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GOVERNMENT OF THE PUNJAB  
MINISTRY OF AGRICULTURE

PUBLIC WORKS DEPARTMENT  
BUILDINGS AND ROADS BRANCH

**ADMINISTRATION REPORT**

INCORPORATING THE REPORT OF  
**THE COMMUNICATIONS BOARD,**

FOR THE YEAR

**1932-33.**

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Lahore :

PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRINTING, PUNJAB.

1934.

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# ADMINISTRATION REPORT, 1932-33.

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**Proceedings of the Punjab Government (Ministry of Agriculture) in the  
Public Works Department, Buildings and Roads Branch.  
No. 512-G., dated the 6th March 1934.**

READ—

The Administration Report of the Public Works Department, Buildings and Roads Branch, for the year 1932-33.

THE total expenditure for the year was Rs. 1,04,27,059 as against Rs. 1,21,32,504 for 1931-32 and an average of Rs. 1,60,18,264 for the past ten years. The decrease is due to curtailment of expenditure on new works as well as on repairs and maintenance of buildings, roads and bridges, necessitated by the continuance of financial stringency.

The net percentage of expenditure on establishment to the total expenditure on works during the year amounted to 14.35, as compared with 14.8 last year, and an average of 14.45 for the past ten years. This is creditable in view of the decrease in total expenditure and is due to further drastic reduction in establishment.

*Communications.*—The total mileage of roads maintained by the Department at the end of the year was 2,703 miles metalled and 1,949 miles unmetalled, showing an increase during the year of 4 miles in the former, which is mainly due to the completion of new works. There was practically no change in the total unmetalled length. The widening of the metalled and tarred width of the road between Lahore and Amritsar from 12' to 20' proved to be a very great boon to the motoring public, the increased width enabling cars and lorries to pass one another with ease on the metalled surface, so avoiding the necessity for utilising the berms which are a source of inconvenience and danger, especially in wet weather. It is obvious that similar action will have to be taken on other congested roads as funds permit.

The policy of surface-treatment has been vigorously continued, 595 miles of the Grand Trunk and other roads being surfaced during the year, leaving only 1,043 miles still to be done, and it was anticipated that the surfacing the whole of the Grand Trunk Road would be completed before the end of the year 1933-34, which will indeed be a matter for congratulation. Apart from the question of solving the dust nuisance with the rapid increase in motor traffic, it was realized that the withholding of funds for this important work was only a false economy in the long run, and there were satisfactory signs that the maintenance costs were gradually dropping and the drop will be even more marked as the programme draws nearer to completion. The opening paragraphs of Chapter 2 deal in more detail with this matter.

Certain sections of the more important of the Arterial Roads in the province which were taken over from District Boards under the Road Classification Scheme still remain unmetalled owing to lack of funds. With the large increase in motor lorry traffic these sections have been subjected to heavy wear, and the funds available for maintenance are insufficient to maintain them adequately for fast moving light motor traffic. The year under report has seen the inauguration of a system of service roads along these sections, which consist of carefully maintained tracks about 10' wide on one side of the main surface. They are restricted under the Punjab Motor Vehicles Act to the use of light motor vehicles only, access thereto by lorries being prevented by the construction of barriers and dividing trenches. These service roads are cheap to maintain and provide a long felt want in the shape of a satisfactory surface for all high speed light motor traffic. The principal sections on which these service roads have been constructed are—

Montgomery-Chichawatni-Khanewal.

Multan-Jehanian.

Lyallpur-Jhang.

Jhang-Shorkot-Kabirwala.

Lyallpur-Chiniot-Sargodha.

Chiniot-Pindi Bhattian.

Fazilka-Ferozepore.

