	44,266	24	8,484	91	—	—	1,097	50	37	85	12,485	89	44,845	35	27,119	75
Southern ..	10,489	69	19,873	70	—	—	59,619	62	—	—	69,303	66	—	—	37,258	53
Northern ..	69,055	67	9,075	81	—	—	6,801	77	—	—	525,905	47	16,531	50	1,224	25
Eastern ..	12,045	6	3,625	53	14,680	38	3,375	34	—	—	15,904	92	—	—	35,601	46
North-Western ..	138,781	30	5,374	9	50,973	91	27,682	6	—	—	14,242	42	36,404	96	76,232	9
North-Central ..	19,751	53	3,572	27	—	—	3,075	42	—	—	1,177	61	—	—	5,938	35
Uva ..	58,172	84	31,560	82	—	—	692	36	—	—	33,037	13	10,181	81	64,262	24
Sabaragamuwa ..	119,762	19	10,302	29	—	—	49,458	2	—	—	23,380	0	50,144	93	26,401	37
Miscellaneous ..	—	—	—	—	—	—	—	—	—	—	28,790	40	—	—	—	—

23. The more important works in hand during the year are detailed in the following paragraphs. The general rise in the prices of steel, cement, coal, and indeed every imported article, as well as the difficulty in obtaining them, has increased the cost of work and retarded progress in not a few instances. The use of steel and cement has been restricted as far as possible; old material from obsolete and dismantled bridges has been worked into new ones, and the construction of masonry arches for smaller spans has been ordered wherever practicable. Few new works were commenced during the period under review, the bulk of the expenditure being incurred in completing and carrying on works already started, and in the case of bridges, making renewals which it would have been unsafe to postpone.

Western Province.

24. *Bungalows for Government Officers in Colombo.*—Of the 55 bungalows provided in the modified scheme, 28 have been completed and occupied, and 17 are nearing completion, and will be ready for occupation in the course of a few months. It is not proposed to take the remaining bungalows in hand at present. These houses have been carefully planned and well built, and reflect credit on the Architectural and Executive Staff. The gardens have been tastefully laid out under the direction of the Curator of the Royal Botanic Gardens, Peradeniya, and when the trees and shrubs planted become more mature, these bungalows in the vicinity of the racecourse will form one of the most attractive residential quarters of Colombo. Expenditure during the year Rs. 441,353·76.

25. *Extension of the Customs Premises, Old Coaling Grounds, Colombo.*—The concrete walling forming the wharf frontage to the harbour and mouth of the lake to harbour canal was completed during the year. This now completes the two different portions of work on the harbour frontage allotted to this Department: the one providing for quayage, jetties, and warehouses from the roof of the South-west Breakwater up to and including the Passenger Jetty; and the other, a later one, the bulk of the programme outlined in Sessional Paper X. of 1913, pages 13 and 14, under the heads (e), (g), and (h) in paragraphs 66 and 67. The completion of this latter work has been delayed, but it has now been handed over to the Port Commission many months in advance of the dates stipulated in the report above referred to. The work done during the year is as follows :—

Quay Wall.—210 lineal feet of concrete walling built on 8 feet octagonal concrete cylinders sunk to a depth of 20 feet below mean sea level.

Jetties.—Three jetties have been constructed, two being 120 feet long by 20 feet wide and one 120 feet long by 28 feet wide. They are composed of hardwood platforms supported on 5 feet diameter concrete cylinders sunk to a depth of 25 feet below mean sea level. The longitudinal bearers and fender beams are in reinforced concrete. The centre and wider jetty is roofed in.

The Old Plumbago Shed was taken down and re-erected in another and more convenient site, alongside the new wall on the eastern side of the canal. A good deal of the corrugated sheeting of this building had to be renewed and additional doors were added. The other work done in connection with this project comprised the completion of the sloping paved approach roads, 2,156 squares of stone sett paving, 5 sets of entrance gates and checkers' office, 933 lineal feet of boundary walling, and the trenching for 1,100 feet of 10-inch water main. Expenditure for the year Rs. 153,332·50.

26. *Erection of Grain Sheds, Colombo.*—Considerable difficulty was experienced during the year in procuring the necessary materials for this work, notably cement, expanded steel, and cast iron gutters, but steady progress has been made notwithstanding, and portions of the various warehouses were handed over to the Principal Collector of Customs immediately they were completed, a total of Rs. 102,685

square feet of covered area being thus handed over in the course of the year, making 142,685 square feet in all in occupation. The portions completed during the year are as follows :—

	Verandah. Square Feet.	Store. Square Feet.	Total. Square feet.	Date of Completion.
Whole of D Warehouse	4,250	15,750	20,000	November 22, 1915
Whole of F Warehouse	6,250	26,250	32,500	June 26, 1916
Part of C Warehouse	5,250	21,000	26,250	January 5, 1916
Part of A Warehouse	2,310	5,375	7,685	June 2, 1916
Part of G Warehouse	3,650	12,600	16,250	June 10, 1916
	21,710	80,975	102,685	

Portions of Warehouses A and C cannot be proceeded with until the railway line which crosses a portion of the site is laid in its final position. Two other warehouses, the last of the ten comprised in the scheme, have been commenced. In addition to the buildings themselves, 47,987 squares sett paved roads have been laid and 2,743 lineal feet of concrete drains constructed, while latrine accommodation and a water service have been provided. When completed these granaries will afford storage for 500,000 bags of rice. The expenditure incurred during the year was Rs. 526,334. This work and that described in the previous paragraph have been carried out by the Factory Engineer.

27. *Colombo Lake Development Scheme.*—The progress made with this work and those subsidiary to it, viz., the canal from the lake to the harbour and the approach roads and bridges for the new crossing of the railway at Parsons road, has been good.

The land reclaimed increased the total to 43 acres. The lake walling is now complete from the Galle Face spill to dhoby island, with the exception of the portion which will be occupied by the entrance to the lake to harbour canal, and the reclamation behind it is practically completed. The roading of the portion at the Galle Face end has also been completed.

The bridge across the channel between dhoby island and Captain's Garden is ready for the placing of the superstructure, and the reclamation and walling at Captain's Garden have been commenced. Dredging has been systematically proceeded with. Channels have been dredged to many important points, and shallow parts of the lake deepened.

On the canal from the lake to the harbour the walls have been completed, with the exception of the portions occupied by locks, Norris road bridge, and Main street bridge, while the north wall of the additional basin is practically finished.

