

E76

56

PUNJAB PUBLIC WORKS DEPARTMENT.

HYDRO-ELECTRIC BRANCH.

ADMINISTRATION REPORT

FOR THE YEAR

1931-32.

(Not to be sent up to Simla.)

PUNJAB CIVIL SECRETARIAT
LIBRARY COPY.

(To be returned to the Library when done with.)



13636

Lahore :

PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRINTING, PUNJAB.

1933.

Price : Rs. 3-0-0 or 4s. 6d.

PUNJAB PUBLIC WORKS DEPARTMENT

HYDRO-ELECTRIC BRANCH

ADMINISTRATION REPORT

FOR THE

1922-23



1922-23

1922-23

1922-23

E.76

PUNJAB PUBLIC WORKS DEPARTMENT.
HYDRO-ELECTRIC BRANCH.

ADMINISTRATION REPORT

FOR THE YEAR

1931-32.



Lahore :

PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRINTING, PUNJAB.

1932.

PUNJAB PUBLIC WORKS DEPARTMENT
HYDRO-ELECTRIC BRANCH

Revised List of Agents for the Sale of Punjab Government Publications.

ON THE CONTINENT AND UNITED KINGDOM.

Publications obtainable either direct from the High Commissioner for India, at India House, Aldwych, London, W. C. 2, or through any bookseller :—

IN INDIA.

The GENERAL MANAGER, "The Qaumi Daler" and the Union Press, Amritsar.

Messrs. D. B. TARAPOREVALA, Sons & Co., Bombay.

Messrs. W. NEWMAN & Co., Limited, Calcutta.

Messrs. THACKER, SPINK & Co., Calcutta.

Messrs. RAMA KRISHNA & Sons, Lahore.

The SECRETARY, Punjab Religious Book Society, Lahore.

The UNIVERSITY BOOK AGENCY, Kacheri Road, Lahore.

L. RAM LAL SURI, Proprietor, "The Students' Own Agency," Lahore.

L. DEWAN CHAND, Proprietor, The Mercantile Press, Lahore.

The MANAGER, Mufid-i-'Am Press, Lahore.

The PROPRIETOR, Punjab Law Book Mart, Lahore.

The MANAGING PROPRIETOR, The Commercial Book Company, Lahore.

Messrs. GOPAL SINGH SURI & Co., Law Booksellers and Binders, Lahore.

R. S. JAURA, Esq., B.A., B.T., The Students' Popular Depôt, Anarkali, Lahore.

Messrs. R. CAMBRAY & Co., 11-A., Halder Lane, Bowbazar P. O., Calcutta.

Messrs. B. PARIKH & Co., Booksellers and Publishers, Narsinhji Pole, Baroda.

Messrs. DES BROTHERS, Booksellers and Publishers, Anarkali, Lahore.

The MANAGER, The Firoz Book Depôt, opposite Tonga Stand of Lohari Gate, Lahore.

The MANAGER, The English Book Depôt, Taj Road, Agra.

*The MANAGING PARTNER, The Bombay Book Depôt, Booksellers and Publishers, Girgaon, Bombay.

*The PROPRIETOR, The Book Company, Calcutta.

*Messrs. CHATTERJI & Co., Booksellers, 204, Cornwallis Street, Calcutta.

*The MANAGER, Standard Book Depôt, Lahore.

*The PROPRIETOR, Aftab Punjab General Law Book Agency, Lahore.

*The MANAGER, Oxford Book and Stationery Co., The Mall, Lahore.

*The PROPRIETOR, City Book Co., Post Box No. 283, Madras.

*The MANAGER, The New Book Depôt, No. 79, The Mall, Simla.

* These firms will be allowed discount at 15%.

ADMINISTRATION REPORT, 1931-32.

CONTENTS.

	PAGES.
Chapter I.—General Preface	1
„ II.—Administration	2—8
„ III.—Construction	4—11

STATEMENTS

Statement " A " of progress on works during the year 1931-32	12—15
Statement " B "—Statement of expenditure	16
Statement " C "—Details of Establishment charges	17—18

Proceedings of the Punjab Government (Ministry of Local Self-Government) in the Public Works Department, Hydro-Electric Branch, No. 446-W. S., dated 17th September 1932.

READ—

The Administration Report of the Punjab Public Works Department, Hydro-Electric Branch, for the year 1931-32.

THIS is the sixth administration report since the Uhl River Hydro-Electric Scheme was begun in 1926. It records not only steady advance in all directions but the completion, on the first of March, of the excavation of the tunnel begun on the first of January 1928 and continued thereafter without cessation, night and day. The operations of drilling and blasting with high explosives, in shattered treacherous rock, discharging large volumes of excessively cold water, have been dangerous and difficult. Occasionally there have been sudden falls of rock creating cavities which have had to be carefully rendered solid by packing and cement injection. The excavation has involved a number of casualties, some unfortunately fatal. The tunnellers have been recruited from all parts of India and have been encouraged to remain at work by the example, enthusiasm, and tact of the executive officers Messrs. Hunt, Aylward and Dorofeeff and Captains Keane and Guthrie.

The expenditure on works during the year (exclusive of March supplementary accounts) was 99.43 lakhs and on establishment Rs. 7.77 lakhs. To March 31st 1931 the cost of establishment inclusive of leave and pensionary charges was 28.8 per cent. of the works expenditure (excluding interest and suspense). The corresponding figure for the year under review is 7.81. This large reduction is attributable to a definite reduction in establishment charges as shown by the statement below and also to the works being in a stage where heavy expenditure on plant and equipment has been incurred.

Establishment charges.

	Rs.		Rs.
1925-26	.. 45,000	1929-30	.. 9,50,670
1926-27	.. 5,61,381	1930-31	.. 11,63,272
1927-28	.. 8,66,957	1931-32	.. 7,77,214
1928-29	.. 12,93,690		

Apart from the tunnel, the year has seen the virtual completion of the penstock pipes and most of the hydraulic works in the Uhl Valley. The transmission system has also made good progress.

The original project contained provision for local distribution in certain towns, but it was not until the possibility of transferring this part of the scheme to private enterprise had been explored, without concrete results, that it was decided to embark on it. The prospect of retailing electricity has made it necessary to enquire closely into the controversial questions of tariffs and conditions of supply, and to prepare detailed surveys and estimates for the low pressure networks in towns.*

The foregoing remarks relate exclusively to the main work with which the Hydro-Electric Branch is concerned, that is, the Uhl River Hydro-Electric Scheme, but the Branch has also been responsible for a temporary supply to the Amritsar Municipality and the electrification of Lyallpur by departmental agency.

The Amritsar supply is bought from the Lahore Electric Supply Company and transmitted by a temporary line to Amritsar, the sale terms providing a margin to cover expenses. The scheme was undertaken on behalf of the Amritsar Municipality, who are the licensees, to obviate the necessity of their installing new generating plant. Both schemes, though entailing some financial loss, have been of useful working experience to the department as a preliminary to the coming operation of the Uhl undertaking.

By order of the Punjab Government
(Ministry of Local Self-Government).

A. R. ASTBURY,

Secretary to Government, Punjab,
(Electricity).

*Since the end of March 1932, the construction has advanced rapidly and there is now good reason to expect that the Hydro-Electric Branch will be in a position to supply energy from April or May 1933.