*Bridges.*—The most important work under execution during the year was the rehabilitation of the bridge over the river Jhelum at Kohala, which was damaged and rendered unsafe by the abnormal floods

of 1929. The work was completed at an approximate cost of Rs. 52,000 and the bridge was opened to traffic on the 1st of August 1932. The design which was prepared by the Deputy Chief Engineer, Bridges, North-Western Railway, was an ingenious one, which, by a system of cantilevers, rendered the main structure independent of the unstable hill side on the right bank. The cost of the work was more than compensated for by the amount obtained in tolls for one year only.)

**Quarries.**—The output from Government quarries continued to be extremely small, the demands for road metal having decreased very considerably with the increase in surface treatment. Moreover, with the drop in labour rates, privately owned quarries have been in a position to compete successfully with rates for Government quarries which were fixed on long leases.

**Buildings.**—The total value of buildings erected during the year was Rs. 14,76,564. Medical buildings formed the largest item, followed by those for the Education Department and Civil Works. The expenditure under major heads on buildings (Original Works and Repairs) was—

Department.	MAJOR HEADS.		
	41—Civil Works.	60—Civil Works Capital Expenditure.	56—Capital Industrial Development.
	Rs.	Rs.	Rs.
General Administration (Reserved) .. .. .	72,006	..	..
General Administration (Transferred) .. .. .	1,74,334	..	..
Jails and Convict Settlements .. .. .	1,61,543	..	..
Police .. .. .	1,49,664	..	..
Education .. .. .	2,23,834	..	..
Medical .. .. .	1,73,501	84,289	..
Agriculture .. .. .	74,317	..	..
Civil Works .. .. .	2,16,022	..	..
Other Departments .. .. .	1,45,108	..	1,787

The year under review saw the completion of the project, previously known as the Maternity Hospital, Lahore. The Operation Block of this hospital, which was the last building to be erected, was opened by Lady Willingdon on the 12th March 1933, and at the opening ceremony the hospital was named after Her Excellency. The project was completed, exclusive of equipment, at a total expenditure of Rs. 10,76,430, of which the sanitary, water, electrical, heating and air conditioning services alone cost about Rs. 3 lakhs. With the completion of this work, Lahore has been provided with one of the most modern and up-to-date maternity hospitals in India.

The Public Health Circle continued its activities, and 22 preliminary and detailed major projects, 208 minor projects and more than 225 estimates for maintenance and operation of water supply and sanitary installations were prepared during the year, during which period five new schemes were commenced and 11 were completed. The total expenditure in the circle amounted to Rs. 1,85,311, against which Rs. 1,11,002 were earned for Government from contribution works only. The more important works carried out were—

- (i) **Murree Waterworks Extension.**—This work involved the construction, in two compartments, of a large pressed steel reservoir of over three million gallons capacity at Dunga Gali, to store the surplus water available in the hills in the early spring for use at Murree during the succeeding dry months, and was completed at the end of September 1932.
- (ii) **Steam Boiler Plant and refrigerative air conditioning installation in the Lady Willingdon Hospital, Lahore.**—The



former is supplying steam for the sterilizers and for the heating and hot water supply of the whole hospital, and the latter maintains the desired atmospheric conditions for the Septic block through all seasons of the year.

- (iii) *Work on the Bhiwani water supply* also continued to progress. During the year from installations maintained by the Public Health Circle 108,146,261 gallons of sewage and sullage, and 897,102,202 gallons of drinking water were pumped as compared with 130,399,290 gallons and 1,006,319,395 gallons, respectively, during the previous year.

*Electrical Engineering.*—The activities of this branch continued to be steadily on the increase during the year under review. Estimates were prepared for electrifying all Government buildings in 15 towns covered by the Uhl River Hydro-Electric Project and also in the towns of Montgomery and Sargodha.

*Engineering Education.*—

(a) *The Maclagan Engineering College, Moghalpura.*—The report for the year shows that the college maintains its popularity. Owing probably to retrenchment and the consequent difficulty of obtaining employment, competition for admission to the college was not so keen as in the previous year, and in the 'B' class only 200 candidates competed for 35 vacancies, as against 400 in 1932. Twenty students competed for admission to the 'A' class, of whom 17 were admitted.