The abutments and piers of Norris road bridge are in progress, and the abutments and piers for the southern portion of the Main street bridge completed. On each of these bridges, which are 100 feet wide, half widths are being undertaken at a time, in order to accommodate the traffic on these busy roads.

The total length of walling built on the lake and canal sides is 12,425 lineal feet, or something over $2\frac{1}{4}$ miles.

Excellent progress has also been made with the approaches to the bridge over the railway at Parsons road, which will when completed enable the present level crossings over two lines of railway to be done away with. The re-arrangement of roads will allow of access to the new reclamation, as well as to the Fort, more or less on present lines, but by raised embankments, in order to get the necessary head room for the railway. The bridge over the railway is being constructed by the Railway Department, but all other work is in charge of the Public Works Department.

28. *Passenger Jetty.*—The first instalment of the projected improvements at the Passenger Jetty in the shape of alterations to the approach bridge begun late in 1915 was continued. When complete railway communication under the bridge will be possible, and provision is made in the scheme for linking up the existing lines between the roof of the South-west Breakwater and the Passenger Jetty with the Mutwal Railway. The works referred to in this paragraph are under the supervision of the Chief Engineer, Colombo Lake Development Scheme.

29. *Police Station and Barracks, Panadure.*—Quarters for an Inspector, sergeants, married and single constables, with necessary baths and latrines and other outbuildings, were completed at a total cost of Rs. 50,599.40.

30. *District Engineer's Office and Quarters, Panadure.*—This group of buildings, comprising an office, stores, work sheds, yard, and quarters for the District Engineer, was completed at a cost of Rs. 51,179.53.

31. *Hospital at Pimbura.*—Work on this hospital in the Kalutara District made little progress in the first part of the period under review, but rapid progress has since been made, and most of the buildings should be completed in a few months. The five wards will accommodate 86 beds, and the hospital will be provided with an administration block and quarters for the Medical Officer, dispenser, nurses, and attendants. Expenditure during the year Rs. 41,527.41.

32. *Merchants' Ward and Operating Room, General Hospital.*—The gift of a Colombo resident, this block of wards, which is being erected to the east of and at right angles to the Planters' Ward of the Colombo Hospital, will provide accommodation on two floors for 9 beds. Work was started in June, 1916, and by the end of the year the roofs of the main building and sanitary annexes were on, and the walls of the operating room carried up to roof level. The expenditure incurred was Rs. 18,516.

Additions and Improvements to Buildings.

33. *Extensions, Customs Office, Colombo.*—This work—the addition of a new wing to H. M. Customs House, Colombo—was completed during the year, the total cost being Rs. 117,789.95. The building now furnishes a convenient and commodious range of offices, with a large room for Board or Committee meetings.

34. *Additions, Civil Medical Stores.*—This work consisted of (a) a fireproof store, 32 feet by 20 feet, for turpentine and oils; (b) a store of 508 feet by 20 feet for disinfectants; (c) extensions of the main building on the south side, and was completed at a cost of Rs. 23,974.

35. *Additions, Neboda Hospital.*—Owing to delay in the acquisition of the land required and modifications in the project, work on the buildings comprising these additions was not started until late in the year. Steady progress is being made on the buildings where the sites are available, but this Department up to the time of writing this report had not been put in possession of the site of the Medical Officer's quarters.

Bridges.

36. *Digarolla Bridge.*—The existing Digarolla bridge, which carries the Colombo-Galle road across the Panadure river or lagoon at Moratuwa, is both long and narrow. It consists of 20 spans of 30 feet carried on trestles formed of old rails. For some years past the corroded condition of these trestles where they are in contact with the brackish water of the lagoon has been a cause of anxiety. The piles of four trestles failed in 1914, causing a dangerous sag and twist in the superstructure, and repairs were effected only with great difficulty and at considerable expense. The conditions of modern traffic and the cost of strengthening the bridge to take it made the necessity for a new structure apparent, and work was commenced in the middle of 1916 and is now in progress. The new bridge will be one of 8 spans, 6 of 81 feet and 2 of 31 feet 6 inches, carried on concrete cylinder piers, and provided with a roadway 18 feet wide, with footpaths on either side. Expenditure Rs. 48,298.

37. *Clyde Bridge, Kalutara District.*—Work on this bridge of 100 feet span was proceeded with. The piled foundations, abutment, and retaining walls on one side of the stream have been completed, and the piling for the other abutment practically finished. The steelwork is at the site. The work, which is on a tributary of the Kalu-ganga, and is close to the main stream, has suffered frequent interruption from floods.

38. *Talpitiya Bridge.*—The bridge on the 19th mile of the Colombo-Galle road, which was washed away in the floods of May, 1916, is being replaced by one of 2 spans of 50 feet, supporting an 18 feet roadway, the abutments and pier being carried on concrete cylinders. Work has been slow owing to the difficulty in sinking through the remains of the old abutments and fallen piers below water level, but it is hoped, now these obstructions have been got rid of, to expedite progress considerably.

39. In addition to the works referred to, nine other bridges of minor importance have been in course of construction in this Province.

Additions and Improvements to Roads.

40. *Moragala-Pelawatta Road.*—The work of raising, widening, and metalling the 6th, 7th, and 8th miles of the former minor road between Moragala and Pelawatta in the Kalutara District was proceeded with, and is nearly completed.

41. *Veyangoda-Ruanwella Road.*—This work which consisted in deviating and raising above flood level the 1st mile of the above road was completed. Four bridge spans of 30 feet each were provided. The total cost was Rs. 69,551.

42. *Road Widening.*—(a) The Katukurunda-Nagoda road is being widened to provide a platform width of 16 feet with foundation and metalling. Land and houses are being acquired to improve the very dangerous junction with the Colombo-Galle road at Katukurunda.

(b) *Panadure-Nambapana Road.*—The widening of the metalled surface of this road to 14 feet on the 4th, 5th, 6th, and 7th miles has made steady progress.

(c) *Padukka-Bope Road.*—One mile of widening, bottoming, and metalling this road has been completed, and work on the remaining $1\frac{1}{2}$ miles is in progress.

(d) A commencement has been made with the following :—Improvements, Henaratgoda-Yakwala-Radawana road; widening roads to new Government buildings, Panadure; improving Walbotale-Kinadeniya road; widening the Henaratgoda road; and providing metal depôts on the roads in the Negombo District, on the Anguruwatota-Alutgama road, and Colombo-Avissawella road.

Central Province, North.

New Works and Buildings.

