

SEVENTEENTH ANNUAL REPORT

OF THE

SUPERINTENDING ENGINEER,
PUBLIC HEALTH DEPARTMENT
(ENGINEERING BRANCH)

BIHAR AND ORISSA

FOR THE YEAR ENDED

31st MARCH 1929.



SUPERINTENDENT, GOVERNMENT PRINTING
BIHAR AND ORISSA
• 1929.

Priced Publications of the Government of Bihar and Orissa can be had from—

IN INDIA

The Superintendent, Government Printing, Bihar and Orissa,
Gulzarbagh P. O.

- (1) MESSRS. THACKER SPINK & Co., Calcutta.
- (2) MESSRS. W. NEWMAN & Co., Calcutta.
- (3) MESSRS. S. K. LAHIRI & Co., College Street, Calcutta.
- (4) MESSRS. R. CAMBRAY & Co., 6 and 8-2, Hastings Street, Calcutta.
- (5) MESSRS. THOMPSON & Co., Madras.
- (6) MESSRS. D. B. TARAPOREVALA SONS & Co., 103, Meadow Street, Fort, Post Box No. 18, Bombay.
- (7) MESSRS. M. C. SIRKAR & SONS, 75, Harrison Road, Calcutta.
- (8) PROPRIETOR OF THE NEWAL KISHORE PRESS, Lucknow.
- (9) MESSRS. M. N. BURMAN & Co., Bankipore.
- (10) BABU RAM DAYAL AGARWALA, 184, Katra Road, Allahabad.
- (11) THE STANDARD LITERATURE Co., LTD., 13-1, Old Court House Street, Calcutta.
- (12) MANAGER OF THE INDIAN SCHOOL SUPPLY DEPÔT, 309, Bow Bazar Street, Calcutta.
- (13) MESSRS. BUTTERWORTH & Co., LTD., 6, Hastings Street, Calcutta.
- (14) MESSRS. RAM KRISHNA & SONS, Anarkali Street, Lahore.
- (15) THE OXFORD BOOK AND STATIONERY COMPANY, Delhi.
- (16) MESSRS. DAS BROTHERS, Nouzerkatra, Patna City.
- (17) THE BOOK COMPANY, 4/4(a), College Square, Calcutta.
- (18) MR. K. L. MATHUR, Guzri, Patna City.
- (19) MESSRS. RAGHUNATH PRASAD & SONS, Patna City.

IN ENGLAND AND ON THE CONTINENT

THE OFFICE OF THE HIGH COMMISSIONER FOR INDIA, 42, Grosvenor Gardens
London, S. W. 1, direct or through any bookseller.

SEVENTEENTH ANNUAL REPORT
OF THE
SUPERINTENDING ENGINEER,
Public Health Department (Engineering Branch),
Bihar and Orissa, for the year ended
31st March 1929.

Staff.—The post of Superintending Engineer was held by Mr. S. E. Platt and Messrs. T. S. Soorma and E. R. Smith, Executive Engineers, held charge of the 1st and 2nd Division respectively, throughout the year.

Mr. A. N. Banerjee was attached to the 1st Division until 15th October 1928 when he was posted to the 2nd Division. Mr. M. Sadique was attached to the 2nd Division until 15th October 1928 when he was transferred to the 1st Division until 31st March 1929 when he resigned to take up a post at the Bihar College of Engineering.

Mr. S. B. Dutt was appointed temporary Assistant Engineer on 1st October 1928 and was attached to the 1st Division. On the resignation of Mr. Sadique he was confirmed as permanent Assistant Engineer.

Babu S. R. Banerjee, permanent supervisor, was promoted to the post of temporary Assistant Engineer with effect from 1st October 1928 and attached to the 2nd Division.

Babu B. D. Dhawan continued to work as Assistant Mechanical Engineer.

During the year the development of this department has continued and on the 2nd February 1929 Mr. E. D. McDonald joined the post of Mechanical Executive Engineer which has been sanctioned by Government for a period of five years.

On the same date Mr. C. E. Whittaker joined the staff of the department for the purpose of preparing a comprehensive sewerage scheme for Patna.

Two posts of temporary Assistant Engineers have also been sanctioned so that the Engineer staff of the department now consists, in addition to the Superintending Engineer, of three Executive Engineers, the special Drainage Engineer and seven Assistant Engineers. For facility of inspection of works, economy in the travelling allowance of staff and want of accommodation at Patna the headquarters of the 2nd Division of this Department were transferred to Ranchi which is much more central for Orissa and Chota Nagpur than Patna.

During the year the following places were visited by the Superintending Engineer :—

Bhagalpur, Gaya, Daltonganj, Dhanbad, Jharia, Ranchi, Hazaribagh, Kanke, Itki, Jamalpur, Monghyr, Puri, Cuttack, Muzaffarpur, Katihar, Forbesganj, Sonapur, Laheria Serai and Bihta and in addition the Executive Engineers of the department visited the following places :—

Purulia, Khunti, Chakradharpur, Jhajha, Kanke, Rajgir, Darbhanga, Motihari, Bettiah, Arrah, Buxar, Sassaram, Bhabhua and Bihar.

Expenditure.—Work to the value of Rs. 7,41,132 was carried out during the year of which Rs. 3,07,014 was expenditure on deposit works on behalf of local authorities. In addition the expenditure on the maintenance of open waterworks amounted to Rs. 3,87,572, and Rs. 1,04,605 was spent by local authorities on sanitary works.

The total value of work carried out under the supervision of the Superintending Engineer, Public Health Department was Rs. 12,33,309 being 13 per cent. more than in 1927-28.

Detail schemes amounting to Rs. 5,99,500 and outline and preliminary schemes amounting to Rs. 16,72,485 were prepared and submitted either to Government or to a local authority.

Work on the preparation of schemes totalling about Rs. 30,53,000 is now in hand, whilst projects estimated to cost about Rs. 36,24,800 have to be prepared when staff is available.

The expenditure on the establishment of the department during the year was Rs. 2,22,579 and fees to the total of Rs. 49,563 were earned by carrying out work for local authorities.

CONSTRUCTION—ORIGINAL WORKS.

Patna-Bankipur water-supply.—The erection of the new electrically driven pumping plant was started by Messrs. Worthington Simpson, Limited, in July 1928 but the completion of this work has not yet been notified by the contractors owing to trouble at present ascribed to the motors which are of a new type manufactured by Messrs. The General Electric Company Limited. Four of the seven motors supplied have had to be returned to Calcutta for repair.

The erection of the service reservoir at the University is in hand and will be completed in a few weeks.

Expenditure during the year was Rs. 1,30,848.

Patna General Hospital.—Hot water installation and supply of electric sterilisers.—The sterilisers, have been received from Messrs. Down Brothers Limited and work on the hot water installation is well in hand. Expenditure during the year amounted to Rs. 53,577 against the sanctioned estimate of Rs. 65,800.

Patna Amlatola water-supply.—The 9 inches diameter boring was sunk to a depth of 381 feet and the tube well completed. When tested the yield was 10,300 gallons per hour with a depression of 3 feet from sub-soil rest water level.

To comply with the orders of the Chief Engineer a revised design for the foundations of the service reservoir is in hand.

Expenditure during the year was Rs. 37,013.

Patna University water-supply and sanitary installation.—No work on the sewerage system has been done during the year but as Mr. Whittaker has now started work on the preparation of the comprehensive drainage scheme for Patna it is hoped that work on the sewers for the drainage of the University can be started in the near future. Some essential surface drains have been constructed and internal water-supply fittings installed as progress on the completion of the various buildings proceeded.

Expenditure during the year amounted to Rs. 38,090.

Bhagalpur water-supply reorganization.—A contract for the construction of five 9 inches diameter tube wells was completed with Messrs. Scott and Saxby Limited and boring started on the first well at Tarbanna on 29th June 1928 and was carried to a depth of 353 feet. The tube well was completed with 48 feet of Ashford strainer and tested by means of an air lift in November 1928. The yield proved very disappointing and was at the

rate of 6,600 gallons per hour with a depression of sub-soil water level of 38 feet. The guaranteed yield was 12,000 gallons per hour with a depression not exceeding 12 feet so the tube well was not taken over from the contractors who attempted to withdraw the pipes and strainers but the coupling between them failed and the strainers were lost.

A boring was then sunk at Nathnagar to a depth of 400 feet but the tube well was not completed as the contractors did not consider that the yield would be more than about 5,000 gallons per hour.

From Nathnagar the boring plant was removed to Barari and the casing pipes sunk to a depth of 400 feet. A bed of good water bearing sand was not found so the contractors asked permission to endeavour to develop a "slotted pipe" tube well of the type recently used with some success in the United Provinces. The permission of Government and the municipal Board was obtained and a portable compressor loaned to the contractors who endeavoured for 23 days to develop the tube. At the end of that period the yield was only 1,900 gallons per hour and gave no indication of increasing so the attempt was abandoned.

The failure of tube wells in the three areas definitely established that the supply of water wholly drawn from tube wells is not possible and alternative sources are now under consideration.

Puri water-supply.—The pumping of the trial tube well referred to in the report for 1927-28 was completed on 22nd May 1928 and a report on the results obtained submitted to Government.

These results are considered to indicate that an adequate source of supply of potable water sufficient for needs of Puri has been proved after a search lasting about 38 years.

To remove any possibility of doubt the writer's proposals were examined by the Sanitary Engineer, Madras and the Superintending Engineer, Public Health Department, United Provinces and their reports, in which they express general agreement with the conclusions of the writer, are now under the consideration of Government.

Narendra tank tube well, Puri.—The tube well which was sunk to a depth of 328 feet below ground level was test pumped for 7 days in July 1928. The water on the completion of the test

was found to have a chemical composition practically identical with that of sea water. The yield was at the rate of 2,141 gallons per hour and as it was less than the guaranteed yield of 3,000 gallons per hour, the tube well was not taken over from the contractors (Messrs. Scott and Saxby, Limited), who tried to remove the strainers, etc., but lost most of the material owing to the failure of a joint.

Ravenshaw College (Cuttack) drainage.—The pumping plant was completed in October 1928 and the installation is now in working order. Occasional nuisance has been caused by obnoxious odours from the filter which is situated on the south bank of the Taldanda Canal and the effects of (a) inoculation of the septic tanks with septic sludge from Kanke and (b) the chlorination of the tank effluent are being observed. If neither is successful it will be necessary to remove the filter further from the College staff quarters.

Medical School and General Hospital, Cuttack.—The water supply scheme has been completed and is working satisfactorily. The total expenditure was Rs. 42,960 against the sanctioned estimate amounting to Rs. 50,800.

Drainage.—Work on the drainage scheme was started in October and fair progress was made. Owing to late rains in October the sub-soil water level was very high so that the construction of some of the sewers has had to be postponed until May. Expenditure during the year was Rs. 49,188 against two sanctioned estimates totalling Rs. 1,41,000.

Mental Hospitals, Kanke.—In addition to the maintenance of the water-supply and sanitary installations various small extensions were carried out during the year at a total cost of Rs. 23,364.

Portable pumping plant.—Sixteen portable sets were used at the Sonapur Mela in November 1928 and worked satisfactorily. The supply given was better than in previous years but was limited by the quantity available in the surface wells.

For the Mela at Bihta in March 1929 three shallow 3 inches diameter tube wells were sunk and yielded a copious supply of water.

Gaya water-supply.—It was finally decided not to take over from the contractors the nest of tube wells sunk early in 1927 and fresh proposals for the improvement of the supply at a cost of about Rs. 90,000 are under consideration.