The results of the final examinations in 1932 showed that out of 9 'A' class students who sat, 6 passed, and of the 37 'B' class students who appeared, 22 secured qualifying marks.

The 'A' class is now affiliated to the University of the Punjab in the Faculty of Engineering and it is gratifying to note that of the 18 students who sat for the degree of B.Sc. in Engineering in 1932, 13 were successful.

A number of 'A' class students have appeared for External Examinations of the institution of Mechanical, Electrical, Structural and Automobile Engineers, London, and many have been successful.

The general health of the staff and students has been satisfactory and this is undoubtedly due to the keen interest taken in games and sports by all.

The cost per student amounted to Rs. 814 as compared with Rs. 919 last year.

(b) *The Government School of Engineering, Punjab, Rasul.*—Here again competition for entrance to the School was not so keen as in previous years, only 113 candidates competing for 55 vacancies as compared with 295 candidates for 66 vacancies in 1931-32.

The results of the final examination for overseers were very satisfactory, 42 students obtaining the higher certificate (12 "Honours" and 30 "Credit") and 26 the Lower or "Ordinary" certificate. Of the successful Punjabi candidates employment was found for 15 in the Subordinate Engineering Service and Military Engineering Service. Students from the Indian States and other Provinces were dependent on their respective Governments for employment.

All 11 draftsmen students in the 2nd year and all 5 in the 3rd year course qualified, the latter doing exceptionally well. Of the total only 3 obtained employment.

During the year a new post of Vice-Principal was created and was held by Mr. R. F. T. Farrant, Assistant Engineer, on deputation from the Irrigation Branch.

Considerable retrenchment has been effected in the staff and it is gratifying to note that the endeavours to reduce the running expenses of the school have resulted in a further saving of Rs. 6,945 during the year under report. Owing to a fewer number of students appearing in the

admission examination, however, the net cost per student has risen slightly, being Rs. 504 per annum against Rs. 487 per annum last year.

*Communications Board.*—During the year the Board held two regular meetings and one sub-committee meeting. Administrative approval was accorded to one project of the value of Rs. 41,300 and Commissioners were advised to accord similar approval to 43 projects at a value of Rs. 68,940. Technical sanctions were accorded to 47 projects amounting to Rs. 1,60,138 by the Engineer Secretary and he also advised certain district boards in regard to the preparation of estimates for maintenance of Class II roads. Funds to the extent of Rs. 3,23,091 were distributed as grants-in-aid, but owing to acute financial stringency there was little expansion of communications and the activities of the Board were therefore mainly confined to questions relating to the development and maintenance of Class II roads.

At the end of the year under review there were 1,201.58 miles of metalled and 6,895.50 miles of unmetalled Class II roads under the charge of district boards, these roads being improved and maintained with the aid of grants from the Communications Board. Due to the inability of district boards to provide for the efficient maintenance of their existing metalled mileage, the Communications Board has been averse from considering applications for the increase of such mileage, and during the year under review  $6\frac{1}{2}$  miles only were added to the metalled mileage.

Again, due to financial stringency, the Board has been unable to continue the systematic improvement of the remaining Class II roads by means of road grading outfits and during the year under review the Board was allotted only Rs. 25,000 for the improvement of roads, as against an average of Rs. 3.70 lakhs during the past six years.

The diagram placed in the pocket of this report shews the grants made by the Communications Board during the past 6 years. From this it can be seen that grants have dropped almost steadily from Rs. 5.59 lakhs in 1927-28 to Rs. 2.78 lakhs in 1932-33, notwithstanding the fact that the total mileage metalled and unmetalled has increased from 8,035 miles to 8,097 miles. In the same period the total expenditure on maintenance of Class II roads has dropped from Rs. 13.35 lakhs to Rs. 9.68 lakhs.

During the year the Board passed a resolution that the post of whole-time Secretary should be revived in the interests of efficient supervision. This has however not materialised so far for want of funds. On the other hand one of the two posts of Assistant Engineer was reduced during the year.