43. *Children's Ward, Kandy Hospital.*—Provision is made for 16 beds, with usual bathing and latrine accommodation. The site has been cleared, and materials for construction collected.

44. *Buildings for Department of Agriculture, Peradeniya.*—This work which consists of the construction of a class room, quarters for clerks, 3 sets of cooly lines, and the sinking of 2 wells was commenced late in the year. Satisfactory progress is being made.

45. *Public Works Department Buildings, Nalanda.*—The construction of quarters and offices for a Public Works Department station at Nalanda made slow progress during the year, owing to delay in obtaining possession of the site. Materials have been collected, and future progress should be rapid.

46. *Public Works Department Cooly Lines, &c.*—Twelve rooms of permanent lines have been built at Teldeniya and an overseer's quarters in Kandy.

Additions and Improvements to Buildings.

47. Additions and improvements were effected to the following buildings :—Post Office, Maturata; Kadugannawa school; Jail Superintendent's quarters, Kandy; Deltota hospital; Kandy hospital; Madulkele hospital; Mulhalkele hospital; and Rangalla dispensary.

Bridges.

48. The obsolete platforms of one bridge on the Gonawatta ferry-Rajawella road and of four bridges on the Kandy-Haragama-Kurunduoya road were replaced by up-to-date platforms.

49. The Pallepola-oya bridge on the Palapatwela-Galawela road was completed in September, 1916, at a cost of Rs. 40,728.58. It consists of 2 spans of 60 feet lattice girders carried on concrete cylinders, and has a platform width of 14 feet, the roadway being sett paved.

Miscellaneous.

50. Under the head of Flood Damages, a short deviation of the Dumbara Valley road, including the construction of a small bridge, was completed, and substantial repairs to culverts and removal of slips were carried out on numerous roads, the total expenditure being Rs. 20,531.

Additions and Improvements to Roads.

51. The widening and improvement of the following roads was continued and is still in hand :—
Peradeniya-Rikiligasgoda road, where culverts have been widened, corners cut back, and the metalling of the Deltota-Rikiligasgoda section advanced.
Kandy-Haragama-Kurunduoya road, where metalling, widening culverts, and improvements to corners have been carried out.
Road from Hunasgiriya Junction to Iriyagastenna, where the widening of the road platform is in progress.
Madulkele-Kabaragala road, cutting back and benching dangerous corners.

Central Province, South.*New Works and Buildings.*

52. *Colonial Secretary's Residence, Nuwara Eliya*.—Though occupied in the last financial year, the work on this residence was not fully completed. The total cost has been Rs. 83,978. Cost per cubic foot 58 cents.
 53. *Post Office, Nanu-oya*.—This work has been completed at a cost of Rs. 18,651, the cost per cubic foot being 37½ cents.
 54. *Dispensary, Watawala*.—Quarters for a District Medical Officer and dispenser have been completed, with the exception of the stables, the cost per cubic foot being 20½ cents. These buildings are adjacent to the site chosen for the proposed Watawala hospital.
 55. Progress has been made with a new block of quarters for married constables at Nuwara Eliya, and with quarters for the Secretary of the District Court, as also with quarters for the District Engineer's clerk, Dimbula.

Additions and Improvements to Buildings.

56. *Improvements, Nawalapitiya Hospital*.—Legal difficulties in connection with the handing over of the site for the Medical Officer's quarters and mortuary prevented the completion of the building scheme for this hospital. These difficulties have since been overcome, and the work will now be proceeded with.
 57. *Additions, Dolosbage Hospital*.—The work on the construction of an additional ward of 12 beds and an operating room has been very slow. The foundations had to be carried down to a considerable depth owing to the treacherous ground met with, and labour proved difficult to obtain. Better progress is now being made.
 58. *Uda Pussellawa Hospital*.—A Jewell filter has been installed, and the drainage and approach road improved.
 59. *Pussellawa Hospital*.—Covered ways have been provided from the wards to the latrines and kitchen, and the approach road improved.

Bridges.

60. *Bridge on 10th Mile, Dolosbage Road*.—The reconstruction of this bridge of small span but with heavy abutments, which had been destroyed by flood, was commenced late in the year, and made good progress.

New Roads.

61. *Road from St. Margarets to Kirklees*.—The last mile of this road was opened to traffic in November, 1916, and the work is practically complete. The road is 5½ miles in length, has been cut 14 feet wide in the solid in sidelong ground and 20 feet wide in double cutting, and is bottomed and metalled throughout. Total expenditure Rs. 119,653·31, or Rs. 21,755·14 a mile.

Additions and Improvements to Roads.

62. Improvements in widening metalled surfaces at narrow places, improving dangerous corners, lengthening culverts, and other works of improvement were carried out on the following roads :—*Lindula-Nanuoya road, Glenlyon-Preston road, Hatton-Dikoya road, Uda Pussellawa road, Lindula-Agras road, Ramboda-Wilson's bungalow road, Peradeniya-Gampola road, Talawakele-Lindula road, and Nawalapitiya-Hatton road.*

Miscellaneous.

63. Storm damages to roads necessitating the rebuilding of numerous culverts, retaining walls, and the repair of bridges were fairly numerous, and the number of slips cleared considerable, the expenditure incurred on this account being Rs. 12,371.

Southern Province.*New Works and Buildings.*

64. *Galle Customs*.—The new export shed with a floor area of 3,900 square feet was completed, as also the new jetty. The jetty is 162 feet long by 20 feet wide, and is carried on concrete cylinders 6 feet in diameter spaced 20 feet from centre to centre longitudinally and 14 feet transversely, the end pair being carried down to a depth of 20 feet. Special cylinders of 8 feet diameter form the seats for two 3-ton cranes. The jetty is roofed in for 137 feet of its length. Total cost Rs. 73,849·02. Cost per square foot Rs. 22·51. Cost of cylinders sunk, 6 feet diameter Rs. 59·25 per foot run, 8 feet diameter Rs. 77·20 per foot run, the sinking being troublesome owing to the presence of old piles, rubble, and boulders.
 65. *Quarters for Police Magistrate, Matara*.—This building, which was practically finished in 1915-16, had the finishing touches put to it, and was completed at a cost of Rs. 26,162·07, or 21 cents a cubic foot.
 66. *Forest Ranger's Quarters, Hambantota*.—This work was completed at an expenditure of Rs. 5,642. Cost per cubic foot 22 cents.

Additions and Improvements to Buildings.

67. Improvements to the Police Barracks, Pilot's quarters, and Post Office, Galle, were completed.

Bridges.

