

1935.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

REPORT

OF THE

DEPARTMENT OF PUBLIC WORKS

FOR THE

YEAR ENDED 30TH JUNE, 1935.

Ordered by the Legislative Assembly to be printed, 11 December, 1935.



SYDNEY: ALFRED JAMES KENT, I.S.O., GOVERNMENT PRINTER.

1936.

INDEX.

<i>Branch.</i>	<i>Page.</i>
Accounts—Financial ...	11
Electrical Engineering ...	31
Engineering Design ...	44
Government Architect ...	36
General ...	5
Harbours, Roads, and Bridges...	21
River Murray Waters Commission ...	50
Survey and Survey Drafting ...	46
Testing and Inspection...	49
Water Supply and Sewerage ...	14

THE DEPARTMENT OF PUBLIC WORKS, N.S.W.

(ANNUAL REPORT FOR THE YEAR 1934-35.)

The Under Secretary, Department of Public Works to the Honorable E. S. Spooner,
M.L.A., Minister for Works and Local Government.

Department of Public Works, New South Wales,
Sydney, 10 December, 1935.

Dear Sir,

I have the honour to submit the following report upon the operations of the Department of Public Works for the year ended 30th June, 1935.

FINANCIAL.

The Statements of Accounts disclose that the total expenditure for the year amounted to £4,105,251 14s. 3d., an increase of £252,490 over the preceding year. The expenditure was met from the following sources :—

	£	s.	d.
Consolidated Revenue Fund	466,687	11	10
General Loans	1,056,442	17	4
Special Expenditure Loans	1,488,278	15	5
Special Deposits Accounts	694,714	7	5
Payments by other Departments	399,128	2	3
	£4,105,251	14	3

The Departmental administration and supervision of works occupied a total general staff numbering 799, involving salaries amounting to £246,090. In addition there was a dredge staff of 215, with £54,494 for salaries.

Expenditure from Consolidated Revenue Fund was incurred in the following directions :—

	£
Salaries and Payments in the nature of Salaries... ..	117,834
Maintenance and Working Expenses, other than Salaries	19,675
Maintenance of Public Works and Services	321,505
Unemployment Relief	7,673
	£466,687

The item "Special Expenditure Loans" appears in the Departmental Expenditure for the first time. It was voted on the Departmental Loan Estimates and was used to finance works suitable for Unemployment Relief, replacing almost entirely, allocations previously made by the Unemployment Relief Council.

The main classes of construction work financed from Departmental Loan Votes were :—

Item.	Ordinary. Loans.	Special Expenditure.	Total.
	£	£	£
Roads and Bridges	20,222	77,673	97,895
Harbours and Rivers	137,885	30,624	168,509
Water Supplies	217,246	16,569	233,815
Sewerage and Stormwater Drainage	193,691	1,298,784	1,492,475
Buildings	299,211	62,258	361,469
Electrical Works	61,198	.....	61,198
River Murray Scheme	112,036	.....	112,036
Other Works	14,954	2,371	17,325
	£1,056,443	£1,488,279	£2,544,722

From *Special Deposits Account*, the following were the main expenditures :—

	£
Western Division Roads	54,403
Subsidised Hospitals	213,983
<i>Trading Activities—Operation and Maintenance :—</i>	
Junee Water Supply	12,927
Broken Hill Water Supply	29,029
South-West Tablelands Water Supply	6,543
Dyke End Workshops	20,034
Burrinjuck Electricity Supply	99,119
Port Kembla Electricity Supply	74,860
Leichhardt Depot Working Account	18,886
Testing Branch Working Account	8,614

The major expenditures paid by other Departments were :—

Education Department	193,527
River Murray Commission	127,005
Hospitals Commission	18,017
Child Welfare Department	15,845
Unemployed Homes Trust	14,265

Details of the various phases of Departmental Operations appear in the accompanying report of the Heads of the several branches of the Department.

WATER SUPPLY AND SEWERAGE BRANCH.

As compared with the previous financial year, there was an increase in expenditure of £250,003 on works of water supply, sewerage and stormwater drainage, £299,273 having been expended on water supply works and £1,517,789 on sewerage works and stormwater drainage.

At the end of the year public water supplies were in operation in ninety-five towns, nineteen towns are seweraged, an increase of two water supply schemes and four sewerage installations, while stormwater channels have been constructed in sixteen towns.

The total capital cost of water supply and sewerage schemes and stormwaters channels, excluding the cities and towns in the Metropolitan and Hunter River Districts, amounts to £7,131,344.

Commonwealth-cum-State Works.—In December, 1934, a schedule of works was approved by the Commonwealth and State Governments to be carried out under conditions which provided for Councils to borrow the proportion of the cost of a scheme of water supply or sewerage which was considered to be within their financial capacity and for the Federal and State Governments between them to find the balance of the cost equally. Under this arrangement works of water supply were approved for Gosford, Tumbarumba, Katoomba, Parkes, Woodford-Springwood-Valley Heights, Murrurundi, Crookwell, Hillston, Aberdeen and Dunedoo, and sewerage schemes for the towns of Nowra, Taree, Queanbeyan, Griffith, Corowa, Bega and Moss Vale. The estimated costs of the works enumerated totalled £806,150, towards which the Councils were expected to find £448,400 and the Commonwealth and State Governments each £178,875.

In addition, a sewerage scheme for Maitland was approved at an estimated cost of £370,000, towards which the Commonwealth Government agreed to contribute £92,500. At the 30th June an amount of £13,385 had already been expended on this work.

Certain of the works under the Commonwealth-cum-State Scheme were commenced during the financial year, while negotiations with a view to a start being made with the others were well in hand at the 30th June.

Water Supply Schemes.—Complete schemes of Water Supply for the towns of Barraba and Kyogle were brought to a conclusion and many augmentations to existing supplies were completed.

Works of Water Supply were carried out in twenty towns and at 30th June similar works were in progress in thirteen towns.

New schemes of water supply for ten towns were investigated, while consideration was given to the augmentation of five existing supplies.

South-West Tablelands Water Supply Scheme.—Work on this scheme was continued, the reticulation of Temora and the construction of the service reservoir having been completed, as well as the laying and jointing of the cast-iron pipes from Demondrille to Young.

New Sewerage Schemes.—Schemes of sewerage for the towns of Casino, Grafton, Glen Innes and Quirindi were completed and schemes were in progress at the end of the financial year at Cowra, Wellington, Taree, Nowra, Armidale, Bowral, Corowa and Bega, as well as the augmentation of the existing Katoomba sewerage.

WATER SUPPLY AND SEWERAGE TREATMENT AND PURIFICATION.

Investigation for filtration plants were prepared in connection with water supply proposals for the towns of Adelong, Barellan and Berrigan, whilst the enlargement of the existing filtration plant at Glen Innes is approaching completion. Filtration plants were constructed and put into operation for the towns of Kyogle, Mittagong and Nowra.

Water treatment plants were installed for the hospitals at Canowindra, Inverell and Macleay (Kempsey), and a plant to treat boiler water only was under construction at Urana. In addition, investigations were carried out and estimates prepared for treatment plants for domestic supplies and mechanical engineering services for the Bega, Blayney, Nyngan and Wagga public hospitals and the Yanco Agricultural High School.

Swimming Baths.—Reports were made on swimming pool filtration plants for the Municipal Councils of Broken Hill, Cessnock, Cootamundra, Kyogle, Parkes and Young.

Stormwater Channels in Metropolitan Area.—Work was brought to completion or was still in progress on thirty-one stormwater channels in the Metropolitan Area, the total expenditure for the year being £1,004,077 18s. 10d. The principal channels undertaken were Bunnerong Creek, Cup and Saucer Creek, Cook's River (Upper), Duck River, Haslem's Creek, Hen and Chicken Bay, Homebush Bay, Kogarah Bay, Lachlan Swamps, Maroubra Bay, Salt Pan Creek, Shea's Creek, Terry's Creek, Wolli (Upper) Creek.

Newcastle District.—Expenditure for the year on the Newcastle sewerage amplification amounted to £58,250, bringing the total to £667,450.

Further progress was made with the sewerage scheme at Carrington, which was completed with the exception of the installation of the pumping plant, which work is in hand. The expenditure for the year amounted to £5,875.

Stockton Sewerage.—The reticulation and main sewers have been completed with the exception of small sections at each pumping station and the rising main; pumping stations and treatment works are all nearing completion. The expenditure for the year amounted to £26,995.

Throsby Creek Stormwater Drainage.—The expenditure for the year amounted to £64,935, bringing the total up to £712,638.

RIVER MURRAY WATERS AGREEMENT.

Amending legislation was passed by the contracting Authorities limiting the capacity of the Hume Reservoir, excising certain structures on the Murray River and adding to the schedule two weirs on the Murrumbidgee River and five barages at the Murray mouth.

At Lock and Weir No. 15 (Euston) the first coffer dam was dewatered in March, 1935, and good progress was made with the placing of concrete in the lock structure within the coffer dam. Surveys and borings were carried out at the proposed sites for Nos. 5 and 7 weirs on the Murrumbidgee River. The construction of a road of access to No. 5 Weir was commenced.

The only uncompleted works at the Hume Reservoir were the earth filling in the embankment behind the North Wing Wall, together with concrete slabbing, the laying of the bituminous surface on the sluice and spillway sections of the roadway and clearing up the site.

It is proposed to commemorate the completion of the reservoir to the 1½ million acre-feet level with an official opening ceremony early next year.

HARBOURS, ROADS AND BRIDGES BRANCH.

The expenditure of this branch amounted to £562,241, as compared with £533,154 for the previous twelve months. This amount was made up as follows:—

	£
Harbour Works (including dredging)	340,992
Roads	182,804
Bridges	26,109
Punts and Ferries	6,376
Public Watering Places	5,960
	<hr/>
	£562,241

As in previous years officers of the Branch carried out a considerable volume of duties for other Departments, such as conducting Local Government inquiries, inspections for Water Rights, Unemployment Relief Works, etc.

Harbour Works.

Major improvement works at Coff's Harbour, Port Kembla, and Newcastle and the construction of an Eastern training wall at Hastings River entrance (Port Macquarie) were continued.

Coff's Harbour.—The total expenditure on the Eastern Breakwater, Coff's Harbour, to date is £240,116. Repairs were also effected to the Northern Breakwater and the Jetty.

Newcastle.—The submarine rock excavation operations continued and an estimated quantity of 14,776 cubic yards of rock was broken during the year.

Port Kembla.—The Eastern Breakwater was extended 56 feet, making the total length 3,404 feet.

During the year 35,414 tons of stone were placed in position at a cost of £18,503, bringing the total quantity of stone up to 1,215,771 tons, costing £379,162.

Port Macquarie.—The construction of the Eastern training wall was continued. The wall was extended a distance of 1,150 feet, involving an expenditure during the year of £8,572 10s. 6d., bringing the total expenditure to date up to £14,714 19s. 11d. This work is being carried out to divert the channel into a more stable position, and thus materially reduce the annual expenditure on dredging which, as the result of flood waters breaking through the entrance, has proved excessive.

Dredging.—The quantity of material dredged during the year totalled 3,206,779 tons at a cost of 7.23d. per ton.

Roads and Bridges.

Roads.—The expenditure on roads amounted to £182,804. In the Metropolitan district, where £94,545 was expended, the works mainly comprised roads within National Park, roads within various State institutions, at the Royal Agricultural Show Ground, Scheyville Training Farm, and Lithgow Emergency Relief Scheme roads.

The Western Division Roads Vote, provided by the Commonwealth Government from the proceeds of the petrol tax, amounted to £50,218, and this was spent on new construction and maintenance in the Western Division. In addition, an amount of £2,009 was provided from the departmental revenue vote for general maintenance to roads in this area.

Bridges.—The total expenditure on bridges amounted to £26,109. The works undertaken included a new bridge over Bunker Creek, completion of the bridge over North Creek, East Ballina; new bridges over Morumbil Creek and Boorooma Creek, on the 26 mile Warrambool Bridge, and general maintenance (£11,402) of bridges in the Western Division.

Aviation.—The work of clearing and grading seventeen landing grounds in the Western Division was carried out with funds provided by the Unemployment Relief Council.

Settler's Water Supplies.—An amount of £1,751 was made available from Unemployment Relief Funds for the provision of wells for settlers in the Western Division.

Punts and Ferries.—The maintenance of these services involved an expenditure of £6,374.

WALSH ISLAND GOVERNMENT DOCKYARD.

Operations at Walsh Island Dockyard were confined to the maintenance and control of the floating dock and slipways and the disposal by public tender of surplus and obsolete stores and plant.

The revenue received during the year from the floating dock and slip dues amounted to £2,428 15s. 9d. and the expenditure on operation of the dock and slipways, excluding ordinary maintenance and insurance totalled £785 9s. 5d.

ELECTRICAL ENGINEERING BRANCH.

The varied nature and the scope of the work of this branch is indicated by the following statement of its activities :—

Section I.—Electrical Engineering Works.

1. Hydro-electric investigations.
2. Construction, operation and maintenance of Burrinjuck electricity supply.
3. Construction, operation and maintenance of Port Kembla electricity supply.
4. Electrical engineering assistance to other departments and other branches of this Department.

Section II.—Engineering Services in Government Buildings.

1. Steam heating and hot water services.
2. Laundry, cooking and sterilising equipments.
3. Refrigeration.
4. Ventilation and air conditioning.
5. Electric lighting and power, including heating, cooking, and miscellaneous domestic uses of electricity.
6. X-ray and other electro-medical appliances.
7. Radio transmitting and receiving appliances.
8. Boiler inspection.

Burrinjuck Electricity Supply: Power Station No. 2.—A contract has been entered into for the supply and erection of two 5,000 kW hydro-electric generators which will develop full capacity under a gross head of 150 feet. This station will be operated normally as a completely automatic unit controlled from No. 1 Station.

The increase in the quantity of energy sold from Burrinjuck continued, rising from 19,515,480 kWh last year to 20,652,917 kWh for the year just concluded.

Port Kembla Electricity Supply.—The increase in the quantity of energy sold was maintained. The units sold this year were 12,802,173, as against 12,085,654 for 1933-1934, representing an increase of about 6 per cent.

GOVERNMENT ARCHITECT'S BRANCH.

The value of works supervised was £1,048,000, as against £1,085,000 for last financial year.

State and Mental Hospitals.—The most important contracts dealt with during the year were:—New diphtheria ward block and a third medical ward block at the Prince Henry Hospital; two two-ward blocks for male refractory patients and a female hospital block at the Morisset Mental Hospital; a new ward block at the Callan Park Mental Hospital for the Repatriation Department; operating block, Gladesville Mental Hospital; new quarters for nurses, a general lavatory block and a general store block, Lidcombe State Hospital; new quarters for the Medical Superintendent and a general ward block, Liverpool State Hospital; male and female ward blocks, Orange Mental Hospital; new male wards, Parramatta Mental Hospital; pathological block, Prince Henry Hospital; kitchen block, Prince Henry Hospital; operating unit, Prince Henry Hospital.

Public Hospitals.—As a consequence of the forward Government policy in hospital construction, the expenditure for the year on new buildings, alterations, etc., was £272,000, as against £251,000 last year.

Entirely new hospital buildings were erected at Bowral (Berrima District), West Wyalong, Inverell and Eastern Suburbs, whilst a new building was commenced at Urana, and plans were practically ready for the invitation of tenders for one at Walgett.

Large additions were also carried out to the nurses' quarters at the Royal Prince Alfred Hospital; new nurses' quarters at St. George District Hospital, and extensive alterations and additions to the administrative block at the Royal Alexandra Hospital for Children.

Extensive contracts in progress are:—Alterations and additions, Grafton District Hospital; additional accommodation for intermediate patients and nurses, Griffith District Hospital; infectious diseases unit, Newcastle District Hospital; maternity block, Royal North Shore Hospital; out-patients' department, Royal Prince Alfred Hospital; new nurses' quarters, Wagga Wagga District Hospital.

Considerable additions and improvements are also in hand at the following public hospitals:—Bellinger River, Canowindra, Carcoar, Condobolin, Coonabarabran, Coonamble, Dungog, Gunnedah, Kyogle, Lithgow, Macleay District (Kempsey), Manilla, Mudgee, Narrandera, Parkes, Parramatta, Peak Hill, Quirindi, Rylstone, Tamworth, Tumut and Windsor.

Numerous works involving minor expenditure were executed throughout the State.

School Buildings.—Expenditure on works carried out for the Department of Education was £292,000. The principal new buildings constructed are as follows:—Bathurst (Boys' and Girls' Primary); Inverell (High); Queanbeyan (Intermediate High); Quirindi (Primary); St. George (Junior Boys' High); and Tamworth (Agricultural High). Extensive alterations and additions were made to the North Sydney Boys' High School.

Other considerable works undertaken comprise new buildings at Bathurst (Domestic Science and Manual Training), Earlwood (Girls'), Murwillumbah (Domestic Science), Parkes (Public and Intermediate High), Pitt Row (Infants') and Randwick (Domestic Science). Plans for new buildings and extensive additions at other centres were well in hand.

Works deserving of mention include new buildings at Albury (Domestic Science), Raymond Terrace, Warner's Bay, Wentworthville (Infants'); and additions at Coniston and Hurlstone Agricultural High.

Public Buildings Generally.—The Government Architect's Branch functions in respect of the whole of the public buildings throughout the State and during the year carried out considerable work for the other departments, notably the Chief Secretary's, Justice, Child Welfare. Details will be found in the Government Architect's report attached hereto.

ENGINEERING DESIGN BRANCH.

The services of this Branch are correlated to the activities of all the construction branches of the Department, including the diverse requirements of water supply, sewerage, stormwater drainage, harbours, drainage, bridges, electricity, etc.

As in the previous twelve months, a considerable volume of work was carried out in connection with the design of stormwater drainage works in the Metropolitan area.

In addition to the preparation of plans and specifications required in connection with works under construction or proposed, the Branch gave consideration to draft specifications submitted by the Standards Association of Australia for comment before final adoption. One of the most important items considered was the standard specification for cement.

SURVEY DRAFTING BRANCH.

This branch serves the whole of the Department in general survey, drafting, recording, heliographing, photostat copying, plan mounting, etc. As the Department's operations for the year were more extensive than for the previous year, the output of the Branch was consistently maintained.

TESTING BRANCH.

The estimated value of the material tested and inspected amounted to £501,068, while fees totalling £7,305 were collected.

The quantity of cement issued under test certificates was 2,612,640 bags, as against 2,229,550 bags last year.

GENERAL.

With regret I record the death of Mr. Herbert Fleming, late Chief Engineer, who at the date of his decease, 20th August, 1935, was on leave prior to retirement, after 45 years' of service, mainly associated with the Department's activities in water supply and sewerage.

In conclusion, I wish to acknowledge the support I have at all times received from the whole of the staff, the members of which have performed their duties with zeal and efficiency during a year which has made heavy demands on them.

E. H. SWIFT,
Under Secretary.

Accountant's Report.

For the Year ended 30th June, 1935.

The staff of the Department, and the annual salary charges as at the 30th June, 1935, and the comparison with the similar particulars of the previous year will be found in the following :—

Year.	Permanent Officers.		Temporary Officers.		Total.	
	No.	Salary.	No.	Salary.	No.	Salary.
1934-35—		£		£		£
General Staff	*343	124,393	456	121,697	799	246,090
Dredge Service Staff.....	100	27,385	115	27,109	215	54,494
	443	151,778	571	148,806	1,014	300,584
1933-34—						
General Staff	353	120,765	410	101,127	763	221,892
Dredge Service Staff.....	104	25,128	108	23,157	212	48,285
	457	145,893	518	124,284	975	270,177

* Includes 27 officers on loan from various Departments and excludes 6 officers on loan to various Departments.