The overhead charges computed against the total expenditure of Rs. 10,99,782 on all Class II roads, by both the district boards and the Communications Board, amount to a nominal figure of 1.4 per cent. as against 1.8 per cent. last year.

*Administration.*—The Punjab Government (Ministry of Agriculture) has already recorded in the last Administration Report its profound sense of loss caused by the untimely deaths of Mr. E. L. Crawford, late Chief Engineer and Secretary to Government, Punjab, Public Works Department, and Mr. A. K. Cargill, late offg. Superintending Engineer, which occurred on the 6th July 1932 and 22nd May 1932, respectively. The Ministry wishes to record its appreciation of the great energy, tact, and resourcefulness which Mr. Macfarlane has brought to bear on the administration of the Department.

By order of the Punjab Government,

JOSENDRA SINGH,  
Minister for Agriculture.

D. MACFARLANE,  
Secretary to Government, Punjab,  
Public Works Department,  
Buildings and Roads Branch.

# ADMINISTRATION REPORT OF 1932-33.

## CHAPTER I.—Administration.

*Secretariat.*—Mr. E. L. Crawford, I.S.E., continued as Secretary to Government, Punjab, Public Works Department, and officiating Chief Engineer up to the 6th July, 1932, when the Department suffered a great loss by his sudden death. He was succeeded on the 11th idem forenoon by Mr. D. Macfarlane, I.S.E., who remained incharge of the office till the close of the year.

Mr. S. Bashiram, I.S.E., Executive Engineer, continued as Under-Secretary throughout the year.

Mr. G. E. J. Haegert held the post of Assistant Secretary.

*Circles.*—The charge of the first Circle of Superintendence was held by Mr. D. Macfarlane, I.S.E., Superintending Engineer, up to the forenoon of the 9th July, 1932, when he was relieved by Mr. R. Trevor Jones, M.C., I.S.E., Executive Engineer, who held officiating charge of the Circle up to the forenoon of the 22nd October, 1932. He was relieved by Sardar Bahadur Sardar Gurbakhsh Singh, M.B.E., I.S.E., Superintending Engineer, who continued to hold charge till the close of the year.

Mr. A. K. Cargill, I.S.E., officiating Superintending Engineer, held charge of the Second Circle of Superintendence up to the afternoon of the 22nd May, 1932, when he died after a very brief illness. Mr. S. G. Stubbs, O.B.E., I.S.E., officiating Superintending Engineer, held charge of the Circle for the remaining period of the year.

Sardar Bahadur Sardar Gurbakhsh Singh, M.B.E., I.S.E., Superintending Engineer, held charge of the Third Circle of Superintendence till the forenoon of the 15th October, 1932, when he was relieved by Rai Bahadur Lala Sant Ram, I.S.E., Superintending Engineer, who remained in charge of the Circle till the close of the year.

Mr. D. A. Howell took over charge of the office of Superintending Engineer of the Public Health Circle on the 2nd April, 1932, from Rai Bahadur Diwan Amar Nath, Nanda, who proceeded on leave preparatory to retirement.

*Electrical.*—Mr. F. L. Milne continued as Electrical Engineer to Government, Punjab, throughout the year.

*Architectural Circle.*—Mr. B. M. Sullivan, O.B.E., continued as Superintending Architect, Architectural Circle, throughout the year.

*Communications Board.*—Sardar Bahadur Sardar Gurbakhsh Singh, M.B.E., I.S.E., held charge of the office of the Secretary to the Board in addition to his own duties as Superintending Engineer, Third Circle, Lahore, till the forenoon of the 15th October, 1932, when he was relieved by Rai Bahadur Lala Sant Ram, I.S.E., Superintending Engineer, who remained in charge of the combined offices till the close of the year.