CHAPTER II - Administration
PUNJAB PUBLIC WORKS DEPARTMENT,

HYDRO-ELECTRIC BRANCH.

**ADMINISTRATION REPORT FOR THE
YEAR 1931-32.**

CHAPTER I.—General Preface.

1. Generally the year was one of steady and successful work. The chief item of interest was the breaking through of the tunnel on the 1st March 1932. In the Construction Circle the pipe line, power-house building, reservoir, flume and headworks were all nearing completion at the end of the year. In the Transmission Circle the transmission lines had progressed steadily while the substations and other transmission line buildings and quarters were well in hand. The railway sidings at Lahore and Amritsar were completed, and those at Dhariwal and Pathankot were begun.

CHAPTER II.—Administration

ORGANISATION AND ESTABLISHMENT.

2. The only change during the year was the abolition of the M./B. (Building) Sub-Division of the Mechanical Division in May 1931. The usual changes in personnel, the more important were—

- (1) the absence of Colonel B. C. Battye, Chief Engineer, on 8 months' leave, when Mr. H. P. Thomas officiated ;
- (2) the departure of Captain R. D. Keane, Executive Engineer, in March 1932, and Lala Harbans Rai, Executive Engineer, in August 1931 ;
- (3) the unfortunate death of Lala Parmeshri Das, Civil Officer, in July 1931.

3. The staff with these exception was the same as last year.

GENERAL ADMINISTRATION.

4. The general health of the staff and labour was good, apart from a slight epidemic of mumps in the Brot area.

Medical and sanitary arrangements.

5. The Welfare Officer, Mr. E. P. Hillier, assisted by a local voluntary organization, continued to maintain various useful and much appreciated activities. Among these were :—

Welfare work.

- (a) A school of lower middle grade, for boys and girls, at Brot, and a girls' middle school at Shanan. The latter was supervised and financed by the Kangra Canadian Mission, the net cost being Rs. 1,370. The work of these two institutions, as also that of the Mandi State middle school for boys at Sakroti, was inspected during the year by the Inspector and Inspectress of Schools of the Punjab Education Department and favourably commended. One hundred and twenty children of employees attended these schools.

Schools.
- (b) As Hospital Visitor, the Welfare Officer kept in touch with all the sick and injured. Small grants were made from welfare funds towards assisting disabled and indigent coolies. In certain cases, contractors' labourers were assisted in recovering their dues for wages and accident compensation from their employers.

Welfare of labour.
- (c) Close supervision was exercised over the prices, quality and sufficiency of foodstuffs sold at shops in the works area under agreement with Government.

Food shops.
- (d) A health visitor and Dai were retained to look after the health of the families of employees, and in the absence of a woman doctor, their services met a very real need. The work was highly commended by both the Public Health Department and the authorities of the Indian Red Cross Society. The cost of these activities during the year was Rs. 2,731-5-0, of which Rs. 469 was received as grant-in-aid from Government through the Public Health Department, Rs. 1,500 as recurring grant from the Headquarters, Indian Red Cross Society, and Rs. 250 as non-recurring grant from the Punjab Branch of the Red Cross Society. The remaining Rs. 512-5-0 was raised from private subscriptions and fees.

Maternity and child welfare.
- (e) Small institutes and reading rooms at various points in the works area provided indoor and outdoor games, library, newspapers, dramatic performances, lantern lectures, etc., all of which were well

Recreation, etc.

patronized and greatly appreciated. The cricket team did creditably against the Lahore Gymkhana and other clubs. The cost of these activities was met exclusively from voluntary subscriptions.

6. The total recurring cost for the year of maintaining the various activities, in the interests of the well-being of the employees of the Project, was Rs. 5,952-5-0. Towards this Government contributed Rs. 469 for maternity and child welfare. The rest was met by grants from the Red Cross Societies and private subscriptions.

7. This question continued to engage the attention of the Government of India and had not been settled when the year expired. Since then, however, certain principles have been recommended for adoption.

Inductive interference of telegraph, telephone and power circuits.

8. A license for the operation and maintenance of telephones to serve the 33 k. v. and 11 k. v. transmission lines and transforming stations was issued by the Government of India during the year.

Telephone lines for the Project.

ACCOUNTS.

9. Statement B attached to this report shows the expenditure incurred during 1931-32 in the Hydro-Electric Branch as a whole.

Accounts.

10. Considerable improvement was noticed during the year in the accounts work of the Divisions and Sub-Divisions. Arrears still exist in the Mechanical Division and the M/M Sub-Division but are being gradually cleared.

COMMERCIAL.

11. (i) In accordance with the advice of the Standing Finance Committee of the Punjab Legislative Council it was announced that the Punjab Government would be prepared to consider the granting of licences to persons willing to enter into an agreement to purchase from Government energy in bulk, in accordance with certain terms.

Conditions of supply under which Government would be prepared to sell energy in bulk to private agency for distribution.

(ii) As no firm offer was received the Local Government decided itself to undertake local distribution, and advertised its application for a license in the *Civil and Military Gazette* in its issues of 25th, 26th and 28th December 1931.

12. The tariffs proposed in Memo. T.-29-A were re-examined and several modifications were proposed. Proposals for conditions of supply were also drafted.

Tariffs and conditions of supply.

13. With a view to determining the commercial justification of undertaking local distribution, a financial forecast was prepared for each of the towns embraced by the first stage of the Mandi Scheme. These forecasts were based on preliminary estimates of capital cost of local distribution in the towns concerned.

Financial forecast statements.

14. A memorandum on rural electrification in the province is under preparation.

Memo, on Rural Electrification.

15. Two hundred copies of a pamphlet entitled "The Mandi Hydro-Electric Scheme" reproducing articles in the *Civil and Military Gazette* were supplied to leading firms and others interested in the hydro-electric development of the Punjab.

Publicity.

A summary of the narrative progress reports for the year 1931-32, i.e., from 1st April 1930 to 31st March 1931, was prepared and supplied to H. M. Trade Commissioner in India, Calcutta.

Photos of the tunnel under construction were supplied to 9 of the leading Indian newspapers.

CHAPTER III.—Construction.

FINANCE.

16. As it was realised that the provision made for hydraulic works, generating plant, and trunk transmission lines would be inadequate, a further revision of the Project Estimate was made in April 1931 which raised the total cost to Rs. 6,14,00,000. This was sanctioned by the Local Government except for 8 sub-heads which Government did not consider it necessary to revise. Owing, however, to the fact that customs duties were heavily increased towards the end of the year by the Government of India the provision will not suffice and the estimate must be again revised.

Revision of Uhl River Hydro-Electric Project Estimate.

CONSTRUCTION CIRCLE.

17. The Divisions in this Circle have been employed on the following works during the year :—

Distribution of work by Divisions.

M/M (Independent) Sub-Division.

(i) The handling of the Circle stores organization including taking delivery of all consignments for the Circle. In addition, all bills for supplies made for the Circle were passed and paid in this Sub-Division, even though the expenditure against the estimates to which such stores were chargeable was being worked up in Divisions. The system of passing all tools and plant through the central stores tools and plant account was continued and this method of procedure has proved of great assistance to Divisions in reducing their accounts work and correspondence.