Muzaffarpur drainage and water-supply improvement schemes.—Outline schemes for drainage (Rs. 7,97,000) and water supply improvement (Rs. 3,70,300) were prepared in the summer of 1928 and have since been under consideration.

It has now been decided that it will not be possible to finance the drainage scheme and that the improvement of the water supply should be carried out at a cost of about Rs. 2,43,000. It is intended to provide two 9 inches diameter tube wells, partially re-arrange the distribution system and replace the existing service reservoirs which are constructed of reinforced brick work by steel tanks and at the same time to raise the towers by about 10 feet in order to give a more satisfactory pressure in the distribution system.

Arrah drain flushing.—The survey work for the scheme is in hand and indicates that the cost of putting the existing drains into a state of repair to render it possible to flush them will be considerably more than was originally anticipated. This is partly due to the numerous encroachments which have been constructed over the drains.

Sonepur water-supply.—To increase the quantity of water available in the existing surface wells a 3 inches diameter tube well was sunk to a depth of 204 feet in no. 7 well and 3 inches diameter plain tubes to depths varying from 96 to 120 feet in 12 other wells. The results obtained were as anticipated, the yield from no. 7 well being satisfactory, but no appreciable increase was observed in the yield from the other wells. After consultation with the various authorities interested in the public health of the people attending the annual Mela it was decided to accept the writer's recommendation to instal permanent water-supply arrangements. An estimate amounting to Rs. ₹1,600 has been sanctioned and the preparation of the detailed scheme is in hand. Effort will be made to complete the work in time for the Mela to be held in November 1929.

Veterinary College, Patna.—An estimate amounting to Rs. 1,15,919 providing a water-supply and sanitary installation was sanctioned in February 1929 and arrangements made to start the work. Expenditure during the year amounted to Rs. 23,202.

Drainage for the dairy farm, Phulwari, Patna.—A surface drainage scheme amounting to Rs. 16,912 was sanctioned and the work is nearly completed.

MAINTENANCE OF OPEN WATERWORKS.

Arrah.—The pumping plant at Bahiara continues to give fair results but one of the filtered water sets has needed a thorough overhaul for some time and should receive attention without further delay. There is no standby plant for pumping water from the river and the provision of a new set for this duty and a small workshop merits the consideration of the board unless it is intended in the near future to ascertain whether a supply is available from tube wells in Arrah. Recent difficulty in leading water to the existing intake has emphasised the necessity of arriving at an early decision on this matter.

Bhagalpur.—The unsatisfactory state of the pumps and purification plant has been commented on in previous reports and in the year under review no improvement has taken place. The proposed installation of two electrically driven pumping sets to replace the existing unfiltered water pumps will greatly relieve the present anxiety. It is hoped that the new sets will be working by about October 1929.

Daltonganj.—The quantity of water supplied by the Railway Company is insufficient but with the opening of the Central India Coalfields Railway some improvement is hoped for. Outline proposals for the overhaul of the supply have been submitted to the municipal board and an early decision is desirable.

Gaya.—The pumping plant is in moderate order but requires more careful maintenance and the state of the boilers, economiser, etc., is unsatisfactory. The condition of the stand-posts indicates that they receive little or no attention and that they are a source of considerable waste of water.

The deficient supply available from the intake and wells continues to cause anxiety and is partially due to neglect of necessary repairs to the gallery in the bed of the river.

A scheme for the improvement of the supply at a cost of about Rs. 90,000 is under consideration ; in addition to the work provided in that scheme it has recently been ascertained that, due to corrosion, it will be necessary to replace the steel suction pipes.

Monghyr.—The pumping plant and filters have been well maintained but due to the grant of a number of private connections the supply is deficient. An additional filter has been under construction for about two years but owing to want of the necessary technical knowledge the staff of the municipal board have been unable to complete it.

Muzaffarpur.—The pumping plant has been maintained in fair order but due to the partial failure of the tube wells at the waterworks and in the compound of the district board it has been impossible to give the pumping plant on the tube well at Kachisarai the necessary attention with the result that a thorough overhaul is now very urgently required.

Patna-Bankipore.—The installation of new electrically driven pumping sets has not yet been completed by Messrs. Worthington Simpson Limited with the result that it has been necessary to retain in use some of the old steam plant. There has been a steady increase in the quantity of water supplied.

Jharia.—Leakage from the distribution system has been reduced by re-caulking the joints in certain areas where it was found that more than ninety per cent. were defective and the preparation of completion plans is in hand. Acting on a recommendation made by the writer a Paterson Chloronome has been installed at Topchanchi and has resulted in the supply of water of a satisfactory degree of purity.

An order has also been placed for a recorder at the head of the supply line to replace the original one which is inaccurate.

The causes of rapid clogging of the filters during the dry hot weather months is being investigated but there is no doubt that the steadily increasing demand will shortly necessitate the construction of additional filters.

Government pumping installations.—Pumping installations have been maintained by this department in good order at the following institutions :—

Patna Medical College Hospital.

„ Gulzarbagh Press.

„ Government House.

„ High Court.

„ Phulwari Dairy Farm.

Darbhanga Medical School.

„ Banwarilal Hospital, Laheriasarai.

Cuttack General Hospital.

„ Ravenshaw College.

Dhanbad School of Mines.

In the great majority of cases the maintenance of open waterworks by municipalities tends to the formation of the

opinion that local authorities are not really interested in the maintenance of the pumping plant in a satisfactory condition or in the efficient working of the complete water-supply system. The selection of fuel, lubricants, etc., is not made on the basis of value for money and recommendations of experts for improvement of the plant and the execution of urgent repairs are either ignored or given effect to in such a dilatory manner as to be almost useless and to be the cause of serious waste of public money. In almost every case the state of the distribution system and particularly of the stand-posts is unsatisfactory. It is the exception for private connections to be metered and the results are seen in the income obtained from the water supplied.

The following appendices are attached :—

Statement no. I.—Details of open waterworks.

Statement no. II.—Details of cost of maintenance during 1928-29.

Statement no. III.—Capital expenditure incurred on water-works.

Statement no. IV.—Results of analysis of water.

Statement no. V.—Comparative statement of working expenses at waterworks.

Statement no. VI.—Details of drainage schemes and cost of maintenance and extensions during 1928-29.

Statement no. VII.—List of outline schemes submitted.

Statement no. VIII.—List of detailed schemes submitted.

Statement no. IX.—List of works under construction by the Public Health Department.

Statement no. X.—List of works under construction by local authorities.

Statement no. XI.—List of detailed schemes under preparation.

Statement no. XII.—List of outline schemes under preparation.

Statement no. XIII.—List of schemes to be prepared.

From appendix IV it will be seen that the water supplied to the public at Arrah, Bhagalpur, Daltonganj and Muzaffarpur

has not been of a satisfactory standard of bacterial purity and considerable improvement is very desirable at these towns and also at Monghyr. The percentage of unsatisfactory analysis is too high in all supplies except the Hospital supplies at Kanke and Patna, and is to some extent due to the fact that the distribution systems are not continuously full of water, the supplies in all cases being intermittent.

General.—The year 1928-29 has seen a very considerable increase in the work of the department and to deal with it the staff has been strengthened by sanction to the appointment of one Executive Engineer, four temporary Assistant Engineers, eight overseers and four draftsmen. Considerable difficulty has been experienced in filling the new posts by domiciled men with the necessary qualifications with the result that the increase in the output of work has not been as large as might have been expected. The writer considers the results obtained to have been satisfactory and desires to thank the staff for their assistance, the work of the majority having been satisfactory. In particular, he desires to place on record his appreciation of the considerable improvement in the standard of the project work done by Mr. E. R. Smith and the staff of the Second Division.

S. E. PLATT,

*Superintending Engineer,
Public Health Department,
Bihar and Orissa.*

The 12th June 1929.

APPENDIX I.

Statement of operations of various water works in Bihar

		1	2	3	4	5	6
Particulars.		Arrah.	Bhagalpur.	Buxar (Central Jail).	Cuttack Ravenshaw College.	Cuttack General Hospital.	Daltonganj.
Serial no.	Year of completion.	1894	1888	1925	1925	1928	1904
POPULATION.							
1	By census of 1921 ...	40,769	68,878	...	...	...	9,817
2	Approximate population served.	36,000	68,878	1,350	600	850	7,700
CONSUMPTION OF WATER							
3	Unmetered supplies—Galls	54,782,287	...	...	...	...	16,939,130
4	Metered supplies Galls ...	4,066,733	...	...	...	...	257,570
5	Total quantity supplied Galls.	58,869,020	310,464,885	10,665,400	Not known	1,894,375	17,197,000
6	Daily average supply ...	161,285	850,568	29,220	...	10,787	47,115
7	Consumption per head per day.	4.4	12.3	21.6	...	12.6	6.1
8	Hours of daily supply ...	10.0	7.0	...	13.0	24.0	9.0
LIFT OF PUMPS.							
9	From river or well to pump sump L. L. feet.	32.77	70.45	...	23.0	...	...
10	From filter water pump to tank H. L. feet.	61.27	113.50	59.59	68.0	50.0	...
11	Total Lift in feet ...	94.04	183.95	59.59	91.0	50.0	40.0

DIX I,

and Orissa for the year ended the 31st March 1929.

7	8	9	10	11	12	13	14	16
Darbhanga Medical School.	Dhanbad Indian School of Mines.	Gaya.	Gulzarbagh Press water supply.	Hazaribagh.	Hinoo (Government) Staff quarters.	Jharia Water Board.	Kank.	Laheriasari (B. L. Hospital).
1925	1927	1913	1927	1914	1913	1927	1925	1927
...	...	67,562	...	...	...	122,000	...	...
400	300	67,563	...	1,800	1,200	Not known	5,000	300
...	...	11,605,000	...	...	...	...	...	...
...	...	404,968,500	...	...	...	...	...	...
3,910,500	8,369,550	416,578,500	5,176,800	21,277,600	2,989,190	468,974,000	50,013,500	1,913,290
10,738	22,830	1,141,297	14,183	58,940	8,189	1,279,360	158,667	5,243
26'8	78'4	16'8	...	32'7	6'8	10'5	27'7	17'4
24'0	16'0	8'5	24'0	9'0	...	24'0	...	...
...	...	...	...	39'5	...	Gravitation	53'0	...
49'0	79'9	201'62	55'0	98'0	128'4	Supply ...	185'0	83'5
49'0	79'9	201'62	55'0	137'50	128'4	...	238'0	33'5

APPENDIX I—contd.

		16	17	18	19	20
Particulars,		Monghyr.	Muzaffarpur.	Patna Bankipur.	Patna General Hos- pital.	Ranchi Government House.
Serial no.	Year of completion.	1913	1920	In progress.	1927	1915
POPULATION.						
1	By Census of 1921	46,825	32,755	...	...	...
2	Approximate population served ...	40,000	32,755	25,200	1,700	360
CONSUMPTION OF WATER.						
3	Unmetered supplies—Gallons. ...	...	...	...	...	...
4	Metered supplies—Gallons. ...	...	...	...	...	...
5	Total quantity supplied—Gallons ...	109,637,666	82,061,847	217,812,304	37,160,450	1,545,956
6	Daily average supply ...	300,377	127,197	596,746	101,809	4,285
7	Consumption per head per day ...	7'5	6'9	23'7	69'0	12'1
8	Hours of daily supply	8'5	9'5	9'0	21'0	6'0
LIFT OF PUMPS.						
9	From river or well to pump sump L. L. feet.	...	(1) L.L. = 33'91" (2) L.L. = 39'02" (3) H.L. = 53'37" (4) .. = 59'45"	L.L. = 24'0 H.L. = 108'0. Et. = 151'0.	...	...
10	From filter water pump to tank or H. L. feet.	34'5	...	...	64'4	124'07
11	Total Lift in feet	34'5	...	...	64'4	124'07

APPENDIX I—contd.