The total expenditure and repayments in respect of works supervised by the Department during the year ended 30th June, 1935, may be summarised as follows :—

	Gross Expenditure.		Repayments.	
	£	s. d.	£	s. d.
1. Consolidated Revenue Vote	466,687	11 10	30,593	10 11
2. General Loans	1,056,442	17 4	39,819	13 4
3. Special Expenditure Loans	1,488,278	15 5	7,950	5 4
4. Special Deposits Account	694,714	7 5	616,764	17 6
5. Payments made by other Departments for Works and Services carried out by the Public Works Department	399,128	2 3	12,057	3 8
	£4,105,251	14 3	£707,185	19 9
Nett Expenditure	£3,398,066	3 6		

Details of the foregoing summary will be found in the following statements :—

1. Consolidated Revenue Vote—

	Expenditure.		Receipts.	
	£	s. d.	£	s. d.
(a) Salaries and Payments in the nature of Salaries	117,833	13 10		
(b) Maintenance and Working Expenses other than Salaries	19,675	8 9		
(c) Maintenance of Public Works and Services—				
Roads	2,009	9 10		
Bridges.....	10,076	3 7		
Punts, Ferries and Floodboats.....	6,374	7 0		
Public Watering Places	1,915	9 7		
Harbours and Rivers	17,202	10 10		
Dredge Service	99,152	11 11		
Public Buildings	53,685	11 10		
Water Supply, Sewerage and Stormwater Drainage	10,638	9 7		
State Power Supply	34	13 3		
State Telephones	31,134	16 6		
Electricity and Gas	46,494	16 5		
Government Dockyard (excluding Floating Dock).....	5,390	10 8		
Government Dockyard Floating Dock (except Hiring Operations)	8,173	9 7		
Miscellaneous	26,222	0 5		
	321,505	1 0		
(d) Unemployment Relief.....	7,673	8 3		
(e) Revenue Received and Paid into Consolidated Revenue—				
Repayments made to previous years Consolidated Revenue Votes..			5,558	0 11
Rents ex Land			8,046	17 0
Miscellaneous Services rendered			6,721	4 1
Unclassified Receipts			9,623	5 5
Exchange on Remittances			113	10 1
Fees			3	11 0
Advances for Departmental Working Accounts and other purposes				
—Advances to be recovered			23	0 5
Repayments to previous years Unemployed Relief Fund			902	3 0
Repayment of Advance on account of Unemployed Relief Authority				
86—Bridge over George's River at Milperra			198	19 0
	£466,687	11 10	£30,593	10 11

2. General Loans—

	Expenditure.			Receipts.		
	£	s.	d.	£	s.	d.
Bridges.....	20,221	17	8	904	0	3
Harbours, Rivers and Dredge Service	137,884	10	4	17,422	5	0
Water Supply Works	217,245	11	9	2,341	17	2
Sewerage and Stormwater Drainage	193,691	4	3	5,989	9	10
Public Buildings	299,211	1	7	2,662	0	9
Electrical Works	61,198	5	0	2,404	12	4
Public Watering Places	3,455	14	4	55	5	3
Unemployment Relief	11,499	2	0	.....	
River Murray Commission—						
State Contribution to their Funds, Purchase of Plant, etc.	112,035	10	5	331	13	7
Sale of No. 1 Plant, etc. ....	.....			5,868	4	0
Miscellaneous .....	.....			1,840	5	2
	£1,056,442	17	4	£39,819	13	4

3. Special Expenditure Loans—

Roads	77,413	15	10	3,435	6	11
Bridges.....	259	4	1	.....	
Harbours and Rivers	30,623	14	8	152	17	5
Public Watering Places	589	4	11	10	10	9
Country Towns Water Supplies	16,568	13	8	433	9	4
Country Towns Sewerage	183,909	18	5	3,866	0	8
Stormwater Drainage	1,114,874	9	4	8	15	10
Buildings generally	62,258	4	11	32	5	10
Miscellaneous Minor Works	1,781	9	7	10	18	7
	£1,488,278	15	5	£7,950	5	4

4. Special Deposits Accounts.

	Balance at 1st July, 1934.			Receipts.			Total.			Expenditure.			Balance at 30th June, 1935.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Public Works Department Store Advance Account	125,147	17	3	68,799	5	4	193,947	2	7	65,604	3	1	128,342	19	6
Public Works Department Western Division Plant Account	Dr. 4,078	15	3	1,813	13	0	Dr. 2,265	2	3	329	19	2	Dr. 2,595	1	5
Public Works Department Working Account	3,947	1	3	36,477	3	1	40,424	4	4	24,112	11	10	16,311	12	6
Public Works Department Suspense Account—															
General	861	13	6	57,244	19	8	58,106	13	2	9	14	9	58,096	18	5
Main Roads Board	2,047	10	3	.....			2,047	10	3	1,935	3	0	112	7	3
Western Division Roads and Municipalities...	85,419	0	9	.....			85,419	0	9	54,408	15	8	31,010	5	1
Hospitals Commission	220,651	4	0	.....			220,651	4	0	213,988	8	4	6,662	15	8
Junee Water Supply Administration Account.....	1,323	19	2	14,572	18	1	15,896	17	3	12,926	15	10	2,970	1	5
Junee Water Supply Renewal Reserve	49	16	11	1	10	2	51	7	1	.....			51	7	1
Broken Hill Water Supply Administration Account	18,442	4	0	38,851	5	3	57,293	9	3	29,029	0	7	28,264	8	8
Medlow Water Supply Working Account	58	11	11	328	3	6	386	15	5	308	3	5	78	12	0
Bethunga Water Supply Working Account	117	5	4	119	5	1	236	10	5	28	2	7	208	7	10
South-west Tablelands Water Supply Working Account	5,901	0	11	10,670	8	7	16,571	9	6	6,543	0	3	10,028	9	3
Dyke End Workshops Working Account.....	7,721	19	7	17,851	13	11	25,573	13	6	20,094	4	2	5,479	9	4
Government Dockyard Store Advance Account...	183,102	9	6	50,944	17	0	234,047	6	6	14,639	13	5	219,407	13	1
Government Dockyard Plant Hire Account .....	.....			1,888	14	0	1,888	14	0	48	8	6	1,840	5	6
Port Kembla Haulage and Shipment	22,172	9	7	22,694	9	7	44,866	19	2	17,551	3	11	27,315	15	3
Burrinjuck Electricity Supply Working Account ..	5,780	0	0	96,571	2	0	102,351	2	0	99,119	10	0	3,231	12	0
Burrinjuck Electricity Supply Renewal Reserve ..	50,014	19	2	41,849	6	11	91,864	6	1	.....			91,864	6	1
Port Kembla Electricity Supply Working Account	3,089	7	7	72,780	0	3	75,869	7	10	74,859	19	8	1,009	8	2
Port Kembla Electricity Renewal Reserve	10,000	0	0	24,267	19	1	34,267	19	1	949	11	10	33,318	7	3
Leichhardt Depot Working Account	102	0	9	20,231	9	0	20,333	9	9	18,885	14	11	1,447	14	10
Testing Branch Working Account	37	6	11	8,800	13	2	8,838	0	1	8,614	3	8	223	16	5
State Timber Yards Working Account	2,393	1	6	47	15	3	2,440	16	9	.....			2,440	16	9
State Sawmills Working Account	8,775	5	2	4,032	10	1	12,807	15	3	0	8	3	12,807	7	0
State Brickworks Working Account	1,354	10	2	194	2	5	1,548	12	7	1,354	10	2	194	2	5
State Lineworks Working Account	485	15	0	.....			485	15	0	485	15	0	.....	
Treasury Fire Risks Account	193	7	10	.....			193	7	10	143	7	10	50	0	0
Public Trustee Balance of Intestate Estates	34	19	5	.....			34	19	5	34	19	5	.....	
Loan Repayment Suspense Account—Country Towns Water Supplies and Sewerages .....	.....			56	14	4	56	14	4	.....			56	14	4
Unclaimed Salaries and Wages	316	5	9	804	1	5	1,120	7	2	749	4	0	371	3	2
Unclaimed Moneys	132	2	10	285	6	7	417	9	5	276	2	5	141	7	0
Security Deposit Trust Account	13,834	19	6	24,291	14	11	38,126	14	5	23,938	16	9	14,187	17	8
Unemployment Relief	3,745	12	11	293	15	10	4,039	8	9	3,744	15	0	294	13	9
£	773,175	3	2	616,764	17	6	1,389,940	0	8	694,714	7	5	695,225	13	3

5. *Payments made by other Departments for Works and Services carried out by the Public Works Department—*

	Expenditure.			Receipts.		
	£	s.	d.	£	s.	d.
Agriculture	1,034	10	10	.....	
Chief Secretary	1,147	3	9	.....	
Child Welfare	15,844	13	8	.....	
Commonwealth Government	943	1	1	.....	
Education	193,526	15	7	.....	
Government Printer	4,128	1	1	.....	
Health	3,346	16	11	.....	
Hospitals Commission	18,017	9	5	.....	
Lands	675	16	6	.....	
Metropolitan Water, Sewerage and Drainage Board	586	0	11	.....	
Navigation	467	10	7	.....	
Premier's	2,649	13	5	.....	
Registrar-General's	930	6	11	.....	
Sydney University	4,876	13	5	.....	
Treasury	2,583	8	6	.....	
Unemployed Homes Trust	14,265	4	5	.....	
Miscellaneous	1,909	0	1	.....	
	£ s. d.					
River Murray Commission	243,004	19	1			
Less Amount taken through Head Office						
Control Account	116,000	0	0			
				127,004	19	1
Accident Claims paid on behalf of Government Insurance Office ...				5,190	16	1
				£399,128	2	3
				£12,057	3	8

JAMES ROBERTSON,
Accountant,

19th September, 1935.

The Under Secretary.

Water Supply and Sewerage Branch.

1. WATER SUPPLY AND SEWERAGE GENERALLY.

At the end of the year public water supplies were in operation in ninety-five towns, nineteen towns are seweraged, an increase of two water supply schemes and four sewerage installations, while stormwater channels have been constructed in sixteen towns.

The total capital cost of water supply and sewerage schemes and stormwater channels, excluding the cities and towns in the Metropolitan and Hunter River Districts, amounts to £7,131,344.

Generally speaking, the rainfall for the first half of the year was much above the average, while during the latter six months the weather was dry.

No shortages were reported from existing Country Towns Water Supplies.

New Water Supply Schemes.—Complete schemes of water supply for the towns of Barraba and Kyogle were brought to a conclusion and many augmentations to existing supplies were completed.

Works of water supply were brought to a conclusion in twenty towns and at 30th June similar works were in progress in thirteen towns.

Investigations of new schemes of water supply were carried out in ten towns and for the augmentation of existing supplies in five towns.

Work on the South-West Tablelands Water Supply was continued.

New Sewerage Schemes.—Schemes of sewerage for the towns of Casino, Grafton, Glen Innes, and Quirindi were completed and schemes are in progress at Cowra, Wellington, Taree, Nowra, Armidale, Bowral, Corowa and Bega, and augmentations to the existing scheme is in progress at Katoomba.

Stormwater Channels in Metropolitan Area.—Work was brought to completion or is still in progress on thirty-one stormwater channels in the Metropolitan Area during the year.

2. WATER SUPPLIES ADMINISTERED BY THE DEPARTMENT.

For the three supplies administered by the Department the corresponding period is the twelve months ending 31st December in each year.

(a) BROKEN HILL WATER SUPPLY.

The total quantities of water pumped from the two storages, were :—

	Gallons.
Umberumberka	32,322,000
Stephens Creek	447,741,000
Total	480,063,000

The average cost of pumping was approximately :—

Umberumberka	8·41d. per 1,000 gallons.
Stephens Creek	3·67d. per 1,000 gallons.

(b) JUNE E WATER SUPPLY.

Pumped at Tenandra.	Cost per 1,000 gallons to Railway Commissioners and June E Council.	Supply from Bethungra to Railway Commissioners.	
Gallons.		Gallons.	Cost per 1,000 gals
85,295,000	{ June E Council 2/6 } { Railway 3/6·61865 }	1,749,410	8d.

(c) SOUTH-WEST TABLELANDS—WATER SUPPLY.

Total quantity of water pumped	92,198,000 gallons.
Cost of pumping (per 1,000 gallons) (excluding Capital Charges)	15·7126d.

3. EXPENDITURE FOR YEAR.

	£	s.	d.
Water Supply Works	299,273	4	8
Sewerage Works and Stormwater Channels	1,517,789	14	3
Total	£1,817,062	18	11

B. DETAIL REPORT.

(I) WATER SUPPLY.

(a) Country Towns Water Supply.

1. Works completed.
2. Works under construction.
3. Works proposed and investigations.

(II) SEWERAGE.

(a) Country Towns Sewerage and Stormwater Channels.

1. Works completed.
2. Works under construction.

(b) Newcastle Sewerage and Stormwater Channels.

(III) WATER SUPPLY AND SEWERAGE.

Treatment and purification and general investigation.

(IV) METROPOLITAN STORMWATER CHANNELS.

(A). Country Towns Water Supply.

1. WORKS COMPLETED (LOAN VOTE).

Bathurst.—An additional concrete service reservoir to serve the high levels with a capacity of 200,000 gallons and a 6-inch woodstave service main from the gravitation main to service reservoir were completed at a cost of £3,736 to 30th June, 1935.

Cowra.—Reticulation extensions to Taragala were completed at a cost of £1,583.

Dubbo.—A new 15-inch cast iron rising main was laid from the new pumpwell to service reservoir.

Inverell Hospital.—A pump station on the MacIntyre River, a rising main, service reservoir, filtration plant and a transmission line have been constructed, the cost to 30th June being £1,798.

Mittagong.—A filtration plant with a capacity of 15,000 gallons per hour was installed for the purification of the water supply to the town, the cost to 30th June being £5,568.

Moree.—A borehole pump with a capacity of 12,000 gallons per hour was installed in No. 1 well at a cost of £1,261 to 30th June, 1935.

South-West Tablelands.—The laying and jointing of the 15-inch steel main from Cootamundra to Temora, the reticulation of Temora, and the construction of the service reservoir have been completed.

The laying and jointing of the 12-inch and 9-inch cast iron pipes from Demondrille to Young have been completed.

Singleton.—An additional borehole pump was installed in existing well at a cost of £1,694.

Tamworth.—A new 6-inch cast iron main was laid in Raglan-street, Tamworth, and a 6-inch cast iron main was laid in Fitzroy-street, West Tamworth, and connected to new service reservoir to take the place of the existing 3-inch main in that street.

Wentworth.—An electrically-driven pump with a capacity of 15,000 gallons per hour was installed, and a 6-inch fibrolite rising main was laid to take the place of the existing main. The cost to 30th June was £750.

Works Completed (Unemployed Relief Works).

Barraba.—A complete scheme for the town was brought to a conclusion consisting of a concrete storage dam on O'Connor's Creek, a cast iron gravitation main and reticulation. The cost to 30th June was £30,137.

Cobar.—The cleaning of catchment drains and other improvements were carried out at a cost of £1,262 to 30th June, 1935.

Glen Innes.—Additions to the existing filtration plant and to the reticulation were carried out at a cost to 30th June of £5,518.

Gulgong.—Reticulation extensions were carried out and a second pump was installed in pumpwell.

Gunnedah.—Extensions to the reticulation were carried out with galvanised iron pipes at a cost of £112.

Hay.—A new suction main and staging for pumping plant was constructed at a cost to 30th June of £715.

Kyogle.—A complete scheme for the town consisting of a pump station, rising main, service reservoir, reticulation and a filtration plant was completed at a cost of £30,976 to 30th June.

Lismore.—Extensions to the reticulation were carried out at a cost of £3,764 to 30th June.

Picton.—The re-laying of the balance of the 8-inch steel gravitation main from the dam with 10-inch and 8-inch cast iron pipes was completed at a cost of £9,677 to 30th June.

Manilla.—Repairs were carried out to erosion in river bed below weir on the Namoi River.

2. WORKS UNDER CONSTRUCTION (LOAN VOTE).

Broken Hill.—Reticulation extensions are in progress.

Dubbo.—A new pumpwell on the bank of the Castlereagh River and a timbered drive therefrom under the river are being constructed.

Junee.—Reticulation extensions are being carried out partly with the 9-inch pipes from old gravitation main and partly with fibrolite pipes.

South-West Tablelands.—The laying and jointing of the 12-inch concrete pipes between Demondrille and Young and the construction of the pumping station and control reservoir on the line also the service reservoir at Young and the reticulation of that town are in progress.

The laying and jointing of 12-inch spun cast iron pipes between Temora and West Wyalong are in progress.

Tamworth.—A new concrete service reservoir with a capacity of 300,000 gallons is in course of construction to augment the supply of West Tamworth and a roof is being erected over existing service reservoir in the main town.

Waterfall Sanatorium.—The cast-iron rising and gravitation mains are being cement lined *in situ*.

Works under Construction (Unemployed Relief Works).

Bourke.—A new suction main and staging are in course of construction and a duplicate high lift pump with a capacity of 10,000 gallons p.h. has been installed.

Coonabarabran.—A second pump, electrically-driven, with a capacity of 10,000 gallons p.h. is being installed in pumpwell.

Gosford.—A complete scheme for the town is in progress consisting of a concrete dam in Mooney Mooney Creek, a pumping station, transmission line, rising and gravitation mains, balance tank, service reservoir and reticulation.

Lower Blue Mountain Villages.—A complete scheme is the course of construction and comprises the raising of the dam on Woodford Creek with extensions to existing pump station, also service mains and reticulation for Linden, Faulconbridge and Springwood to Buckland Hospital, including a break pressure tank.

Narooma.—A complete scheme is in progress including pipehead dam on Dromedary Creek, gravitation main, service reservoir and reticulation.

Rabbit Island.—A subaqueous gravitation main from the existing storage dam on the mainland, a service reservoir and reticulation for the Mental Institution are under construction.

Wellington.—A 3½-inch fibrolite pipe is being laid from the town reticulation in Percy-street to take the place of the existing 7-inch steel main from the Bushrangers Creek dam.

3. WORKS PROPOSED AND INVESTIGATIONS.

During the year investigations were carried out for the proposed water supplies for Aberdeen, Adelong, Bingara, Dunedoo, Pitt Town, Alstonville, Milton and West Narrabri, and for proposed augmentations to existing supplies at Berry, Bomaderry, Parkes, Kempsey and Kiama.

Further investigations were carried out at Coolamon, Crookwell, Coffs Harbour, Gosford, Lower Macleay, Trundle, Milton, Murrurundi and Murwillumbah.

(a) Country Towns Sewerage.

(1.) WORKS COMPLETED (LOAN VOTE).

Dubbo.—Extensions to sewers were carried out at a cost of £2,947 to 30th June, 1935.

Works Completed (Unemployment Relief Works).

Casino.—A complete scheme for the town was completed consisting of pump station, ejector station, rising mains, reticulation and treatment works. The cost to 30th June was £61,635.

Glen Innes.—A scheme for the town was completed consisting of sewers and treatment works at a cost to 30th June of £76,359.

Goulburn.—Alterations to the treatment works were carried out at a cost of £257 to 30th June, 1935.

Grafton.—A complete scheme for the town was brought to conclusion consisting of three pumping stations, rising mains and treatment works. The cost to 30th June was £53,680.

Quirindi.—A scheme for the town was completed consisting of sewers and treatment works at a cost to 30th June of £27,036.

West Tamworth.—The reticulation has been completed, the sewers discharging into the main Tamworth Pump Station at a cost of £21,243.

2. WORKS UNDER CONSTRUCTION (UNEMPLOYMENT RELIEF WORKS).

Complete schemes of sewerage were in progress in the following towns:—

Armidale, Bega, Bowral, Corowa, Cowra, Nowra, Taree and Wellington.

Bowral is a gravitation scheme, Armidale and Cowra partly gravitation and partly pumping, the balance being entirely pumping schemes.

Katoomba.—Augmentation and improvements are being carried out consisting of a main sewer which intercepts sewage at present discharging into the existing treatment works and carries it into new treatment works in the Kanimbla Valley. Reticulation extensions are also being carried out at Echo Point.

Tamworth.—The existing treatment works are being enlarged to deal with the additional sewage now being received from West Tamworth.

Water Supply and Sewerage.

TREATMENT, PURIFICATION AND GENERAL INVESTIGATION.

Water Supply.—Investigations and estimates for filtration plants proposals were prepared for the towns of Adelong, Barellan and Berrigan and for a modification of the treatment process at the existing softening plant at Singleton.

The enlargement of the existing filtration plant at Glen Innes is approaching completion.

Filtration plants have been constructed, equipped and put into operation for the towns of Kyogle, Mittagong and Nowra.

Field examinations have been made of the soil conditions obtaining along the route of the proposed gravitation main for the Narooma Water Supply.

Regular inspections have been made and reports furnished in connection with the water treatment plants at Bowral, Glen Innes, Lake Cargelligo, Manilla, Orange, Singleton, Tenterfield and Wellington.

Swimming Baths.—At the request of the Local Government Department, reports were made on swimming pool filtration plants for the Municipal Councils of Broken Hill, Cessnock, Cootamundra, Kyogle, Parkes and Young.