The stores section of the Circle Office placed orders and indents for stores and spare parts amounting to Rs. 8,68,000, a total of 700 orders being placed, Indents on the Indian Stores Department for stores, spare parts and plant amounted to approximately Rs. 60,000, orders for cement amounted to Rs. 6,33,000, direct orders for spare parts to Rs. 33,000 and direct orders for miscellaneous stores amounted to Rs. 1,32,000, the balance of Rs. 10,000 being the amount of orders placed with the approval of the Chief Engineer, Hydro-Electric Branch.

(ii) The operation and maintenance of the haulageways from Jogindernagar to Zero Point (including operation of Hill Top Tramway).

(iii) Construction of the main power house at Shanau.

(iv) Water supply, sanitation and hospital arrangements in the Jogindernagar area.

'M' (Mechanical) Division.

(v) Working and maintenance of Dhelu and Thuji power schemes including all transmission lines and substations.

(vi) Working and maintenance of telephone exchanges and lines.

(vii) Operation of permanent workshops at Shanau.

(viii) Construction of subsidiary haulageway.

'A' (Adit) Division.

(ix) The construction of pipe line from tunnel exit to the power house.

(x) Driving and lining of the main tunnel from Adit Junction northward to midpoint.

(xi) Lining of the main tunnel from Adit Junction to the surge shaft.

(xii) Lining of the surge shaft.

(xiii) Grouting of main tunnel.

(xiv) Tunnel mantling.

(xv) Driving and lining of the main tunnel from North Portal to midpoint.

T (Tunnel) Division.

(xvi) Excavation of Diurnal Reservoir.

(xvii) Construction of Hydraulic works.

(xviii) Water supply, sanitation and hospital arrangements in the Uhl Valley.

18. Statement A contains a list of the more important estimates sanctioned and the works in progress during the year. Works carried out during the year. Works completed or undertaken during the year, include the following :—

The haulageways have continued to give satisfactory service. The total maundage despatched from Shanau to various sites of works was 10,23,860 maunds.

Transportation and communications.

The construction of the power-house building has been practically completed. In all about 3,50,000 c.ft. of concrete was poured with over 200 tons of superstructure steelwork erected and over 20,000 s. ft. of roofing fixed by the contractors.

Main Power-House.

The machinery for the power-house started to arrive in the latter half of the year and by its end the 60 ton crane in the main machine room and 5 ton cranes in the subsidiary gallery and switch houses were erected and are in working order. Three alternator bed plates complete with stators were also fixed and one rotor completed with spider sections. The erection of the machinery is progressing satisfactorily.

The subsidiary power plants at Dhelu and Thuji have continued to give good service. The diversity factor varied between 37 and 60 per cent.

Power generation.

The power distribution system has continued to work satisfactorily, and few breakages were experienced.

Transmission lines.

The permanent workshops operated continually throughout the year and turned out work to the value of approximately Rs. 90,000 of which 2/3rd was in the metal section and consisted principally of steel sets for the tunnel, miscellaneous structural steelwork, overhauling machinery and electrical welding.

Permanent workshops.

The branch and subsidiary haulageways required to enable penstock pipes to be delivered at the lower end of the pipe track were completed.

Haulageways.

As work on the pipe tunnels had been practically completed, the pipe line, with all its connected works was transferred from the control of Mechanical Division to Adit Division in the beginning of the year. All anchors and supports were completed and the erection of the penstock pipes was finished in November. Three butterfly valves at Tunnel Exit and also needle valves were fitted. The testing of the penstock pipes was deferred till June 1932. Final surfacing of the pipe line track was practically completed. The small amount of work remaining to be done consists of alteration to drains and construction of bridges for local zamindars.

Pipe Line.

Excavation of the main tunnel.—(i) Midpoint heading, i.e., northwards from the junction of the adit with the main tunnel in the direction of the Uhl Valley.

Tunnel driving.

The Adit Division was to drive the tunnel up to R.D. 3,953.96 and this point was reached at the end of December 1931, but in order to expedite the work this Division continued driving operations in the reach allotted to Tunnel Division with the result that the tunnel was holed through on 1st March 1932 well ahead of the programme. Two thousand and seventeen feet were thus driven in Adit Division giving an overall average of 6.1 per day as compared with 6.8' in the previous year. The rock encountered was treacherous and the progress varied accordingly, but a record progress of 357' was achieved during the month of May 1931.

The tunnel alignment was found to be extremely accurate, an error of 11/16 of an inch in the centre line being detected at the meeting of the headings.

The tunnel was formally opened by His Excellency the Governor on 20th March 1932.

The driving from the North Heading was stopped at 8 A.M. on 28th February 1932 and that from the South Heading continued till the headings met at 5 A.M. on 1st March 1932. The progress recorded from 1st April 1931 to 28th February 1932 was 2,338 feet. The daily average progress was 7.0 feet against 5.1 feet for the year ending 31st March 1931 and 5.3 feet for the year ending 31st March 1930. In January 1932 the record drive for the North Heading was obtained with 300 feet progress; the highest figures previously obtained being 265 feet in June 1931 and 266 feet in August 1931. The total length driven from the Northern end was 6,411 feet, excluding 274 feet from R. D. 0 to the main portal and the 570 feet of valve Adit.

Midpoint heading.—Two thousand, seven hundred and ninety-three feet of complete ring were constructed leaving only 139 feet of invert and 159 of ring to complete the work up to R. D. 3,939.

Tunnel lining.

Surge Shaft Heading.—The work has been completed, 1,796 feet of complete ring having been constructed during the year. Low pressure grouting from the surge shaft up to R. D. 2,000 in the midpoint heading was also completed. Tunnel mantling in this heading was started at the beginning of October 1931 and 3,098 feet completed, *i.e.*, up to Adit Junction.

The surge shaft concreting was started in March 1931 and excellent progress was made until October when all but 100 feet had been lined. At this date owing to the bad ground and old timber in the shaft considerable sinkage occurred which, however, was stabilized after 3 weeks' grouting and the lining was completed to within 9 feet of the top on January 1st, 1932. After this date the chamber was started and all concreting in it was practically finished at the end of the year. At the same time low pressure grouting in the shaft was completed in the 16' dia. portion by the middle of March.

Pipe Tunnels.—The last 30 feet of each pipe tunnel near the surge shaft and short length of the main tunnel was concreted up along with that of the surge shaft.

North Heading.—One thousand, five hundred and three feet of concrete invert was laid and 1,743' of main ring lining was completed during the year. The valve chamber lining was completely finished and made ready for the installation of the high pressure valve, pipes and blank flange. All timber sets in valve Adit were replaced by steel sets and slabs.

Reinforced lining from the valve chamber to the main portal was completed to where transition to the lower pressure duct commences just inside Main Portal, *i.e.*, 538'.

In the granite gneiss 1,818 r.ft. of arch section lining was laid and 506' of invert completed. Grouting under a pressure of 100 lbs. per square inch was finished from R. D. 403 to R. D. 2,914, *i.e.*, 2,511 r.ft. in addition to the valve chamber was grouted up and extra grouting was applied to those portions of the tunnel where leaks were still showing after the first grouting had been done.