		1	2	3	4	5	6
Particulars.		Arrah.	Bhagalpur.	Buxar Central Jail.	Catrack Ravenshaw College.	General Hospital, Catrack.	Daitongani.
Serial no.	Year of completion.	1894	1888	1925	1925	1928	1904
SUPPLY CONNECTIONS.							
12	Total number of unmetered connections.	168	...	...	...	30	14
13	Total number of metered connections.	69	...	...	...	Nil	1
ANNUAL CHARGES— COST OF WATER.							
14	Maintenance charges Rs.	19,532	60,027	...	1,290	1,972	3,643
15	Interest and sinking fund ...	Nil	Nil	...	Nil	Nil	Nil
16	Total charges ... Rs.	19,532	60,027	...	1,290	1,972	3,643
17	Total charges per 1,000 gallons.	As. 5'30	3'00	...	...	16'7	3'38
INCOME FROM WATER- WORKS.							
18	From assessment or unmetered.	Rs. 28,315	54,409	...	...	...	5'871
19	From metered supplies Rs.	2,046	6,820	...	...	...	58
20	From other receipts Rs.	Nil	556	...	...	...	38
21	Total Income ... Rs.	30,361	61,853	...	...	...	5,967
22	Total receipts per 1,000 gallons.	As. 8'42	3'18	...	...	...	5'55
23	Profit or loss on year's working.	Rs. +10,820	+1,926	...	...	...	+2,228
24	Profit or loss in annas per 1,000 gallons.	+3'12	+0'00	...	...	...	+2'17

From 8th October 1928,
 *F on previous report.

		7	8	9	10	11	12
	Particulars.	Darbhanga School.	Dhanbad Indian School of Mines.	Gayá.	Gulzarbagh Press water-supply.	Hezaribagh.	Hinco. (Government Staff Quarters).
Serial no.	Year of completion.	1925.	1927.	1913.	1927.	1914.	1913.
	SUPPLY CONNECTION.						
12	Total number of unmetered connections.	...	...	219	...	...	...
13	Total number of metered connections.	...	...	377	...	...	...
	ANNUAL CHARGES—COST OF WATER.						
14	Maintenance charges Rs.	8,702	2,652	45,293	1,834	12,102	...
15	Interest and sinking fund ...	Nil	Nil	Nil	Nil	...	...
16	Total charges ... Rs.	8,702	2,652	45,293	1,834	12,102	...
17	Total charges per 1,000 gallons annas	35.52	5.07	1.74	5.68	9.10	...
	INCOME FROM WATER-WORKS.						
18	From Assessment or unmetered Rs.	...	...	43,404	...	...	...
19	From metered supplies Rs.	...	...	9,396	...	...	...
20	From other receipts ...	...	...	...	...	...	...
21	Total Income ... Rs.	...	...	52,800	...	...	...
22	Total receipts per 1,000 gallons annas	...	...	2.02	...	...	...
23	Profit or loss on year's working Rs.	...	...	+7,507	...	...	...
24	Profit or loss in annas per 1,000 gallons.	...	...	+0.28	...	...	...

DIX I—concl'd.

13	14	15	16	17	18	19	20	21
Jharia Water Board.	Kanke.	Laheribarai Banwari Lal Hospital.	Monghyr.	Muzaffarpur.	Patna-Bankipur.	Patna General Hospital.	Ranchi Government House.	Remarks.
1927	1925	1927	1913	1930	In progress.	1927	1913	
...	...	...	51	55	...	...	...
...	...	...	50	Nil	1,051	...	..
84,410	23,676	1,557	33,353	26,381	44,920	9,417	2,207	
444,195	...	...	Nil	5,776	Nil	Nil	Nil	
528,605	23,676	1,557	33,353	32,156	46,920	9,417	2,207	
16'11	7'49	13'02	4'81	6'24	8'44	4'05	23'84	
...	...	...	...	42,761	} 71,238	...	...
...	...	...	...	Nil		...	...
...	1,740		2,987
5,88,313	..	...	...	44,491	74,205	...	...
20'15	...	...	...	8'58	5'45	...	...
+59,907	...	...	...	+12,335	27,285	...	...
+2'04	..	...	..	+2'34	2'01	...	...

Annual maintenance accounts of various waterworks in

Serial no.	Particulars.	Arrah.	Bha'alpur.	Buxar Central Jail.	Cuttack Ravenshaw College.	Cuttack General Hospital.	Daltonganj.	Darbhanga.	Dhanbad.
1	2	3	4	5	6	7	8	9	10
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1	Establishment and Fees ..	6,771	13,121	...	...	907	390	3,571	1,338
2	Fuel, power and Lubricating oils—	...	...	...	...	...	...	...	...
	(a) Coal	5,225	9,051	...	...	...	...	...	...
	(b) Fuel oil	Nil	6,802	...	...	...	...	...	...
	(c) Electrical charges ...	Nil	...	...	...	308	...	...	...
	(d) Lubricating oils ...	425	1,809	...	...	25	...	...	5
3	Stores and Materials ...	2,632	3,780	...	...	...	...	...	359
4	Cleaning channels and wells ...	158	2,021	...	...	...	...	...	...
5	Cleaning settling tanks ...	337	1,154	...	...	...	...	...	...
6	Cleaning and Renewing filter beds.	977	6,097	...	...	...	178	...	...
7	Purchase of sand for filters ...	Nil		...	...	...	...	...	...
8	Purchase of Anumina Ferric...	477	3,055	...	...	...	443	...	...
9	Purchase of Bleaching power	37	...	...	...	...	...	...	...
10	Repairs to distribution system	648	...	...	...	25	52	...	300
11	Repairs to :—								
	(a) Pumping machinery, Boilers and Accessories.	3,377	8,500	...	...	...	...	...	400
	(b) Rising supply and distribution mains.	Nil	...	...	...	...	...	...	250
	(c) Buildings, grounds, towers and reservoirs.	65	320	...	...	...	...	...	...
	(d) Tools and Plant ...	Nil	...	...	...	...	...	...	...
12	Cost of water analysis ...	Nil	...	...	...	...	...	...	...
13	Cost of water	Nil	...	...	...	...	3,580	...	...
	Any other charges ...	Nil	1,388	...	...	617	...	5,131	...
	Total charges ...	10,532	60,027	...	...	1,972	3,643	8,703	2,652

DIX II.

Bihar and Orissa for the year ended the 31st March 1929.

Gaya.	Hazari bagh.	Hinoo Staff quarters.	Jharla water board.	Kanke.	Laberissarai Banwari Lal Hospital.	Monghyr.	Muzaffarpur.	Patna-Bankipar.	Patna General Hospital.	Ranchi Government House.	Guizarbagh Press Water supply.
11	12	13	14	15	16	17	18	19	20	21	22
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
14,358	3,802	...	26,875	2,042	1,331	6,750	1,227	10,057	1,095	548	827
...	...	...	...	...	...	...	...	...	...	763	...
11,030	5,605	...	...	150	...	1,119	4,147	13,328	...	...	...
...	...	...	...	...	...	...	3,001	...	...	...	...
...	...	...	...	10,948	...	...	...	9,010	3,241	...	676
598	185	...	...	16	...	593	2,400	...	...	102	...
6,773	439	...	5,580	605	...	493	1,106	...	...	25	...
3,668	...	...	...	...	...	...	87	...	...	...	...
...	...	...	9,478	...	...	...	...	...	...	...	...
...	10	...	2,000	...	...	453	...	...	...	...	...
...	88	...	...	1,605	...	1,100	...	...	...	...	...
1,023	347	...	...	...	...	Nil	...	...	...	...	...
2,550	660	...	13,038	593	...	25	1,220	7,382	...	...	...
3,362	581	...	...	107	...	...	4,122	...	...	360	...
...
728	...	...	2,406	400	...	547	24	10,234	...	...	...
...	203	...	280	200	...	...	46		...	...	...
...	...	...	420	50	...	...	...		...	...	...
...	...	...	...	...	...	27,400	...	...	...	...	...
...	...	...	14,100	...	226	...	...	...	2,178	...	331
45,203	13,102	...	84,410	23,078	1,557	38,469	30,380	46,920	9,417	2,207	1,834

APPENDIX III.

Statement of capital cost of various waterworks in Bihar and Orissa,
for the year ended the 31st March 1929.

Serial no.	Name of waterworks.	Cost up to 31st March 1928.	Cost during 1928-29.	Total cost.
1	2	3	4	5
		Rs.	Rs.	Rs.
1	Arrah	4,23,353	2,188	4,25,541
2	Bhagalpur	10,85,086	18,052	11,03,138
3	Buxar Jail	19,975	10,000	29,975
4	Cuttack (Ravershaw College) ...	58,031	804	58,835
5	Cuttack General Hospital...	5,000	36,270	41,270
6	Daltonganj	68,824	319	69,143
7	Darbhanga Medical School ...	45,655	Nil	45,655
8	Dhanbad School of Mines ...	45,650	258	45,908
9	Gaya	8,38,238	Nil	8,38,238
10	Gulzarbah Press	14,290	Nil	14,290
11	Hazaribagh Jail	1,00,108	Nil	1,00,108
12	Hinoo	Not known.		
13	Jharia Water Board	86,57,164	13,097	86,70,261
14	Kanke (Ranchi)	4,86,037	3,834	4,89,871
15	Laheriasari	23,357	Nil	23,357
16	Monghyr	5,67,707	4,462	5,72,169
17	Muzaffarpur	5,62,022	10,519	5,72,541
18	Patna Rankipur	10,97,093	39,541	11,36,634
19	Patna General Hospital ...	63,983	Nil	63,983
20	Ranchi Government House ...	*9,100	Nil	...

*Cost up to December 1928.

APPENDIX IV.

APPENDIX

Analysis statement of major water works in

Serial no.	Water works.	Bacteriological.			
		Total number of samples examined.	Number of samples examined of water as supplied to the public.	Number of sample of water as supplied to the public in which colonies exceed 100 per c. c.	Percentage of samples below standard.
1	2	3	4	5	6
1	Arrah	31	26	22	84.6
2	Bhagalpur	24	16	13	81.2
3	Daltonganj	24	17	14	82.3
4	Gaya	24	22	6	27.3
5	Kanke	22	18	3	16.1
6	Monghyr	24	20	11	55.0
7	Muzaffarpur	18	18	15	83.3
8	Patna-ankipur	78	78	18	23.1
9	Jharia Water Board	201	166	21	12.5
10	Patna Medical College Hospital.	66	56	5	7.5

IV.

Bihar and Orissa for the year 1928-29.