*Engineering Education.*—Captain H. Whittaker continued as Principal of the Maclagan Engineering College, Moghalpura, and Mr. C. E. Blaker, as Principal of the Government School of Engineering, Punjab, Rasul, throughout the year. Mr. R. F. T. Farrant, Assistant Engineer (Irrigation Branch), joined the latter institution as Vice-Principal from the 7th November, 1932.

*Divisional Charges.*—On the abolition of the Shahpur Provincial Division on the afternoon of the 10th April, 1932, Shahpur Sub-Division was attached to the Lyallpur Provincial Division and Jhelum Sub-Division to the Rawalpindi Provincial Division.

In the Public Health Circle, the Ambala Public Health Division was amalgamated with the 2nd Lahore Public Health Division from the afternoon of the 14th May, 1932, and the latter, with the 1st Lahore Public Health Division from the afternoon of the 25th idem, and during the rest of the year, only one Division, re-named the Lahore Public Health Division, remained open. The number of Sub-Divisions in this Circle was also reduced from five to four, the Ludhiana Sub-Division being amalgamated on the 6th April, 1932, with the Bhiwani Sub-Division, with headquarters at Bhiwani.

Under the Electrical Engineer to Government, Punjab, a second electrical division, known as the II Lahore Electrical Division, was formed from the afternoon of the 5th September, 1932, the existing Division being designated the I Lahore Electrical Division. The latter Division comprised the No. 2 Lahore Electrical Sub-Division, the Renala Hydro-Electric Sub-Division and the Simla Power House; and the II Lahore Electrical Division, the Nos. 1 and 3 Lahore Electrical Sub-Divisions.

*Expenditure and Establishment.*—The following statement shows for the year under report and the previous year, the expenditure incurred, and the percentage of establishment to total expenditure :—

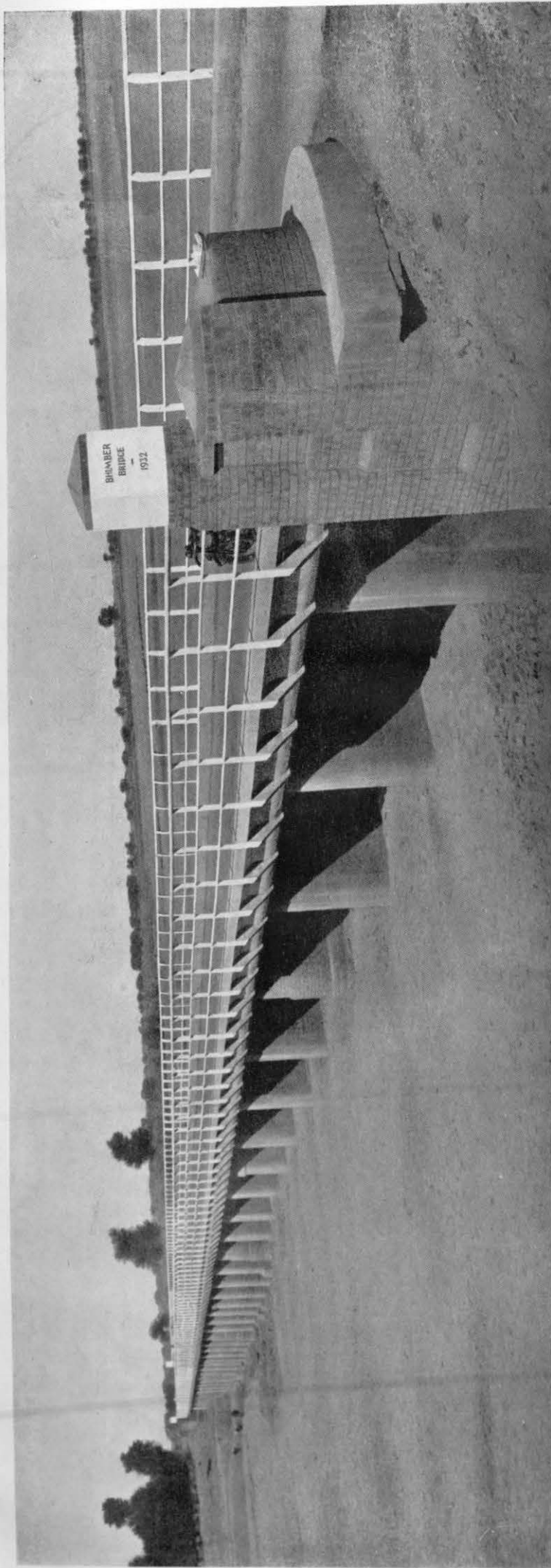
Year.	Total Expenditure on Works.	EXPENDITURE ON ESTABLISHMENT.			Gross percentage of figures in column 5 to those in column 2.	Net percentage after deducting 25 per cent on account of extraneous works.
		Total Expenditure.	Deduct cost of engineering education.	Net Expenditure.		
1	2	3	4	5	6	7
	Rs.	Rs.	Rs.	Rs.		
1931-32 ..	89,18,215	22,52,318	4,93,443	17,58,875	19·72	14·8
1932-33 ..	77,83,838	19,18,745	4,28,795	14,89,950	19·14	14·35