68. The reconstruction of the Kananke bridge of 150 feet clear span on the Galle-Akuressa road was successfully completed, the work being in the hands of the Factory Engineer.

69. Steady progress has been made with the new bridge at Goiyapana, on the Galle-Matara road, which will replace the existing timber piled structure. The cylinders for the abutments and pier have been sunk and one span erected. The bridge is one of 2 spans of 57 feet 8 inches each, with a 14 feet roadway and 4 feet footway on one side.

70. The heavy rainfall experienced in the Galle and Matara Districts from March to May, 1916, caused floods of unusual severity, and the damage caused to bridges on the coast road was considerable, several being wrecked and others seriously injured. The following were the most important :—

(a) *Gintota Bridge*.—Serious scour on the southern bank of the river endangered the safety of the abutment on that bank and the adjacent pier. It was decided to repair the damage by (a) removing the old abutment and replacing it by a pier of two cylinders, (b) building a new abutment on cylinders further inland, (c) providing another span, making five in all, and (d) underpinning the damaged pier. The addition of a fifth span was considered advisable, as the ground round the old abutment and approach was badly scoured and undermined owing to the shifting of the river southwards. The work is well in hand, and will be completed in April, 1917.

(b) *Aturuwella Bridge*.—This bridge across the Deduwa flood outlet had four piers wrecked, and though it has been possible to keep traffic open by supporting the roadway with cribs and trestles, reconstruction on the same site is not considered desirable owing to proximity of the sea. A road deviation is in course of construction, with a bridge of 2 spans of 36 feet with 18 feet roadway over the channel, the abutment and pier cylinders of which have been sunk.

(c) *Mirissa Bridge*.—This bridge of 20 feet span was washed away in May, 1916, and is being replaced by a new lattice girder bridge of 50 feet span with 14 feet roadway: the steel work is carried by masonry abutments built on concrete cylinders sunk down to hard ground. The abutments on the seaside, which are exposed to the south-west monsoon, are protected by rubble mounds.

(d) *Midigama Bridge*.—This bridge of 20 feet span was also washed away in May, 1916, and is being replaced by a 35 feet span bridge with 14 feet 10 inches roadway: the steelwork being carried in the same way as the Mirissa bridge. The line of the new bridge was shifted slightly to the south of the existing bridge to enable the concrete cylinders to be sunk.

Additions and Improvements to Roads.

71. *Ambalangoda-Elpitiya Road*.—A commencement has been made with the general improvement of this minor road, which will on completion of the work be taken over as a principal road. The work consists of widening, metalling, bridging, and re-grading where necessary.

72. Steady progress has been made with the widening and bottoming of the Hambantota-Tanamalwila road and the Matara-Tangalla road, and also in the widening of the Galle-Udugama road and Matara-Akuressa road.

Miscellaneous.

73. *Weligama Drainage*.—A total length of 9,195 lineal feet of drains has now been laid in this important bazaar, and the work is nearing completion.

74. *Coast Erosion*.—During the period under review erosion by the sea on the west and south-west coasts has been unusually severe; and at Hikkaduwa and Matara the damage done has been serious. At other places, where the coast road runs in close proximity to the beach, fresh erosion has only been stopped by the prompt tipping of rubble. At Hikkaduwa, where the land and road have been carried away for a considerable distance on the 60th mile, Colombo-Galle road, large quantities of rubble have been tipped, but without avail, and groins have been erected, only to be undermined and wrecked within a few days. The slope of the beach is steep, and the waves break right inshore on soft sand. It would appear that a far heavier class of rubble than it has hitherto been possible to obtain is required for protection at this place. The denudation of the foreshore of coral for lime burning at Hikkaduwa, which is still carried on surreptitiously, has undoubtedly much to do with this erosion.

75. At Matara, where erosion has been proceeding for years, but has only recently become dangerous, the conditions are different. The causeway to the island just off the coast has interrupted and diverted the natural travel of the sand, which is greater from east to west, with the result that the beach to the west of it has gradually been depleted. It is hoped to be able to restore the natural order of things by the removal of the causeway, and by assisting the beach to the westward to gradually recover itself by the help of low groins, which will be raised as the sand accumulates between them.

Northern Province.*New Works and Buildings.*

76. *Government Buildings, Talaimannar*.—The expenditure in connection with the above buildings, which are now practically completed, was Rs. 64,314.

Efforts to prevent the drifting of sand by levelling, earth covering, and the planting of trees and creeping plants have been continued, and considerable improvement has resulted. In windy weather—and it is often windy at Talaimannar—the air is laden with sand, which gets into everything and everywhere, and these efforts to prevent this state of affairs should be continued and extended. The filling up of hollows to facilitate drainage and prevent the breeding of mosquitoes has also been continued.

Three miles of road have now been constructed between the north pier and Talaimannar station with a coral stone foundation and gravelled surface. The convenience afforded by these roads is great. The cost was Rs. 36,356.

The segregation camp, an iron frame building with concrete floors, has been practically completed, and has been in use for some time.

77. *Lighthouse, Kovilam Point*.—This work was completed in a satisfactory manner at a cost of Rs. 25,958, or Re. 1·14 a cubic foot, exclusive of lantern and ironwork above the cap. The tower is carried on a reinforced concrete platform over piles, and is built of dressed coral stone in lime mortar,

the exterior being cement rendered. The walls are 2 feet $7\frac{1}{2}$ inches thick above the plinth, and are carried up from the top of the plinth with a uniform thickness at a batter of 1 in 48. The internal diameter of the tower is 8 feet 3 inches, and the height from top of foundation to cap, which is of reinforced concrete, is $90\frac{3}{4}$ feet. The focal plane of the light, which is a fourth order light, is $97\frac{1}{2}$ feet above mean sea level, and is visible for 16 miles.

Additions and Improvements to Buildings.

78. *Police Barracks, Jaffna.*—This work which consisted of concreting floors to rooms and verandahs of A block, and for concreting floors of rooms in C, D, and E blocks, and for fixing trellis work to the verandahs of four wards was proceeded with, but not completed.

79. *Jaffna Jail.*—Improved ventilation was provided in 26 cells by alterations to the ceilings and ridge of the block. Cost Rs. 1,284·36.

80. *Mantota Hospital.*—The ventilation of the male wards was improved, and the drainage made more efficient.

Bridges.

81. An unsound bridge of 16 feet span on the Kayttadi-Mankulam road was replaced by one of type design at a cost of Rs. 1,488, while the work of reconstructing the Kalaru bridge—one of 3 spans of 30 feet with high piers—on the Mannar-Madawachchi road was completed at a cost of Rs. 14,867·93.