Hospitals.—Investigations have been carried out and estimates prepared for water treatment plants for domestic supplies and mechanical engineering services for the following public hospitals:—

Bega, Blayney, Nyngan, Urana, and Wagga, and for Yanco Agricultural High School.

In the case of Canowindra, Inverell and Macleay (Kempsey) Hospitals, water treatment plants have been installed and put into service. A plant to treat boiler water only is under construction at Urana Hospital.

An inspection has been made and a report furnished on the water supply to the Prince Henry Hospital.

General.—Reports have been furnished on the Standards Association of Australia Specifications for—

Flushing Cisterns,
Stoneware Pipes,
Cast-iron Pipes and Fittings, and
Standard Plumbing and Drainage Regulations.

Sewerage.—Investigations and designs have been carried out and reports and estimates furnished for complete sewerage schemes for the towns of Bega, Corowa, Nowra and Queanbeyan.

Preliminary investigations have been completed, reports furnished and detail surveys put in hand for the towns of Cootamundra, Mittagong, Muswellbrook and Tumut, while detail surveys are in progress at Cooma and Singleton.

General designs have been completed for the sewage treatment works at Armidale, Bega, Bowral, Corowa, Nowra, Queanbeyan and Taree.

The sewage treatment works at Albury, Bathurst, Casino, Cowra, Dubbo, Forbes, Glen Innes, Goulburn, Grafton, Hay, Katoomba, Lismore, Lithgow, Mudgee, Narrandera, Orange, Parkes, Quirindi, Tamworth and Wagga, have been visited regularly, the effluents tested and samples forwarded for analysis to the Health Department.

Inspections have been made and reports furnished in connection with the existing treatment works at the following public hospitals and Government Institutions:—

Cootamundra, Griffith, Jerilderie, Junee, Kurri Kurri, Lake Cargelligo, Moruya, Murrumburrah-Harden, West Maitland and Yass Public Hospitals, also at Gladesville and Morisset Mental Hospitals, Lidcombe, Liverpool and Newington State Hospitals, Eastwood Farm Home and at Curl Curl Preventorium and Maroubra Bay Tram Terminus.

New sewerage schemes were designed and constructed at the following hospitals and Government Institutions:—

Dungog, Gunnedah and Manilla District Hospitals, Woods Point (Morisset) Criminal Mental Hospital and Riverina Farm Home,

while designs have been prepared for new sewerage schemes at the following hospitals and institutions:—

Berrima, Collarenebri, Merriwa, Tenterfield, Wialda and Walgett District Hospitals and Wilson Memorial Hospital (Murrurundi) and at Berry Experimental Farm Home, Gladesville Mental Hospital (old hospital) Morisset Mental Defectives Hospital and Tanworth Agricultural High School.

(b) Newcastle Sewerage and Stormwater Channels.

NEWCASTLE SEWERAGE AMPLIFICATION.

Pumping Stations, etc.—Pump house and well are complete, excepting the installation of penstocks. The main pumping machinery and motors have been installed and erection of the electrical switchgear in pump house and well has been practically completed.

The Venturi meter chamber has been completed and Venturi meters installed.

Screening chamber and house have been completed and fine screens with motors installed.

The bucket elevators have been partly erected.

A commencement has been made on the erection of trestles to support conveyors over the coarse screens.

Effluent Line.—Completed.

	£	s.	d.
Expenditure for the year	58,250	4	2
Total expenditure to date	667,450	9	9

Carrington Sewerage.—Carrington Sewerage is completed with the exception of the installation of the Pumping Plant. This is now being installed.

	£	s.	d.
Expenditure for the year	5,875	16	10
Total expenditure to date	78,360	9	6

Stockton Sewerage.

Reticulation and Main Sewers.—These have been completed with the exception of small sections at each Pumping Station.

Rising Main.—Completed except small lengths of pipes to connect up to each Pumping Station.

Pumping Stations.—Work is nearing completion.

Treatment Works.—Work is nearing completion.

	£	s.	d.
Expenditure for the year	26,994	19	10
Total expenditure to date	91,987	12	0

Maitland Sewerage.

Construction work has been commenced at Maitland Sewerage on the reticulation sewers in the Loin section.

	£	s.	d.
Expenditure to date	13,385	19	3

Morisset Mental Hospital Sewerage.

The sewerage of the Wyee Criminal Mental Hospital has been completed.

	£	s.	d.
Expenditure to date	1,223	9	10

Cessnock Sewerage.

Installation of excess water syphons to digestion tanks at Cessnock Treatment Work was completed.

	£	s.	d.
Expenditure for the year	582	6	2
Total expenditure to date	251,738	17	1

Throsby Creek Stormwater Drainage System.

Main Channel.—The "Bucyrus" Excavator was brought from the Hume Dam and has removed 35,000 cubic yards of O.T.R. and 100 cubic yards of rock, completing the section upstream of Union-street. Footbridge has been constructed at Union-street and the Electric Dredge has proceeded upstream as far as Sparke-street and is now depositing sand on the right bank, having removed 24,000 cubic yards from the creek during the past twelve months. Stone Pitching of the banks has been continued and another 2,080 lineal feet have been completed as well as additional excavation of 1,700 cubic yards of O.T.R. and 315 cubic yards of rock and 2,550 cubic yards of filling for the formation of banks.

The concreted section of this channel has been completed. A new concrete bridge at Chinchon-street has been completed.

Branches and Sub-Branches.—Construction of the branches and sub-branches has been completed with the exception of the following work:—

Mayfield Branch Completed with the exception of a small length of channel near Maitland-road bridge.

Lambton Branch Pearson-street Extension—under construction.

Dora-street Branch has been completed.

	£	s.	d.
Expenditure for the year	64,935	15	5
Total expenditure to date	712,638	14	5

Cottage Creek Stormwater Drainage System.

National Park Branch.—This branch has been completed.

								£	s.	d.
Expenditure for the year	...	...	...	...	...	...	...	2,676	18	9
Expenditure to date	...	...	...	...	...	...	...	13,116	2	8

Cessnock Stormwater Drainage.

Centre Line Surveys were completed for Bellbird Creek Extension and Lavender Creek Extension Stormwater Drains. Easement Surveys are in progress.

Bellbird Creek.—Channel has been completed over entire length from Junction with Black Creek. The reinforced concrete bridge at Allandale-road has been completed.

Bellbird Creek Extension.—Excavation has been completed from Lavender Creek Junction to Matthews-street and is in progress upstream to Westcott-street.

Lavender Creek Extension.—Excavation and Concrete Invert have been completed from Westcott-street to McGrane-street. Concrete Gravity Wall Section has been completed from Westcott-street to within 200 feet of McGrane-street.

Black Creek.—Channel Excavation and Concreting have been completed between Junction with Bellbird Creek and downstream end of possible deviation through Sarroff's premises above Main-street. No work has been done over length affected by deviation proposal pending settlement of land matters.

From upstream end of deviation at Junction with Kearsley Creek to the end of proposed construction above North-avenue all work has been completed.

A new bridge consisting of 2 span timber superstructure with reinforced concrete sub-structure has been completed at Ferguson-street.

Black Creek Extension.—Excavation is nearing completion over the section from chainage 00 at Junction with Bellbird Creek to chainage 700 feet downstream.

Kearsley Creek.—Kearsley Creek has been completed with the exception of a small length at the Junction with Black Creek.

Timber bridges have been constructed at Edgeworth-street, Maitland-street, McFarlane-street, and Sixth-street. A small access bridge has also been constructed at lane between Maitland and McFarlane streets.

Charlton-Snape street Deviation (Relief Channel).—A reinforced concrete box section has been constructed from the downstream junction with Kearsley Creek to Vincent-street. Excavation is nearing completion to the upstream junction with Kearsley Creek.

Morisset Mental Hospital Water Supply.

The alterations and additions to the Morisset Mental Hospital Water Supply have been completed.

Metropolitan District.

The following drainage systems were being constructed during the year :—

Arncliffe.—Reinforced concrete box section draining Arncliffe Municipality.

Bunnerong Creek.—Partly reinforced concrete box section; partly open channel, concrete invert, brick and concrete walls; partly reinforced concrete pipes, draining portions of Randwick and Botany Municipalities.

Belmore Creek.—Open channel, brick walls, draining portion of Canterbury Municipality.

Brickfield Creek.—Partly open channel, concrete and brick walls; partly reinforced concrete box section, draining portion of Parramatta Municipality.

Cup and Saucer Creek.—Partly open channel, concrete invert, brick and concrete walls; partly reinforced concrete box section partly reinforced concrete pipes, draining portion of Canterbury Municipality.

Clay Cliff Creek.—Partly open channel, concrete invert, brick walls; partly reinforced concrete box section, draining portion of Holroyd and Parramatta Municipalities.

Cook's River (Upper).—Partly open channel, concrete invert, brick and concrete walls; partly box section; partly reinforced concrete pipes, draining portion of Bankstown, Enfield and Canterbury Municipalities.

Duck River.—Partly open channel, concrete invert, brick and concrete walls, partly reinforced box section; partly reinforced concrete pipes, draining portion of Granville, Parramatta and Bankstown Municipalities.

Exile Bay.—Open channel, concrete invert and walls, draining portion of Concord Municipality.

Forbes Creek.—Partly open channel, concrete invert, stone walls; partly reinforced concrete box section, draining portion of Sutherland Shire.

Haslem's Creek.—Partly open channel, concrete invert, brick walls; partly reinforced concrete box section; partly reinforced concrete pipe, draining portion of Auburn and Lidcombe Municipalities.

Hen and Chicken Bay.—Partly open channel, concrete walls, concrete invert; partly reinforced concrete box section, draining portions of Burwood and Drummoyne Municipalities.

Homebush Bay.—Open channel, concrete invert, concrete walls, draining portion of Homebush and Strathfield Municipalities.

Kogarah Bay.—Partly open channel, concrete invert, brick walls; partly reinforced concrete pipes, draining portion of Kogarah Municipality.

Lachlan Swamps.—Partly open channel, concrete invert, brick walls; partly reinforced concrete box section; partly reinforced concrete pipes; draining portion of Waverley, Randwick, Botany and Mascot Municipalities.

Lime Kiln Bay.—Reinforced concrete box section, draining portion of Hurstville Municipality.

Maroubra Bay.—Reinforced concrete box section, draining portion of Randwick Municipality.

Muddy Creek.—Partly concrete invert, concrete walls; partly reinforced concrete box section, draining portions of Rockdale, Kogarah, Bexley and Hurstville Municipalities.

Pennant Hills-Thornleigh.—Reinforced concrete box section draining portion of Hornsby Shire.

Punchbowl-road.—Partly open channel, concrete invert, brick and concrete walls; partly reinforced concrete box section, draining portions of Canterbury, Bankstown and Enfield Municipalities.

Rozelle Bay.—Enlarging channel constructed by Metropolitan Water Sewerage and Drainage Board, including demolition of walls and reconstruction in reinforced concrete; open channel, concrete invert; draining portions of Annandale and Leichhardt Municipalities.

Salt Pan Creek.—Partly open channel, concrete invert, concrete and brick walls; partly reinforced concrete box section; partly reinforced concrete pipes, draining portions of Canterbury and Bankstown Municipalities.

Shea's Creek.—Partly open channel, concrete invert, brick walls; partly reinforced concrete box section; partly reinforced concrete pipes; draining portions of Mascot, Alexandria and Waterloo Municipalities.

Saville's Creek.—Reinforced concrete pipes *in situ*, draining portion of Sutherland Shire.

Small's Creek.—Open channel, concrete invert, brick walls, draining portion of Ryde Municipality.

Spring Gully.—Partly reinforced concrete box section; partly concrete core, (Contract), draining portion of Hornsby Shire.

Terry's Creek.—Partly open channel, concrete invert, brick walls; partly reinforced concrete box section, draining portion of Eastwood and Dundas Municipalities and Hornsby Shire.

Toongabbie Creek.—Partly open channel, concrete invert, brick and concrete walls, draining portion of Blacktown Shire.

Tarban Creek.—Partly open channel, concrete invert, brick walls, draining portion of Ryde and Hunter's Hill Municipalities.

Wolli (Lower) Creek.—Partly reinforced concrete box section; partly open channel, concrete invert, brick walls; draining portions of Bexley and Hurstville Municipalities.

Wolli (Upper) Creek.—Partly open channel, concrete invert, brick walls; partly concrete box section; partly reinforced concrete pipe, draining portions of Hurstville Municipality.

Besides the work enumerated above, investigations were made regarding construction of a further number of drains.

The total expenditure for year was £1,004,077 18s. 10d.

J. KEITH ROSS, M.A., B.Sc., M.Inst. C.E.
Principal Engineer, Water Supply and Sewerage.

5th December, 1935.

Harbours, Roads, and Bridges Branch.

Annual Report, 1934-35.

TOTAL EXPENDITURE.

The total expenditure on construction and maintenance, comprising harbour works, dredging, roads, bridges, ferries, public watering places, etc., amounted to £562,241 (including £157,192 from Special Expenditure Loan Funds) as detailed hereunder :—

	£
Harbour works (including dredging)	340,992
Roads (including those in public institutions and trust areas)	182,804
Bridges	26,109
Punts and ferries	6,376
Public watering places	5,960
	<hr/>
	£562,241

LOCAL GOVERNMENT INQUIRIES.

Local Government inquiries totalling 16 (sixteen) were conducted by officers of the Branch for the Department of Local Government, including eleven applications from Councils for special loans amounting to £105,550.

INSPECTIONS FOR WATER RIGHTS.

Inspections in connection with water right applications and the supervision of shallow bores in the Western Division were again undertaken on behalf of the Water Conservation and Irrigation Commission.

SERVICES ON BEHALF OF OTHER DEPARTMENTS.

During the year, officers of the Branch reported upon applications of Shire and Municipal Councils for unemployment and emergency relief grants and advances, including applications in connection with flood damage.

General maintenance of jetty appurtenances was carried out on behalf of the Navigation Department.

At Newcastle, extensive wharf repairs were carried out for the Railway Department. Repairs to wharves were carried out for the Explosives Department and Stockton Municipal Council, and the boat harbour bridge was renewed for the Newcastle City Council. Sea wall construction at King George's Park was undertaken for the Department of Lands.

Erection of fencing and repairs to farms and cottages at Port Kembla were effected on behalf of the Resumed Properties Department.

HARBOUR WORKS.

The major improvement works at Coff's Harbour, Newcastle and Port Kembla, and the construction of an eastern training wall at Hastings River entrance (Port Macquarie) were continued by day labour.

Particulars of these works are detailed later.

During the year the following larger repairs and extensions were carried out by day labour :—

Byron Bay Jetty	Repairs to piles and superstructure damaged by storm, were completed.
Woolgoolga Jetty	Maintenance of jetty and moorings.
Coff's Harbour Jetty	Maintenance of jetty and moorings.
Macleay River	Repairs to training walls.
Newcastle Harbour	General repairs to wharves, including wharves controlled by Railway Department.
Port Kembla	General repairs to jetties.

Rationing was continued on all day labour works in order to distribute employment as far as possible with the limited funds available.

DREDGING.

The quantity of material dredged during the year totalled 3,206,779 tons at a cost of 7.23 pence per ton compared with 5.82 pence per ton for the previous twelve months.

The cost is normal, the increase being due to a greater number of overhauls during the period under review than in the previous year.

RIVER ENTRANCES.

During the year the majority of river entrances were worked by bar dredges and were maintained at a fairly satisfactory depth in view of the time that dredges were available at each port.

Over the latter part of the year in particular, the dry conditions prevailing resulted in very little natural scour from upland waters to assist in maintaining the entrance channels.

Particulars of depths of bars at crossings at the various river entrances are detailed in Statement "D."

GENERAL MAINTENANCE.

The expenditure on maintenance at the various harbour and river works (excluding dredging and major construction works separately referred to) amounted to £28,946, of which £11,743 was from Special Expenditure Loan Funds and the balance of £17,203 from Revenue Vote.

DOCKS.

The transactions of the docks at the Tweed, Richmond and Clarence Rivers are detailed in Statement "E."

SURVEYS.

This Branch has been responsible for the administration of all Departmental surveys during the period under review.

Tacheometer surveys of several towns were carried out for sewerage purposes.

During the latter part of the year, draftsmen were attached to survey parties so that drafting and survey could be carried out simultaneously. The adoption of this method has expedited the preparation of final estimates.

The costs of the surveys were :—

Town.	Number of Tenements.	Acreage.	Cost per Tenement.		Total Cost Survey and Field Drafting.
			Survey.	Field Drafting.	
			s. d.	s. d.	£
Bega	598	1,300	7 10	.....	236*
Mittagong	440	1,000	16 4	.....	360*
Cootamundra	1,140	2,000	6 10	2 0	503
Tumut	560	1,600	8 9	3 5	340
Muswellbrook	843	1,150	8 6	2 4½	458

* No draftsmen attached.

Investigation and easement and resumption surveys were carried out for a great number of Metropolitan stormwater channels. Surveys were also made for water supply proposals at Gosford, Aberdeen, Kempsey, Young, Nowra and Bega, lock sites on the Murrumbidgee River, electric transmission lines from Yass to Moss Vale, Darby's Falls to Blayney, Monteagle Retail District and Kirkton Retail District, bank erosion and flood prevention on the Macleay River, State Metal Quarries, and miscellaneous boundary definitions for hospitals, schools, police stations and Sydney University.

HYDROGRAPHIC SURVEYS.

Surveys of Coff's Harbour, Port Kembla, and Macleay River from entrance to Jerseyville were undertaken during the year. Dredging surveys were also carried out in the various coastal districts.

BOURKE LOCK WEIR AND WHARVES.

A new steel punt was installed at a cost of £187 5s. 7d. for operating the wickets of the weir.

Operation charges of the wickets amounted to £112 13s. 7d., regulation of the river being necessary for installation of suction main at the water supply pumping station.

Survey measurements of the wharves were made to check the alignment. The wharf structures are unsafe and will be demolished.

The total expenditure for the year on this lock weir and wharves amounted to £304 9s. 7d. No shipping was recorded during the year.

SWAMP DRAINAGE.

Twenty-six Trusts and twenty-nine Unions were functioning at the close of the year, including Whalen Drainage Union, Macleay River, and Lake Urana Drainage Union, which were constituted during the period.

Petitions received for constitution of Drainage Unions at Wilberforce, Dunmore and Goulburn Grove were under consideration at the close of the year.

The drains and other works of the various North Coast Trusts have generally been satisfactorily maintained and have proved beneficial to the swamp holdings.

During the year a Committee appointed by the Government inquired into the finances of the various Trusts. The findings of this Committee are under consideration.

BYRON BAY JETTY.

Repairs to jetty necessitated by severe storm damage during previous year were completed at a total cost of £2,461 17s. 8d., of which £1,203 3s. 7d. was expended during the period under review.

The total expenditure for the year on the jetty access road and moorings amounted to £1,671 3s. 9d.

RICHMOND RIVER.

Repairs were carried out during the year to the Riley's Hill coal wharf at a cost of £264 13s. 1d. and to the Ballina crane wharf at a cost of £69 2s. 2d.

The dismantling and repairs of the dock gates at Riley's Hill were completed, the expenditure for the year being £457 4s. 1d.

CLARENCE RIVER.

Woodford Island coal wharf was repaired at a cost of £133 1s. 8d. and repairs to pile punt were carried out at a cost of £92 8s. 3d.

At Yamba, 25 chains of fascine fencing were erected and a quantity of Marram grass was planted for prevention of sand drift. Expenditure on this work was £101 6s. 10d.

WOOLGOOLGA JETTY.

Expenditure on maintenance of this jetty during the year amounted to £703 6s. 8d., including renewal of piles and girders, repairs to plant and boiler inspections.

COFF'S HARBOUR.

The construction works in connection with the eastern breakwater were continued throughout the year. Concreting the top of the northern wall was resumed in March.

Construction expenditure	...	...	...	...	...	...	...	£29,624 17s.
Tonnage of stone quarried	...	...	...	...	...	...	...	44,748 tons.

Eastern Breakwater.—Extended 59 feet during the year to chainage 1025. Heavy seas in September and June damaged the wall at the outer end but the greater part of this damage was repaired during the year, and satisfactory progress was made with the limited funds available. During the period 10,007 tons of stone were tipped at a cost of £4,713 19s. 5d., making a total of 213,984 tons at a total cost of £134,719 15s. 2d. or a unit cost of 12s. 8d. per ton.