Bile salt lactose test for presence of B Coli.				Chemical.		
Total number of samples examined.	Number of samples examined of water as supplied to the public.	Number of samples of water as supplied to the public in which B coli were detected in less than 10 c. c.	Percentage of samples below standard.	Total number of samples examined.	Number of samples considered good.	Number of samples considered bad.
7	8	9	10	11	12	13
31	26	16	53.4	16	16	Nil
24	16	11	68.7	16	16	Nil
24	17	17	100.00	14	14	Nil
24	22	6	27.4	16	16	Nil
22	18	Nil	...	16	16	Nil
24	20	8	40.0	16	16	Nil
18	18	12	66.6	12	12	Nil
78	78	9	11.5	...	...	...
201	166	24	14.4	46	46	Nil
66	66	1	1.5	Nil	Nil	Nil

APPENDIX

Comparative statement of fuel consumption, working expenses

Serial no.	Water works.	Pumping plant.	Fuel consumption.	Fuel consumption per 1,000ft. gallons.	Total lift average.
1	2	3	4	5	6
			Tons.	lbs.	Feet.
1	Arrah	Steam plant	245'50	'0920	94'09
2	Bhagalpur	Ditto	824'25	'0766	183'85
		Oil plant	80'70	'0037	183'85
3	Buxar	Steam plant	136'28	'4808	59'59
4	Cuttack Ravenshaw College.	Electric plant ... ..	...	...	...
5	Cuttack General Hospital	Ditto ... ..	...	...	50'0
6	Daltonganj ... ..	...	...	...	*40'0
7	Darbhanga Medical School.	Oil plant	1'25	'0146	49'0
8	Dhanbad School of Mines	Electric plant ... ..	...	...	79'9
9	Gaya	Steam plant	1308'6	'0373	201'62
10	Gulzarbagh Press	Electric plant ... ..	...	...	55'00
11	Hazaribagh	Steam plant	234'8	'176	137'50
12	Hinoo (Ranchi)	Ditto	81'9	'485	126'4
13	Kanke	Electrical plant ... ..	...	...	...
14	Laheriasarai	Ditto ... ..	...	...	33'50
15	Monghyr	Oil plant	9'58	'0055	34'50
16	Muzaffarpur	Steam plant and oil plant	(1) 5166'5	(2) 0'11	L.L. = 33'91 H.L. = 39'02 H.L. = 53'37 H.L. = 54'45
17	Patna-Bankipur	Steam and Electric plant	1386'1	'197	180'6 151'2
18	Patna General Hospital	Electric plant ... ..	...	...	64'4
19	Ranchi (Government House).	Oil plant	(1) 780	(3) '0324	124'69
20	Jharia Water Board	Gravitation supply ... ..	...	...	...

*In previous report.
(1) Gallons.
(2) Pint.

V.

and receipts of water in Bihar and Orissa for the year ending 1928-29.

Percentage of charges for—			Per 1,000 gallons.		Per head of population (on census figures).			Remarks.
Establishment.	Fuel or power.	Other charges.	Total working cost.	Total receipts.	Total working cost.	Total receipts.	Profit or Loss.	
7	8	9	10	11	12	13	14	15
			As.	As.	As.	As.	As.	
34'86	10'53	47'81	5'30	8'42	7'66	11'91	+4'25	
21'85	4'22	73'03	3'00	3'18	13'03	14'36	+0'43	
...	
...	
...	
45'81	10'18	44'01	16'70	...	...	...	...
10'70	Nil	80'30	3'38	5'55	5'01	9'72	+3'81	
41'03	...	158'97	35'62	...	...	...	...
50'45	Nil	40'55	5'07	...	...	...	...
31'70	20'33	41'97	1'74	2'02	10'72	12'50	+1'78	
45'08	80'82	19'19	5'68	...	...	...	...
82'15	48'31	21'54	9'10	...	...	...	...
...	
12'49	71'58	16'00	7'45	...	...	...	...
85'48	14'52	...	13'02	...	...	...	...
25'62	4'28	70'10	4'81	...	9'01	...	...
38'78	27'09	34'15	6'24	8'58	12'88	21'73	+8'85	
21'43	41'23	37'34	3'44	8'42	...	...	...
21'18	55'61	23'14	4'05	...	...	...	...
38'43	34'67	28'01	22'84	...	...	...	...
31'83	Nil	68'17	18'11	20'15	69'28	77'12	+7'84	

STATEMENT

Statistics with regard to drainage and sewerage works in

Name of the place or works.	Approximate population served.	Total length of existing pucca drains.	Total length of pucca drains added during the year.	Cost of pucca drain added during the year.	Total length of sewer, if any, in feet.
1	2	3	4	5	6
		Feet.	Feet.	Rs.	
1. Arrah	31,000	132,234	...	...	...
2. Dhabua	5,438	21,980	...	...	...
3. Bhagalpur	25,000	53,683	2,057	2,519	...
3a. Buxar	10,098	...	..	...	...
4. Chapra	42,416	42,502	..	..	..
5. Chakradharpur	7,944	900	000	950	..
6. Cuttaok ... ..	...	...	287	560	...
7. Daltonganj	7,000	65,900	...	...	...
8. Deoghar	8,500	32,900	...	...	...
9. Dhanbad	11,973	*32,079	636	706	...
10. Dumka	4,030	17,001	..	...	...
11. Gaya	67,563	...	300	484	...
12. Giridih	460	3,218	...	...	...
13. Gulzarbagh	8,100	33,190	80	100	...
14. Jamalpur	18,000	81,982	...	...	...
15. Jharia	10,000	27,982	...	...	...
16. Kissenganj	4,000	10,560	...	..	...
17. Madhupur	3,500	17,070	...	...	...
18. Monghyr	35,000	2,04,500	760	400	...
19. Motihari	9,000	52,800	...	...	...
20. Muzaffarpur	32,755	37,620	125	125	...
21. Patna City	1,10,523	2,14,500	5,050	4,720	...
22. Patna Administration Committee ..	9,453	...	...	...	50,700
23. Puri	10,000	...	1,579	501	...
24. Purnea	13,800	11,352	...	...	...
25. Purulia	14,000	25,900	1,855	1,831	...
26. Ranchi ... ..	...	26,400	938	1,311	...
27. Sahebganj	12,000	91,810	44	74	...
28. Sambalpore	13,543	40,300	91	58	..
29. Sasaram	18,000	42,340 r.ft.	...	...	...
30. Sewan	7,000	22,497	...	...	...

STATEMENT VII.

List of outline schemes prepared during 1928-29.

Serial no.	Place.	Nature and name of scheme.	Amount.	Remarks.
1	2	3	4	5
			Rs.	
1	Patna	Water connection to the proposed 17 'C' type quarters for the staff of Executive Engineer Central Division in 'R' Block including extension of main.	3,070	
2	Do.	Drainage scheme for the acquired area in Dbakanpura and Yarpur for clerks quarters.	54,000	
3	Saran	Sonepur mela water supply.	91,600	
4	Muzaffarpur	Muzaffarpur drainage ...	7,97,000	
5	Ditto	Ditto water supply reorganization (full scheme).	3,70,300	
6	Darbhanga	Banwari Lal Hospital sanitary installation and water supply to the proposed double storied ward for 64 beds.	6,660	
7	Angul	Angul water supply scheme.	1,93,820	
8	Ranchi	Water supply to Government residence including the Government House at Ranchi.	49,900	
9	Cuttack	Cuttack Collector's residence water supply.	1,235	
10	Do.	Independent water supply scheme to the Government officers' quarters at Cuttack.	65,000	
11	Do.	Additional tube well with pumping plant for Ravenshaw College, Cuttack.	14,000	
12	Do.	Installation of small tube wells with hand pumps for Government residences in Orissa.	19,000	
13	Dumka	Dumka Sadr Hospital water supply scheme.	6,900	

STATEMENT VIII.

List of detailed schemes submitted during 1928-29.

Serial no.	Place.	Nature and name of scheme.	Estimated amount	Progress.	Remarks
1	2	3	4	5	6
			Rs.		
1	Patna ...	Revised estimate for accommodating at Tikintoli the people dispossessed from the Patna University site	22,165	Sanctioned.	
2	Do. ...	Patna University—Providing a temporary latrine for the use of the Science College and its hostels.	1,170	Do.	
3	Do. ...	Patna University—Surface drainage for the Administrative Block and other buildings of the Science College.	3,580	Do.	
4	Do. ...	Patna University—Internal drainage for New College Hall now converted into Bayley Library.	270	Submitted.	
5	Do. ...	Patna University—Temporary latrines for Patna College Hostel at Ranighat.	706	Not sanctioned.	
6	Do. ...	Patna Medical College—Constructing masonry pits and improving the existing drains in the Botanical Garden.	440	Sanction	
7	Do. ...	Patna Medical College—Sanitary installation and sewerage and water supply to the Public Health Laboratory.	7,420	Do.	
8	Do. ...	Patna Medical College—Modified scheme for the sanitary installation in the Physiological Laboratory and its extension.	8,910	Do.	
9	Do. ...	Patna Medical College—Proposed masonry tank in the Maceration yard of the Dissection Block.	520	Do.	

STATEMENT VIII.—*contd.*

Serial no.	Place.	Nature and name of scheme.	Estimated amount.	Progress,	Remarks,
1	2	3	4	5	6
10	Patna ...	Patna Medical College—Sanitary installation in the Animal House.	Rs. 825	Sanctioned.	
11	Do. ...	Patna Prince of Wales Medical College—Providing chequered plate cover over pucca drain in the organic chemistry laboratory.	45	Do.	
12	Do. ...	Patna Medical College—Lawn watering scheme—Fixing a 6" Venturi Meter.	3,770	Do.	
13	Do. ...	Patna General Hospital—Provision of a tap in the house physician's quarters in the hospital for women.	175	Do.	
14	Do. ...	Patna Medical College—Proposed masonry tank and water and sewer connection in the Dissection Block.	400	Do.	
15	Do. ...	Patna Medical College—Sanitary installation to the Pathological Block.	12,630	Do.	
16	Do. ...	Patna General Hospital—Sanitary installation in the proposed water closet and the preparation room in X-Ray Block.	975	Do.	
17	Do. ...	Patna General Hospital water connection to the ironing room of the Laundry.	30	Submitted.	
18	Do. ...	Patna General Hospital independent water supply (Supplementary).	380	Sanctioned.	
19	Do. ...	Patna General Hospital—Fixing body baths with water fittings in X-Ray Block.	177	Do.	
20	Do. ...	Patna Medical College—Proposed storage room for the boilers of the hot water installation.	1,165	Approved.	

STATEMENT VIII—*contd.*

Serial no.	Place.	Nature and name of scheme.	Estimated amount.	Progress.	Remarks.
1	2	3	4	5	6
21	Patna ...	Patna Medical College— Extension of sewer.	Rs. 4,820	Submitted	
22	Do. ...	Bihar College of Engineering— Water connection to the residence of the Superintendent, Mechanical Apprentice classes.	226	Sanctioned.	
23	Do.	Water connection to the 3rd foreman's quarters at the Bihar College of Engineering.	307	Do.	
24	Do. ...	Bihar College of Engineering— Water connection to the residence of the Superintendent, Mechanical Apprentice classes (supplementary).	18	Approved.	
25	Do.	Patna Training College and Collegiate School water supply.—Proposed water connection to the two flushing tanks one near the Principal's residence and the other near the professor's quarters west.	250	Do.	
26	Do. ...	Patna Veterinary College water supply.	1,15,919	Sanctioned.	
27	Do. ...	Phulwari Dairy Farm Drainage.	16,912	Do.	
28	Do. ...	Phulwari Dairy Farm Staff quarters water supply.	2,610	Submitted.	
29	Do. ...	Phulwari Shariff water supply to Mela.	404	Sanctioned.	
30	Do. ...	Patna Government House— Revised estimate for independent water supply to the gardens.	5,351	Do.	
31	Do. ...	Patna Government House— Water borne latrine, and ferro concrete standpost for the 2nd driver's quarters.	780	Do.	