Roads.

82. *Parantan-Karaichchi Road.*—Work on this road was continued, and five culverts constructed, the road being completed as far as it is at present considered necessary. The total expenditure has been Rs. 138,552, or Rs. 19,964 a mile.

83. *Pandichuddan-Kandavalai Road.*—The causeways on the 1st and 2nd miles were completed. The surface of this road should be metalled, the soil is soft, and cuts up badly under traffic.

84. *Vavuniya-Paraiyanalankulam Road.*—The metalling of this road has now been carried 16 miles from Vavuniya towards the Paraiyanalankulam junction with the Mannar-Madawachchi road, 3 miles being completed during the year.

Miscellaneous.

85. *Causeway, Puneryn.*—This causeway 217 feet in length, carrying an 18 feet roadway, has been completed at a cost of Rs. 14,685.

86. *Karaiyur Reclamation.*—This work has been proceeded with, prison labour being employed, the area reclaimed during the year being $8\frac{1}{2}$ acres. It is desirable at the present stage of the work to concentrate the labour on the deviation of Seabeach road, as the early completion of this part of the scheme will not only prove of considerable benefit to the town, but will enable the drainage of the adjacent area to be proceeded with. The work at present stands as follows :—

			A.	R.	P.
Area reclaimed before 1914	..	..	9	0	0
Area reclaimed in 1914-15	..	..	3	3	0
Area reclaimed in 1915-16	..	..	7	0	16
Area reclaimed in 1916-17	..	..	8	1	26
		Total reclaimed	28	1	2
Still to be reclaimed ..	..	..	35	2	38
		Total Area	64	0	0

Eastern Province.

New Works and Buildings.

87. *Officers' Quarters, Batticaloa Prison.*—Nine new quarters for jail guards were completed, each consisting of two rooms with kitchen and bathroom accommodation. Cost Rs. 10,292, or 19 cents per cubic foot.

88. *Apothecary's Quarters, Eravur.*—This quarter of type design, consisting of three rooms, with kitchen, bathing, and latrine accommodation, was erected at a cost of Rs. 4,149, or 24 cents a cubic foot.

89. *Leper Asylum, Batticaloa.*—Work in connection with this project, which had been shut down owing to retrenchment, was recommenced late in the year; it is being proceeded with.

90. *Water Supply, Batticaloa.*—The works in connection with the water supply of Batticaloa have been completed, and are about to be handed over to the Local Board. Water service has now been given without interruption since April, 1916, and the plant been found to work satisfactorily. The supply from the pump and collecting wells have proved ample, and the quality of the water good. During the drought in the first half of 1916 and the subsequent dry season the maximum fall in the pump well due to the day's pumping was 9 inches; this was invariably made good by the water rising to its former level during the night. The cost of the scheme, including the duplicate pumping plant, reservoir of 100,000 gallons capacity, and $11\frac{1}{4}$ miles of pumping and service mains, is Rs. 143,000, the pumping capacity being 100,000 gallons per diem working 10 hours.

Bridges.

91. A new bridge of the type steel trestle and rolled joist pattern has been erected at Nadukal-turai on the 24th mile, Batticaloa-Trincomalee road, to replace the old timber bridge at that place. The new bridge, which is 150 feet long, was begun in May, 1916, and completed in six months.

Roads.

92. *Muppene-Pottuvil Road.*—Good progress was made with the bottoming and metalling of this road. An excellent labour force was available, and every advantage taken of it, ballast and metal for improving miles 1 to 12 being procured. A good start has been made with laying the foundation stone and spreading and consolidating the metal, and the first 10 miles will shortly be completed.

93. *Nilaveli-Kuchchaveli Road.*—The 18th and 19th miles of this road have now been properly formed and gravelled, and cart traffic is now possible to a point 21 miles north of Trincomalee.

94. *Batticaloa-Trincomalee Road*.—The work of constructing concrete ramps to facilitate the passage of vehicles at eight ferries on this road has been proceeded with, and a decided improvement effected. A further improvement has been carried out by extending the causeway on the 22nd mile by 250 feet.

North-Western Province.

New Works and Buildings.

95. *Police Barracks, Kurunegala*.—The construction of these buildings was practically completed, the following being occupied during the year :—

- One block of 8 rooms for married constables.
- One block of 12 rooms for married constables.
- One block of 12 rooms for married sergeants.
- One block baths and latrines for sergeants.
- One block latrines and cattle pound.
- One block stables.
- Two blocks quarters for Sub-Inspectors.

With the station house and Inspectors' quarters, these buildings, grouped round the parade ground, form an excellent local headquarters for the police. The quarters are convenient, well ventilated, and substantially built. Amount spent during the year Rs. 79,354.

96. *Quarters for Public Works Department Clerks, Kurunegala*.—Four quarters have been completed, two being for senior clerks and two for junior clerks. Cost Rs. 21,589, or 24 cents a cubic foot.

97. *Public Works Department Buildings, Maho*.—The construction of these buildings, which form the headquarters of the new Maho district, have been completed at a cost of Rs. 25,530; they consist of a District Engineer's bungalow (a former circuit bungalow enlarged), a quarter for clerks, an office and store, a steam roller and cart shed, and six rooms of cooly lines.

98. *Chilaw Hospital*.—Steady progress has been made with the erection of this hospital, and the following buildings were partly completed and roofed, viz. :—

- | | |
|-----------------------|---|
| Administration block, | Parangi ward and isolation ward. |
| Two male wards, | Nurses' quarters. |
| Two female wards, | Kitchen block and attendants' quarters. |

Bridges.

99. *Gin-oya Bridge, Negombo-Chilaw Road*.—Most of the steelwork for this bridge of 4 spans of 70 feet was completed prior to the commencement of work on the site, which it was not possible to take in hand until the land required for the abutments and approaches had been acquired in June, 1916.

Rapid progress has since been made in sinking the cylinders for the piers and abutments, and the work generally hurried forward, as the old bridge across the river is in a very unsatisfactory condition. The Factory Engineer is in charge of the work.

100. *Deduru-oya Bridge, Kurunegala-Puttalam Road*.—The removal of the old timber platform bridge across the Deduru-oya and the erection of a new bridge in its place has been proceeded with, and the work is nearing completion.

101. Timber bridges are fast disappearing in the North-Western Province, and during the year under review twenty-six such bridges of short span were replaced by modern structures.

Roads.