Concrete Work.—The construction of 40 ton blocks was continued throughout the year, 650 blocks being tipped on the ocean side and in the centre of breakwater at a cost of £12,718 5s. 10d. 358 tons of concrete were deposited in core wall as repairs at a cost of £165 1s. 10d.

The total amount expended on the eastern breakwater to 30th June amounted to £240,116 16s. 4d.

Northern Breakwater.—A length of 481 feet of wall was concreted during the year, costing £1,002 17s. 1d.

Reclamation Wall.—1,310 tons of stone were placed in position at a cost of £375 6s. 9d.

The total expenditure on these works, including all charges, amounted during the year to £29,037 7s. 10d.

Coff's Harbour Jetty.—The expenditure on general maintenance of this jetty during the year amounted to £723 13s. 10d. covering renewal of piles, girders, rail tracks and cranes, etc.

Sand Drift Prevention.—A fascine fence was erected on the northern side of the jetty at a cost of £18 11s. 4d.

MACLEAY RIVER.

Training Walls.—Repairs to the training walls at Shark Island were completed at a total cost of £4,000, the expenditure during the year being £1,236 18s. 4d. Funds were provided from Special Expenditure Loan Vote.

Breakwaters.—The work of reconstructing subsided sections of the northern and southern breakwaters, commenced last year, was continued, the expenditure for the year being £8,805 3s. 4d. from Special Expenditure Loan Vote.

PORT MACQUARIE.

Construction of the Eastern Training Wall was continued during the year. The wall was extended a distance of 1,150 feet from chainage 220 feet to 1,370 feet. 34,265 tons of stone were tipped on the wall making the total tonnage tipped at the end of the year 42,535 tons, including 3,900 tons placed for bank protection and quarry road.

The expenditure during the year was £8,572 10s. 6d. and the total expenditure from Loan Vote on this work to the end of the year £14,714 19s. 11d.

CAMDEN HAVEN.

An amount of £40 was expended from Revenue Vote on minor repairs to training walls.

CAPE HAWKE.

The replacement of a mooring jetty at Forster which had been damaged by a steamer was carried out by contract at a cost of £82 10s.

PORT STEPHENS.

The buoy marking Red Patch rocks was overhauled and two decayed piles in the Karuah Channel were removed at a cost of £16 5s.

NEWCASTLE.

Submarine Rock Excavation.

Newcastle Bar.—The rock-breaker "Cyclops" continued operations throughout the year when weather conditions permitted. Dredging to 25 feet 6 inches at L.W.S.T. was completed on a cut 50 feet in width making a total width of 150 feet on the south side of the main leads in line. The quantity of rock lifted by the dredge "Juno" was 2,693 cubic yards.

Rock-breaking was continued on a further cut 100 feet in width, an estimated quantity of 14,776 cubic yards being broken during the year.

North Harbour.—Rock-breaking, during such times as weather conditions on the bar were unfavourable, was continued at the entrance channel to North Harbour to give a depth of 26 feet 6 inches at L.W.S.T. At the end of the year an estimated quantity of 3,725 cubic yards had been broken and was awaiting removal. Dredging of the overlying silt was undertaken during the year to facilitate rock-breaking operations and dredging of the broken rock was commencing at the close of the year.

Dredging.—

*Harbour Improvements and Maintenance Cost	{	1,915,860 tons.
		£50,303 11 6

* Tonnage includes submarine rock excavation.

Lee Wharf.—A subsidence at the back of wharf near No. 1 Cargo Shed was repaired with steel sheet piling at a cost of £343 7s. 2d.

Foreshore erosion at west end of wharf was repaired at cost of £165 5s. 8d.

Newcastle Hunter River S.S. Company's Wharf.—Renewal of piles and girders was effected at a cost of £178 12s.

A.A. Company's Foreshore.—The foreshore was re-aligned and strengthened by the placing of piles and back-logging at a cost of £445.

King's Wharf.—Subsidence near the Pilot Station was restored by new piles and backlogging at cost of £201.

General.—Repairs were carried out to wharves, beacons, breakwaters and plant within the harbour.

The total expenditure on harbour maintenance, including works enumerated above, amounted to £7,866 5s.

Railway Department's Wharves.—Extensive renewal of piles and superstructure of wharves at Carrington Basin and Dyke, controlled by the Railway Department, was carried out, the expenditure during the year being £4,103. The cost of this work was met by the Railway Department.

Boat Harbour Bridge.—The renewal of the bridge over the entrance to the Boat Harbour was carried out at a cost of £744 5s. of which cost the Treasury provided £200, the remainder to be met by the Newcastle City Council.

Mitchell-street (Stockton) Ferry Landing.—The passenger ferry landing at Stockton was repaired at a cost of £224 7s. 6d., the cost being met by Stockton Municipal Council.

Magazine Jetty, Fullerton Cove.—The magazine jetty at Sandy Island was repaired at a cost of £117 15s. 7d. for the Explosive Department funds being provided by that Department.

Dredging Repair Shop Dyke End.—Repairs and overhauls of dredge and other plant not entirely suitable for contract work were carried out at the Repair Shop during the year.

SYDNEY HARBOUR AND PARRAMATTA RIVER.

Repairs and reconstruction of sea wall were carried out at Nielsen Park and Botanical Gardens at a cost of £1,695 0s. 9d. and £189 10s. 9d. respectively. This expenditure was met from Special Expenditure Loan Vote.

Construction of a sea wall at Dobroyd Point was undertaken, the expenditure during the year being £1,757 5s. 7d. from Loan Vote.

At King George's Park sea wall construction at a cost of £2,273 13s. was undertaken for the Department of Lands the funds being provided by that Department.

COOK'S RIVER, GEORGE'S RIVER AND BOTANY BAY.

Training walls at Cook's River and Shea's Creek were re-constructed at a cost of £1,701 0s. 5d. from Special Expenditure Loan Vote. An amount of £211 4s. 3d. from Revenue Vote was expended on general maintenance of walls.

Cook's River flood gates were repaired at a cost of £227 15s. 6d. from Revenue Vote.

Repairs to La Perouse Wharf were effected at cost of £355 15s. 9d. Kurnell Jetty and Buoy were repaired at cost of £214 2s. 7d.

Construction of a sea wall at Ramsgate was commenced, the expenditure for the year from Loan Vote being £1,933 3s. 4d.

WOLLONGONG HARBOUR.

Repairs to mooring dolphin, fenders, and general maintenance were carried out at a cost of £139 1s. 8d.

PORT KEMBLA.

The output for the year from Gillan's Hill Quarry amounted to 92,408 tons distributed as follows :—

	Tons.
Eastern Breakwater Construction	35,414
Eastern Breakwater repairs	122
Northern Breakwater repairs	570
Sea Wall	16,883
State Metal Quarries	39,419
	<hr/>
	92,408

The total output of the quarry since developmental work ceased amounted to 584,966 tons costing £130,664 6s. at unit cost of 53·60 pence per ton.

Eastern Breakwater.—Extended 56 feet during the year to chainage 3,404 feet. A severe gale in September caused some damage to the wall, but repairs were effected and satisfactory progress was made with the limited funds available. During the year 35,414 tons of stone were placed in construction at a cost of £18,503 17s. 5d. Total stone placed to the end of the year amounted to 1,215,771 tons costing £379,162 15s. 7d.

Repairs to storm damage of the breakwater during the year were effected, 122 tons of stone being placed at a cost of £38 4s. 9d.

Northern Breakwater.—570 tons of stone were placed in repairs at a cost of £215 13s. 9d.

Jetties—No. 1 Jetty.—Fender piles, fenders, kerbing and decking were renewed during the year at a cost of £462 0s. 7d.

No. 3 Jetty.—Renewal of defective piles, girders and decking cost £180.

No. 4 Jetty.—Access road and pipe culvert were repaired during the period.

The total cost of repairs to Port Kembla Jetties during the year amounted to £669 11s.

Government Cottages and Farms.—On behalf of the Resumed Properties Department minor repairs were effected to cottages at a cost of £49 0s. 10d.

New fencing was erected by contract on the boundaries of leased farms at Port Kembla, the total length being 458 chains. The cost of this work was paid direct by the Resumed Properties Department.

HAULAGE AND SHIPPING UNDERTAKING.

The rebate of 6d. per ton on coal and coke shipped for export beyond the Commonwealth and taken as bunkers by vessels trading beyond the Commonwealth was continued throughout the year.

This rebate was introduced by the Government with the object of assisting the coal industry and its employees and of developing the trade with consumers outside the Commonwealth.

Statements "A," "B" and "C" indicate details of the traffic and shipping of the port during the year.

KIAMA.

Renewal of decking and eleven fenders was carried out at the Metal Berth.

The concrete sea wall damaged by heavy seas was repaired.

Expenditure for the year amounted to £122 17s. 4d.

ULLADULLA HARBOUR.

Repairs to rail tracks and trucks and renewal of fender piles together with maintenance of roadway and crane were carried out during the year at a cost of £110 1s.

BATEMAN'S BAY.

Mooring chain was supplied for bar and river buoys.

WAGONGA RIVER.

Minor repairs were effected to Navigation Department's boatshed and slipway.

BERMAGUI JETTY.

Renewal of piles and girders, overhaul of moorings, and alterations to cargo shed were carried out at a cost of £158 6s. 8d.

TATHRA JETTY.

Girders and decking were renewed, and moorings overhauled. Expenditure for the year amounted to £144 15s. 10d.

MERIMBULA JETTY.

Renewal of two piles and overhaul of moorings together with painting new roof of cargo shed were carried out at a cost of £108 3s. 6d.

EDEN JETTY.

Repairs were effected to crane, rail tracks and trucks, and two mooring piles were renewed. Gravel filling was placed on sleeper stacking area. The expenditure on maintenance for the year amounted to £123 12s.

SPECIAL EXPENDITURE LOAN WORKS (HARBOURS AND RIVERS).

During the year a total amount of £13,627 13s. 7d. was spent on various works from Special Expenditure Loan Vote including the larger works separately referred to under the specific headings above.

ROADS.

The total expenditure on roads amounted to £182,804, of which £3,524 was provided from Unemployment Relief Funds, £50,218 from Western Division Roads Vote, £2,009 from Departmental Revenue Vote, £1,300 grants to Western Division Municipalities, £125,731 from Special Expenditure Loan Vote, and £22 from Working Account.

Unemployment Relief Works (including Special Expenditure) (£129,225).—Works put in hand in the Metropolitan District and the expenditure thereon included the following:—

	£
National Park Road	15,369
Royal Agricultural Showground Roads	4,365
Roads within various State Institutions	39,780
Scheyville Training Farm Roads	5,583
Lithgow Emergency Relief Scheme Roads	3,650

The total expenditure in the Metropolitan District was £94,545. Road works in the Western Division absorbed £30,630 in new road construction in the vicinity of various towns.

The expenditure on road works carried out under Unemployment Relief conditions in districts other than Metropolitan and Western Division amounted to £4,080.

Western Division Roads Vote (£50,218).—The Western Division Roads Vote, provided by the Commonwealth Government from the proceeds of the petrol tax, has been expended partly on maintenance but mainly on new construction of roads in the Western Division. The expenditure from this source amounted during the year to £50,218.

Public Works Department Revenue Vote (£2,009).—General maintenance of roads in the Western Division absorbed £1,829, and an amount of £180 was paid to the Merriwa and Warrah Shire Councils, for repairs to the Coulson's Creek-Miller's Creek road.

BRIDGES.

The total expenditure on bridges amounted to £26,109 comprising £3,917 from Public Works Department Loan Vote, £4,259 from Special Expenditure Loan Vote, £2,891 from Western Division Vote, £11,666 from Department's Revenue Vote, £1,935 from Department of Main Roads contribution and £1,441 from Working Account.

Loan Vote (£3,917).—A new bridge was constructed over Bunker Creek and two additional spans were built on Bonley Creek Bridge. A contribution of £500 was paid to the Wakool Shire Council for the construction of a bridge over Merran Creek in approach to Gonn Crossing. Part of the contribution of the Bellingen Shire Council for the construction of the Urunga Bridge was refunded.

Special Expenditure Loan Vote (£4,259).—The main work under this vote was the completion of the North Creek Bridge, East Ballina, the expenditure on this work for the year being £3,999.

Public Works Department Revenue Vote (£11,666).—General maintenance work on bridges in the Western Division and in other districts was carried out at a cost of £11,402. Preliminary construction expenses absorbed an amount of £264.

Western Division Vote (£2,891).—The bridge over Borumbil Creek was completed and work was commenced on a bridge over Boorooma Creek and also on 26 mile Warramboul Bridge.

Department of Main Roads (£1,935).—An amount of £1,935 was expended on maintenance of bridges in the Metropolitan District from funds contributed by the Department of Main Roads.

PUBLIC WATERING PLACES.

The total expenditure amounted to £5,960 made up as follows:—

Loan Vote (£3,456).—The sinking of tanks at Culpaterong and Geraki, sinking of bores at Mount Sturt and Mount King, and the erection of cottages, appliances and fencing.

Special Expenditure Loan Vote (£589).—An amount of £589 was expended on Public Watering Places mainly on general maintenance and repairs.

Public Works Department Revenue Vote (£1,915).—General maintenance of Public Watering Places in the Western Division was carried out at a cost of £1,915.

Transfer to Department of Agriculture.—On 29th March the control of Public Watering Places was transferred to the Department of Agriculture.

AVIATION.

In continuation of the work of providing aerodromes in the Western Division to facilitate medical assistance at isolated centres, an amount of £1,098 was spent on clearing and grading seventeen landing grounds.

An amount of £12 was expended on attention to Newcastle District Park Aerodrome.

Funds for these works were provided by the Unemployment Relief Council.

SETTLERS WATER SUPPLIES.

An amount of £1,751 provided from Unemployment Relief Funds was expended on the provision of various wells for settlers in the Western Division.

PUNTS AND FERRIES.

The maintenance of punt and ferry services controlled by this Department involved an expenditure for the year of £6,374.

WALSH ISLAND GOVERNMENT DOCKYARD.

Operations at Walsh Island Dockyard during the year were confined to the maintenance and control of the floating dock and slipways and the disposal by public tender of surplus and obsolete stores and plant.

The transactions at the floating dock and slipways for the period under review were as follows :—

							Number.	Tonnage.
Vessels docked at floating dock ...	...	...	...	...	...	...	20	42,402
Vessels slipped on slipways ...	...	...	...	...	...	...	26	4,190
Totals ...	...	...	...	...	...	...	46	46,592
Total Government vessels slipped and docked...	...	...	...	...	...	...	27	8,561
Total private vessels ...	...	...	...	...	...	...	19	38,031
Totals ...	...	...	...	...	...	...	46	46,592

The revenue received during the year from floating dock and slips dues amounted to £2,428 15s. 9d. and the expenditure on operation of dock and slipways excluding ordinary maintenance and insurance totalled £785 9s. 5d.

The slipping, docking and undocking of vessels only is undertaken by the Department at the floating dock and slipways, the work of overhauling vessels slipped and docked being carried out by private firms under contract.

H. F. SEARL, A.M.I.E. Aust.,
Principal Engineer.

ANNUAL REPORT—PORT KEMBLA DISTRICT, 1934-35.

STATEMENT A.

*Port Kembla Traffic and Shipping Returns.**Coal and Coke Shipped at Port Kembla.*

	Tons.
Cargo coal	129,025
Bunker coal	92,953
Cargo coke	66,225
Total (all jetties, including A. I. and S. Jetty)	288,203

Traffic (other than for Shipment).

	Tons.
Inwards haulage	55,944
Outwards haulage	69,058
	125,002

PORT KEMBLA DISTRICT, 1934-35.

STATEMENT B.

Summary of Accounts Issued.

	£	s.	d.	£	s.	d.
Port Kembla Shipping—						
Shipping cargo	7,144	17	3			
Shipping bunkers	3,663	10	0			
Berthing	1,853	16	1			
Mooring ropes	393	7	7			
Launch	702	0	0			
Gangway	103	0	0			
Electric crane, 5-ton	471	16	3			
" 2-ton	457	8	1			
Waiting time	74	2	6			
Haulage waggon hire and loco. hire	3,659	19	6			
Way leave	145	15	8			
Telephone calls	9	1	9			
Water to shipping	263	7	6			
Miscellaneous revenue	18	4	7			
A. I. and S. Jetty repayments	10	10	9			
On cost (loco. operating)	136	14	9			
Loco. operating	1,367	5	10			
				20,474	18	1
	£	s.	d.			
Rebate on coal shipped	4,257	5	0			
Less Unrecouped by Treasury	2,156	16	6			
				2,100	8	6
Navigation Department—						
Harbour dues	12,698	5	2			
Tonnage dues	2,500	12	2			
				15,198	17	4
Port Kembla Electricity Supply—						
Bulk supplies	36,252	15	9			
Industrial supplies	31,923	5	0			
Retail supplies	2,759	3	0			
Rents receivable	313	5	4			
Miscellaneous revenue	268	7	0			
Motor vehicles	240	9	8			
Outside services	66	18	8			
				71,824	4	5
Resumed Properties Department—						
Rent of cottages	736	18	6			
Rent of land	1,411	12	0			
Camping area	50	15	0			
				2,199	5	6
Port Kembla Harbour Improvements—						
Sale of spalls	3,613	11	9			
Outside services	198	8	3			
				3,812	0	0
Stock				71	19	9
Wollongong Harbour—						
Coal into bins				56	0	0
Miscellaneous Votes—						
Boat fees	24	2	6			
Miscellaneous services	189	3	4			
Sundries	29	15	6			
				243	1	4
Total				£115,980	14	11

PORT KEMBLA.

Trade and Shipping Returns.

Vessels entering Port Kembla.	Arrivals.	Net Registered Tonnage.
Overseas	156	394,019
Interstate	262	394,387
Coastal	185	35,530
Totals	603	823,936

Principal Exports.

Item.	Tonnage.	Value.
		£
Cargo coal	129,025	129,025
Bunker coal	92,953	92,953
Coke	66,225	66,225
Copper	3,947	159,265
Bluestone	776	18,081
Acids	76	380
Fertilisers	50,298	199,678
Manufactured metals	5,234	368,830
Finished products of iron and steel	106,660	582,376
Refined antimonial lead	302	6,584
Refined antimonial products	103	9,216
Totals	455,599	1,632,613

Principal Imports.

Blister copper	1,843	132,732
Cathodes	6,929	279,585
Copper ores and concentrates	512	6,115
Scrap copper	31	1,263
Copper residues	338	4,884
Slimes	139	62,772
Matte	993	23,969
Phosphate Rock	23,397	41,200
Sulphur	2,354	13,915
Pyritic ore (by rail)	8,538	12,583
Fertiliser (by rail)	1,015	8,045
Bags and packing material (by rail)	690	19,303
Lead	42	633
Soft lead	654	10,797
Lead ingots	1,322	19,615
Zinc ingots	225	4,289
Aluminium bars	20	2,223
Tin	5	1,664
Galvanised steel wire	8	275
Cotton yarn	11	3,825
Antimonial slag	2,173	56,007
Iron ore	310,746	245,069
Stores	382	15,824
Insulating paper	79	4,817
Gold ores and concentrates	241	8,699
Gold residues	431	21,535
Totals	363,118	1,001,638

Financial Statement.

Item.	Revenue.	Expenditure.
	£ s. d.	£ s. d.
(a) Haulage and shipment	21,208 0 9	17,138 7 5
(b) Electricity supply	71,552 11 10	76,782 1 1
Totals	£ 92,760 12 7	93,920 8 6

(a) Interest on capital debt provided for since and including 1928-29.

(b) Initial provision for contribution to Capital Assets Renewal made in 1929-30. Interest on capital debt provided for since and including 1928-29.

PARTICULARS OF RIVER ENTRANCES OF NEW SOUTH WALES.

1934-35.