Reservoir, flume and Headworks.—These were all approaching completion by the end of the year, the Lambadug weir with the connecting duct to the Uhl weir, the decantation chamber, the blue pool rapid and stilling pond, the upper pressure duct, the upper main rapid, the open flume, the lower rapid, and forebay, the overflow channel, the filling flume and the various scours and sumps from the diurnal reservoir having been practically completed. Very little also remained to be done on the Uhl weir, where the installation of the gates was well in hand. The excavation and pitching of the diurnal reservoir was approaching completion and the slabbing of the bund has just been started. The whole reservoir should be finished by the end of September 1932.

19. The following work relating to the Construction Circle was carried out by the Technical Section of the Chief Engineer's office :—

- (i) Designs and skeleton estimates were completed for the power-house, tail race and weir, while a large number of detailed construction drawings were prepared showing the necessary foundations for the power-house generating machinery and the switch gear as these had to correlate the work of the contractors and our own constructing engineers at Jogindernagar.
- (ii) Contracts were placed through the Indian Stores Department, Delhi, for the steel work of the Shanan Power-House, the Shanan Power-House roof, and the transformer repair house at Shanan and Kangra.
- (iii) Tenders for transformers and switch gear for Shanan Power-House were also examined.
- (iv) Much other miscellaneous work of a routine but important character.

20. Much useful work was also done by the Resident Engineer in the Construction Circle. This covered :—

- (a) General survey work.
- (b) Major setting out and alignment and checking of completed work.
- (c) River gauging, rainfall and temperature records ; and
- (d) Aggregate, cement and concrete testing.

Details of the work done are not given in this report but the work has demanded the exercise of the greatest accuracy and care.

21. Lala Parmeshri Dass, Civil Officer, died on 5th July 1931 and the work was temporarily taken over by Major R. N. Aylward, Executive Engineer, until the arrival of Rai Sahib Shiv Shankar on 11th September 1931. In the Civil Officer's Court, 19 Civil and 31 Criminal cases were dealt with. The total value of Court fees amounted to Rs. 722 and the sale of non-judicial papers to Rs. 336.

TRANSMISSION CIRCLE.

22. The erection work on these lines has progressed steadily and well.

The position at the end of March 1932 was as under :—

Trunk and branch transmission lines.

(a) *Lahore-Amritsar section.*—The construction was started from the Lahore end and this section has been pushed to completion during the year under review. The

Trunk Line.

line has since been energised, and the Amritsar supply which is bought from the Lahore Electric Supply Company and which was previously transmitted by a temporary pole line has been transferred to this tower line and is working satisfactorily. This has afforded practical proof of the correctness of design and the sound construction of the line.

(b) & (c). *Amritsar-Dhariwal, Dhariwal-Pathankot Sections.*—The Amritsar-Dhariwal section previously formed part of the T. L/N Sub-Division and was added to the T. L/S Sub-Division during the year under report due to the changed requirements of the T. L. Division and during the latter part of the year under review (from February 1932) the Kangra substation construction was transferred to the control of Construction Circle to allow this Division to pay its entire attention to the completion of the trunk transmission line and the important technical buildings which are under construction at Lahore and Amritsar. Both these sections were completed during the year under report.

(d) *Pathankot-Kangra Section.*—The erection of towers in this section has been completed and the stringing of conductors is in progress and the work on the whole is more than 90 per cent. completed.

(e) *Kangra-Jogindarnagar Section.*—The erection of towers in this section is also finished and the stringing work is being vigorously pushed ahead. The work on the whole is about 90 per cent. completed and is well under control.

23. For the erection of towers and stringing of conductors and the consequent operation, it was necessary to remove all tall trees from 55 feet on either side of the trunk transmission line. This required careful attention and occupied a good deal of the time of the engineering staff engaged on the line, but it was accomplished in time to allow the construction work to proceed without hindrance in spite of the objections at times by the civil population in certain parts of the Kangra District.

24. A draft agreement for a right of way through the Kapurthala State was drawn up during the year and transmitted to the Kapurthala Darbar for acceptance.

25. In addition to improving the Kotla-Trilokpur, Ghandwal-Pathankot, Bhadiarkhar-Maranda District Board roads a light motor road at Bhed Khad, Ghatta and at mile 33 of the Pathankot-Kulu Road and a foot-path near Kotla were constructed for the transportation of heavy materials for the construction of the trunk transmission line. The total mileage of roads thus improved comes to 24 miles, and this has materially helped in the speedy construction of the line in the hills section.

26. The survey work for the 33 k. v. transmission line from Joginder-nagar to Mandi was commenced and completed during the year under report to enable the supply of current to the town of Mandi being made as soon as the ordinary commercial supply from the Shanau Power Station commences as is required under the terms of the agreement, with the Mandi Darbar. Other surveys in connection with the 11 k. v. lines from Kangra to Dharamsala and to Kangra town and Palampur are in hand. Several minor estimates for the supply of tools and plant and electrical and mechanical equipments were sanctioned during the year under report and purchases were effected and distributed according to the requirements of the Division.

27. The following is a brief explanation of the work done on the Branch Lines :—

Branch Lines.

- (a) *Lahore-Lyallpur*.—All steel work of towers, erected. Conductors 70 per cent. erected.
- (b) *Lahore-Ferozepore*.—All steel work of towers, with the exception of the Sutlej River crossing special towers, erected. Conductors 90 per cent. erected.
- (c) *Amritsar-Kartarpur*.—All steel work of towers, with the exception of the Beas River crossing special towers, erected. Conductors 50 per cent. erected. Sinking of wells for foundations of the Beas River crossing towers is in hand, but has been delayed by the presence of old steel rails, and boulders under the well curbs, which have delayed the sinking owing to difficulty in removing them under water.

28. The survey work in connection with the telephone system along the trunk transmission line has been commenced and was completed from Lahore to Pathankot. The services of a telephone expert have been obtained from England by Messrs. Callender's Cable and Construction Company, Limited, and the construction work will be started immediately after the completion of surveys through the agency of the firm with whom the contract has been placed.

29. As stated in the Administration Report for the year 1930-31, layout plans for the suggested distribution in 19 towns had been prepared, but these were not acceptable in as much as they represented the ultimate development in those towns in the 12th year of operation. Another set of estimates was accordingly asked for showing the expenditure likely to be required in the first 5 years together with a forecast of the minimum expenditure necessary to secure the load in those towns which would be ready for connection at the date power is made available. For this purpose it was found that the maps and plans in possession of the department

Town distribution.

were practically useless and as time was the essence of the contract it was impossible to wait until surveyors went out and surveyed the whole of these towns and produced fresh plans showing the location of the consumers' premises. In order, therefore, to expedite the work aerial photographs were taken of the towns and plans prepared from these photographs on a sufficiently large scale to show houses, trees, wells and compounds in the village so that not only could it be decided which side of the street the distributing mains should occupy, but also which of the suitable vacant pieces of land within the area of the village could be chosen as sub-station sites. This method of obtaining plans has expedited the work of preparing these new estimates considerably.

30. The order for the supply and erection of 132 k. v. substation equipment has been placed through the Director-General of Stores, India Stores Department, and the substation cranes have since been received and are being fitted up at Lahore and Amritsar.

31. The erection of switchgear and transformers in Shahdara substation (permanent equipment) and Verka substation (temporary equipment) has been completed and the supply to Amritsar has been given from March 16th, 1932, through these sub-stations over one circuit of the Lahore-Amritsar trunk transmission line.

32. Sheikhpura substation equipment is practically completely erected and only awaits minor details.

33. A temporary substation has been erected on the Shalimar substation site for the supply of power required by the crane, etc., for erection purposes.