102. *Alawwa-Dampelessa Road*.—This road has now been carried through and opened to traffic. The work, which has throughout been done by village labour, has been slow, and often interrupted by epidemics of malaria. A gravelled surface has been provided to the road, but traffic is increasing rapidly, and it is probable that metalling will have to be laid at no distant date.

103. *Malloyapitiya-Rambodagala Road*.—This road, which is 13½ miles long, was completed. It is largely used, and is open to motor lorry traffic.

104. *Kurunegala-Kandy Road*.—The Kurunegala end of this road, from the town to the railway station, was widened to 23 feet, foundationed, and metalled at a cost of Rs. 9,853.

105. *Dankotuwa-Madampe Road*.—The improvement of this minor road has made slow progress, owing to difficulty in obtaining metal and stone for foundations. Metal and rubble are now being sent up by train from Mahara, and progress will be more rapid in future. Stone of any kind is almost unobtainable in the Chilaw District, and its transport from Mahara is both expensive and slow. Labour is also a difficulty.

106. *Nattandiya-Dunkannawa Road*.—Slow progress was made here also for the same reason as the above.

North-Central Province.

New Works and Buildings.

107. *Clerks' Quarters, Anuradhapura*.—Two semi-detached quarters for junior clerks were completed at a cost of Rs. 9,752, or 21 cents per cubic foot.

108. *Quarters for the District Engineer, Maradankadawala*.—Owing to the out-of-the-way position of Maradankadawala and the difficulty in getting skilled labour and materials, the building of these quarters has taken considerably longer than was anticipated. The work is now nearing completion.

109. *Survey Department Premises, Anuradhapura*.—An office for the Superintendent of Surveys and an office for his clerks were erected and alterations to the coach house were completed at a cost of Rs. 5,595.

Bridges.

110. Two bridges of small span were erected on the Anuradhapura-Trincomalee road, and the decking of another on the Mirisgonioya-Galkandamaduru road was renewed. A bridge of 16 feet span was also erected on the 1st mile of the road to Sigiriya.

Additions and Improvements to Roads.

111. The track metalling and widening of the Maradankadawala-Habarana road has been completed.

Province of Uva.

New Works and Buildings.

112. *Passara Hospital.*—This work has been completed and in occupation and use for some months. The hospital provides 42 beds, and has the usual quota of offices and quarters. Cost Rs. 73,308·25.

113. *Alutnuwara Hospital.*—Considerable progress has been made with this work ; the administration block, apothecary's quarters, and one ward are almost completed.

114. *Lunugata Hospital.*—In connection with the re-modelling of this hospital, the kitchen block has been completed and is in use, the Medical Officer's quarters and the corridors are nearing completion, and work on the operating room, administration block, &c., is in hand. An additional room in the nurses' quarters is also being built.

115. *Buttala Hospital.*—New quarters for the District Medical Officer and an administration block have been completed and handed over. Cost Rs. 14,593, or 24 cents a cubic foot. The erection of latrines, mortuary, and kitchen block is in hand, but is being delayed owing to difficulties in obtaining timber.

116. *Muppene Hospital.*—A modern operating room and connecting corridor to the wards have been completed at a cost of Rs. 3,255, or 33½ cents per cubic foot. Servants' quarters and a kitchen have also been provided. Cost per cubic foot 20 cents.

117. Dispensaries have been completed at Badulwela, Hambegamuwa, and Kahataruppe under circumstances of exceptional difficulty owing to locality and inaccessibility.

118. *Haputale Hospital.*—Quarters for two apothecaries are in course of erection, and certain improvements to the hospital have been effected.

119. *Forest Department Office, Haputale.*—This building, which provides office accommodation for the Assistant Conservator of Forests and his staff, has been completed. The walls are of rubble masonry pointed in cement, the floors of concrete, and the roof of Calicut tiles on sawn timber. Expenditure Rs. 7,949, or 28 cents per cubic foot.

Bridges.

120. *Heda-oya Bridge, Muppene-Pottuvil Road.*—This bridge which consists of 7 spans of 27 feet 6 inches supported on iron trestles enclosed in a concrete casing has been successfully completed. The total length is 240 feet. Expenditure Rs. 62,964. Cost per foot run Rs. 260.

121. *Bridges, Muppene-Pottuvil Road.*—The timber platforms of all the bridges on this road have now been replaced by steel and concrete at a cost of Rs. 7,871.

122. *Spring Valley Road.*—The reconstruction of the bridge on the 7½ miles has been practically finished.

123. *Pussellawa Bridge, Badulla-Taldena Road.*—Work on this bridge and on several culverts near to it has been completed successfully.

Roads.

124. *Muppene-Pottuvil Road.*—The remaining portion of this road, 4·67 miles in length, has been completed as a gravel road and opened to traffic. Expenditure Rs. 91,399, and excluding the Heda-oya bridge, but including the cost of the approaches, cost per mile Rs. 19,600. The metalling of the road generally from Muppene to the Province boundary has been proceeded with. Metal for 15 miles has been got out, and the remainder is well in hand. Various hills have been cut down and the gradients improved.

125. *Widening of Roads.*—The first 3 miles of the Badulla-Batticaloa road have been widened to a metalled width of 14 feet and platform of 20 feet. Similar work on the Haputale Pass and the Haldummulla-Wellawaya road is progressing satisfactorily. Certain narrow places on the Wellawaya-Pottuvil road have been widened, and also on the Hangiliela-Hakgala road.

Miscellaneous

126. *Passara Water Supply.*—This gravitation scheme has been completed. It furnishes an excellent supply of good water to Passara town and to the hospital, resthouse, and Post Office. Cost Rs. 24,790.

Province of Sabaragamuwa.

New Works and Buildings.

127. *Kitulgala Hospital.*—The construction of this hospital, which provides accommodation for 84 beds, was sufficiently far advanced to be handed over to the Medical Department for occupation by the end of the year, the expenditure up to that time being Rs. 113,720.

128. *Kahavatta Hospital.*—Four main wards of this hospital are nearly completed, and a fifth is being roofed ; the administration block, mortuary, kitchen, Medical Officer's quarters, apothecary's quarters, and attendants' quarters are completed, and the quarters for nurses is well in hand. Expenditure Rs. 91,356.

129. *Aranayaka Hospital.*—Work on this hospital is well in hand, and making steady progress. The site has been prepared, roads formed, banks turfed, and the whole fenced in. The apothecary's quarters have been completed, and the erection of wards, quarters, and other buildings is proceeding. Expenditure Rs. 14,068.