Name of Port.	Depth on Bar prior to commencement of work. Position variable.	Sailing distance from Sydney.	Total length of River.	Limit of Navigation for Boats drawing 4 feet.	Catchment Area of River.	Area of Tidal Compartment.		Proposed width of River Entrance between Breakwater.	Depths during the year 1934-35 at Low Water Spring Tides.						Anticipated Depth on Completion of Scheme.
									Maximum.		Average.		Minimum.		
									Bar.	Crossing.	Bar.	Crossing.	Bar.	Crossing.	
	ft. in.	sea mls.	st. mls.	st. mls.	sq. mls.	acres.	sq. mls.	ft.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft.
Tweed	3 0	372	46	24	418	5,000	8	500	6 0	5 6	4 5	5 2	3 0 ^a	3 6 ⁱ	9
Richmond	7 0	328	149	68	2,683	6,800	10½	1,000	12 0	11 0	10 8	10 5	8 6 ^b	9 6 ^j	12
Clarence	8 0	294	247	67	8,505	34,000	53	1,400	13 0	11 6	10 9½	10 6	7 3 ^c	10 0	18
Nambucca	4 9	219	58	9	552	2,730	4½	500	7 9	4 6	5 5	4 0	4 0	4 0	9
Macleay	5 0	208	214	39	4,581	3,550	6	700	8 6	...	7 4	...	6 0 ^d	...	12
Hastings	5 0	172½	110	19	1,389	6,400	10	650	6 3	8 3	5 6	6 8	4 6	4 9	10
Camden Haven	4 6	159½	18	13	238	7,240	11½	400	6 10	9 0	5 11	7 1	4 9 ^e	6 9	8
Manning	8 0	141	141	29	3,164	6,800	10½	800	6 3	8 6	5 8	8 6	3 6 ^f	8 6	12
Cape Hawke ...	2 3	125	46	17	514	21,930	34½	400	6 2	7 10	4 4	6 10	1 9 ^g	4 10 ^k	9
Lake Macquarie	...	50	...	...	291	26,000	40½	...	7 0	6 4	6 5	4 6	5 9	3 0 ^l	...
Crookhaven (including Shoalhaven River).	11 0	71	205	22	2,801	2,808 6,533	4½ 10½	...	13 6	8 6	13 6	8 6	13 6	8 6	12
Bateman's Bay (Clyde).	4 0	129	70	24	696	3,750	6	...	10 0	...	6 11	...	5 6	...	10
Moruya	6 0	139	93	4	609	1,550	2½	...	10 0	10 0	7 1	7 11	4 0 ^h	7 0	9
Wagonga .....	...	152	9	5	52	1,650	2½	340	9 0	7 0	7 9	5 6	6 0	3 9	10

a—Tweed River, Minimum bar, 4 days only.

b—Richmond „ „ „ 1 „

c—Clarence „ „ „ 1 „

d—Macleay „ „ „ 4 „

e—Camden Haven „ „ „ 1 „

f—Manning „ „ „ 1 „

g—Cape Hawke, Minimum bar, 2 days only.

h—Moruya „ „ „ 2 „

i—Tweed River, Minimum crossing, 1 day only.

j—Richmond River „ „ „ 2 days only.

k—Cape Hawke „ „ „ 3 „

l—Lake Macquarie „ „ „ 1 „

STATEMENT E.

DOCK TRANSACTIONS.

	Terranora.	Riley's Hill.	Ashby.
No. of Government vessels docked	5	1	1
Gross Tonnage of Government vessels docked	536	83	80
No. of private vessels docked	5	Nil.	4
Gross Tonnage of private vessels docked	337	Nil.	206
Revenue received during year	£53 13s. 9d.	Nil.	£44 3s. 9d.
*Expenditure, docking private vessels	£16 9s. 0d.	Nil.	£9 19s. 2d.
Cost of Dock maintenance and repairs	£248 8s. 11d.	£1,126 7s. 11d.	£228 15s. 5d.

* This amount repaid by owners of vessels docked.

† In case of Riley's Hill Dock cost of maintenance and repairs includes £264 13s. 1d. for repairs to Coal Wharf and £457 4s. 1d. for repairs to Dock Gates.

Electrical Engineering Branch.

Annual Report, 1934-35.

INTRODUCTION.

The work of the Branch is naturally divided into two sections, containing four groups and eight groups respectively, as follow :—

SECTION I.—ELECTRICAL ENGINEERING WORK.

This section falls into four main groups :—

- (1) Hydro-electric investigations.
- (2) Construction, operation and maintenance of Burrinjuck Electricity Supply.
- (3) Construction, operation and maintenance of Port Kembla Electricity Supply.
- (4) Electrical engineering assistance to other Departments and other Branches of this Department.

SECTION II.—ENGINEERING SERVICES IN GOVERNMENT BUILDINGS.

This section falls into eight main groups :—

- (1) Steam heating and hot water services.
- (2) Laundry, cooking and sterilising equipments.
- (3) Refrigeration.
- (4) Ventilation and air conditioning.
- (5) Electric lighting and power, including heating, cooking and miscellaneous domestic uses of electricity.
- (6) X-ray and other electro-medical appliances.
- (7) Radio transmitting and receiving appliances.
- (8) Boiler inspection.

SECTION I.

I. HYDRO-ELECTRIC INVESTIGATIONS.

A preliminary investigation of the power possibilities of the Macintyre River and a field investigation and report on the available power of the Bell River at Wellington have been made.

Stream Gauging.—Stream gauging on the Gilmore Creek for hydro-electric purposes has been continued. Negotiations with the Water Conservation and Irrigation Commission have been commenced with a view to re-establishing gauging stations which have been discontinued and to continue gauge readings for hydro-electric purposes at stations which have been maintained by the Commission for general information on stream flows.

II. BURRINJUCK ELECTRICITY SUPPLY.

Construction.

Power Station No. 1.—No construction work has been carried out at No. 1 Power Station during the year.

Power Station No. 2.—Authority was given to proceed with the construction of No. 2 Power Station. The first section of this work, the construction of the southern steel pipe was completed, as recorded in last year's report.

The design provides for an ultimate station of four 5,000 kW. units, two connected to the northern pipe and two to the southern pipe. The present stage includes only the two turbines on the northern pipe.

A contract has been entered into for the supply and erection of two 5,000 kW. hydro-electric generators which will develop full capacity under a gross head of 150 feet. The turbines are being manufactured by Boving and Co., London, and the generators by the Metropolitan-Vickers Electric Co. After considerable discussion it was decided to put in horizontal turbines operated at a speed of 500 r.p.m. The turbines will be of the double runner type.

This station includes some unusual features. The pipe lines supplying the turbines will be required to act as discharge pipes for irrigation purposes.

A discharge valve of 7 ft. 6 in. diameter, having a maximum discharge capacity of 3,000 cusecs, has been ordered for the northern pipe; the southern pipe will be left with a free discharge until it is required for the second stage of the Power Station.

The Station will be operated normally as a completely automatic unit controlled from No. 1 Station. A step-up substation will be provided at No. 2 Station and power transmitted by a 66,000 volt inter-connecting line to the main substation at No. 1 Station.

Work on the foundations is in progress.

Transmission Lines, Substations, etc.—No extensions have been made to the 66,000 volt transmission lines. One 25 kVA. 66,000 volt single-bushing transformer has been installed at Kurrajong, near Wagga Wagga, for providing supplies to rural consumers. Contracts have been entered into and work is proceeding on one 50 kVA. installation at Monteagle and one 25 kVA. installation at Kirkton, near Yass, both of which are for groups of rural consumers.

Supplies have been provided to a number of retail consumers entailing the construction of 11,000 volt and 6,600 volt lines and substations in Yass, Wagga Wagga and Mogongong Districts. Similar work is in progress in the Tenandra and Adelong Districts.

The Tumut-Adelong line has been changed from single-phase to three-phase owing to the increased demand and an extension has been made from Adelong to the Gibraltar Gold Mine. Work is in progress on an extension to the Princess Marina Mine near Gundagai.

A number of consumers have been connected to the township reticulations administered by this Department.

A survey for an interconnecting 66,000 volt line between the Burrinjuck System at Darby's Falls, near Cowra, to the Lithgow System of the Railway Department at Blayney has been completed. Another survey for a similar interconnecting 66,000 volt line between the Burrinjuck System at Yass and the Port Kembla System at Moss Vale has also been completed.

Operation and Maintenance.

Generation.—The operation of the power station plant during the year has been satisfactory. The second bank of step-up transformers continued to give satisfactory service.

The manually operated frequency control system operated satisfactorily during the year.

Statistics—

Year.	1934-35.	1933-34.	1932-33.
Energy—			
Generated, kWh.	24,200,650	22,608,450	21,297,700
Output, kWh.	23,612,630	22,262,570	20,954,877
Used in Station, kWh.	27,774	32,874	31,727
Sold, kWh.	20,652,917	19,515,480	18,391,689
Maximum Half-hour Demand—			
Station, kW.	5,100	4,700	4,700
Annual Load Factor—			
Station, per cent.	54	55	52

The units sold, 20,652,917, represent an increase of about 6 per cent. over the number sold in the previous year.

Transmission and Distribution.—The operation of the system has been generally satisfactory. Further improvements in operating facilities at main 66,000 volt substations were effected.

The small 66,000 volt single-bushing transformers with earthed return continue to operate satisfactorily and have not caused any telephone interference.

The treatment of all poles by the oxy-acetylene flame as a means of preservation has been continued.

The patrol motor vehicles which have given up to seven years satisfactory service are being replaced by modern vehicles.

Commercial.

Bulk Supplies.—Consideration has been given to the provision of a bulk supply to the Water Conservation and Irrigation Commission for its Yanco system, but it has been decided to proceed no further with the matter for the present.

A general reduction in bulk supply rates has been made.

Industrial Supplies.—Agreements have been negotiated with the Gibraltar Gold Mines (Adelong) (N.L.) and Princess Marina Goldfields Ltd., under which supplies will be provided to these Gold Mines.

Retail Supplies.—Supplies have been provided to additional township consumers from existing reticulations. Negotiations have been conducted with a number of rural residents, the activity in this regard being marked, resulting in the completion of agreements with residents, principally in the Monteagle, Kirkton, Kurrajong, Tenandra and Wagga Districts.

Township and rural supply rates have been reduced. Action has been taken to determine collective guarantees in those townships where the revenue was likely to continue to be greater than the guarantee.

III. PORT KEMBLA ELECTRICITY SUPPLY.

Construction.

Power Station.—No construction of any note has been carried out other than fitting locking relays to the sub-feeders.

Transmission Lines, Substations, etc.—Extensions of 11,000 volt transmission lines have been completed and supplies given to the township of Yanderra and The Towers, Douglas Park, and of 6,600 volt lines for Terara Township and rural consumers. A considerable number of new consumers have been connected in the retail districts.

Operation.

The operation of the power station plant during the year has been satisfactory. No failures of plant have occurred. The usual annual inspection and testing of the boilers have been carried out, also minor inspections of the turbine plant.

The manually operated frequency control system has operated satisfactorily during the year.

Statistics—

Year.	1934-35.	1933-34.	1932-33.
Energy—			
Generated and purchased, kWh.	15,125,679	14,740,609	10,234,941
Output, kWh.	13,939,566	13,700,580	9,547,942
Used in Station, kWh.	831,900	821,984	491,856
Maximum Half-hour Demand—			
Station, kW.	6,322	5,890	3,477
System, kW.	6,067	5,728	3,353
Annual Load Factor—			
Station, per cent.	27	28	34
System, per cent.	26	27	33

The units generated totalled 14,828,199 which constitutes a record for the Station. The units sold were 12,802,173, an increase of about 6 per cent. over that of the previous year.

Distribution.—The operation of the system continues to be satisfactory and insulator performance good. Storms have been severe and have occurred in places where they were hitherto practically unknown.

Treatment of poles by the oxy-acetylene flame has been continued, and in addition to the benefits of the charring it has been the means of giving more detailed information regarding the condition of the poles. General and special maintenance have been carried out, bulk supply meters have been overhauled and calibrated, and relay testing has been done.

The Upper Cordeaux Substation has been extended to cope with the increased loading of the South Coast Towns Water Supply Scheme.

Commercial.

Retail Supplies.—Supplies have been provided to additional township consumers from existing reticulations.

New reticulations have been established in the villages of Terara and Yanderra covered by collective guarantees.

Negotiations have been conducted with a number of rural residents, resulting in the completion of agreements with rural residents principally in the Terara and Yerrinbool Districts.

IV.—WORK FOR OTHER DEPARTMENTS AND OTHER BRANCHES OF THIS DEPARTMENT.

Department of Agriculture.

Hawkesbury Agricultural College.—Assistance has been given to the Department of Agriculture in connection with the sale of the generating plant which became unnecessary on the change-over to a bulk supply from the Richmond Council. Metering equipment was installed to meter the bulk supply.

Local Government Department.

Grants and loans issued by the Unemployment Relief Council during the year entailed much additional work.

Brewarrina Municipal Council.—The new power plant and reticulation was completed during the year.

Towns North of Dungog.—An investigation of the power requirements of towns as far north as Kempsey was carried out in connection with a proposal for the further development of the Northern Coal Fields for power-generating purposes. The alternative of extending the Railway Department's System from Dungog was also considered and reported upon.

Mudgee.—The question of extending the Railway Department's System from Wallerawang for the purpose of giving bulk supply to Mudgee and Towns en route was investigated and reported upon.

Wingham Municipal Council.—An investigation was conducted and a report prepared in connection with the franchise for supply of electricity in this Municipality. This action was taken as a result of the Council desiring to obtain a continuous service and reduced rates. Since the investigation continuous service has been instituted and certain reductions made in rates.

Casino Municipal Council.—Assistance was given to the Commissioner conducting the inquiry into a proposed loan for extensions of the Undertaking.

Other Works.—Extensions to existing Undertakings were investigated and reported upon in the cases of the Municipality of Peak Hill, Mudgee, Lismore, Nyngan, Hay, Merewether, Narrandera and the Shires of Erina, Coonabarabran, Woy Woy, Bland, Hornsby, Baulkham Hills and Blacktown.

Energy rates, street lighting charges and minor matters of policy were investigated and reported upon in the cases of the Municipalities of Penrith, St. Marys, Boggabri and Corowa and the Shires of Warringah, Peel and Wakool.

Applications for renewal loans in the cases of the Municipalities of Ermington and Rydalmere, Ingleburn and Orange were investigated and reported upon.

Applications for loans and permission to extend into rural areas within the Shires of Wakool, Wallarobba, Abercrombie, Canobolas and Warrah were investigated and reported upon.

Franchise Agreements were reviewed for Cessnock, Macksville, Lake Cargelligo, Wilcannia, Coolah, Dubbo, Braidwood, Macleay Shire, Tweed Shire, Wallarobba Shire, Hillston, Merriwa Shire, Ungarie, Manildra and Cobar.

Works for Other Branches.

Water Supply and Sewerage Branch.—Assistance has been given to the Water Supply and Sewerage Branch in connection with the following Undertakings:—

Armidale Sewerage Works.—Supply of electrical power for the Treatment Works, a distance of about three miles.

Taree Sewerage Works.—A low tension line is being constructed from the Town to the Works.

Glen Innes Sewerage Works.—Electrical power is being transmitted over a high voltage line from the Town to the Works, a distance of about two miles.

South-West Tablelands Water Supply.—A 6,600 volt transmission line and indicator and control circuits, have been completed for the No. 3 Pumping Station near Demondrille.

Harbours, Roads and Bridges Branch.—General technical supervision and maintenance of the electrical installation of the Byron Bay Jetty have been carried out.

Morisset Mental Hospital.—The transmission line supplying the hospital has been extended to Woods Point, thence to St. Peter's Convalescent Home by the Newcastle City Council.

SECTION II.—ENGINEERING SERVICES IN GOVERNMENT BUILDINGS.

The work of the Section has continued to increase both in quantity and capital expenditure involved. The bulk of the work has been the replacement or extension of equipment in existing hospitals and buildings, and completion of work in new buildings commenced during previous years.

Detailed investigations into the condition and capacity of existing installations were, therefore, necessary in order to decide on the extent of the replacements or extensions to meet immediate requirements and to permit of economical further extension to meet future increased demands.

Standard specifications and designs have been prepared for the utility equipment generally in use in all hospitals, but in such forms that consideration can be given to any new developments of specialised plant introduced by either local or overseas manufacturers. In preparing standards considerable study has been necessary, and manufacturers have been encouraged to develop apparatus to comply with the performance requirements of the various types of hospital throughout the State.

Typical examples of the mechanical and electrical works undertaken during the year have been installed in the Prince Henry Hospital, Cowra Hospital, Albury District Hospital, Orange Mental Hospital, Grafton District Hospital, Parramatta Mental Hospital, and smaller examples of similar plant have been installed in other places.

The total cost of the work undertaken during the year was £163,786 and was made up in the following way:—

Mechanical Engineering Works—

Drawings and Specifications—								£
86 Works	...	...	...	...	...	...	...	50,790
50 Works (included in Building Specifications)	...	...	...	...	...	...	...	45,000
Jobbing Works	...	...	...	...	...	...	...	631
Mechanical Maintenance	...	...	...	...	...	...	...	5,116
								£101,537

Electrical Engineering Works—

Drawings and Specifications—								
93 Works	...	...	...	...	...	...	...	24,711
140 Works (included in Building Specification)	...	...	...	...	...	...	...	28,000
Jobbing Works	...	...	...	...	...	...	...	4,012
Maintenance Contracts...	...	...	...	...	...	...	...	1,353
Electrical Maintenance...	...	...	...	...	...	...	...	4,173
								62,249
Total	...	...	...	...	...	...	...	£163,786

The erection of the first unit of the new boiler station at Sydney Hospital has been completed and performance tests to check guarantees will be undertaken on completion of building extensions. The first boiler is of the cross-drum water tube type, having a normal evaporation of 11,000 lb. per hour. Space has been provided for two additional boilers each of the same output with auxiliaries which when installed will meet the estimated maximum demand for 500 occupied beds.

Investigations of high pressure boiler stations for Newcastle Hospital and Balmain Hospital were made and careful consideration was given to the most suitable site for immediate requirements and future extensions to provide for the ultimate maximum bed capacity in each case.

Ventilation and Air Conditioning.

A modern system of air conditioning for the new operating theatre at the Prince Henry Hospital was completed during the year, and all major surgical operations will now be carried out under controlled conditions of temperature and humidity.

X-Ray and Electro-Medical Appliances.

The hospitals of the State have been divided into four groups and X-ray equipments of varying radiographic performance with suitable accessories were standardised for each group, but modern development of such apparatus in the form of intensifying screens, films, etc., has been so rapid that important modifications of the departmental standards are now under consideration.

A deep therapy plant capable of maintaining a pressure of 350,000 volts across the tube for the treatment of malignant diseases was completed during the year and performance tests are being carried out.

Laundries.

Two large laundry proposals received attention during the year, viz. Sydney Hospital and the Prince Henry Hospital. The former with a maximum of 500 beds and an unusually large Out-patients' Department presented difficulties on a restricted site, which were overcome by adjustment of the space occupied by two adjacent Departments.

Laundry operations at the Prince Henry Hospital entails providing for 1,150 beds and staff, or approximately 1,900 patients and resident staff.

A modern layout was ultimately adopted, which included high pressure boiler plant and modern washing machinery, together with labour-saving wet and dry conveyor equipment.

Boiler Inspections.

The Boiler Inspection Service coupled with supervision of the operation of steam raising equipment was followed along similar lines to previous years.

Inspections totalling 219 were carried out and 188 certificates were issued during the year in respect of boilers actually in service.

There are 400 boilers scheduled for inspection, 181 of which are out of service.

No accidents or failures of boilers carrying the Department's certificates occurred during the year.

Electrolysis Investigation.

A scheme of electrolysis investigation has been pursued continuously during the year, and as a result corrective measures have been installed in certain areas. Much work remains to be done before the whole of the Sydney Metropolitan Area shall have been investigated and suitable corrective measures devised and applied.

Staff.

I desire to place on record my appreciation of the loyal and efficient service given by all members of the staff during the year.

Department of Public Works, New South Wales,
September, 1935.

V. J. F. BRAIN, B.E.,
Chief Electrical Engineer.

Government Architect's Branch.

Annual Report for year 1934-35.

The certified expenditure for the year is as follows :—

	£	s.	d.
Revenue	58,788	1	1
	£	s.	d.
Special Deposits Account	6,278	18	11
Hospitals Commission	192,325	7	5
	198,604	6	4
Loans—			
Ordinary	291,209	8	4
Special Expenditure	12,779	9	4
	303,988	17	8
Payments direct by other Departments	52,787	11	2
	£614,168	16	3

In addition to the foregoing, works costing £192,101 13s. 1d. were supervised for the *Education Department*.

DESIGN.

The high level of output recorded during the last two preceding financial years has been well maintained, the figures for this year showing little variation when compared with those of the year 1933-1934.

NEW WORKS.