STATEMENT VIII—*contd.*

Serial no.	Place.	Nature and name of scheme.	Estimated amount.	Progress.	Remarks.
1	2	3	4	5	6
32	Patna ...	Gulzarbagh Press water supply—Providing two clerestory windows in the pump chamber.	Rs. 23	Sanctioned.	
33	Do. ...	Gulzarbagh Press water supply store room and quarters for the electrical mistry and an attendant.	1,825	Submitted.	
34	Do. ...	Patna-Bankipore water works—Digha Headworks. Filling in cinders and earth all round the chargemen pumpmen's quarters.	174	Do.	
35	Do. ...	Patna-Bankipore water works—Constructing pump chamber at Digha headworks—			
		(a) Chamber nos. 1 and 3	14,170		
		(b) Chamber no. 2 ...	9,746		
36	Do. ...	Providing two showers and an additional tap in the residence of the Assistant Post Master-General, Bihar and Orissa, (modified estimate.)	167	Sanctioned.	
37	Do. ...	Diverting the existing water pipe line due to the extension of the servants' quarters attached to the residence of the Deputy Inspector-General of Police, Central Range, Patna.	23	Do.	
38	Do. ...	Patna-Bankipore water supply extension—Revised design of foundation and steel staging for 120,000 gallons capacity reservoir in the University area.	31,000	Do.	
39	Do. ...	Drainage scheme for the residence of the Hon'ble Chief Justice, Patna High Court for disposal of water from bath and pantry rooms, Patna.	600		

STATEMENT VIII—contd.

Serial no.	Place.	Nature and name of scheme.	Estimated amount.	Progress.	Remarks.
1	2	3	4	5	6
40	Patna ...	Water connection to the "C" type quarters for an assistant to the Legislative Department south of old Patna Distributory.	Rs. 83	Sanctioned.	
41	Do. ...	Water connection to the A1 type quarters for the office Superintendent of the Board of Revenue at Amlatola.	200	Do.	
42	Do. ...	Improvement of drain for junction of road no. 6 to Mithapore.	236	Submitted.	
43	Do. ...	Water connection to the residence of the Assistant Inspectress of Schools, Patna, Shahabad.	400	Sanctioned.	
44	Do. ...	Providing a standpost in the Telegraph Department Store Godown.	135	Do.	
45	Do. ...	Provision of a house meter in the 'A' type quarters south of Bank road for the Accountant, Patna Division.	60	Do.	
46	Do. ...	Water connection to the Public Works Department Architectural Draftman's quarters at Amlatola.	88	Do.	
47	Do. ...	Providing an additional tap in the residence of the Assistant Secretary, Education and Development Department.	70	Do.	
48	Do. ...	Providing an additional tap with a shower in the residence of the office Superintendent of the Inspector General of Prisons at Amlatola.	118	Do.	
49	Do. ...	Water connection to the office of the Assistant Director of Public Health, South Bihar Circle.	350	Do.	

STATEMENT III—*contd.*

Serial no.	Place.	Nature and name of scheme.	Estimated amount.	Progress.	Remarks.
1	2	3	4	5	6
50	Patna ...	Sanitary installation to the Electrical Engineer's office and attached workshop.	Rs. 715	Sanctioned.	
51	Do. ...	Water connection to the proposed two sets of 'C' type quarters for the staff of the Medical Examination Board and Council of Medical Registration.	200	Do.	
52	Do. ...	Providing a masonry reservoir in the kitchen verandah outside in the residence of the Hon'ble Minister, no. 1.	92	Do.	
53	Do. ...	Patna High Court—Sanitary installation in the lavatories for two judges and converting the L shaped room into clerks lavatory.	2,467	Do.	
54	Do. ...	Providing two taps in the lavatory in the compound of Patna Post and Telegraph office.	206	Do.	
55	Do. ...	Temporary water connection to the camping ground in connection with His Excellency the Viceroy's visit at Patna on the 14th and 15th November 1928.	294	Do	
56	Do. ...	Addition and alteration in the water-supply of the residence of the Hon'ble Justice Jwala Prashad.	82	Do	
57	Do. ..	Sinking 2" Abyssinian tube well in the compound of Patna Collectorate.	494	Do.	
58	Do ...	An lapara (Patna) Dispensary water connection to the compounders and dressers' quarters.	250	Submitted.	

STATEMENT VIII—*contd.*

Serial no.	Place.	Nature and name of scheme.	Estimated amount.	Progress.	Remarks.
1	2	3	4	5	6
59	Patna ...	Water connection to the proposed 17 sets of 'C' type quarters for the staff of the Executive Engineer, Central Division in 'R' Block including extension of 2" main.	Rs 3,070	Sanctioned.	
60	Do. ...	Providing temporary water connection for use of Shahabad Police and Armed Police of several districts in the Patna High Court ground from the 26th January to the 3rd February 1929.	187	Do.	
61	Do. ...	Constructing six bore hole latrines at Phulwari.	223	Do.	
62	Do. ...	Patna-Bankipur water works—Providing an additional tap in the south-east corner of the bath room in the residence of the Executive Engineer, Central Division, Patna.	105	Submitted.	
63	Do. ...	Patna-Bankipore water works—Water connection to the proposed 12 sets of quarters for the staff of the Superintending Engineer, South Bihar Circle, Bankipore.	960	Do.	
64	Do. ...	Patna-Bankipore water works—extension of 2" main for water connection to the 12 sets of quarters for the staff of Superintending Engineer, South Bihar Circle at Bankipore.	1,232	Do.	
65	Do. ...	Special repairs to the chaukidar's shed in the divisional store yard.	50	Do.	
66	Do. ...	Special repairs to water supply to the residence of the European Judge late Sir John Bucknill.	71	Sanctioned.	

STATEMENT VIII—*contd.*

Serial no.	Place.	Nature and name of scheme.	Estimated amount.	Progress.	Remarks.
1	2	3	4	5	6
			Rs.		
67	Patna ...	Construction of spill water drain for the standpost at Sabjibagh.	208	Sanctioned.	
68	Do. ...	Lowering the exposed pipe line in the Sangat lane, dismantling stop cock chamber and platform and rebuilding them, etc.	51	Do.	
69	Do. ...	Extension of 2" C. I. main for water connection to the proposed additional quarters on the south of old Patna Distributory.	3,000	Do.	
70	Do. ...	Provision of house meters in the quarters on the south of Bank Road for the staff of the Board of Revenue.	848	Do.	
71	Do. ...	Patna-Bankipur water works—Providing a double mouthed ferro concrete standpost for the menials under the Caretaker Secretariat building.	235	Do.	
72	Do. ...	Patna Market Extension Surface drainage.	5,330	Do.	
73	Do. ...	Patna-Bankipur water works—Estimate for providing spare meters and meter card boards (modified).	2,680	Submitted.	
74	Do. ...	Bihta Mela water-supply—Boring.	1,490	Sanctioned.	
75	Do. ...	Revised estimate for flushing drains along main bazar road thana road and Laheria maha'la lane, Bihar.	4,116	Submitted.	
76	Gaya ...	Gaya water works—Erecting a standpost for the staff of the Public Works Department Subdivision office.	100	Sanctioned.	

STATEMENT VIII—*contd.*

Serial no.	Place.	Nature and name of scheme.	Estimated amount.	Progress.	Remarks.
1	2	3	4	5	6
			Rs.		
77	Gaya ...	Gaya water works—Water connection to the residence of the Superintendent, Gaya Central Jail.	1,532	Sanctioned.	
78	Do. ...	Gaya water works—Removal of the existing standpost and refixing it in new position in the Civil Court compound.	75	Do.	
79	Do. ...	Gaya Central Jail—Replacing 3" main by a 4" main for improvement of water supply to the Jail.	18,984	Not yet sanctioned.	
80	Arrah ...	Buxar Central Jail—Revised estimate for provision of spill water drains and platform inside the jail.	1,366	Sanctioned.	
81	Do. ...	Erection of water tower close to the tube well of the Central Jail at Buxar.	13,500	Do.	
82	Do. ...	Erection of water tower—Special repairs to the pump chamber at Buxar Central Jail.	163	Do.	
88	Do. ...	Constructing bench mark pillars Arrah.	325	Do.	
84	Do. ...	Arrah water works—Water connection to the Civil Surgeon's residence.	750	Do.	
85	Do. ...	Arrah water works—Fixing of meters and stop cocks in Ponce lines and Police Hospitals.	332	Do.	
86	Chupra ...	Chupra flood protection scheme—Strengthening of the Khanwa sluice gate at Chupra.	210	Do.	
87	Saran ...	Improved arrangements for water supply at the Sonepur Mela 1928.	14,125	Do.	

STATEMENT VIII—*contd.*

Serial no.	Place.	Nature and name of scheme.	Estimated amount.	Progress.	Remarks.
1	2	3	4	5	6
88	Saran ...	Sone Mela—Boring—Supplementary.	3,600	Sanctioned.	
89	Muzaffarpur	Muzaffarpore water works—Water connection to the residence of the Deputy Superintendent and the Telegraphists quarters attached to the Telegraph Office, Muzaffarpur.	785	Do.	
90	Do ...	Muzaffarpur water-works—Water connection to the newly extended buildings and out houses attached to the Greer Bhumihar Brahman College.	4,910	Submitted.	
91	Do. ...	Muzaffarpur water works—Cutting R. B. floor of water tower at Pakki Sarai near Zilla School for examination.	64	Sanctioned,	
92	Darbhanga	Banwari Lal Hospital—Proposed elevated reservoir (modified).	7,600	Do.	
93	Do. ...	Banwari Lal Hospital—Providing hose pipe for floor washing.	550	Do.	
94	Do. ...	Banwari Lal Hospital—Diverting drain from the servants' quarters.	340	Do.	
95	Do. ...	Banwari Lal Hospital—Water connection to the Dhobis washing vats.	108	Do.	
96	Do. ...	Banwari Lal Hospital—Providing meters in the residential buildings.	449	Submitted.	
97	Do. ...	Darbhanga Medical School—Workshop and smith's shop.	4,315	Do,	

STATEMENT VIII—*contd.*

Serial no.	Place,	Nature and name of scheme.	Estimated amount.	Progress,	Remarks.
1	2	3	4	5	6
98	Katihar ...	Katihar Municipality—Modified surface drainage scheme for station bazar,	Rs. 2,150	Submitted.	
99	Balasure ...	Balasure Zila School—Water supply scheme.	1,200	Do.	
100	Do. ...	Installation of a tube well with pump and pipe connection at Growse General Hospital, Balasure.	5,000	Do.	
101	Cuttack ...	Cuttack Ravenshaw College drainage and sewerage scheme (supplementary).	17,000	Sanctioned,	
102	Do. ...	Cuttack Ravenshaw College—Surface drainage scheme—making masonry well for the soakway pits and covering a portion of open drain near Durbar Hall.	750	Submitted.	
103	Do. ...	Drainage of Whitlock's compound, Ravenshaw College, Cuttack.	725	Sanctioned.	
104	Do. ...	Cuttack Ravenshaw College water works—Providing an independent rising pipe to the service reservoir.	670	Do. ...	
105	Do. ...	Providing masonry walls above the drain on the north of Botany block in the Ravenshaw College, Cuttack.	220	Do. ...	
106	Do. ...	Scheme for the provision of meters in Ravenshaw College, Cuttack.	3,072	Submitted.	
107	Do. ...	Providing wash basin in the Professors's common room—Ravenshaw College.	375	Do.	
108	Do. ...	Installation of tube well with hand pump for water supply to the quarters for the hostel Superintendent attached to Ravenshaw Collegiate School, Cuttack.	800	Do.	