130. The wards in all the above hospitals are of the "light construction" type, which under normal conditions, regarding the supply of steelwork and cement, admits speedy and economical construction. Light steel framing and trusses carry a Calicut or Poilite tiled and ceiled roof, the floor being of concrete. Between the steel uprights, dwarf walls 4 feet 6 inches high are built, and, while protection is afforded from weather, ample through ventilation and cross breezes are ensured. Where wards are mosquito-proofed, timber window framing is fitted above the dwarf wall with clear glass and wire gauze in alternate panels. The whole ward is thus rendered mosquito-proof, while light and air are abundant.

131. *Kolonna Hospital.*—The new female ward for this hospital was completed, and considerable alteration and improvement made in the arrangement of the hospital generally. Expenditure Rs. 12,496.

132. *Quarters for Police, Avissawella.*—This work which provides quarters for four married men with bathing and latrine accommodation attached, was completed at a cost of Rs. 7,750.

133. *Kegalla Hospital*.—Though most of the work comprised in the re-modelling of this hospital was completed during the previous financial year, an expenditure of Rs. 5,749 was incurred in 1916 in finishing off certain details, and in the erection of a new stable and coach house for the District Medical Officer.

Bridges.

134. Slow progress was made with the approaches and construction of the Rahawatta-ela bridge on the Kegalla-Polgahawela road. There was much sickness amongst the labour employed on the work which delayed progress. A great improvement to a dangerous corner on the 3rd mile of this road has been effected by the construction of a skew bridge across the stream.

135. The old girders and wooden platform of the bridge on the 85th mile of the Ratnapura-Halpe road, near Balangoda hospital, were replaced by a modern bridge of 100 feet span, the work being carried out by the staff of the Government Factory at a cost of Rs. 20,421, or Rs. 204 a foot run.

136. *Weratuppe Bridge*.—The old girders and timber platform of this bridge, situated at the Colombo entrance to Ratnapura, were replaced by a bridge of modern design, carrying footpaths on the outer sides of the girders. Span 66 feet. Cost Rs. 14,826.

137. Permanent platforms replacing the old planking on the Gurugoda-oya and Kurugammodara bridges were completed, and a stone sett paving was laid on the Yatiyantota station road bridge.

138. The reconstruction of the obsolete bridges on the Karawanella-Glenalla road has been practically finished, and two bridges of a similar character have been replaced on the Madampe-Hambantota road.

139. *Hangamuwa Bridge*.—The additional span of 60 feet, provided to give more waterway in time of flood, has been completed at a cost of Rs. 20,432.

Roads.

140. *Karandupone-Rambukkana Road*.—Good progress has been made with the construction of this road, which is now completed, with the exception of the bridge across the Maha-oya. The abutments of the bridge and four of the piers have been completed, and work on the remaining four piers is well in hand. Steelwork for the superstructure is on the site. The bridge is one of 9 spans of 30 feet, and has a total length of 312 feet.

141. *Madampe-Hambantota Road*.—Improvements to this road by reducing steep gradients and making diversions where required have been effected on the 85th, 86th, 87th, and 88th miles, and work on the 89th mile is in hand.

142. *Pelmadulla-Balangoda Road*.—The work of widening this important road has been continued and good progress made, the expenditure for the year being Rs. 12,209.

143. *Avissawella-Ginigathena Road*.—The work of extending short culverts and widening and protecting dangerous corners of this road as well as the metalling of the surface which was previously widened has been continued.

MANDAPAM CAMP.

144. Steady progress has been made in the construction of the immigrant cooly camp at Mandapam, and it is anticipated that it will be sufficiently far advanced to allow of the camp being transferred from Tonitorai in May next. The following items of work have been completed :—

Metalled Roads.

16 feet 30 mile | 9 feet 2.91 miles

Water Supply.—Work on the reservoir was started in February and completed in November, 1916. Two feeder wells were sunk and connected to the main well, thereby increasing the supply to the quantity required for all purposes. A steam pump has been provided for this service pending the arrival of the electric plant. 4,809 lineal feet of mains and 12,703 lineal feet of service piping have been laid.

Sewage Scheme.—Work was started in November, and 5,640 lineal feet of sewers have been laid, together with all the connections to the twenty latrines of the camp. Work on the pumping tank at the sewer outfall is in hand.

Fencing.—A boundary fence of reinforced concrete posts and barbed wire has been erected round the camp site (some 11,000 lineal feet), and fencing has also been completed round the wards of the cooly camp, hospital, and officers' quarters.

Buildings.—The approximate floor area of the completed buildings is 270,000 square feet, or 6 acres. Expenditure for the year Rs. 488,461.

145. During the year the temporary camp at Tonitturai was maintained and added to as required, Rs. 13,372 being expended in this service.

Eleven Farmer's boilers were installed in the east kitchen in January, 1916, and have given satisfaction.

An experimental steam cooker was made at the Government Factory and installed in the cooly camp east kitchen in November, 1916. A series of tests have given very satisfactory results, and it has been decided to adopt this method of cooking in the permanent camp.

GOVERNMENT FACTORY.

146. The work carried out by the Government Factory, both inside the Factory and out of it, has been, as usual, varied and extensive; in the period under review the expenditure amounted to Rs. 1,478,443.66.

147. The principal works carried out by the Factory Engineer were :—

- | | |
|--|---|
| 1. Grain sheds, Racquet Court. | 10. Mahara Jail water supply and improvements. |
| 2. Colombo Customs extension. | 11. Mahara Public Works Department quarry. |
| 3. New wing, Customs Office. | 12. The steelwork for 44 bridges of varying spans up to 100 feet. |
| 4. Construction of Kananke bridge. | 13. Steel framing for the wards of three hospitals. |
| 5. Gin-oya bridge. | 14. pontoons for dredgers and metal transport. |
| 6. Bridge, 85th mile, Ratnapura-Halpe road. | 15. Repair and overhauling of steam rollers. |
| 7. Digarolla bridge. | 16. Repair of telegraph and telephone instruments. |
| 8. Mahaveli-ganga bridge, Dumbara Valley road. | |
| 9. Gintota bridge. | |

148. In all 850 orders were in course of execution during the year. There was a large increase in the volume of machined work turned out of the machine shop, for the wear and tear on the machinery and plant in use throughout the Island is heavy, and must naturally still further increase with the continual expansion that is going on.

Electrical.