The reasons for adopting the figure of 25 per cent. in the last column of the statement are explained in Chapter I of the Administration Report for 1930-31.

*General.*—The Department lost, during the year under report, two valuable officers in Mr. E. L. Crawford and Mr. A. K. Cargill whose untimely deaths on 6th July, 1932, and 22nd May, 1932, respectively, are much deplored.

Mr. K. G. Mitchell, I.S.E., Executive Engineer, continued to remain on deputation with the Government of India, Department of Industries and Labour, Public Works Branch, as Road Engineer to the Government of India.





NEW BHIMBER BRIDGE IN MILE 74.

G. T. ROAD NEAR GUJRAT.

## CHAPTER II.—Roads.

The total mileage of roads maintained by the Department at the end of the year was 2,703 miles metalled and 1,949 miles unmetalled. The increase of 4 miles in the metalled length during the year was mainly due to the completion of new work and there was practically no change in the total unmetalled length as the increase due to new construction was compensated for by reduction due to remeasurement of mileages. During the year 2.05 miles of unmetalled road were taken over under the second instalment of the Road Reclassification Scheme.

2. The grant received from the Central Road Fund during the year amounted to Rs. 6,08,119, which sum, together with Rs. 4,25,731 which formed the balance from the preceding year, gave a total of Rs. 10,33,850 available for road development during 1932-33. It again became necessary, however, to divert a portion of this sum, with the prior approval of the Government of India, to road maintenance and Rs. 6,00,000 were accordingly diverted, subject to the condition that the Punjab Government would undertake, at the earliest opportunity when finances render this possible, to restore the amount borrowed and apply it to the construction of works in the approved programme and further that Government would undertake that they would not, as the result of the relief afforded by the loan, relax their efforts to provide funds for maintenance, or allow the total provision to fall below the minimum necessary to prevent serious deterioration of their roads. The total expenditure on maintenance was kept down to Rs. 45,09,893 as against the budget provision of Rs. 45,00,000. The tarring policy was extended still further, 595 miles of the Grand Trunk and other roads being surfaced leaving 1,043 miles still to be done. The policy was adopted of surfacing every freshly reconsolidated mile regardless of its position in the Province. It was anticipated that the surfacing of the whole of the Grand Trunk Road would be completed before the end of the year 1933-34.

3. The diagram in the pocket of this report shows the progress during the past 10 years. It is interesting to note the increase in mileage, the metalled mileage having been more than doubled whilst the unmetalled mileage has been very nearly trebled. The curves show, however, that the total expenditure on both types of road has not risen proportionately, and in fact, that the maintenance costs of both types have shown downward tendencies, particularly as regards the metalled roads, for which the peak of Rs. 1,703 per mile was reached in 1925-26, since when, there has been an almost steady drop in expenditure, which amounted to only Rs. 1,466 per mile in 1932-33. This drop is mainly due to the recent introduction of surface treatment. It will be more marked as the programme approaches completion.