34. (i) The work on the switch and condenser houses at Lahore and Amritsar was commenced in November 1931 and in spite of its being of an intricate nature, and the annoying delays which have taken place in the delivery of material they have been nearly completed.

(ii) The work on the outdoor switchgear foundations and plinths at Lahore and Amritsar was commenced during the year and finished in about three months.

(iii) The switch houses at Sheikhpura, Kasur and Ferozepore were taken in hand and the temporary switch houses completed at Verka and Shalimar.

(iv) The construction of staff quarters at Lahore and Amritsar, Dhariwal and Pathankot was undertaken during the year under report and pushed to completion within four months.

(v) The staff quarters at Sheikhpura, Kasur, Ferozepore, Lyallpur and Shahdara are well in hand. All will be completed within two months.

35. The construction of Railway sidings at Lahore and Amritsar was undertaken through the agency of the North-Western Railway and has been completed during the year under review. This will facilitate the transportation of heavy materials and machinery for the substation equipments. The construction of Railway sidings at Dhariwal and Pathankot is being taken in hand immediately.

36. In the Technical Section of the Chief Engineer's office the following works relating to the Transmission Circle were dealt with :—

(1) Final layout plans were prepared based on the contractors' switchgear drawings for all the 132 k. v. and 66 k. v. substations. This work had to be done twice over owing to the change made from the double busbar to the mesh type of outdoor switchgear upon the recommendation of our Consulting Engineers as unfortunately this recommendation only came in after the plans had been completed for the busbar type of layout.

(2) Preliminary designs and specifications were prepared for 11,000 and 400 volt local distribution lines and 11,000/400 volt substations for the towns of Pathankot, Dinanagar, Gurdaspur, Batala, Kartarpur, Phillaur, Ludhiana, Jandiala, Tarn Taran, Kasur, Ferozepore, Sheikhpura, Chuharkana, Nankana Sahib,

- Jaranwala, while the calling for tenders for these works through the Indian Stores Department, Delhi, included the preparation of specifications 567, 568 and G-13.
- (3) A specification No. 526-B was also prepared for 11,000/3,300 volt transformer and switchgear equipment for a substation at Moghulpura which would be necessary if an agreement is to be reached to supply power to the North-Western Railway. This specification was forwarded to the Director-General of Stores, London, so that he could obtain prices for the equipment required.
- (4) Tenders were received and considered for the local distribution to specification 567 for the towns already mentioned and Messrs. Callender's Cable and Construction Company's tender amounting to 9½ lacs was accepted in December subject to certain modifications and the omissions of the towns of Phillaur, Dinanagar, Jandiala, Tarn Taran, Nankana Sahib, pending further investigations.
- (5) The tenders on specification No. 526-B were examined but nothing further could be done towards accepting any tenders for the supply of this material until an agreement had been reached for the supply to the North-Western Railway ; but specification No. 571 covering the necessary modifications to the 3,300 volt switchboard at the North-Western Railway Moghulpura station was issued so that everything is in train for the prompt placing of the order once the agreement has been reached.
- (6) Contracts were placed through the Director-General of Stores, London, with the British Thomson Houston Company for the Amritsar 11 k. v. grid substation switchgear, with Messrs. Herbert Morris for the cranes for the 132 k. v. substations, with Messrs. Callender's Cable and Construction Company for the main trunk and branch transmission line telephone system, and through the Indian Stores Department, Delhi, for the steel work for the synchronous condenser house at Lahore, as well as the switchgear and transformer repair houses at Lahore and Amritsar.
- (7) An order was also placed through the Director-General of Stores for the special points and crossings for the heavy transformers tracks in the 132 k. v. substation. Tenders have also been received through the Director-General of Stores to specification 525 for the 33 k. v. substation equipment, transformers and switchgears for Kartarpur, Jullundur, Phagwara and Ludhiana and specification No. 570 has been issued for 11 k. v. ring mains, branch lines, and rural mains and general specification No. G-13 of 1932 has also been prepared and issued. This specification deals with 11 k. v. branch lines and rural mains as well as the 11,000 and 400 volt local distribution lines.

AMRITSAR ELECTRIC SUPPLY SCHEME.

37. The estimate was sanctioned for Rs. 8,16,000 in May 1929. During the year it was revised and finally approved for Rs. 7,24,000. The reduction is mainly due to a deduction for depreciation charges.
- Finance and accounts.**
38. The supply of power to Amritsar has continued throughout the year with only a few minor disturbances. The supply is now being given over the Lahore-Amritsar trunk transmission line which was energised at 33 k. v. for this purpose from 16th March 1932.
- Operation.**
39. Enquiries for additional power were received from the Municipal Committee, Amritsar, but as the Municipal Committee were not prepared to agree to the rates quoted, the negotiations fell through. Further enquiries were also received from Dhanpat Mall-Jawala Das of Lyallpur (for a
- Enquiries and negotiations for the sale of power.**

new Mill at Amritsar) and the Sheikh Ghulam Sadiq Woollen Mills, Amritsar, but no additional demand for power materialized.

LYALLPUR ELECTRIFICATION SCHEME.

40. It came to notice during the year that the Lyallpur Electrification Project Estimate was insufficient to cover the expenditure which had been incurred. Steps

Finance and accounts.

were immediately taken to have this project estimate revised and figures recently received from the Superintending Engineer, Transmission Circle, will enable this to be done.

41. The suppliers changed one of the faulty engines which failed last year, and the second is in process of change.

Power-House operations.

The scheme has run without trouble during the past year and the total load connected to the mains now aggregates 660 k. w.

42. This has been in operation for the past nine months, and has effected considerable saving in staff and increased efficiency in the distribution system.

Magneto telephone system.

43. Low tension mains have now been run into the factory area and to Abdullapur. Service connections totalled 748, with 15 power connections to motors of varying

Extensions and service connections.

sizes. Municipal street lights totalled 315.

STATEMENT A.