149. The expenditure on maintenance, new works, and extensions to Government electrical installations was Rs. 95,316·73 and for electricity Rs. 61,211·23, making a total of Rs. 156,527·96, the distribution of the former being as follows :—

<i>Maintenance.</i>	Rs. c.		Rs. c.
Electric lights, fans, motors, and other apparatus, Colombo and Kandy ..	24,999 6	Education Department ..	1,667 92
Electric light and power station and distribution system, Nuwara Eliya ..	3,870 93	Post Office ..	654 78
		Nuwara Eliya ..	6,273 5
		Miscellaneous ..	1,205 39
		Telegraph instruments ..	9,187 53
		Telephone and Railway signalling instruments ..	4,872 69
		Total ..	95,316 73
<i>New Works and Extensions.</i>			
New Government bungalows, Colombo ..	20,257 46		
Colombo Customs ..	13,005 7		
Railway, Colombo ..	4,797 89		
Medical Department ..	1,710 80		
Police Department ..	2,814 16		

150. During the past year the block of warehouses in the Colombo Customs near the Patent Slip has been fitted with a complete electrical installation on a three-wire system. Seventeen Government bungalows have been installed with electric lights and fans, and a variety of small installations in Colombo and Kandy have been completed. A total of 82 ceiling and desk fans, 427 lamps of 16, 32, 50, 100, 200, and 500 candle power, and one 5 B.H.P. A. C. motor have been installed.

151. *Hydro-Electric Installation, Nuwara Eliya.*—The financial results of the nine months' working in 1916 have been satisfactory, resulting in a nett profit of Rs. 20,151·84. The generating plant has been run satisfactorily, but the demand during the season, when Nuwara Eliya is at its fullest, is about as heavy as the present pipe line and turbines can meet. Plans are being prepared for an additional pipe line for supplying power for extensions and new consumers, and as a stand-by against possible happenings to the existing one.

GENERAL.

152. Among the more important work carried out in the Head Office, in addition to the checking and revision of plans and estimates received from the Provinces, the following may be mentioned :—

(a) Preparation of preliminary plans and estimates for—

New Customs building at Passenger Jetty.
 Proposed University College, Colombo.
 Quarters for the Assistant Superintendent of Police, Chilaw.
 Quarters for the Assistant Conservator of Forests, Haputale, Uva Division
 Quarters for the District Engineer, Moneragala.
 Schools for poorer classes in the city of Colombo.
 Quarters for Telegraph and Telephone Inspectors, Anuradhapura.
 New Branch Post Office, Kandy.
 Chilaw bridge.
 Hatton water supply.
 Tangalla water supply.
 Talawakele-Lindula road.
 Agalawatta-Badureliya road.
 Kuliypitiya-Hettipola road.

(b) Preparation of working drawings and estimates for—

New laboratory for Government Analyst, Colombo.
 Extra accommodation, Lunatic Asylum.
 Quarters for Religious Nursing Sisters, General Hospital.
 Quarters for Master Attendant, Colombo.
 Quarters for Clerks, Nuwara Eliya.
 Government Offices, Nuwara Eliya.
 Pimbura Hospital.
 Police Headquarters on old Royal College site.
 Panadure Hospital, Salgado Ward.
 Digarolla bridge, Moratuwa.
 Temporary salt stores.

(c) Preparation of detail drawings for works in progress :—

Government quarters, Colombo.
 Merchants' Ward, General Hospital.
 Rice Warehouse, Colombo.
 Extensions to Customs Office, Colombo.
 Reservoir, Cooly Camp, Mandapam.
 Gin-oya bridge.
 Kotiyagala bridge.

(d) Preparation of working drawings for—

Lunatic Asylum, Angoda.
 Type plans of police buildings.
 Type plans of hospital buildings.
 Type plans of doors and windows.
 Signal Station, Galle, and quarters for officer in charge.
 Additions and improvements to District Court, Jaffna.
 Negombo Jail, additional cells ; and conversion of Chilaw Jail into a police station.
 Quarters for the Assistant Superintendent of Police, Nuwara Eliya.
 Quarters for Police Magistrate, Dandagama.
 New Public Works Department Headquarters, Nalanda.
 Hospital, Udugama.
 Quarters for the District Judge, Chilaw.
 Nikaweratiya hospital.
 Puttalam hospital.
 Police Training School, Bambalapitiya.
 Hospital, Lunugala.
 Kirindi-oya bridge.
 Mabola bridge, Colombo-Negombo road.
 Uma-oya bridge.
 Maguru-oya bridge, Kurunegala-Giriwella road.
 Tripichang-oya bridge.
 Minuwangoda bridge.
 Bope bridge, Galle.
 Bridges on Haragama-Kurundu-oya road.
 Deduru-oya bridge.
 Talpitiya bridge, 19th mile, Colombo-Galle road.
 Aturuwella bridge, 41st mile, Colombo-Galle road.

STAFF.

153. *Retirements.*—Mr. J. D. Hawkes, District Engineer, resigned his appointment on October 17, 1916.

Mr. G. Waddell, Deputy Director of Public Works, proceeded on three months' leave on December 1, 1916, prior to retirement after thirty years' service in the Colony. Mr. Waddell's knowledge of the country and people and his general all-round ability and capacity for work made him a very valuable officer, and by his departure the Public Works Department loses one of its best men.

154. *War Service.*—The following officers are serving :—

Mr. H. B. Lees	..	Captain, Royal Engineers.
Mr. A. Lewis	..	Ministry of Munitions.
Mr. B. A. Horsfall	..	Second Lieutenant, East Lancashire.
Mr. J. Gray	..	Ministry of Munitions.
Mr. S. H. Bower	..	Lieutenant, Royal Engineers.
Mr. H. L. Grocock	..	Captain, Royal Engineers.
Mr. W. J. Thornhill	..	Captain, Royal Engineers.
Mr. S. Davies	..	Captain, Royal Engineers.
Mr. W. A. Coradine	..	Second Lieutenant, Royal Engineers.
Mr. C. H. Bradley	..	Captain, Royal Engineers.
Mr. E. B. Bowen	..	Second Lieutenant, Royal Engineers.
Mr. S. J. Kirby	..	Second Lieutenant, Royal Engineers.
Mr. L. W. Peach	..	Lieutenant, Royal Engineers.

Mr. H. P. G. Young, who had seen service in Gallipoli, was invalided out of the Army, and returned to duty.

In addition to the above, six officers have been mobilized throughout the year with the Ceylon Engineer Volunteers and one with the Ceylon Artillery Volunteers.

Colombo, April 20, 1917.

T. H. CHAPMAN,
 Director of Public Works.