STATEMENT III—*contd.*

Serial no.	Place.	Nature and name of scheme.	Estimated amount.	Progress.	Remarks.
1	2	3	4	5	6
			Rs.		
109	Cuttack ...	Cuttack medical school sanitary fittings to hospital latrines (two bed pan sinks).	750	Sanctioned.	
110	Do. ...	Cuttack General Hospital and Orissa Medical school sanitary and water fittings in the proposed administrative block.	2 800	Do.	
111	Do. ...	Regarding existing drains and cutting drains from engine room for discharging water from pumping water from pump Cuttack General Hospital.	90	Do.	
112	Do. ...	Cuttack General Hospital water-supply to Dhobikhana.	400	Submitted.	
113	Do. ...	Water supply to the Power House, Cuttack General Hospital.	500	Do.	
114	Bhagalpur	Estimate for installation of two sets of low lift pumps to replace the old pumps at Bhagalpur water works.	23,240	Do.	
115	Do. ...	Bhagalpur jail storm water disposal scheme and additional sillage disposal works.	2,400	Do.	
116	Do. ...	Bhagalpur internal water supply to the Commissioner's residence.	960		
117	Do. ...	Bhagalpur Tarbanna drainage—Additional culverts (supplementary).	657	Sanctioned.	
118	Do. ...	Bhagalpur mufassal police-station changing the position of the existing taps from inside the quarters of the Sub-Inspector to a convenient place outside.	420	Submitted.	

STATEMENT VIII—*concl'd.*

Serial no.	Place.	Nature and name of scheme.	Estimated amount.	Progress.	Remarks.
1	2	3	4	5	6
119	Chakradhar, ur.	Chakradharpur Bazar drainage and storm drainage.	Rs. 3,460	Submitted.	
120	Dhanbad ...	Estimate for house connection meters in the Dhanbad School of Mines.	2,115 •	Do. ...	
121	Do. ...	Providing a tap in the pantry of the residence of the Principal, School of Mines, Dhanbad.	67	Sanctioned.	
122	Do. ...	Dhanbad School of Mines water supply to the new kitchen attached to the hostel.	205	Do. ...	
123	Do. ...	Dhanbad School of Mines internal water supply to the Principal's residence for additional works.	273	Do.	
124	Hazaribagh	Installation of water taps in the subordinate officer's quarters, Central Jail, Hazaribagh.	1,262	Submitted.	
125	Ranchi ...	Staff quarters and godown at Itki sanatorium.	1,060	Do.	
126	Do. ...	Outfall for storm water and effluent from septic tank no. 2, Indian Mental Hospital Drainage.	10,500	Do.	
127	Do. ..	Water connection to the Kanke Public Works Department staff quarters,	672	Sanctioned.	
128	Do. ...	Kanke permanent state dispensary and staff quarters sanitary fittings and water connection.	1,300	Submitted.	
129	Do. ..	Water supply drainage and sewerage schemes for additional accommodation in Indian Mental Hospital at Kanke.	50,800	Do.	
130	Do. ...	Certain minor works in Indian Mental Hospital, Kanke.	1,120	Do.	

STATEMENT VIII—*contd.*

Serial no.	Place.	Nature and name of scheme.	Estimated amount.	Progress.	Remarks.
1	2	3	4	5	6
131	Ranchi ...	Kanke Indian Mental Hospital sanitary fittings, water connection to the newly added portion of Laboratory building, male section hospital annexe.	230	Sanctioned.	
132	Do. ...	Water supply to the Thresh Disinfect'or (male ward), Indian Mental Hospital, Kanke.	282	Do.	
133	Do. ...	Improvement to the sullage filter.	125	Submitted.	
134	Do. ...	Kanke water supply to the Mental Hospital—providing an electric water level indicator for the water towers (revised estimate).	1,891	Sanctioned.	
135	Kanke ...	Drainage to drivers and switch board attendant's quarters (Electric Department), Kanke.	356	Do.	
136	Do. ...	Kanke Police quarters latrine intercepting drains.	108	Submitted.	
137	Do. ...	Kanke Indian Mental Hospital surface drains in the quarters of work sarkar Head Mistry, Electric Department.	210	Do.	
138	Do. ...	Scheme for sanitary fittings in the Occupational Therapy building European Mental Hospital, Kanke.	620	Do.	
139	Do. ...	Providing a storage tank for Maudsley ward in European Mental Hospital, Kanke.	392	Do.	
140	Do. ...	Kanke water works—providing $\frac{1}{2}$ " meter to the Dhobi khana, European Mental Hospital.	84	Do.	

STATEMENT VIII—contd.

Serial no.	Place.	Nature and name of scheme.	Estimated amount.	Progress.	Remarks.
1	2	3	4	5	6
141	Kanke ...	Kanke water works—additions and alterations to staff quarters for the Subdivisional clerk.	Rs. 500	Sanctioned.	
142	Do. ...	Kanke State dispensary—Internal water connection to temporary buildings (modified).	105	Do.	
143	Do. ...	Kanke Middle English School and 5 teachers' quarters water connection.	1,048	...	
144	Do. ...	Test pumping of well in connection with water supply to new Government House, Ranchi.	30	Sanctioned.	
145	Do. ...	Water supply to the new Government House at Ranchi, construction of well including test pumping.	4,370	Submitted.	
146	Moughyr...	Reserve Police line—internal water connection.	650	Do.	
147	Pakur ...	Pakur sub-jail drainage scheme improvement of out-fall (Revised estimate).	987	Do.	
148	Singhbhum	Segregation shed at Jugsalai (Singhbhum).	2,711	Sanctioned.	
149	Do. ...	Water connection to the constables quarters at Golmuri in the district of Singhbhum.	485	Do.	
150	Manbhum	Purulia Sadr Hospital—Water supply scheme.	35,200	Do.	
151	Do. ...	Pipe connection to the Police buildings at Kenduadih in the district of Manbhum.	1,228	Do.	

STATEMENT VIII—*contd.*

Serial no.	Place.	Nature and name of scheme.	Estimated amount.	Progress.	Remarks.
1	2	3	4	5	6
		TOOLS AND PLANT.	Rs.		
152	Manbhum	Purchase of sheet steel piles for the 2nd division, Public Health Department,	10,000	Sanctioned.	
153	Do. ...	Rescrewing 15" pipes and supplying new sockets and guard rings.	3,000	Do.	
154	Do. ...	Tools and plant—new supply 1928-29—2nd division, Ranchi.	3,321	Do.	
155	Do. ...	Tools and plant—Repairs and carriage 1928-29.	556	Do.	
156	Do. ...	Purchase of iron tripod derrick.	850	Do.	
157	Do. ...	Purchase of lamps for office	270	Do.	
158	Do. ...	Shifting office furniture, etc., from Patna Secretariat to Ranchi Secretariat for the office of the Public Health Department, 2nd Division.	1,150	Do.	
159	Do. ...	Carriage of tools and plant (Supply.)	1,615	Do.	
160	Do. ...	Supplementary estimate for tools and plant for the 2nd Division, Public Health Department.	815	Do.	
161	Do. ...	Estimate for obtaining tools and plant (new supply) for the year 1928-29—1st Division, Patna.	2,850	Do.	
162	Do. ...	Repair and maintenance and carriage of tools and plant for 1928-29, 1st Division, Patna.	2,780	Do.	
163	Do. ...	Running 16 sets of Crossley pumps for 10 days for Sonepur mela water supply during 1928-29.	2,835	Do.	

STATEMENT VIII—*concl'd.*

Serial no.	Place.	Nature and name of scheme.	Estimated amount.	Progress.	Remarks.
1	2	3	4	5	6
			Rs.		
164	Manbhum	Running 4 sets of pumping plant at Bihta Mela 1928-29.	284	Sanctioned.	
165	Do. ...	Water supply to Rajgir Mela	562	Do.	
166	Do. ...	Purchase of tools and plant for sinking 1½" diameter to 2" diameter abyssinian tube well.	340	Do.	
167	Do. ...	Supply of camp furniture ...	600	Do.	
168	Do. ...	Supply of furniture for the office of the Executive Engineer, Mechanical Division.	1,080	Do.	
169	Do. ...	Supply of furniture for the office of the Drainage Engineer.	1,450	Do.	
170	Do. ...	Supply of mathematical instruments for the office of the Drainage Engineer.	1,110	Do.	
			5,99,406		
		or say ...	5,99,500		

STATEMENT IX.

List of works under construction in 1928-29 by the Public Health Department, Bihar and Orissa.

Serial no.	Place.	Name of work.	Amount of estimate.	Progress.	Expenditure during the year.
1	2	3	4	5	6
			Rs.		Rs.
1	Patna ...	Accommodating at Tikiatoli the people dispossessed from the Patna University site (Revised estimate.)	2,165	Completed	4,237
2	Do. ...	Patna University water-supply and other sanitary projects.	2,79,703	In progress	38,090
3	Do. ...	Patna University water-supply and sanitary installation to Educational buildings west of Science College area.	18,658	Do. ...	8,955
4	Do. ...	Water-supply and sanitary installations to the new Patna University office.	6,807	Completed	207
5	Do. ...	Provision of latrines and urinals, Patna Science College and its Hostels.	1,100	Do. ...	1,097
6	Do. ...	Patna Training College and Collegiate School drainage scheme.	20,024	Do. ...	1,612
7	Do. ...	Water-supply to new buildings in the site of the old Lunatic Asylum at Patna Training College and Collegiate School.	4,871	Do. ...	406
8	Do. ...	Patna General Hospital Hot water installation, electric sterilisers and additional sanitary fittings.	55,800	Nearly completed.	53,577
9	Do. ...	Sanitary installation to the buildings in connection with the Patna Medical College.	1,26,025	Completed	2,647
10	Do. ...	Provision of motors in the residential buildings—Patna General Hospital and Medical College.	1,173	Do. ...	1,042

STATEMENT IX—*contd.*

Serial no.	Place.	Name of work.	Amount of estimate.	Progress.	Expenditure during the year.
1	2	3	4	5	6
			Rs.		Rs.
11	Patna ...	Sanitary installation, sewerage and water-supply to Public Health Laboratory, Patna Medical College.	7,420	Nearly completed.	5,000
12	Do. ...	Sanitary installation to the Physiological Laboratory and its extension—Patna Medical College.	8,910	Do. ...	8,826
13	Do. ...	Scheme for watering Patna Medical College and Hospital Lawn watering.	30,000 1,254	Completed...	1,344
14	Do. ...	Sanitary installation and water-supply to the acquired house of Dr. Asdarali, Deputy Superintendent.	1,390	Do. ...	1,149
15	Do. ...	Patna Veterinary College, water-supply, sewerage and drainage scheme.	1,15,919	Works started in February.	23,202
16	Do. ...	Phulwari Dairy Farm drainage.	16,912	Nearly completed.	16,061
17	Do. ...	Patna Government House Independent water-supply to the garden pump chamber and elevated tank including pipe connection.	5,351	Do. ...	2,845
18	Do. ...	Patna High Court—Sanitary installation in the Lavatories for two Judges and converting the L shaped room into clerk's lavatory.	2,467	Completed...	2,397
19	Do. ...	Patna Museum—Water supply and sanitary installation.	3,985	Do. ...	3,405
20	Do. ...	Construction of 6 seated water flushed latrines and 4 seated urinals on south side of Patna Secretariat.	3,150	Do. ...	385
21	Do. ...	Outside drainage work for 10 sets of C type quarters in R Block.	2,170	Do. ...	1,937

STATEMENT IX—*contd.*

Serial no.	Place.	Name of work.	Amount of estimate.	Progress.	Expenditure during the year.
1	2	3	4	5	6
			Rs.		Rs.
22	Patna ...	Patna Sewerage extension for the residence of the Secretary and Director of Industries on the north of King George Avenue.	2,400	Do. ...	35
23	Do. ...	Patna-Bankipore waterworks—old scheme.	2,11,015	Nearly completed.	43,197
24	Do. ...	Patna-Bankipore water-supply extension.	3,44,000	Do. ...	87,651
25	Do. ...	Independent water-supply scheme at Amlatola.	1,00,000	Tube well completed. Distribution system laid.	37,013
26	Do. ...	Replacing the house meters for which parts are not available with G. K. Meters.	24,364	Completed...	1,494
27	Do. ...	Extension of 2" C. I. main for water connection to the additional proposed quarters on the south of old Patna Distributory.	3,000	Do. ...	1,916
28	Do. ...	Bihta Mela water-supply boring.	1,490	Do. ...	1,540
29	Saran ...	Improved arrangements for Sonepur Mela water-supply 1928-29.	14,125	} Completed	15,707
30	... ..	Ditto Supplementary ...	3,600		
31	Gaya ...	Gaya water-works—water connection to the residence of the Superintendent, Central Jail, Gaya.	1,532	Do. ...	1,325
32	Buxar ...	Provision of spill water drain and platform inside Buxar Central Jail.	1,366	Do. ...	163
33	Do. ...	Erection of water tower close to the tube well of the Central Jail, Buxar.	13,545	Nearly completed.	9,718

STATEMENT IX—contd.