Some contraction is noticeable in the case of *State and Mental Hospitals*, whose requirements were met at an estimated cost of about £176,000. The most important contracts dealt with during the year were as follows :—

Prince Henry Hospital, a new Diphtheria Ward Block and a third Medical Ward Block, two such blocks having been designed last year. *Morisset Mental Hospital*, two Ward Blocks for Male Refractory Patients and a Female Hospital Block. *Callan Park Mental Hospital*, a new Ward Block for the Repatriation Department.

Other works deserving of mention include an Operating Block at Gladesville Mental Hospital; new Quarters for Nurses, a General Lavatory Block and a General Store Block at the Lidcombe State Hospital; and new Quarters for the Medical Superintendent and a General Ward Block at Liverpool State Hospital—the latter work not yet quite complete.

Public Hospitals have more than maintained their position, the requirements in this case reaching almost £272,000, as against £251,000 last year.

The largest works completed include :—Additions to the Nurses' Quarters at the *Royal Prince Alfred Hospital*, new Nurses' Quarters at *St. George District Hospital*, and extensive alterations and additions to the Administrative Block at the *Royal Alexandra Hospital for Children*.

Entirely new hospital buildings were erected at Bowral (Berrima District); West Wyalong; Inverell and Eastern Suburbs, whilst a new building is in course of construction at Urana and tenders about to be called for one at Walgett.

Plans and specifications have been completed for new Nurses' Quarters in connection with the District Hospitals at Balmain, Bulli, Illawarra, Peak Hill and Wagga Wagga; and progress is being made with plans for Nurses' and Staff Quarters at Orange. Preparation is proceeding for new Hospital Buildings at Dorrigo, whilst plans, etc., were completed for a new X-Ray Block at Parramatta, an Operating Block at St. George and an Isolation Block at Gunnedah. Contracts have been prepared for extensive alterations and additions to hospital buildings at Burrangong (Young), Carcoar, Condobolin, Cootamundra, Dungog, Glen Innes, Griffith, Hay, Hillston, Lismore, Maitland, Manilla, Mudgee, Narrabri, Nyngan, Parkes, Rylstone, Tenterfield, Wialla, Warren and Windsor.

Works carried out for the *Department of Education* indicate expansion at an estimated cost exceeding £292,000. Ranking first in magnitude are new school buildings at Bathurst (Boys' and Girls' Primary), Inverell (High), Queanbeyan (Intermediate High), Quirindi (Primary), St. George (Junior Boys' High), and Tamworth (Agricultural High); also extensive alterations and additions at the North Sydney Boys' High School.

Other considerable works undertaken comprise new buildings at Bathurst (Domestic Science and Manual Training), Earlwood (Girls'), Murwillumbah (Domestic Science), Parkes (Public and Intermediate High), Pitt Row (Infants') and Randwick (Domestic Science). Plans for a new Intermediate High School at Young are in hand, as are also those for extensive additions at Annandale North and at Fort-street Boys' High School.

Works deserving of mention include new buildings at Albury (Domestic Science), Raymond Terrace, Warner's Bay, Wentworthville (Infants'); and additions at Coniston and Hurlstone Agricultural High.

The requirements of the *Chief Secretary's Department* were met at an estimated cost of nearly £37,000. New buildings were designed for Police purposes at Albury, Bundanoon, Capertee, Griffith, Hay, Menindie, Orange, Tallimba, Tamworth, Tullamore, Wollar and Young. The extension of the roof over the Menage at the Redfern Police Depot was another of the larger works undertaken for this Department during the year.

Contracts prepared for the *Justice Department* exceeded £15,000 and included new Court Houses at Boggabri, Capertee, Tallimba, Tullamore and Ungarie, as well as additions and maintenance work in other centres.

Public Buildings, not otherwise classified, include one designed for the the Weights and Measures Department in Sussex-street, Sydney. Preliminary contracts in connection with the extension of the National Library have been completed, covering demolition and excavation work, and the drawings for the superstructure are nearing completion. A good deal of work has been done upon an amended scheme for a new Government Offices Building at the corner of Phillip and Bridge streets; but further work is dependent upon the subdivisions necessary for the accommodation of the Departments to be transferred.

The visit of *His Royal Highness, the Duke of Gloucester*, occasioned some call for plans for temporary pavilions and designs for many of the decorations displayed in the city streets upon that occasion. A sum of £5,000 had been made available for the purpose, and this sum was expended at the discretion of this Branch.

The services of several members of the staff were again made available throughout the year for assessing and reporting upon applications for loans to be made available by the Building Relief Committee. This work has now been transferred to the Rural Bank, the transfer taking effect as from the 1st July, 1935.

During the year 68 contracts for the Homes for Unemployed Trust were completed and tenders invited from this office. Twenty-nine of these contracts were for more than a single cottage, the number varying from two to a maximum of thirteen. The aggregate estimated cost of these works was almost £28,000.

In addition to the foregoing, numerous *sketch schemes* have been drawn for the various Departments. Many of these may be expected to advance to the contract stage when approved and the necessary funds made available. The works so sketched had an estimated value of about £1,366,000.

Summary of Works Compared with Previous Years.

Period.	1931-32.	1932-33.	1933-34.	1934-35.
<i>Plans—</i>				
Including copies	3,742	11,752	12,389	12,477
<i>Specifications—</i>				
Including copies	1,202	4,259	5,975	5,771
<i>Contracts—</i>				
Number prepared	112	404	486	495
<i>Estimated Value</i> £	461,720	941,000	1,085,000	1,048,000

CONSTRUCTION.

Among the principal buildings which were commenced or completed were the following :—

SCHOOLS.

Bathurst Public School—New Building for Infants.—This new two-storey building is being erected on the Princes' Park site, an area recently acquired for school purposes—upon which it will form the central feature of a scheme to supersede the inadequate buildings existing.

Containing a large assembly room on the ground floor, nine ordinary classrooms and a Kindergarten, the new building will accommodate 560 pupils, the head mistress and the staff.

The contract price was £9,714, and the cost has been met from funds provided by the Unemployment Relief Council.

Dubbo High School—Additions and Alterations.—The works recently completed include the erection of a new block comprising the Science and Manual Training rooms, additional classrooms, and the remodelling of the old school buildings.

The main section of the new building is of two storeys, with a single storey wing at one end, built in brick with tiled roof; the staircase and upper floor are of fire-proof construction. This building provides a science room, preparation room, science demonstration room, manual training room and office, also a staff room, office, hat room and store on the ground floor; and three classrooms each accommodating 36 pupils, and a library, on the first floor.

In the old buildings the original science room has been converted into two classrooms, each seating 30 pupils, and the demonstration room refitted as an ordinary classroom. Necessary extensions have also been made to the outbuildings to provide for the increased number of pupils. The completed cost of the whole work was about £6,300.

Eastwood Public School—New Girls' School Building.—The new girls' school recently completed has been built to meet the growing needs of the locality.

This two-storey building is of the usual construction for the better class school, viz., walls of brick, roofs tile covered, and the upper floor and staircases of fire-proof construction.

Three hundred and eighty-four pupils are provided for in eight classrooms; and there are, in addition, rooms for the head mistress and staff as well as storerooms and hat rooms.

The cost (£5,889) was met from funds supplied by the Unemployment Relief Council.

Homebush Junior Boys' High School—New Buildings.—These new buildings are intended to accommodate junior boys during the early period of their high school course and thus relieve the pressure upon the high schools of the surrounding districts. The school building is E shaped on plan and is of two storeys generally. The main front faces Bridge-street and is 266 feet in length; there are three wings running at right angles to the front wing, the centre wing containing a large assembly hall complete with dressing rooms and stage. Shelter-sheds, a tuck shop and stores are located in the basement. There are 28 ordinary classrooms and two demonstration classrooms on the two main floors, with seating for more than 1,100 pupils. Two science rooms, two preparation rooms, a library, staff rooms, locker rooms and offices complete the accommodation in this large building.

Extensive concrete paving surrounds the school building, extending back to the lavatory and closet block which, like the main building, is of brick, roofed with tiles.

A sum of approximately £25,000 will be needed to meet the cost of this work.

Muswellbrook Public School—New Buildings.—Owing to the inadequacy of the old school buildings and to other causes it was decided to erect new buildings on a more elevated site, which had been acquired for the purpose. The new school will be of two storeys and will contain 14 ordinary classrooms, seating 672 pupils. Provision is also made for a large assembly hall and a science room on the ground floor, and located on the first floor is a domestic science section, comprising a combined cookery room and laundry, a change room and a home unit with dining room, bedroom and bathroom. Separate rooms will be available for the head master and the staff and other necessary provision includes hatrooms, storerooms, etc.

The manual training room on the old school site is to be removed and re-erected on the new site, with such alterations and extensions as are required to meet the additional accommodation.

The work is being carried out at a contract price of £14,904.

Neutral Bay Girls' Intermediate High School.—This new building is of two storeys, so planned as to provide easy and direct access to the main corridors and entrances and with the entrance to the upper floor well separated from those to the ground floor.

In the building are seven classrooms, a large science room and preparation room, a library, a sewing room, a large assembly hall, a visiting inspector's room and rooms for the head mistress and staff. The outbuildings include a tuck shop fitted with gas stove, etc., and a shelter shed. There is a 30-ft. wide concrete terrace on the southern side of the main building and footpaths of similar construction continue around the other sides.

The whole work was completed at a cost of £8,579.

Newtown North Public School—New Building for Infants.—This work comprises a basement and one floor, together containing all necessary provision for the accommodation of 280 infant scholars and their teachers. A special feature in this building is a large demonstration room (40 ft. x 24 ft.).

New retaining walls and fencing were erected around three sides of the site, and the contract also included paving, drainage, and minor alterations and general repairs to some existing buildings. The contract price for the whole work was £6,234.

North Sydney Boys' High School—Additions, alterations and remodelling.—The work being carried out consists of the erection of an assembly hall, the addition of two classrooms, a science demonstration room, a library and a tuck shop and includes remodelling and alterations to the two-storied school building.

The assembly hall has been designed to seat 1,000 persons, with facilities for cinematograph displays, etc. The additions to the school building will raise the classroom accommodation for students to a total of 564 seats. Brick arcading replaces the wooden verandah and balcony to the present school building which, with the additions, will enclose three sides of a court yard. Brick construction is being employed throughout the main buildings, with a roof covering of true slates matching those existing.

The work is being carried out by contract, a sum of £13,272 being involved.

North Sydney (Crow's Nest) Public School—New buildings for Boys and Girls.—These two buildings, now nearing completion, are being erected on a portion of the original Crow's Nest estate, adjacent to the Infants' school block erected a few years ago.

The girls' school is of brick construction and, on the Pacific Highway frontage, consists of two floors and a part basement; a short wing along McHatton-street is of one storey only. Shelter and lavatory accommodation are located in the basement. On the main floors are eleven classrooms, and a room each for the head mistress and staff.

The boys' building is also of brickwork and has been built to the westward of the Infants' school, having entrances from McHatton-street and Bay-road. The basement and floor plans generally resemble those of the Girls' school and the seating accommodation for pupils is 528 in each case.

The contract price for these buildings was £18,375.

Parkes Public and Intermediate High Schools.—The work in this instance consisted chiefly of the erection of a new school building for primary boys on the site of the old building and the erection of a new domestic science building on the High School site adjacent to the High School.

The new school building is of brick construction and consists of a basement, ground and first floors. The basement will afford weather shelter and lavatory accommodation, while on the ground and first floors are five classrooms, a headmaster's room, a staff room, hatrooms and stores.

The domestic science building is also of brick and comprises a large cooking room, a changing room and a home unit consisting of dining room, bedroom and bathroom. The contract includes the removal from the Primary School site of the manual training building and its re-erection on the High School site; also the connection to the sewer of the several buildings, both new and existing.

The value of these various works exceeds £7,000.

Queanbeyan Intermediate High School—New buildings and remodelling.—In this case the work consists of the erection of a new High School and outbuildings, together with the remodelling of the existing primary school.

The main building is of brick, two storeys in height along the main frontage and a single storey to the two wings. There are 14 classrooms, with seating for 656 pupils, as well as the various offices required by pupils and staff.

The outbuildings include two new weathersheds and alterations and additions to closets.

The remodelling consists of converting the existing school building into a science and manual training room.

The Contractor's price for the work involved was £12,992.

Quirindi Public School—New buildings.—The old school premises having proved to be inadequate, new buildings are now in course of erection and will in due time supersede those now in use.

The central portion of the main building will be two storeys in height, the remainder generally one storey; advantage however has been taken of the fall in the site to provide for the lavatories and shelter shed as a basement under the end wing. Accommodation is being provided for 384 pupils in eight classrooms; other important provisions include a large assembly hall, a science room, cooking room, and a home unit. Separate rooms will be available for the principal and the staff, and hatrooms, store rooms, etc., complete the scheme. The entrances and staircases have been so planned as to afford easy and direct access to the various sections of the main building.

The existing manual training room on the site of the present school will be removed and re-erected on the new site. The work is being carried out by contract and the completed cost will exceed £14,000.

Randwick Public School—Additions.—The principal works in this contract include a new domestic science building, a class room addition to the Girls' School, and new outbuildings, all of brick construction.

The domestic science building includes a kitchen, laundry, changing room, staff room and a home unit on the ground floor, and two sewing rooms, a trying-on room, etc., on the first floor.

The classroom addition consists of a full-size classroom on the ground floor, and a science room on the floor above.

The outbuildings comprise two weathersheds—one for girls and one for infants—both with a lavatory at each end, and a new closet block for girls.

The work was carried out by the Building Construction Branch, the sum required for completion being estimated at £7,189.

Westmead Public School—Additions.—The works recently completed at this school include an addition to the original school, the erection of a new building, conversion of a double portable classroom and the erection of new outbuildings.

The addition to the original building is two storeys in height and provides accommodation for 192 pupils in four classrooms—two on each floor. A new entrance porch and staircase are also included to supply the additional entrances required.

In the new building are six classrooms, seating 288 pupils, also the lesser rooms required by pupils, principal and staff.

The double portable classroom has been converted into a manual training room, together with needed office and store accommodation.

The weathersheds have been extended and new lavatories included and new closet blocks erected.

The cost of these various works amounted to £6,375.

Other schools at which building works of some importance were undertaken included the following:—Adamstown (£2,197), Ashford (£1,575), Barmedman (£1,720), Bourke (£1,600), Epping (£2,840), Guyra (£1,137), Kyogle Intermediate High (£1,545), Manilla (£4,450), Mortdale (£4,326), Mullumbimby (£1,731), Murrumburrah (£1,699), Oaklands (£1,596), Orange East (£1,195), Ryde West (£3,638), Tamworth (£3,782), Uralla (£1,900), Wagga Wagga High (£2,636) and Walcha (£1,960).

STATE AND MENTAL HOSPITALS.

Morisset Mental Hospital—Female Hospital Block.—This is a single storey brick building having a frontage of about 130 feet. It is being erected to provide accommodation for female patients similar to that already available for male patients.

Two large dormitories and two small wards together furnish accommodation for 35 patients. Other leading features in the building comprise a dining room, a segregation ward, a visitors' room, and a clinic. Electric lighting, hot water, steam and sterilizing services are included in the contract which was let for a sum of £6,657.

Orange Mental Hospital—Male and Female Ward Blocks.—These two ward blocks are being erected for the housing of T.B. patients. Both blocks are of brick construction, finished with tiled roofs.

Each block will provide ten single rooms opening upon an exercise verandah, a dormitory of nine beds and a solarium for six beds. The dormitory, open across the solarium, is enclosed on three sides with steel sashes glazed with "Victor" glass. Day and dining rooms, bathrooms and other facilities are also provided in each ward block. The contract price was £12,679.

Parramatta Mental Hospital—New Male Wards.—Under this contract new ward buildings of brick will replace the wooden buildings which have hitherto served, the latter being demolished to make way for the new work.

The leading features are the wards, the day rooms, the single rooms and the bathroom section. The main ward wings, of which there are three, run parallel to each other with courtyards between. The centre wing is single storey and has accommodation for 36 patients; the outer wings are of two floors each, with beds for 36 patients on each floor, *i.e.*, a total of 180 beds in 5 wards.

In front of the wards are four day-rooms three of which exceed 60 feet in length by 23 feet in width. The fourth day-room adjoins an existing ward and is somewhat smaller. Each day-room is warmed by slow combustion stoves centrally situated, each has its gas pipe-lighter, and two are fitted with bubblers.

At the other end of the wards are the single rooms of which there are fourteen and nearby are the undressing room, bathroom and dressing room, all of large size.

A small epileptic ward of seven beds is included in the work, the contract for which was let at £20,283.

Prince Henry Hospital—Pathological Block.—This new block will be a two-storey brick structure. It includes a waiting room, examination room, nurses' room, conference room, museum, two laboratories, rooms for the pathologist and staff as well as several rooms to be used exclusively for technical purposes. This block when complete will be one of the most modern and best equipped of its kind in the Southern Hemisphere.

The contract price was £8,573.

Prince Henry Hospital—Kitchen Block.—The new kitchen block is a single-storey brick structure, built on reinforced concrete foundations and having concrete floors throughout, finished in the kitchen and certain other rooms with floor tiles. As the name implies, the kitchen is the most important feature in the block. Grouped around it are rooms for the reception and preparation of the various foodstuffs, also a scullery, servery, stores, dining rooms and other rooms for the use of the staff.

Necessary mechanical and electrical services have been provided, including a steam service for cooking and a forced ventilating and exhaust system for the kitchen. The work is being carried out at a contract price of £13,643.

Prince Henry Hospital—Operating Unit.—This new block, necessary to cope with the requirements of this expanding institution, is of brick construction, roofed with slates matching those of adjoining buildings.

The main accommodation provided is as follows:—Two operating rooms, each with its anaesthetic room adjoining; a large sterilizing room, placed between the two operation rooms and serving both; a large central lobby affording access to all rooms; a room each for storage of linen and catgut; an office, a doctor's room and a nurses' room, the two latter each having its dressing room adjoining; a boiler room from which the hot water and steam services will radiate; and a plant room (41 ft. 6 in. x 14 ft.) located in an attic over the lobby. The last mentioned room is provided with a specially heavy concrete floor to eliminate noise and vibration from certain machinery which will be operated from it.

In addition to hot water, steam, heating, sterilizing, electric light and power, the services include ventilation, air-conditioning and an automatic emergency lighting service in the operating rooms.

The tender price for this building was £9,815.

SUBSIDISED HOSPITALS.

Grafton District Hospital—Alterations and Additions.—The alterations and additions to be carried out under this contract are very extensive and, when complete, will enable this institution to function much more effectively. The main features comprise extensions of the male ward, female ward and the isolation block; the erection of a children's ward, a new boiler house and a new morgue.

The ward additions will provide 32 additional beds made up as follows:—12 beds for children; 6 beds for male patients (4 intermediate and 2 private); 8 beds for female patients (2 general, 4 intermediate and 2 private); and 6 beds in the isolation block. In times of emergency a further 15 beds might be accommodated upon wide verandahs which adjoin the various wards.

Apart from the many alterations to buildings, the contract provides for an entirely new water service and reticulation, supply being drawn from the City of Grafton water mains; the sewerage service is also being disconnected from the septic tank and connection made to the Council's sewers. Necessary mechanical and electric services will also be installed.

The contract price was £16,304.

Griffith District Hospital—Additional Accommodation for Intermediate Patients and Nurses.—The work in this case consisted of two ward additions and a new detached building to serve as additional quarters for nurses. One ward addition is for male and the other for female patients. Each new ward makes provision for ten intermediate patients in two four-bed wards and one two-bed ward and is complete with its own sanitary annex, verandahs and covered ways connecting with the existing wards. A visitors' room is included in the case of the male ward.

In the new nurses' quarters building are four bedrooms, a sitting room and a bathroom. A 10 feet wide sleeping-out verandah extends the full length of the north-east side.

The work includes hot water, electric light, sewerage and fire services and cost about £5,500.

Newcastle Infectious Diseases Hospital.—The design of these buildings was governed by the finances available and for this reason the ward block is of weatherboard construction. The other buildings included in the present contract comprise the kitchen block, the laundry block and the nurses' quarters—all of which are of brick.

The ward block has a capacity of forty-eight beds in five ward units, portions of which will be subdivided into cubicles by means of glazed screens 7 feet in height. On three sides of the main building are 10 feet wide verandahs which afford weather protection to the wards and which could be utilized for overflow beds in the event of an epidemic. The ward and kitchen blocks together enclose and protect a large quadrangular sun court which will be valuable for the use of convalescents.

The staff dining room and the nurses' dining room adjoin the kitchen, the latter being fitted with the most modern cooking equipment.