Name of Division.	Estimate No. and date.	Name of work.	Locality.	Amount of sanctioned estimate.	Expenditure incurred up to 3/32.	Date of commencement of work.	Work completed or in progress.	General remarks of progress on each separate work during the year.
1	2	3	4	5	6	7	8	9
		<i>H. P. A. (1)</i>						
'M'	B-157 of 1927-28	Manufacture, supply, delivery and erection, testing and setting to work of Dhelu Penstock Pipe.	Dhelu ..	Rs. 48,267 51,651	Rs. 52,529	November 1926	Completed.	
	Part B-6 of 1931-32.	Working and maintenance of Dhelu Power House.	Do. ..	12,622	12,243	April 1931 ..	Do.	
	B-12 of 1931-32	Maintenance of High and Low Tension transmission and distribution telephone and substation road lighting for 1931-32.	Works area	10,381	10,543	April 1931 ..	Do.	
		<i>H. P. A. (2)</i>						
'T'	B-258 of 1928-29	Additional ventilating duct for Tunnel Division.	Brot ..	33,235	31,349	March 1929 ..	In progress.	
	B-42 of 1931-32	Manufacture, supply and delivery at site and erection of tunnel unwatering steel pipes.	Do. ..	22,106 22,245	21,315	..	Do.	
'M'	B-168 of 1929-30	Supply and erection of one additional electrical main compressor plant.	Works area	28,665 29,463	25,208 25,562	August 1930 ..	Completed.	
	B-25 of 1930-31	Purchase, erection and delivery at site of one additional electric loco, two Edison batteries containers and two Edison batteries.	Do.	39,564 39,938	38,154 38,381	April 1930 ..	Do.	
	6-S. H. of 1927-28.	Purchase of two crushing and granulating plant.	Do.	73,028	84,762	August 1929 ..	Do.	
	B-39 of 1929-30	Manufacture, supply of 3 platforms carrying double and sack crossings and accessories of ramps.	Do.	30,467	27,254	Ditto ..	Do.	
	9-S. H. of 1927-28.	Tunnel Centring equipment	Do.	47,250	48,711	January 1930 ..	Do.	
'A'	B-159 of 1929-30	Additional ventilating ducts required for main tunnel.	Tunnel Adit	34,517	32,983	..	Do.	
	B-40 of 1927-28	Tunnel traction and lighting lines.	Do.	31,202	33,007	..	Do.	
M/M	B-117 of 1929-30	Supply and delivery of additional drilling equipment required for Adit and Tunnel Divisions.	Shanan ..	34,390	30,824	November 1929	Do.	
	B-49 of 1930-31	Supply of 50 lb. track to complete tunnel lining.	Do. ..	20,998	23,469	January 1931	Do.	
	B-123 of 1931-32	Supply and delivery at site of additional $\frac{1}{2}$ and $\frac{1}{4}$ C. yard concrete.	Do. ..	40,960	39,029	August 1930 ..	Do.	
	B-121 of 1929-30	Purchase of one number 4 size Myers Whaley Shovelling Machine.	Do. ..	34,426	31,461	March 1930 ..	Do.	
		<i>H. P. B. (1).</i>						
'M'	B-213 of 1928-29	Permanent way and sidings at Shanan.	Shanan ..	17,108	18,993	October 1928	Do.	
	B-73 of 1926-27	Supply of 3 overhead gantry cranes at Shanan.	Do. ..	14,872	16,096	October 1926 ..	Do.	
		<i>H. P. B. (2).</i>						
M/M	B-43 of 1931-32	Maintenance and operation of Haulageway from Buffer stop to Zero Point 1931-32.	Works area	78,566	94,788	April 1931 ..	Do.	

STATEMENT A—CONTINUED.

Name of Division.	Estimate No. and date.	Name of work.	Locality.	Amount of sanctioned estimate.	Expenditure incurred up to 3/32.	Date of commencement of work.	Work completed or in progress.	General remarks of progress on each separate work during the year.
1	2	3	4	5	6	7	8	9
'M'	B-169 of 1929-30	<i>H. P. B. (3).</i> Moving pipe line winch to new site and temporary haulage arrangements.	Works area	Rs. 21,799	Rs. 20,844	} May 1929 ..	Completed.	
				22,319	20,748			
	2-S.H.-1927-28	Manufacture, supply, erection, testing and taking over of pipe line haulage equipment.	Do. ..	1,25,962	1,31,603	} June 1927 ..	Do.	
			1,31,929	1,39,081				
	B-85 of 1930-31	Annual and manual transportation of materials during the re-construction of Pipe Line Winch House.	Do. ..	31,739	28,892	April 1930 ..	Do.	
'I'	B-74 of 1931-32	<i>H. P. C. (1).</i> Revised estimate for low tension distribution telephone line and connection at works site.	Works area	66,026	67,149	} October 1931	Completed.	
				66,130	67,199			
'T'	B-19 of 1931-32	<i>H. P. D. (1).</i> Construction of Lambadug Weir.	Brot ..	1,09,925	1,05,943	November 1930	Completed.	
	B-18 of 1931-32	Construction of Uhl Weir	Do. ..	2,87,916	2,75,767	October 1930	In progress.	
	B-89 of 1930-31	Decantation Chamber ..	Do. ..	1,39,202	1,18,501	April 1930 ..	Completed.	
	B-102 of 1931-32	Constructing duct connecting the two weirs.	Do. ..	51,476	38,099	September 1931	In progress.	
	B-128 of 1930-31	Hydraulic Gates for Head Works.	Do. ..	64,909	11,519	November 1931	Do.	
	B-8 of 1931-32	Constructing Scour Channels from Decantation Chamber.	Do. ..	15,955	3,453	March 1931 ..	Do.	
	B-57 of 1931-32	Lower pressure duct at Headworks.	Do. ..	1,08,220	1,04,679	July 1930 ..	Do.	
	B-80 of 1931-32	Constructing Forebay at Headworks.	Do. ..	1,15,123	1,00,974	March 1930 ..	Do.	
	B-130 of 1930-31	Hydraulic Gates and Screen for Forebay.	Do. ..	42,552	} 2,766	November 1931	Do.	
				44,150				
	5-S. H. of 1929-30	Excavation and lining of Diurnal Reservoir.	Do. ..	3,00,000	2,81,068	November 1928	Do.	
	B-148 of 1929-30	Scour and sump ..	Do. ..	10,628	8,220	June 1929 ..	Do.	
	B-85 of 1929-30	Diurnal Reservoir offtake	Do. ..	37,480	24,559	May 1929 ..	Do.	
	B-7 of 1931-32	Flume lower filling channel (Rapid and gate).	Do. ..	33,616	22,529	April 1930	Do.	
	B-131 of 1930-31	Lower pressure Hydraulic Valves and Screens for Reservoir.	Do. ..	72,722	} 220	December 1931	Do.	
				74,791				
	B-51 of 1931-32	Diurnal Reservoir Overflow	Do. ..	16,266	18,945	January 1931	Completed.	
	B-105 of 1930-31	Blue Pool Rapid and Stilling Pond.	Do. ..	55,023	54,480	April 1930 ..	In progress.	
	B-137 of 1930-31	Constructing Upper Main Rapid.	Do. ..	43,540	43,744	April 1930 ..	Completed.	
	B-87 of 1930-31	Flume ..	Do. ..	21,042	20,415	April 1930 ..	Do.	
B-54 of 1930-31	Upper Main Duct ..	Do. ..	1,58,000	1,20,706	April 1930 ..	In progress.		
'A'	B-145 of 1930-31	Mantle for tunnel lining ..	Tunnel Adit	25,298	..	..	Do.	

STATEMENT A — CONTINUED.