Serial no.	Place.	Name of work.	Amount of estimate.	Progress.	Expenditure during the year.
1	2	3	4	5	6
			Rs.		Rs.
34	Laheria-sarai.	Banwari Lal Hospital water-supply and drainage.	31,122	Completed	211
35	Chapra ...	Chapra flood protection, Khanwa Sluice	24,500	Do. ...	217
36	Bhagalpur	Surface drainage scheme, Tarlana area, Bhagalpur.	12,700	Do. ..	2,462
37	Do. ...	Bhagalpur water-supply re organization scheme, sinking tube well.	1,00,000	In progress	13,320
38	Dhanbad...	Waterworks, School of Mines, Dhanbid.	57,800	Completed	257
39	Do. ...	Sewerage and sanitary installation in Dhanbad School of Mines.	32,100	Do. ...	330
40	Itki ...	Water-supply, surface drainage and sewerage scheme at Itki Sanitorium.	79,000	In progress	40,750
41	Hazaribagh	Additions and alterations to pipe line attached to sewer valve at Hazaribagh Reformatory School.	1,700	Completed	1,616
42	Kanke ...	(a) Waterworks to Indian Mental Hospital, Kanke.	5,95,975	Do. ...	237
43	Do. ...	Additional sewerage scheme, Indian Mental Hospital.	1,400	Do. ...	6,084
44	Do. ...	Additional surface drainage scheme, Indian Mental Hospital.	11,440	Do. ...	467
45	Do. ...	Provision of Electrical water level indicator for water tower at Kanke.	1,891	Do. ...	575 308
					983
46	Do. ...	Water-supply and sanitary fittings to the additional quarters for the staff of the Indian Mental Hospital, Kanke—Diversión of water main.	15,025	Diversión of the main nearly completed.	1,104
47	Do. ...	Provision of meters at Kanke	20,700	...	5,512

STATEMENT IX—*concl'd.*

Serial no.	Place.	Name of work.	Amount of estimate.	Progress.	Expenditure during the year.
1	2	3	4	5	6
			Rs.		Rs.
48	Cuttack ...	Water-supply to Medical School at Cuttack.	50,800	Nearly completed.	12,486
49	Do. ...	Sewerage and Drainage scheme in the Medical School at Cuttack.	69,000 72,000	Do. ...	49188
			1,41,000		
50	Do. ...	Sewerage and Drainage scheme in Cuttack Ravenshaw College.	56,500	Completed.	11,067
51	Do. ...	Water supply to Ravenshaw College, Cuttack.	28,850 2,500	Do. ...	804
			31,350		
52	Puri ...	Constructing tube well with pumping plant (Narendra Tank).	12,950	Do. ...	3 577
53	Do. ...	Water supply, Puri,—Tube well sinking and test pumping.	18,800	Do. ...	8 6
54	Do. ...	Drainage scheme in Puri Cholera Hospital.	7,440	Do. ...	1,791
55	Do. ...	Puri Cholera Hospital water-supply.	...	Do. ...	6,007
56	Do ...	Petty works estimated at Rs. 1,000 or less.	...	...	1,03,333

STATEMENT X.

List of works under construction by Local Bodies.

Serial no.	Place.	Nature and name of scheme.	Estimated amount.	Progress.	Remarks.
1	2	3	4	5	6
1	Jharia ...	Jharia Drainage ...	Rs. 1,47,385	Works nearly completed.	
2	Bhabua ...	Bhabua Drainage ..	14,000	Major portion completed — work stopped.	
3	Patna ...	Patna New Market Drainage scheme.	5,330	Work in hand.	

STATEMENT XI.

List of detailed schemes under preparation.

Serial no.	Place.	Nature and name of scheme.	Probable cost of scheme.	Remarks.
1	2	3	4	5
			Rs.	
1	Arrah ...	Arrah drain flushing ...	2,25,000	
2	Do. ...	Water supply to the police-station at Arrah.	500	
3	Do. ...	Buxar Jail water supply taking out existing sluice valves and re-fixing the same in new positions.	210	
4	Bhagalpur ...	Bhagalpur water supply re-organisation. .	7,00,000	
5	Do. ...	Bhagalpur Chanpatty Drainage scheme.	10,050	
6	Do. ...	Bhagalpur Jail Drainage scheme	6,000	
7	Cuttack ...	Cuttack Ravenshaw College—detailed estimate for pump house for the additional tube well.	3,800	
8	Do. ...	Making pucca certain of the existing kutcha drains in the Ravenshaw College compound.	2,000	
9	Do. ...	Cuttack Ravenshaw College Surface Drainage Scheme.	4,000	
10	Do. ...	Converting the existing latrines into water flushed ones in Ravenshaw College compound, Cuttack (2nd supplementary).	4,000	
11	Do. ...	Construction of two water flushed latrines for pauper ward, Cuttack General Hospital.	2,000	
12	Do. ...	Proposed drivers' shed and godown at Cuttack Medical School.	3,500	
13	Do. ...	Cuttack Jail Drainage Scheme ...	5,000	
14	Do. ...	Tube well at Jajpur ...	1,500	

STATEMENT XI—*contd.*

Serial no.	Place.	Nature and name of scheme.	Probable cost of scheme.	Remarks.
1	2	3	4	5
			Rs.	
15	Cuttack— <i>concl'd.</i>	Tube well at the High School Hostel, Kendrapara.	2,000	
16	Do. ...	Tube well at Baldevi temple, Kendrapara.	1,500	
17	Darbhangā ...	Construction of a tube well in the compound of Civil Surgeon, Laheriaserai.	1,600	
18	Do. ...	Fauwari Lal Hospital Sewerage and Sanitary Installation.	4,700	
19	Do.	Darbhangā water supply—water connection to the residence of the Civil Surgeon, District Magistrate and Superintendent of Police.	500	
20	Do.	Darbhangā Medical School workshop and its water supply.	4,900	
21	Dhanbad ...	Supplementary sewerage scheme for Dhanbad School of Mines.	5,000	
22	Dumka ...	Improvement of Dumka Jail outfall.	2,500	
23	Gaya ...	Gaya water-works—Reorganisation	90,000	
24	Do. ...	Gaya Central Jail water-supply—Improvement water tower with rising and distribution main.	13,760	
25	Do. ...	Removal of standpost in Civil Court compound—Gaya.	200	
26	Madhupur ...	Additional surface drains in the Madhupur municipality.	5,000	
27	Manbhum ...	Construction of drain for playground, Puruaia Zilla School.	1,750	
28	Monghyr ...	Improvement to the water-supply to the Monghyr Juvenile Jail.	1,490	
29	Motihari ...	Motihari surface drainage scheme for new Civil Court buildings.	1,500	

STATEMENT XI.—*contd.*

Serial no.	Place.	Nature and name of scheme.	Probable cost of scheme.	Remarks.
1	2	3	4	5
			Rs.	
30	Muzaffarpur ...	Greer Bhumihar Brahman College water-supply—Provision of overhead tank for Science classes.	3,750	
31	Do. ...	Greer Bhumihar Brahman College surface drainage for the extended portion of the building and out-houses.	4,217	
32	Do. ...	Muzaffarpur Jail—water connection to Jailor's quarters.	400	
33	Do. ...	Muzaffarpur water-works reorganization.	2,43,000	
34	Patna ...	Patna Main Drainage scheme ...	14,00,000	
35	Do. ...	Patna B. N. College hostel water-supply.	3,708	
36	Do. ...	Patna B. N. College hostel drainage.	3,900	
37	Do. ...	Patna B. N. College Arts Block drainage.	1,000	
38	Do. ...	Patna B. N. R. Training College drainage.	3,000	
39	Do. ...	Patna B. N. College hostel latrines and urinals with covered passage.	8,200	
40	Do. ...	Patna Bihar College of Engineering drainage for Artisan lines.	800	
41	Do. ...	Patna Storm drainage scheme in front of Babu J. N. Sharma's house at Golakpur.	2,900	
42	Do. ...	Drainage scheme for D shaped residence in Civil Surgeon's compound.	2,000	
43	Do. ...	Arts Block water supply, B. N. College.	500	
44	Do. ...	Estimate for obtaining tools and plant (new supply) for 5" boring set.	8,500	

STATEMENT XI—*contd.*

Serial no.	Place.	Nature and name of scheme.	Probable cost of scheme.	Remarks.
1	2	3	4	5
			Rs	
45	Patna— <i>contd.</i> ...	Proposed duplicate filters at Reserve Police lines.	860	
46	Do. ...	Dhakanpura and Yarpur drainage scheme.	60,000	
47	Do. ...	Patna-Bankipore water-works—Providing 3 taps in the compound of Madrasa Ialamin Samsul Hudda.	633	
48	Do. ...	Water-supply to the proposed 8 sets of additional quarters for the staff of the Electrical Works Division, Patna.	700	
49	Do. ...	Water-supply to the proposed 4 sets of quarters for the Sectional Officers of the Executive Engineer, Patna Division.	590	
50	Do. ...	Water-supply to the 6 sets of additional quarters for the assistants of the Local Self-Government Department.	480	
51	Do. ...	Water-supply to the proposed one C type quarters for the assistant of the Director of Industries at Amlatola.	80	
52	Do. ...	Patna-Bankipore water supply—Extension of 2" main for water connection to the additional quarters south of the old Patna Distributory at Amlatola.	1,500	
53	Do. ...	New Police Hospital Drainage Scheme.	1,410	
54	Do. ...	Bihar College of Engineering hostel water supply.	2,000	
55	Do. ...	Patna University water supply and sanitary installation to the Bayley Library.	3,420	