The laundry unit is provided with modern laundry appliances, a fumigating room and staff changing rooms. Incorporated in this unit is a large boiler room from which the steam sterilizing and hot water services will radiate throughout the buildings.

The nurses' quarters building is situated some distance from the three buildings before mentioned and is of two storeys. It has been designed with a private entrance and suite for the matron; the main entrance is for the general use of the nurses for whom twenty-four bedrooms will be provided. There is also a large sitting room with verandah adjoining for the convenience of the nursing staff.

The tender price for this group of buildings was £20,505.

Royal North Shore Hospital—Maternity Block.—This new building, now in course of erection, will be of three storeys. The ground and first floors will be used as ward units and the general labour department will occupy the whole of the second floor.

The arrangement of the ground floor permits of a separate entrance for patients, quite apart from the general visitors' entrance, but both converging centrally and with easy access to stairs and lift. This floor and the first floor each provides for twenty-one patients in single, double and four-bed wards. Situated on these floors are also rooms for the doctors, sisters and nurses.

The second floor will have a unit set apart for the examination and preparation of patients before admission to this department. Two wards of three beds each and an operating theatre are other leading features. Another section of this floor, entirely segregated from the wards before mentioned, will contain a two-bed isolation ward and two separate eclamptic wards as well as necessary minor rooms.

The block will embody the latest ideas for this type of building, both as regards its design and fittings, and the disposition of the various units will ensure direct and easy communication and service. An electric bed and passenger lift will be installed.

The work is being carried out by the Building Construction Branch at a tendered price of £18,895.

Royal Prince Alfred Hospital—Outpatients' Department.—This building will eventually be one of three storeys and will provide for the whole of the outpatients, casualty and administrative work of the hospital and also for the accommodation of the staff. The present contract is for a section of one storey only, designed with a large central waiting hall, capable of seating some 300 patients, and four examination units, also a dispensary and space for the public.

The examination units are entered from the main waiting hall and each is divided up to provide its own consulting rooms, examination cubicles and waiting spaces. The completed building will be furnished throughout with the latest fittings and equipment and all necessary services.

The estimated cost of the work now in hand was £20,000.

St. George District Hospital—Nurses' Quarters.—The work now being carried out comprises the erection of new quarters for nurses, including a recreation hall and dining room block. The main block will be four storeys in height and will include all necessary provision for the matron, sub-matron, theatre sister, home sister, fourteen obstetric nurses and a general nursing staff of eighty-six. An electric lift will serve all floors.

The recreation hall and dining room block will be of one storey only and will contain large recreation and dining rooms, divided with folding partitions so that they can be thrown into one room for special functions. A servery will adjoin the main dining room and a separate dining room for the staff is also included in the same block. Verandahs and a covered way connect this building with the main block.

This work together with an operating block and some lesser items is being carried out by the Building Construction Branch at an estimated cost of £28,134.

Urana District Hospital—New Buildings.—The buildings now in course of erection will provide a complete small hospital unit. The main building has been designed to accommodate ten patients in two single bed wards, one two-bed ward and two three-bed wards, with wide verandahs across the front of the building. An operating unit, centrally situated, comprises the operating theatre, anaesthetic lobby and sterilizing room. The kitchen and laundry, together with necessary stores, also bedrooms for cook and maid are provided for in a wing at the north-west end of main block and nurses' quarters providing bedrooms for matron and two nurses, a sleep-out verandah and necessary bathroom and lavatory will form a wing at the opposite end. The maternity unit, which is being built as a continuation of the main block will provide accommodation for three beds, a labour ward and also a room to house the X-ray apparatus.

The buildings throughout will be centrally heated, hot water and steam services and the necessary sterilizing equipment installed and the sanitary fittings will be connected to a septic tank system of drainage. A detached building will provide a morgue, also rooms for the housing of a generating plant and storage batteries which will give an electric light and power service throughout the hospital.

The whole of the work is being carried out under contract at a cost of £9,590.

Wagga Wagga District Hospital—New Nurses' Quarters, etc.—The works being carried out comprise the erection of new quarters for nurses and alterations and additions to the existing nurses' quarters.

The new building is of brick construction, two storeys in height, finished with a tile-covered roof, and will accommodate the matron and thirty-four nurses. In addition to the matron's suite and bedrooms for nurses, there will be a visitors' room, a sitting room, a large recreation room and minor rooms. A wide verandah with fly-proofed balcony over, will extend across the front of the building.

On completion of the new quarters, the old quarters will be converted into an outpatients' department and a paying unit. The former will comprise a consulting room, waiting room, minor operating room and a pathological laboratory; and the paying unit will contain provision for eighteen patients in twelve single-bed wards and three two-bed wards.

The works, complete with all services including hot water and steam, are being carried out by contract, the accepted price being £10,380.

Other hospital buildings to which considerable additions and improvements were being effected included the following:—Bellinger River (£4,775), Canowindra (£1,913), Carcoar (£1,610), Condobolin (£3,255—second contract), Coonabarabran (£3,525), Coonamble (£2,888), Dungog (£3,000), Gunnedah (£2,488), Kyogle (£3,752), Lithgow (£4,115), Macleay (£3,730), Manilla (£2,104), Mudgee (£1,730), Narrandera (£2,129), Parkes (£6,853), Parramatta (£2,990 and £1,070), Peak Hill (£2,595), Quirindi (£2,470), Rylstone (£1,677), Tamworth (£1,650), Tumut (£1,000), and Windsor (£3,220, £2,797 and £2,350—three contracts).

PUBLIC BUILDINGS NOT OTHERWISE CLASSIFIED.

Berry Training Farm—New Buildings.—This institution was originally an experimental farm controlled by the Department of Agriculture. The existing buildings however were inadequate for the purposes of the Child Welfare Department, by whom it was taken over. In these circumstances new buildings became necessary.

The main building is of brick construction, designed with a view to the addition of another wing when required. At present the building is L shaped on plan, one wing being single storey and the other two storeys in height. The single storey section contains the kitchen, laundry, stores and certain staff rooms. On the ground floor of the two-storey wing are the dining rooms, shower room, lavatory, etc., while the upper floor is occupied as a dormitory with sleeping accommodation for forty-one trainees.

Some adaptation of the existing buildings and the erection of a small detached wooden building completes the scheme. Hot and cold water services, drainage to a septic tank, electric lighting and power services have all been installed, the whole work costing about £9,000.

Orange Police Station—New Buildings.—New buildings became necessary in this case because of certain necessary resumptions in connection with the Base Hospital at Orange.

Three buildings are included in this contract, viz., an inspector's residence, the sergeants' quarters, and a combined garage and stable block.

The inspector's residence faces Anson-street and contains six rooms, a kitchen and offices. The sergeants' quarters building is in Byng-street; therein are two semi-detached residences each of four rooms and a kitchen, etc. The garage and stable block contains a garage of a size suitable for two cars, a room for motor cycles, two horse stalls and a forage room.

All buildings are of brick, roofed with tiles and together cost about £4,600.

Riverina Welfare Farm, Yanco—New Buildings.—The old weatherboard buildings having become unsuitable and undesirable, a new group of buildings, designed to accommodate about 200 delinquent boys, is in course of erection.

The site chosen is upon the crest of a hill about $\frac{3}{4}$ of a mile from the old site. Twelve new buildings were required to fulfil the various requirements of indoor life at this farm. Apart from those satisfying the domestic needs of inmates and staff, the scheme includes an administration block, an assembly hall, a hospital, a manual training and wool-classing block and a special detention block.

The administration block forms the central feature on the north or approach side. On the right side of it is assembly hall which resembles a small theatre complete with dressing rooms and a controlled lighting system. On the other side of the administration block is the hospital which has been completely fitted as a casualty clearing station; it includes also a dentist's room and a self-contained suite for the matron.

All buildings are being constructed with reinforced concrete walls, having externally rendered texture finish of a cream tint. For reasons of economy galvanized iron roof coverings were employed. For similar reasons a proportion of the work was carried out by inmate labour; the remainder is still in the hands of the Building Construction Branch. It is expected that the completed cost will be approximately £35,600.

Weights and Measures Department—New Building.—This new building has been erected in Sussex-street, City, to house the offices and testing branch of the Weights and Measures Department.

The ground floor is occupied by a weighbridge, a garage and various specially designed rooms for testing, weighing and measuring apparatus of all kinds. In the case of the main testing room it was necessary to design a floor capable of sustaining a superimposed load of 5 cwt. per sq. ft. so that heavy platform scales might be tested when required. The general and administration offices are situated on the first floor facing Sussex-street.

A saw-tooth roof construction affords brilliant natural lighting, but electric lighting is also installed.


An expenditure of about £5,000 was required for this work.

In addition to the foregoing, new buildings erected for Police purposes are shown hereunder :—
Bankstown (£1,285), Griffith (£1,748), Gwabegar (£1,119), Leeton (£1,493), Menindie (£1,339) and Morisset (£1,793).

At Tullamore a combined Court House and Police Station was erected at a cost of about £2,400, and at Boggabri a contract is in progress for the erection of a new Court House, together with alterations and additions to the Police Station, for the sum of £2,340.

In conclusion I desire to acknowledge the sustained efforts put forth by members of the staff throughout the year.

EVAN SMITH, F.R.I.B.A.,
Government Architect.



Engineering Design Branch.

Annual Report, 1934-35.

Statement covering the operations of this Branch for the twelve months period ending 30th June, 1935, is submitted hereunder.

The continuance of unemployment relief works, in addition to new Loan Vote undertakings and extensions to existing works, have entailed an unremitting and heavy demand upon the Branch throughout the year, and designs have been called for and supplied constantly in advance of construction at short notice.

Bridges.

Plans, specifications and estimates were prepared for the construction of timber beam or truss highway bridges at the following sites on the roads named:—Bonley Creek, road Menindie to Wilcannia; Boorooma Creek, road Walgett to Brewarrina; Borumbil Creek, road Brewarrina to Walgett; Buckaroon Creek, Askew's Crossing, Cobar to Barnato; Cumborah Bridge over Big Warrambool, Walgett to Cumborah; Dolo Creek, Broken Hill to Wilcannia; Gunderbooka Creek, Bourke to Louth; Kulkyn Creek, Bourke to Wanaaring (day labour); Muggabah Creek, Booligal to Oxley; Pourmalong Creek, near Morisset Mental Hospital; Sparks Warrambool bridge, Walgett to Brewarrina; bridge over 26-mile Warrambool, Walgett to Collarenebri.

Reports and preliminary estimates were made in connection with a number of proposals put forward by Councils.

Harbour Works.

Plans and specifications were prepared for the construction of two 130-ton steel hopper silt punts, and a new steel hull for the tug "Hinton."

Plans and estimates were prepared for reconditioning the bunker wharf at Newcastle, and the erection of foundations for wheat shipping galleries. Estimates and preliminary plans were prepared for an extension to the Lee Wharf, Newcastle, and for mooring dolphins, etc.

Plans and specifications were also prepared for a concrete gravity sea wall at Ramsgate.

Swamp Drainage.

The only work carried out under this heading during the year under review was a preliminary design and estimate for new flood gates at the junction of Wallis Creek with the Hunter River.

Water Supply.

Plans and specifications were prepared for complete schemes for the following towns:—Crookwell; Gosford; Hillston; Narooma; Springwood; South-west Tablelands (Young and West Wyalong sections); Tambarumba; and for augmentations or additions to the following schemes:—Balranald; Coonabarabran; Dubbo; Gulgong; Goulburn; June; Leeton; Mittagong; Morisset Mental Hospital; Moss Vale; Rabbit and Milson Islands; Tamworth; Wellington; Wentworth; South-west Tablelands.

In addition to the above, preliminary reports and estimates were prepared in connection with over thirty proposals for new schemes or augmentation of existing schemes.

Sewerage.

Plans and specifications for the following new schemes were completed:—Armidale; Bowral; Cowra; Wellington; Mudgee; while the work in hand at 30th June, 1935, included the design of complete schemes for Bega; Corowa; Griffith; Leeton; Moss Vale; Nowra; Queanbeyan; and Taree. The designs dealt with during the year also included augmentation schemes for Katoomba and Tamworth.

Plans for sewerage installation were prepared in connection with the following institutions:—Berry Experimental Farm; Riverina Boys' Welfare Home; Tamworth Agricultural High School; also for district hospitals at Gunnedah; Walgett; Wialda, and Windsor.

Stormwater Drainage.

Designs were prepared for the following works:—Gardener's-road Branch Channel; White's Creek Channel Extension; Greenacre Park Channel and Branches; Salt Pan Creek Channel and Branches; St. Luke's Park Channel Extension to Canada Bay; Callan Park Channel; Omaha-street Channel, Belmore Channel; Belmore Channel Extension (Martin-street); Punchbowl-road Channel and Branches; University Grounds Drainage; Dobroyd Reclamation and Catch-drains; William-street Channel; A'Beckett's Creek Channel; Little Duck Creek Channel, Lisgar-street; Cooper's Creek Channel; Oatley Bay System, Appian Way Branch; Kogarah Bay Channel; Myrtle Bay Relief Channel; Birala Station Channel; Farmer's Creek Channel; Roslyn-street Channel; Limekiln Bay Channel; Brickfield Creek, Belmore Park Branch and Gladstone-street Sub-branch; Petersham Park Channel; Cottenham-avenue Channel; Prince Henry Hospital Drainage; Show Ground Channel; Bird's Gully Channel Extension, Eurimbla-avenue Branch and Kara-street Branch; Terry's Creek Channel Extension, Eastwood-avenue Branch with sub-branches; Sugarloaf Bay System, Scott's Creek Channel; Johnstone's Creek Channel Extension; Reilley's Creek Channel; Rookwood-road Branch Channel; Duck River, Sefton Park Channel and Branches;

Exile Bay Channel, Ian-parade; Cook's River Channel, Water's-road to Burwood-road; Grove-avenue to Togo-street Channel; Peach-street and Show Ground Channels; Clio-street Channel; Channels at Spring Creek, Rifle Range Gully and Long Gully; King George Park Sea Wall; Varna Park Improvements.

Plans and specifications for a large number of other stormwater drainage works were in progress at 30th June, 1935.

Electrical.

Preliminary designs were prepared for the No. 2 Power Station at Burrinjuck, and following on the acceptance of a tender for the Hydro-Electric Plant, detailed designs of both power house and arrangement of plant were put in hand.

Plans were prepared for transmission lines on the Port Kembla system to Terara, Yanderra, The Towers and Yerranbool.

Designs and estimates were prepared for electrical equipment required in connection with twenty-five water supply or sewerage schemes.

River Murray Waters.

The design of Lock and Weir No. 15, Euston, was completed during the year under review, and a full set of working drawings prepared. Preliminary designs for No. 5 Weir, Murrumbidgee River, were prepared, also plans covering details of lighting, etc., for the roadway over Hume Dam.

Miscellaneous.

Detailed consideration has been given to a number of proposals for Standard Specifications referred to this Department by the Standards Association of Australia. One of the most important items considered under this heading was the Standard Specification for Cement.

Staff.

The staff at the 30th June, 1935, consisted of the following officers:—Professional, 39; clerical, 2; general, 10; total, 51.

S. W. JONES, B.E., M.Inst.C.E.,
Principal Designing Engineer.

21st August, 1935.

Survey Drafting Branch.

Annual Report, 1934-35.

General survey drafting, recording, heliographing, photostat copying, plan mounting and plan registration were carried out in connection with the following works:—

Country Towns Sewerage.

Armidale, Bega, Blackheath, Bowral, Casino, Corowa, Cootamundra, Cowra, Dubbo, Glen Innes, Grafton, South Grafton, Griffiths, Katoomba, Lithgow, Manilla Hospital, East Maitland, Maitland, Mittagong, Morisset Mental Hospital, Moss Vale, Mudgee, Murrurundi Hospital, Murrumburrah, Muswellbrook, Nowra, Penrith, Queanbeyan, Quirindi, Singleton, Tamworth, West Tamworth, Taree, Tumut, Wellington, Windsor Hospital, West Wyalong, Young.

Metropolitan Sewerage.

Gladesville Mental Hospital, Lidcombe State Hospital.

Country Towns Water Supply.

Aberdeen, Ballina, Barraba, Bathurst, Blayney, Berrigan, Berry, Blue Mountains, Coolamon-Ganmain, Coonabarabran, Central Tilba, Crookwell, Dunedoo, Gloucester, Gosford, Goulburn, Griffiths, Gunnedah, Harden, Katoomba, Kempsey, Kyogle, Lismore, Lithgow, Mittagong, Moruya, Muswellbrook, Murrurundi, Noorooma, Peak Hill, Parkes, Picton, Quirindi, South West Tablelands, Tamworth, Tumbarumba, Tenterfield.

Stormwater Channels (Unemployment Relief Works).

Alexandria.—Doody-street, Gardener's-road.

Annandale-Leichhardt.—White's Creek.

Annandale.—Johnson's Creek.

Bankstown.—The Appian Way Main Channel Extension to Heath-street and Milton-street Branch, Condell Park Main Channel, Hunter-street, Market-street, Norman-street and Shenton-avenue Branches, Canterbury-road to De-Witt-street Main Channel, Herbert-street, Chappel-road Branches, George's River road Sub-branch, and Stacey-street Relief Channel, Greenacre Park Main Channel, Banksia-road, Waterloo, road, Hillcrest-avenue, Hume Highway, Weigand-avenue and Clarence-street Branches, Reilly's Creek Main Channel, Swan-street, Polo-street and Ely-street Branches, Rookwood-road Main Channel, Railway Lands, Brunker-road, Powell-street, Lithgow-avenue, Recreation Reserve Branches and Rookwood-road Sub-branch, Sefton Park Main Channel, Wellington-street, Rose-street, Railway Culvert, Rodd-street Branches and Proctor-parade Sub-branch.

Bankstown-Canterbury.—Gowrie Park Main Channel, Punchbowl-road North, Punchbowl-road South, Punchbowl Park and Scott-street Branches, Salt Pan Creek Main Channel below Canterbury-road, Gowrie Park and Fairford-road Branches.

Burwood-Concord.—St. Luke's Park Main Channel and Park-avenue Branch.

Bexley.—Muddy Creek Main Channel, Prince's Highway (Kogarah) to Queen-avenue (Bexley), Subway-road, Cadia-street, Washington-street and Queen-avenue Branches, Bardwell Creek Main Channel, Croydon-road and Stoney Creek road Branches.

Blacktown-Holroyd.—Cooper's Creek Main Channel, Dunmore-avenue, Smith-street and Western-Road Branches.

Botany-Randwick.—Jersey-road Branch.

Botany.—Booralee Park.

Canterbury.—Omaha-street Main Channel, Baltimore-street, St. Clair-street, Sudbury-street and Cecilia-street Branches, Punchbowl Main Channel, Hillcrest-street to Payten-avenue and Branches, Moxon-road to Belmore-road Main Channel, Bell-street and Belmore-road Branches, Belmore-road to Penshurst-road Main Channel, Shorter-avenue, Penshurst-road Branches, Belmore-road to Chick-street Main Channel, Violet-street, Payten-avenue and Bond's-road Branches, Cup and Saucer Creek Main Channel, Fore-street to Glenoree-road and Seahill-street to Dreadnought-street, Jarrett-street, Alfred-street, William-street, Moncur-avenue, Trafalgar-street, Garden-street and Belmore-street Branches.

Concord.—Exile Bay Main Channel.

Cabramatta-Canley Vale.—George's River to Longfield-street Channel and Prospect Creek to Chadderton-street Channel.

Concord-Homebush.—Powell's Creek Main Channel Extension to Homebush Bay and Salesyard Creek Branch Extension.

Canterbury-Enfield.—Cook's River Main Channel, Seventh-avenue, Omaha-street Branches Extensions and Cox Creek Extension, Punchbowl-road Main Channel, Hampden-road, Wales-street, Punchbowl-road, Yerrick-street and Macquarie-street Branches.

Drummoyne.—William-street Main Channel, William-street Extension to Hen and Chicken Bay and proposed Sea Wall, Regatta-road Branch, Spencer-street Sub-branch.

Dundas.—Terry's Creek, Doonben-avenue Extension to Epping-avenue, Boronia Park Extension to Neil-street and Bridge-street Branch.

Dundas-Hornsby.—Boronia Park Extension to Beecroft-road, Beecroft-road, Ray-road and Victoria-street Branches.

Enfield.—Cox Creek Main Channel and Lower Railway Culvert Branch.