Name of Division	Estimate No. and date.	Name of work.	Locality.	Amount of sanctioned estimate.	Expenditure incurred up to 3/32.	Date of commencement of work.	Work completed or in progress.	General remarks of progress on each separate work during the year.
1	2	3	4	5	6	7	8	9
		<i>H. P. D. (2).</i>		Rs.	Rs.			
'T'	B-103 of 1931-32	Tunnel lining North Adit to R. D. 403.	Brot ..	86,746	83,511	November 1929	In progress.	
	B-72 of 1931-32	Valve Chamber excavation	Do. ...	28,457	27,222	July 1929 ..	Completed.	
'T'	B-118 of 1931-32	Valve Chamber lining ...	Do. ...	47,420	47,766	October 1929 ..	Do.	
	B-94 of 1930-31	Constructing valve Adit Portal at Brot.	Do. ..	13,575	11,641	April 1930 ..	Do.	
	B-129 of 1930-31	High pressure hydraulic valve in the Main Tunnel.	Do. ..	{ 58,639 60,466 }	..	Not commenced	..	
	B-1 of 1931-32	Replacement of timber sets by steel sets in the valve Adit.	Do. ..	33,333	26,301	March 1931 ..	Completed.	
	B-71 of 1931-32	Excavation of Main North Heading of Tunnel (North Adit Junction to Midpoint).	Do. ..	10,12,748	10,48,502	January 1929 ..	In progress.	
	B-112 of 1931-32	Revised estimate lining of Main Tunnel from Adit Junction to Midpoint.	Do. ..	5,39,068	4,76,838	October 1929 ..	Do.	
	B-61 of 1931-32	Grouting of Main Tunnel	Do. ...	26,720	13,968	May 1931 ..	Do.	
	B-109 of 1931-32	Lining tunnel through Granite Gneiss.	Do. ...	1,43,598	1,61,691	August 1931 ..	Do.	
'A'	B-108 of 1931-32	Lining of main tunnel from R. D. 196 Surge Shaft side to R. D. 139 Midpoint Side.	Tunnel Adit	52,469	40,462	..	Do.	
	B-56 of 1931-32	Grouting of Main Tunnel Lining from S. A. J. to Midpoint.	Do. ...	51,857	47,923	..	Do.	
	B-156 of 1929-30	Constructing permanent lining for Wyre Nallah, Adit.	Do. ...	82,126	56,525	..	Do.	
	B-46 of 1931-32	Excavation of Main Tunnel from S. A. J. to Midpoint.	Do. ..	6,02,897	7,37,989	..	Completed.	
	B-48 of 1931-32	Lining of Main Tunnel from F. A. J. to F. S. S.	Do. ..	4,43,075	4,68,906	..	Do.	
	B-144 of 1931-32	Lining of Main Tunnel from S. A. J. to Midpoint.	Do. ..	6,36,263	5,29,248	..	In progress.	
	B-40 of 1927-28	Tunnel traction and lighting lines.	Do. ..	31,202	33,007	..	Completed.	
	B-147 of 1930-31	Grouting of the main tunnel lining from F. A. J. to F. S. S.	Do. ..	52,483	63,605	..	Do.	
	B-145 of 1930-31	Mantle for Tunnel lining ..	Do. ..	8,27,284	4,94,103	..	In progress.	
	2-H of 1929-30	Supply and erection of Tunnel Pipes.	Do. ..	5,02,900	3,31,538	..	Do.	
	B-83 of 1931-32	Revised estimate for lining Surge Shaft.	Tunnel Exit	1,51,631	1,55,146	..	Completed.	
	B-107 of 1930-31	Lining of Pipe Tunnels ..	Do. ..	3,19,748	2,82,585	..	Do.	
	B-139 of 1931-32	Lining Surge Chamber ..	Surge Shaft	50,654	6,243	..	In progress.	
	B-116 of 1931-32	Grouting Surge Shaft ..	Do. ..	27,729	31,243	..	Do.	

STATEMENT A—CONCLUDED.

Name of Division.	Estimate No. and date.	Name of work.	Locality.	Amount of sanctioned estimate.	Expenditure incurred up to 3/32.	Date of commencement of work.	Work completed or in progress.	General remarks of progress on each separate work during the year.
1	2	3	4	5	6	7	8	9
		<i>H. P. D. (3).</i>		Rs.	Rs.			
'M'	B-90 of 1930-31	Branch Haulageway from M2, M4, B3 and Subsidiary Haulageway M4, B3 to XI, X2.	Works area	59,233	44,833	March 1931 ..	In progress.	
'A'	B-107 of 1931-32	Supply and erection of Main Penstock Pipes and Valves.	Pipe Line	21,74,611	18,73,503	..	Completed.	
	B-99 of 1930-31	Final surfacing of the Pipe Track.	Do.	60,145	30,325	..	In progress.	
	B-13 of 1931-32	Protection of Pipe Line Haulageway and Pipe Track.	Works area	50,427	16,918	..	Do.	
	B-100 of 1930-31	Reconstruction of Side Walls of Main drain along pipe line haulageway.	Pipe Line	45,800	43,388	..	Completed.	
	B-73 of 1930-31	Constructing Penstock Pipes anchors 2—8.	Do.	95,490	1,25,728	..	Do.	
	B-55 of 1931-32	Constructing anchors Nos. 9-15, Y1 and Y2.	Do.	2,34,121	1,78,855	..	Do.	
	B-70 of 1931-32	Constructing Anchor No. 1	Tunnel Exit	46,428	49,440	..	Do.	
	B-78 of 1931-32	Constructing Anchor XI, X2	Power-House	49,840	43,939	..	Do.	
		<i>H. P. E. (1).</i>						
'M'	B-5 of 1931-32	Protection Works, Shanan Nallah.	Works area	37,459	27,462	July 1930 ..	In progress.	
	B-86 of 1930-31	Steelwork Shanan Power House (Superstructure).	Jogindarnagar.	2,07,877	1,46,615	June 1931 ..	Do.	
	B-117 of 1931-32	Additional steelwork for Power House.	Do.	12,529	5	March 1932 ..	Do.	
	B-41 of 1931-32	Constructing sloping roof of Jogindarnagar Power-House.	Do.	54,997	98	September 1931	Do.	
	B-6 of 1932-33	Shanan Power-House Superstructure.	Do.	79,658	25,778	November 1931	Do.	
	B-143 of 1930-31	Power-House substructure and tailrace.	Do.	4,60,547	4,37,058	August 1930 ..	Do.	
	B-104 of 1931-32	Tailrace weir at Shanan Power-House.	Do.	38,119	12,614	July 1931 ..	Do.	
		<i>H. P. E. (2).</i>						
	Part 6-H of 1928-29.	Supply, erection and test of Shanan Generating Plant machinery and auxiliaries.	Jogindarnagar.	11,06,224	1,046	August 1931 ..	In progress.	
	Part 6-H of 1928-29.	Supply erection and test of Shanan Generating Plant cranes.	Do.	63,000	2,011	August 1931 ..	Do.	
		<i>H. P. E. (3).</i>						
	B-101 of 1930-31	Generating Station Switch Gear and cable.	Jogindarnagar.	5,83,279	8,918	March 1932 ..	In progress.	
		<i>H. P. E. (4).</i>						
	B-13 of 1932-33	Constructing cable duct ..	Jogindarnagar.	39,641	556	March 1932 ..	In progress.	
	B-81 of 1930-31	Technical equipment for Shanan Transformer Station.	Do.	7,76,000	..	October 1931	Do.	
'A'	B-10 of 1932-33	Constructing Transformer Station Works at Shanan.	Transformer Station.	42,387	16,917	..	Do.	
	B-119 of 1931-32	Constructing Transformer Repair House at Shanan.	Do.	36,320	13,596	..	Do.	

STATEMENT B.

STATEMENT OF EXPENDITURE DURING 1931-32.