STATEMENT XI—*contd.*

Serial no.	Place.	Nature and name of scheme.	Probable cost of scheme.	Remarks.
1	2	3	4	5
			Rs.	
56	Patna— <i>contd.</i>	Patna Training College and Collegiate School replacement of the existing bib cocks by Tylors waste not cocks near kitchens and servants quarters' of hostels.	286	
57	Do. ...	Water supply to the residence of the Director of Agriculture, Bihar and Orissa at Patna.	1,200	
58	Do. ...	Water supply to the residence of for the Personal Assistant to the Director of agriculture.	500	
59	Do. ...	Patna General Hospital Lawn watering—providing additional hydrants.	600	
60	Do. ...	Bankipur Jail—water connection and sanitary installation to the new hospital building.	675	
61	Do. ...	Providing two additional taps with shower in the two bath rooms of the Anglo Indian quarters, No. A-1 on the Mangies road occupied by the Head Assistant of the Judicial Department.	200	
62	Do. ...	Providing temporary water connection in Gachhi west of Sir Justice Jwala Prasad's residence for the Military Police guard of Patna Government House.	6	
63	Do. ...	Additions and alterations in the internal water connection to the residence of the Hon'ble Member, Board of Revenue now used as residence of the District and Sessions Judge, Patna.	128	
64	Do. ...	Sanitary installation to 3 sets of C type quarters for the Assistant of the office of the Inspector-General of Registration at Amlatola.	240	
65	Do. ...	Patna University—temporary 5 seated latrines and 3 seated urinals for Law College hostel.	850	
66	Do. ...	Patna Tauzi and Cess office drainage.	1,000	

STATEMENT XI.—*concl'd.*

Serial no.	Place.	Nature and name of scheme.	Probable cost of scheme.	Remarks.
1	2	3	4	5
			Rs.	
67	Patna— <i>concl'd.</i>	Bihar Drain Flushing along the Main Bazar Road, etc.	6,400	
68	Do. ...	Patna City Drainage for Madhava Oil Mills.	2,358	
69	Ranchi ...	Supplementary estimate for sanitary installation at Itki.	10,000	
70	Do. ...	Kanke Agricultural Farm internal water supply.	3,000	
71	Do. ...	Additions and alteration to sullage filter in Indian Mental Hospital, Kanke.	200	
72	Do. ...	Modification of the scheme for the construction of office and godown at Kanke water-works.	8,000	
73	Do. ...	Kanke water-works—Providing a temporary latrine for the quarters of chargeman at head works.	1,000	
74	Do. ...	Provision of boxes, nozzles and coupling for the hose pipe in Indian Mental Hospital, Kanke.	1,740	
75	Do. ...	Alteration of the suction pipes of the low lift pump at Kanke water-works.	310	
76	Do. ...	Sanitary installation and water connection to the new staff house in the Government house compound at Ranchi.	2,010	
77	Do. ...	Ranchi new Government house—water supply sanitary installation. Sewerage.	50,000	
78	Saran ...	Sonepur Mela water supply ...	95,424	
79	Shahabad ...	Bhabua Drainage Extension outfall.	3,000	
80	Do. ...	Sassaram Garhi Drainage ...	3,000	

STATEMENT XII.

List of outline schemes under preparation.

Serial no.	Place.	Nature and name of scheme.	Probable cost of schemes.	Remarks.
1	2	3	4	5
			Rs.	
1	Deoghur ...	Drainage scheme	60,000	
2	Dhanbad ...	Ditto	5,00,000	
		Water supply	2,50,000	
3	Dumka ..	Drainage scheme	1,60,000	
4	Giridih ...	Drainage scheme	1,25,000	
5	Patna ...	Gulzarbagh Press water supply ...	30,000	
6	Sassaram ...	Municipal market ... ..	...
7	Shahabad ...	Drainage scheme, Bhabhna ...	12,000	
8	Do. ...	Municipal market	6,000	

STATEMENT XIII.

List of schemes to be prepared.

Serial no.	Place.	Nature and name of scheme.	Probable cost of scheme.	Remarks.
1	2	3	4	5
			Rs.	
1	Arrah ...	Improvement of water-works, Arrah.	30,000	
2	Bhagalpur ...	Jail water-supply scheme, Bhagalpur.	25,000	
3	Chapra ...	Flood protection scheme ...	20,000	
4	Cuttack ...	Cuttack Medical School Sewerage, 2nd supplementary.	10,000	
5	Do. ...	Town Drainage, Jajpur ...	10,000	
6	Dhanbad ...	Public Health Department staff quarters at Dhanbad.	8,000	
7	Do. ...	Fitting of tap outside each hostel kitchen attached to Dhanbad School of Mines.	600	
8	Dumraon ...	Dumraon drainage ...	50,000	
9	Hazaribagh ...	Three additional taps in the Reformatory School.	200	
10	Motihari ...	Motihari water-supply scheme ...	2,00,000	
11	Patna ...	Extension of Patna-Bankipur water-supply.	6,00,000	
12	Do. ...	Water-supply to Bihar College of Engineering.	20,000	
13	Do. ...	Sewerage scheme for Bihar College of Engineering.	80,000	
14	Do. ...	Sanitary installation to the Operation-shed—Veterinary College.	800	
15	Do. ...	Storm drainage scheme, Veterinary College.	4,000	
16	Do. ...	Drainage for the side cutting land between the Khagole road and distributary on the east of Domkhana, Patna.	6,000	

STATEMENT XIII—*concl'd.*

Serial no.	Place.	Nature and name of scheme.	Probable cost of scheme.	Remarks.
1	2	3	4	5
			Rs.	
17	Patna— <i>concl'd.</i> ...	Kadamkuan drainage scheme ...	1,50,000	
18	Do. ...	Drainage scheme for the Gentry's quarters in the Khasmahal area.	42,000	
19	Do. ...	Surface drainage scheme for staff quarters at Digha headworks.	1,200	
20	Purnea ...	Kissenganj supply: drainage scheme.	5,000	
21	Puri ...	Puri water-supply scheme ...	12,00,000	
22	Do. ...	Puri Narendra Tank Improvement	10,000	
23	Do. ...	Puri Zila School drainage ...	5,000	
24	Rajmahal ...	Improvement to the water-supply in the sub-jail, Rajmahal.	4,000	

No. 9901-L. S.-G.

GOVERNMENT OF BIHAR AND ORISSA
(MINISTRY OF LOCAL SELF-GOVERNMENT).

RESOLUTION.

Dated the 26th August 1929.

READ—

The annual report of the Public Health Engineering Department
for 1928-29.

2. The work of the Department continued to expand. Expenditure on Government works increased (the figures are given in thousands of rupees) from about 3,37 in 1926-27 to 3,83 in 1927-28 and to 4,34 in 1928-29 and expenditure on deposit works in these years has increased from 2,43 and 2,32 in the two previous years to 3,07 in the year under report. The total expenditure on these two kinds of work in these three years was 5,80, 6,15 and 7,41. There has been a similar increase in the cost of works executed by or under the supervision of the Department which amounted to 9,12, 10,92 and 12,33 in these three years. Owing to the shortage of staff there has been an inevitable decrease in the work done on preparing schemes, for which local bodies have mainly had to suffer. The capital cost of the preliminary schemes prepared, which amounted to 27,70 and 32,90 in the previous two years decreased to 16,72 ; and the corresponding figures for detailed schemes were 8,57, 10,35 and 5,99. But projects estimated to cost about 36,25 are pending preparation when staff is available, while schemes estimated to cost about 30,53 are in hand. When these figures are considered the establishment charges, which amounted to 1,89, 2,16 and 2,22 in these three years, are seen to show in proportion a very slight increase ; and the increase this year was more than counter-balanced by an increase in fees received from local bodies from 33 to 49. The new post of mechanical Engineer foreshadowed in last year's resolution has been created and four temporary Assistant Engineers, eight overseers and four draftsmen have been appointed. The headquarters of the Executive Engineer in charge of the 2nd Division was transferred from Patna to Ranchi in order to bring him nearer to his work.

3. The main original works undertaken on behalf of Government were the installation of a hot water-supply in the medical

college hospital, the completion of the drainage scheme of the Ravenshaw college and of the water-supply scheme of the medical school and general hospital at Cuttack and the inception of the drainage scheme for the same institution. Work was begun on the water-supply and sanitary installation at the veterinary college at Patna, and the drainage for the dairy farm at Phulwari is nearly completed.

4. Of the work done on behalf of or in the interests of local bodies two schemes are of outstanding interest to the general public. One of these was the initiation of a scheme for the supply of pipe water to the Sonapur *mela*, for which an estimate amounting to nearly a lakh of rupees was sanctioned at the end of the year. This work, which it is hoped to complete in time for the next *mela* in November 1929, is being carried out as a Government work entirely at Government's cost and will be maintained by Government. It is hoped that it will add enormously to the safety and comfort of the people not only of this but of neighbouring provinces who attend this *mela* in large numbers. The other scheme is that of the Puri water-supply. It was mentioned in last year's resolution that a tube well had been sunk and that the tests which were being conducted at the close of that year were hopeful. These tests were carried on throughout the hot weather of the year under report and established in the opinion of the Superintending Engineer the fact that there was a supply of fresh water beneath the sand adequate for the needs of a pipe water-supply system for the population of Puri, both permanent and floating. Government obtained the opinions of the Sanitary Engineer, Madras and of the Superintending Engineer, Public Health Department of the United Provinces on Mr. Platt's report after both of them had visited Puri for this purpose. While expressing general agreement with Mr. Platt's conclusions they suggested certain further tests, and experiments have been made subsequent to the close of the year under report to establish the accuracy of Mr. Platt's conclusions; and the results have been entirely satisfactory. The lodging house committee and the municipality at Puri have subsequently been consulted and have been asked to form a joint committee to consider the proposals of Government with a view to the preparation of a scheme and the conducting of further tests; and if all goes well and if Mr. Platt's rough estimates of the financial side of the scheme are found to be correct it should be possible to start construction work in the year 1930-31.

5. The special Drainage Engineer whose appointment was anticipated last year has been appointed to work out a detailed scheme for a sewerage system in the west end of the Patna City

municipality and for part of the Patna administration committee area. Government are bearing the whole cost of his entertainment and of the preparation of this scheme which it is hoped will be ready for examination by November 1929.

6. The following other works done for the local bodies are of interest. The installation of electrically driven pumping plant for the Patna-Bankipore water-supply was almost completed, and a tube well was completed in the Patna administration committee area. Three borings were sunk in the endeavour to tap satisfactory new sources of water-supply for Bhagalpur but without success. A tube well was sunk and test pumped, also without success, for the Narendra tank at Furi. It is of interest to mention that the losses consequent on these failures fell mainly on the contractors, owing to the safeguards provided in all contracts for borings done under Government supervision. A fresh scheme for the improvement of the Gaya water-supply was prepared after the failure of the tube wells sunk early in 1927, and a scheme for the improvement of the Muzaffarpur water-supply was also prepared. Loans have subsequently been sanctioned to the Gaya municipality and are likely to be sanctioned for the Muzaffarpur municipality to enable them to carry out these schemes. In Muzaffarpur it has been decided that it will be impracticable to finance or carry out an improved drainage scheme until the water-supply has been improved. The municipality is being permitted on certain conditions to divert to the water-supply scheme a considerable sum of money from Government's grants made for the drainage scheme.

7. The Superintending Engineer continued to devote a great deal of his time to inspection of municipal waterworks, and in this work was assisted by the newly appointed Mechanical Engineer. The administration of municipal waterworks will be dealt with as usual in Government's resolution on the working of municipalities.

8. Mr. S. E. Platt held the post of Superintending Engineer throughout the year and was confirmed in that post. The thanks of Government are again due to him for the initiative and efficiency which he brought to bear on his duties. They are also pleased to hear of the progress made in particular by Mr. E. R. Smith and his staff in the 2nd Division and to record their general appreciation of the work done by the Department.

By order of the Government of Bihar and Orissa
(Ministry of Local Self-Government),

G. E. OWEN,
Secretary to Government.