Granville.—Little Duck Creek Extension to Lavina-street.

Hornsby.—Hornsby Creek Extension to Myra-street.

Hunter's Hill.—Tarban Creek Main Channel.

Hurstville.—Lime Kiln Bay Main Channel, Walter-street and Villiers-street Branches, Wolli Creek Main Channel, Narwee, Edgbaston-street, Penshurst Park, Dumbleton-road Branches and Sub-branches.

Kogarah.—Penshurst Main Channel, Hillcrest-avenue, Arrowsmith Park and Minnett's Nursery Branches, Carlton Main Channel and Station-street Branch, Kogarah Bay Creek Main Channel Extension to Kogarah Bay, Wonora-road, Taunton-street, Market Gardens, and Forester-street Branches, Grove-avenue to Togo-street near Railway-parade Main Channel, Grove-avenue to Togo-street near Claremont-street, Railway-parade, McRae-avenue, Kuroki-street and Claremont-street Branches, Oatley Bay Main Channel.

Kogarah-Hurstville.—Never Fail Bay to Charles-street, Main Channel, Mulga-street to Letitia-street Main Channel, Railway to Letitia-street Main Channel, Railway and Woonona-parade Branches.

Ku-ring-gai.—Moore's Creek Main Channel and Bancroft-avenue Branch.

Lidcombe.—Haslem's Creek Main Channel Extension to London-road, Berala Branch, Railway Culvert and Elizabeth-street Sub-branches, Wyatt Park Extension to Auburn-road.

Lithgow.—Farmer's Creek Main Channel, Cooerwill Estate, Academy-street, Glanmyre, Cobar Gully, Gas Works, State Mine Gully and Inch-street Branches, Cobar Gully Sub-branch.

Leichhardt.—Callan Park Main Channel, Long Cove Canal to Excelsior-street, Beeson-street to Parramatta-road.

Mascot.—Cook-street, Roslyn-street, Coward-street to Gardener's-road.

Marrickville.—Marrickville Valley Low Level Drainage Proposed Storage Area.

Parramatta-Holroyd.—Clay Cliff Creek Main Channel and Branches.

Parramatta.—Brickfield Creek, Belmore Park Branch and Gladstone-street Sub-branch.

Penrith.—Peach Tree Main Channel, Doonmore-street and High-street Branches.

Rockdale.—Spring-street Main Channel, West Botany street to Railway-street, Tabrett-street, Godfrey-street, Hattersley-street and Park-avenue Branches, Spring-street Extension, Muddy Creek to West Botany street, George's River to Ramsgate-avenue, Teralba, Robinson and Pasadena streets Main Channels.

Ryde.—Westminster-road to Thompson-street, Small's Creek, Morrison Bay Main Channel, Perry-street, Morrison-road, Tyagarah-street and Henry-street Branches, Tarban Creek Main Channel Extension to Eltham-street, Buffalo Creek Main Channel, Kuppa-road, Myra-avenue and Lane Cove road Branches.

Randwick.—Storey-street to Anzac-parade, Cottenham-avenue and Eastern-avenue Branch, Malabar-road to Haig-street, Bird's Gully Main Channel, Bird's Gully Extension to Kara-street, Eurimbla-avenue Branch, Maroubra Bay Main Channel, Maroubra Bay Main Channel re-location, McKeon-street Branch, Prince Henry Hospital, Prince Henry Hospital Extension, Prince Henry Hospital near new Medical building, Bunnerong Channel Beauchamp-road Branch, Royal Agricultural Society's Show Grounds, Maroubra Speedway.

Sutherland.—Prince's Highway to Mersey-street and Eton-street Main Channels, Glencoe-street Channel, Gunnamatta Bay Main Channel, Burraneer Bay road and Burke-road Branches.

Sydney.—(University) Main Line through Oval to Medical building for Tropical Diseases and Relief line around Oval, Relief line Carillon-avenue to Laundry.

Tamworth.—Rifle Range Gully Main Channel and alternative line, Long Gully Main channel and Carthage-street Branch, Spring Creek Main Channel.

Waterloo.—Epson-road Branch and Victoria-lane Relief Channel, Harcourt-parade Main Channel, The Durdans and Dunning-avenue Branches.

Willoughby.—Northcoate-street Main Channel, Sugarloaf Bay Channel, Scott's Creek and Lyle-street to Penshurst-street.

Authorization descriptions only were prepared for the following Stormwater Channels :—

Alexandria.—Alexandra Canal, (Shea's Creek) Canal Improvements.

Bexley.—Bardwell Creek Iliffe-street Branch Channel.

Botany.—Pagewood Channel and Branch.

Cessnock.—Blackbird Creek, Black Creek and Kearsley Creek.

Sutherland.—Mogo Creek Drain, Scylla Bay Reclamation, Gwawley Bay Channel, Prince Edward Park Reclamation.

Roads.

Tumbarumba-Kiandra, Coulson's Creek to Miller's Creek, Bilpin to Mount Irvine.

Electrical Developments.

Transmission Line, Yass to Moss Vale. Easements and resumptions in connection with the Burrinjuck Hydro-electric Scheme. Bega River-Rutheford Creek Investigation.

Harbours and Rivers.

Coff's Harbour, Hunter River, Macleay River, Newcastle Harbour (North Harbour), Newcastle Harbour Improvements (lands, leases and general investigation), Port Macquarie, Port Kembla, Patterson River (New Level to Banks), Wagonga Inlet.

Swamp Drainage.

Austral Eden, Lake Urana, Miller's Forest, Moto, Oxley Island, Whalen, Wilberforce.

Public Watering Places.

Upon the proclamation of the 29th March, 1935, the control of the Public Watering Places passed to the Department of Agriculture under powers conferred by the Pastures Protection Act of 1934.

The administration of the Public Watering Places Act by the Public Works Department ceased as at that date and from the 1st July, 1934, plans and descriptions were prepared in connection with the establishment of seven, the revocation of seven and part revocation of eight Public Watering Places, and thirty-four lease documents were endorsed in duplicate. Investigation was made for the establishment or part revocation in twenty-one additional locations.

Local Government.

Descriptions were prepared of alterations to the boundaries of thirty-five Municipalities and Shires, and in connection with residential districts forty-six Municipalities and Shires. Descriptions for completion of work for Country Towns Water Supply and Sewerage for Gazette purposes were prepared in connection with forty-six Towns and Villages. Descriptions were prepared for one Urban Area and three electricity undertakings; also forty-eight illustrated sketches were prepared in connection with the proposed alteration of boundaries of Shires and Municipalities and of Residential Districts.

River Murray Waters Act.

Acquisition of land for Upper Murray storage and road deviations in connection with the Upper River Murray road.

Murrumbidgee River No. 5 Weir (Redbank) and No. 7 Weir (Maude). Contour plans of site and road of access to No. 5 Weir.

Search and Investigation.

Information on legal and land matters was obtained by search for resumption and easement plans; also in connection with Local Government Administration, Public Watering Places, Country Towns Water Supply and Sewerage, Hydro-electric Developments, Stormwater Channels, Hydrographic Surveys and other works generally, including the preparation of two-hundred and forty Certificates of Identity and four-hundred and fifty search sketches.

Government Undertakings.

Government Dockyard, Walsh Island, Newcastle; plans for appropriation of site. In addition, plans and quantity calculations of Kiama Quarry were prepared for royalty payments.

General Drafting and Recording.

Two hundred and sixty-seven (267) plans and descriptions for resumptions, easements, appropriations and dedications were drawn and prepared, one hundred and forty-seven (147) detail sheets were drawn and traced, eleven base diagrams and seven hundred and ninety-five (795) drawings, including plans, sections, diagrams, capacity curves and tables were prepared.

The number of files dealt with was 5,800.

Printing and Plan Registration.

Heliographs to the number of 35,866 were printed and 2,586 were mounted. This includes (in addition to work for this Department) heliographing and plan mounting for Valuer-General's and Fisheries Departments. The photostats made numbered 10,157. This means of copying has been made use of by a number of Government Departments in addition to this Department.

In the Plan Room 4,673 new plans and 420 Field and Level Books were registered; 21,562 plans were issued and returned.

V. R. BLACKET,
Draftsman-in-Charge.

12th August, 1935.

Testing and Inspection Branch.

Annual Report, 1934-35.

For twelve months ending 30th June, 1935, the estimated value of the material tested and inspected before being despatched from the various manufacturers, amounted to approximately £501,068. The fees charged for the work amounted to £7,305 18s. 8d.

Cement Testing.

Nine hundred and two certificates covering the sampling, testing and issuing of 2,612,640 jute bags of cement of an estimated value of £464,469 were issued during the year. Fees amounting to £5,234 8s. 3d. were charged for the work carried out.

Steelwork Inspection.

Two thousand five hundred and forty (2,540) valves and hydrants, one thousand six hundred and fifty-two (1,652) M.S. pipes together with 204 C.I. pipes and 68 unclassified miscellaneous jobs were inspected and tested prior to despatch from the various works at Newcastle and Port Kembla. A total of 328 consignments were despatched. The fees charged for this work amounted to £1,181 3s. 9d.

Miscellaneous Investigations.

Six hundred and fifty-six (656) reports covering 1,763 tests of concrete cubes, sand, iron and steel bars, etc., were carried out in the Testing Branch laboratories. Fees charged for this work amounted to £890 6s. 8d.

Two hundred and ninety-eight instruments were overhauled and repaired by the Instrument Maker.

Summarised details of the work carried out are given in the following statement :—

Summary of Work carried out.

Particulars of Service.	Unit.	Quantity.	Reports.	Tests.	Estimated Value.	Fees.
					£ s. d.	£ s. d.
Cement Testing	Jute Bags	2,612,640	.....	902	464,469 0 0	5,234 8 3
Steelwork Inspection—						
Valves and hydrants.....	No.	2,540	.....	.....	8,430 0 0	222 14 9
C. I. pipes	"	204	.....	.....	646 0 0	9 14 8
M. S. "	"	1,652	.....	.....	17,653 0 0	738 6 5
Miscellaneous (not classified)	"	68	.....	.....	9,870 0 0	210 7 11
Miscellaneous Investigations—						
Concrete .....	" .....	.....	377	1,150	.....	437 18 5
Sand .....	" .....	.....	76	127	.....	50 1 6
Miscellaneous (not classified) .....	" .....	.....	88	174	.....	239 8 9
Steel and C. I. bars .....	" .....	.....	106	295	.....	118 19 6
Asphaltum .....	" .....	.....	4	4	.....	8 0 6
Paints, Oils, etc. ....	" .....	.....	5	13	.....	32 10 0
Standard sand	Cwt.	2	.....	.....	.....	3 8 0
Instrument maker	No.	298	.....	.....	.....	.....
Totals .....	.....	.....	.....	.....	501,068 0 0	7,305 18 8

A. MORRISON,

Superintendent of Testing and Inspection.

River Murray Waters Act.

Annual Report for Year ended 30th June, 1935.

- A. Hume Reservoir—
- (i) Progress of Work.
 - (ii) Land Acquisition.
 - (iii) Construction—
 - (a) Concrete.
 - (b) Core Wall and Earth Bank.
 - (c) Plant.
 - (d) Outlet Works.
 - (e) Stilling Pool.
 - (f) Condition of Stored Water.
 - (g) Road Deviations.
 - (h) Wymah Ferry.
 - (i) Release of Stored Water.
 - (j) Behaviour of Reservoir.
 - (k) General.
- B. Weirs and Locks, Murray River—
- (i) Weir and Lock No. 10.
 - (ii) Weir and Lock No. 15.
- C. Weirs, Murrumbidgee River.
- D. Administration.

A. Hume Reservoir.

(i) PROGRESS OF WORK.

At the 30th June, 1935, the construction of the Hume Dam to the extent of the present approval, viz., 1½ million acre-feet, including reinforced concrete roadway over the top of the structure was in an advanced stage, the only outstanding work at the date mentioned being the completion of the earth filling in the embankment behind the North Wing Wall together with concrete slabbing, the laying of the bituminous surface on the Sluice and Spillway sections of the Roadway, and clearing up the site, etc.

(ii) LAND ACQUISITION.

A further area of 700 acres was acquired during the year; flood rights were also obtained over an area of 723 acres. At the 30th June, 1935, the total nett area dealt with by acquisition or flood easement rights was 15,405 acres, including residues yet to be disposed of.

(iii) CONSTRUCTION.

(a) *Concrete*.—The following concrete was placed during the twelve months covered by this report :—

	cub. yds.
Road Piers	5,349
Roadway, including Parapet, etc.	2,059
Core Wall in New South Wales Bank	673
Elsewhere	51

Concreting operations in the Main Wall are now completed, the total quantity of concrete placed in the structure to date being 445,002 cub. yards.

(b) *Core Wall and Earth Bank*.—The core wall for the New South Wales bank was completed and 16,328 cub. yards of clay were placed in position, together with 306 cub. yards of spalls.

(c) *Plant*.—To permit the construction of the New South Wales core wall and embankment to be put in hand, it became necessary to remove the power house, boilers, and adjacent plant, and in order to provide an uninterrupted supply of power for the completion of concreting operations, one of the steam generators and the small Babcock and Wilcox boiler were re-erected clear of construction operations. The whole of the belt conveyor plant used for placing the major portion of the concrete in the dam, was dismantled and the trestlework removed. The concrete elevator tower behind the North Wing Wall, and the 2 cub. yards mixer plant and buildings have been partially dismantled.

Every effort has been made to sell or dispose of by transfer to other works, plant not further required, and the following major items were so dealt with :—

- 2 cub. yds. Dragline Excavator;
- 591 tons Steel Sheet Piling;
- Motor Ambulance;
- Motor Car;
- Travelling Gantry Crane;
- Air Compressor;
- 2 Air Receivers;
- 4 Pumps;
- 3 Large Stone Skips;
- Conveyor Belting.

(d) *Outlet Works*.—Needle valves and stoney sluices have been frequently operated and are in good order.

(e) *Stilling Pool*.—During the month of February it was ascertained that a fracture of the floor of the stilling pool had taken place below the regulating valves, presumably due to the hammering effect of the jets of water issuing from the valves. The damage was made the subject of a special investigation, and after consideration by the engineers of the Constructing Authorities and the River Murray Commission it was decided that no action should be taken for the time being, other than to keep this section of the work under close observation. Subsequent investigations at frequent intervals have not disclosed any material extension of the damage.

(f) *Condition of Stored Water*.—Algal infestation was very light during the year under review and no application of copper sulphate was found to be necessary. Liberation of sulphuretted hydrogen gas on a large scale from the outlet works occurred over a period of several weeks in mid-summer, but no effect on the potability of the water either in the reservoir or downstream thereof was noticeable.

(g) *Road Deviations*.—The Upper Murray road deviations have been dedicated as public roads and similar action is in train for the road from the Hume township to Bethanga Bridge, and for the new road to Wymah Ferry.

(h) *Wymah Ferry*.—The Departments concerned in New South Wales and Victoria having agreed to accept responsibility for any extra cost of operation at the new site selected for this ferry, and the River Murray Commission having approved of the proposal, action was taken to carry out the construction of the approach and access roads. This work has been completed, with the exception of the approaches below water, which will be attended to when the reservoir is sufficiently low. The Shire Councils concerned have formally undertaken to assume responsibility for the maintenance of the approaches and action is in hand with a view to dedicating the access road as a public road. The ferry has been operating satisfactorily since January, 1935.

(i) *Release of Stored Water*.—Water was released in accordance with the requirements of the Water Conservation and Irrigation Commission of New South Wales and the State Rivers and Water Supply Commission of Victoria.

(j) *Behaviour of Reservoir*.—The stored water reached the crest level 606, corresponding to $1\frac{1}{4}$ million acre-feet, for the first time on 27th October, 1934, and on 3rd November the spillway discharge reached a maximum depth of 4 ft. 8 in. The water receded to spillway crest level by the end of the same month but following further heavy intakes, the spillway again became surcharged, the maximum depth of 3 ft. 4 in. on this occasion being reached. The characteristics of the October flood were carefully observed and computations based on such observations show that the maximum rate of intake into the reservoir was 75,000 cubic feet per second.

The lowest reservoir level during the year was 560 ft. 6 in. in July, 1934, corresponding to a storage of 180,000 acre-feet. On 30th June, 1935, the reservoir level was 594 ft. 4 in. and the water stored, 890,000 acre-feet.

(k) *General*.—The average number of men employed up to May 31 was 231, at which date owing to the contraction of the work it was necessary to commence reducing hands. As far as possible rationing of labour on the basis of three weeks on and one week off was practised.

B. Weir and Locks, in Murray River.

(i) *Weir and Lock No. 10 at Wentworth* was operated 156 times for the passage of 118 steamers towing 67 barges and 38 small boats.

The traffic figures are as follows :—

										Tons.
Wool	...	...	...	...	...	...	...	...	...	2,082
Fruit	...	...	...	...	...	...	...	...	...	39
General	...	...	...	...	...	...	...	...	...	2,714
Construction Material	...	...	...	...	...	...	...	...	...	607
Total	...	...	...	...	...	...	...	...	...	5,442

The number of passengers passing through the lock was 532. The weir was removed on 14th November, 1934, and replaced on 6th February, 1935. Ordinary maintenance of the structure was attended to.

(ii) *Weir and Lock No. 15 at Euston*.—Detailed designs for this structure were prepared on the lines referred to in the Annual Report for year ended 30th June, 1934, viz., with the inclusion of Trestles and Boule panels for the Navigable Pass in lieu of a Dethridge type of weir as originally proposed. After concurrence by the Victorian Constructing Authority, the designs received the approval of the River Murray Commission.

All plant required has now been installed, contracts for supply of 1,600 timber piles and 2,000 tons of firewood have been completed, and contracts for the supply of 2,000 tons of cement and for the loading of 12,000 cubic yards of Carisbrook gravel are now in operation. The contract for the manufacture and delivery of ironwork was let to the Perry Engineering Company of Adelaide and was completed at the end of June.

The River Wall of No. 1 Cofferdam was completed in July, 1934, but owing to the condition of the river it was not practicable to close and complete the cofferdam until March, 1935. In the meantime 1,288 timber piles were driven for the foundation of the lock and that portion of the Navigable Pass within No. 1 Cofferdam.

The cofferdam was dewatered and leakage found to be very small. Concreting was commenced on 16th May and at the end of June 3,042 cub. yards had been placed in the lock floor upstream apron and land wall of the lock. Driving of steel piling cut-off walls is in progress.

The railway siding from Robinvale to the works was completed and put into operation in November, 1934.

The highest level of the river since the closing of the cofferdam was 155.5 or 6 ft. 6 in. below the top of the cofferdam. The river channel has scoured considerably but, the stone toe of the cofferdam has stood well.

The number of men employed at 30th June was 299, work being carried on in three shifts while river conditions are favourable.

C. Weirs, Murrumbidgee River.

The sites for Nos. 5 and 7 Weirs were surveyed and the strata explored by boring.

At No. 5 site satisfactory clay foundations were found at a suitable level and after considering a preliminary design, the River Murray Commission at a meeting held on 1st April on the site, tentatively approved of the site subject to certain additional boring information proving satisfactory and approved of preliminary works including the construction of a road of access being commenced. The additional boring information referred to had not been completely obtained at the 30th June. The road of access was commenced.

At No. 7 site the boring was not sufficiently advanced to enable a submission with regard thereto being forwarded to the River Murray Commission.

D. Administration.

An Act (N.S.W., No. 31, 1934) to amend the River Murray Waters Act, 1915-1923, was passed by the Parliament of New South Wales and assented to on 9th November, 1934. Similar action was taken by the Commonwealth and the other contracting States. The Act came into effect (in New South Wales) by proclamation on Friday, 23rd November, 1934.

The main provisions contained in this Act are :—

- (1) The construction of the Hume Reservoir with a storage capacity of 1,250,000 acre-feet with roadway along the top, the dam to be constructed so as to permit an extension of the storage to 2 million acre-feet in the future.
- (2) The construction of five barrages in certain channels at the Murray mouth.
- (3) The construction of fourteen weirs or weirs and locks in the course of the River Murray from its mouth to Yarrawonga.
- (4) The construction of two weirs in the course of the River Murrumbidgee from its junction with the River Murray to Hay.

General.

The expenditure by the Department from the River Murray Commission funds was £230,948 making a total to date of £3,542,006.

4th July, 1935.

S. W. JONES, B.E., M.Inst.C.E.,
Chief Engineer for New South Wales,
River Murray Waters Act.