Heads.	Expenditure.	Total.
	Rs.	Rs.
58—HYDRO-ELECTRIC SCHEME—CAPITAL EXPENDITURE (TRANSFERRED).		
(B) UHL RIVER PROJECT.		
B—1 (Production Works)	46,26,116	
B—3 (Transmission Works)	52,24,079	
B—5 (General charges)	92,705	99,43,123
B—6-A (Local Distribution)	223	
B—2 (Production Establishment)	3,62,503	
B—4 (Transmission Establishment)	2,25,428	
B—6 (General Establishment)	1,89,283	7,77,214
B—7 (Establishment Charges in England) .. .. .	..	—168
B—8 (Pensionary charges) .. .. .	..	..
B—9 (Suspense) .. .. .	..	—8,87,318
B—10 (Deduct Receipts on Capital) .. .. .	..	1,48,543
Total Uhl River Project .. .. .	..	99,81,542
(C)—LYALLPUR ELECTRIFICATION SCHEME.		
C—1 (Construction) .. .. .	..	68,212
C—2 (Establishment) .. .. .	..	..
C—3 (Depreciation) .. .. .	..	..
Total Lyallpur Electrification Scheme .. .. .	..	68,212
(D)—AMRITSAR ELECTRIC SUPPLY SCHEME.		
D—1 (Construction) .. .. .	..	1,17,746
D—2 (Establishment) .. .. .	..	..
D—3 (Depreciation) .. .. .	..	..
Interest on capital .. .. .	..	..
Total Amritsar Electric Supply Scheme .. .. .	..	1,17,746
Total 58—Hydro-Electric Scheme .. .. .	..	55,44,902
XXX-A—HYDRO-ELECTRIC SCHEMES—WORKING EXPENSES.		
D—LYALLPUR ELECTRIFICATION SCHEME.		
D—1 General charges .. .. .	..	9,725
D—2 Maintenance and operation of generating system .. .. .	..	35,927
D—3 Maintenance and operation of transmission system .. .. .	..	12,338
Total Lyallpur Electrification Scheme .. .. .	..	57,990
E—AMRITSAR ELECTRIC SUPPLY SCHEME.		
E—1 General charges .. .. .	..	581
E—2 Maintenance and operation of generating system .. .. .	..	2,41,249
E—3 Maintenance and operation of transmission system .. .. .	..	15,440
Total Amritsar Electric Supply Scheme .. .. .	..	2,57,270
Total XXX-A.—Working Expenses .. .. .	..	3,15,260

NOTE—

(1) The expenditure of the Secretary to Government, Punjab (Electricity) and the Commercial Manager is not included in these figures.

(2) These figures are exclusive of March Supplementary accounts and are, therefore, liable to be changed.

(3) XXX-A. D-1, D-2, D-3, E-1, E-2 and E-3 include figures of expenditure on establishment.

STATEMENT 'C.'

DETAILS OF ESTABLISHMENT CHARGES INCURRED DURING 1931-32.

Particulars.	Amount.	Total.
58—HYDRO-ELECTRIC SCHEME—CAPITAL EXPENDITURE (TRANSFERRED).	Rs.	Rs.
UHL RIVER PROJECT.		
B-2 (Production Establishment).		
Pay of permanent officers .. { Non-voted ..	69,041	
.. { Voted ..	7,347	
Pay of temporary officers .. { Non-voted ..	..
.. { Voted ..	78,442	
Pay of permanent establishment	18,996	
Pay of temporary establishment	1,24,961	
Travelling Allowance { Non-voted ..	3,375	
.. { Voted ..	7,959	
Other allowance and honoraria	25,827	
Supplies and services	2,392	
Contingencies	17,207	
Grants-in-aid Contributions and Donations { Non-voted ..	461	
.. { Voted ..	6,900	
Establishment Charges	—405	9,62,508
B-4 (Transmission Establishment).		
Pay of permanent officers { Non-voted ..	25,102	
.. { Voted ..	..
Pay of temporary officers { Non-voted ..	..
.. { Voted ..	59,566	
Pay of permanent establishment	6,096	
Pay of temporary establishment	79,461	
Travelling Allowance { Non-voted ..	1,504	
.. { Voted ..	31,665	
Other allowances and honoraria { Non-voted ..	..
.. { Voted ..	4,685	
Supplies and Services	70	
Contingencies	17,279	
Grants-in-aid Contributions and Donations { Non-voted ..	..
.. { Voted ..	..
Percentage establishment recoveries .. ..	..	2,25,428
B-6 (General Establishment).		
Pay of permanent officers { Non-voted ..	10,926	
.. { Voted ..	25,976	
Pay of temporary officers { Non-voted ..	..
.. { Voted ..	64,882	
Pay of permanent establishment	7,542	
Pay of temporary establishment	47,503	
Travelling Allowance { Non-voted ..	1,510	
.. { Voted ..	7,117	
Other allowances and honoraria { Non-voted ..	..
.. { Voted ..	8,533	
Supplies and services	135	
Contingencies	15,159	
Grants-in-aid Contributions and Donations { Non-voted ..	..
.. { Voted ..	..
Percentage establishment recoveries .. ..	..
Total	1,89,283	
Leave salaries paid in England { Non-voted ..	..
.. { Voted ..	..
Pensionary charges { Non-voted ..	..
.. { Voted ..	..
Total Uhl River Project	7,77,214	

STATEMENT C—CONCLUDED.

DETAILS OF ESTABLISHMENT CHARGES INCURRED DURING 1931-32—CONCLUDED.

Particulars.	Amount.	Total.
	Rs.	Rs.
XXX-A.—HYDRO-ELECTRIC SCHEME—WORKING EXPENSES.		
LYALPUR ELECTRIFICATION PROJECT.		
Pay of temporary officers	2,790	
Pay of temporary establishment	8,210	
Travelling Allowance	110	
Other allowances and honoraria	185	
Supplies and Services .. .. .	..
Contingencies	3,654	
Grants-in-aid Contributions and Donations	Nil	
Percentage establishment recoveries	Nil	
Total	14,949	
AMRITSAR ELECTRIFICATION SCHEME.		
Pay of temporary officers	{ Non-voted	
	{ Voted	
Pay of temporary establishment	6,680	
Travelling Allowance	Voted	794
Other allowances and honoraria .. .. .	..
Supplies and Services .. .. .	..
Contingencies	1,551	
Grants-in-aid Contributions and Donations	Nil	
Percentage Establishment recoveries .. .. .	..
Total	9,025	
Total XXX-A.—Working Expenses Establishment	23,974	

STATEMENT C—continued

DETAILS ON ESTABLISHMENT CHANGES IN FISCAL YEAR 1952

Establishment	Particulars
100	100
101	101
102	102
103	103
104	104
105	105
106	106
107	107
108	108
109	109
110	110
111	111
112	112
113	113
114	114
115	115
116	116
117	117
118	118
119	119
120	120
121	121
122	122
123	123
124	124
125	125
126	126
127	127
128	128
129	129
130	130
131	131
132	132
133	133
134	134
135	135
136	136
137	137
138	138
139	139
140	140
141	141
142	142
143	143
144	144
145	145
146	146
147	147
148	148
149	149
150	150
151	151
152	152
153	153
154	154
155	155
156	156
157	157
158	158
159	159
160	160
161	161
162	162
163	163
164	164
165	165
166	166
167	167
168	168
169	169
170	170
171	171
172	172
173	173
174	174
175	175
176	176
177	177
178	178
179	179
180	180
181	181
182	182
183	183
184	184
185	185
186	186
187	187
188	188
189	189
190	190
191	191
192	192
193	193
194	194
195	195
196	196
197	197
198	198
199	199
200	200