4. As the result of tarring of road surfaces, operations at the Government quarries have slackened off very appreciably as the demand for road metal has very much decreased.

### *Arterial No. 1.—The Grand Trunk Road.*

*Lahore-Amritsar.*—The traffic on this section is very congested, and its previous metalled width, varying between 12 feet and 16 feet was found inadequate.

The portion between Attari and Amritsar was, therefore, widened to 20 feet last year, widening of the remaining miles being also in progress. The work was practically completed during the year. Expenditure of Rs. 1,17,971 was incurred against the sanctioned estimate of Rs. 1,18,667.

Expenditure amounting to Rs. 10,849 and Rs. 7,971 was also incurred on special repairs to the protection works round the piers of the bridges over the Sutlej and Beas rivers, respectively, in the Jullundur district.

A recent photograph of the Bhimber Bridge, near Gujrat, which was completed last year, is included in this report.

### *Arterial No. 2.—Lahore-Sargodha-Mianwali.*

Improvements were undertaken to the sections Khushab to Bundial and Bundial to Mianwali, and some earthwork in the road embankment was carried out. An expenditure of Rs. 36,854 and Rs. 2,118 was incurred on these sections against sanctioned estimates of Rs. 1,13,328 and Rs. 85,000, respectively.

*Arterial No. 4.—Lahore-Multan-Quetta.* ✓

Before the transfer, about six years ago, of this road to the charge of this Department, the Lahore-Multan Road was a katcha road maintained by the District Boards of the respective districts through which it passed. The metalling of this road was gradually put in hand, and now extends to milestone 35 from Lahore. The alignment of this road having been changed from Bhai Pheru to Pattoki *viâ* Halla, to the more direct route *viâ* Jhambar Kalan, an estimate amounting to Rs. 4,37,616 was sanctioned for the construction of this portion, 15 miles in length, and the work was started in February, 1931. The earthwork and construction of culverts were carried out during 1931-32 at a cost of Rs. 48,123 and it was hoped to complete this important section in the following year.

The metalling of the section Pattoki to Wan Radha Ram has been in progress, and is being proceeded with as funds permit. Earthwork for road formation and bridges and culverts were completed, and soling coat was laid in the first  $3\frac{1}{2}$  furlongs of mile 51, the last 3 furlongs of mile 52, and in the whole of miles 53 and 54, except the last furlong of the latter. Work to the extent of Rs. 89,953 was done, against a sanctioned estimate of Rs. 2,16,000. A level crossing was also under construction at Wan Radha Ram by the Railway Department on behalf of the Public Works Department. All work on the crossing was completed, with the exception of the interlocking arrangements for the Distant Signals.

The working of the Steam Ferry at Ghazighat, which was taken over from the North-Western Railway last year, remained in the hands of this Department. The Executive Engineer, Multan Provincial Division, assisted by Mr. J. P. O'Reilly, Ferry Superintendent, were responsible for the satisfactory working of the Boat Bridge, Steam Ferries and Conveyance of Mails.

*Arterial No. 5.—Lahore-Ferozepore-Ludhiana.*

Owing to financial stringency very little progress has been made in the widening of the metalled portion of this arterial road to 12 feet, mile 17 being the only one widened during the year under report.

*Arterial No. 6.—Delhi-Multan.*

The length of this road between Delhi and the Sutlej River at Suleimanki is 264 miles. Of this 193 have been metalled and 7 provided with soling coat. The road from the Delhi border to Badopal was metalled in previous years and details of the work in hand on this road during the year under report are given below :—

*Section Badopal-Sirsa.*—Eleven miles of this section, soling coat for which has already been collected, still require to be metalled. Further work is stopped for want of funds. It was originally proposed to adopt the standard width of 110 feet, but in consequence of surface treatment it is now considered that a width of 80 feet will be sufficient, as a result of which the acquisition of land has been reduced every appreciably.

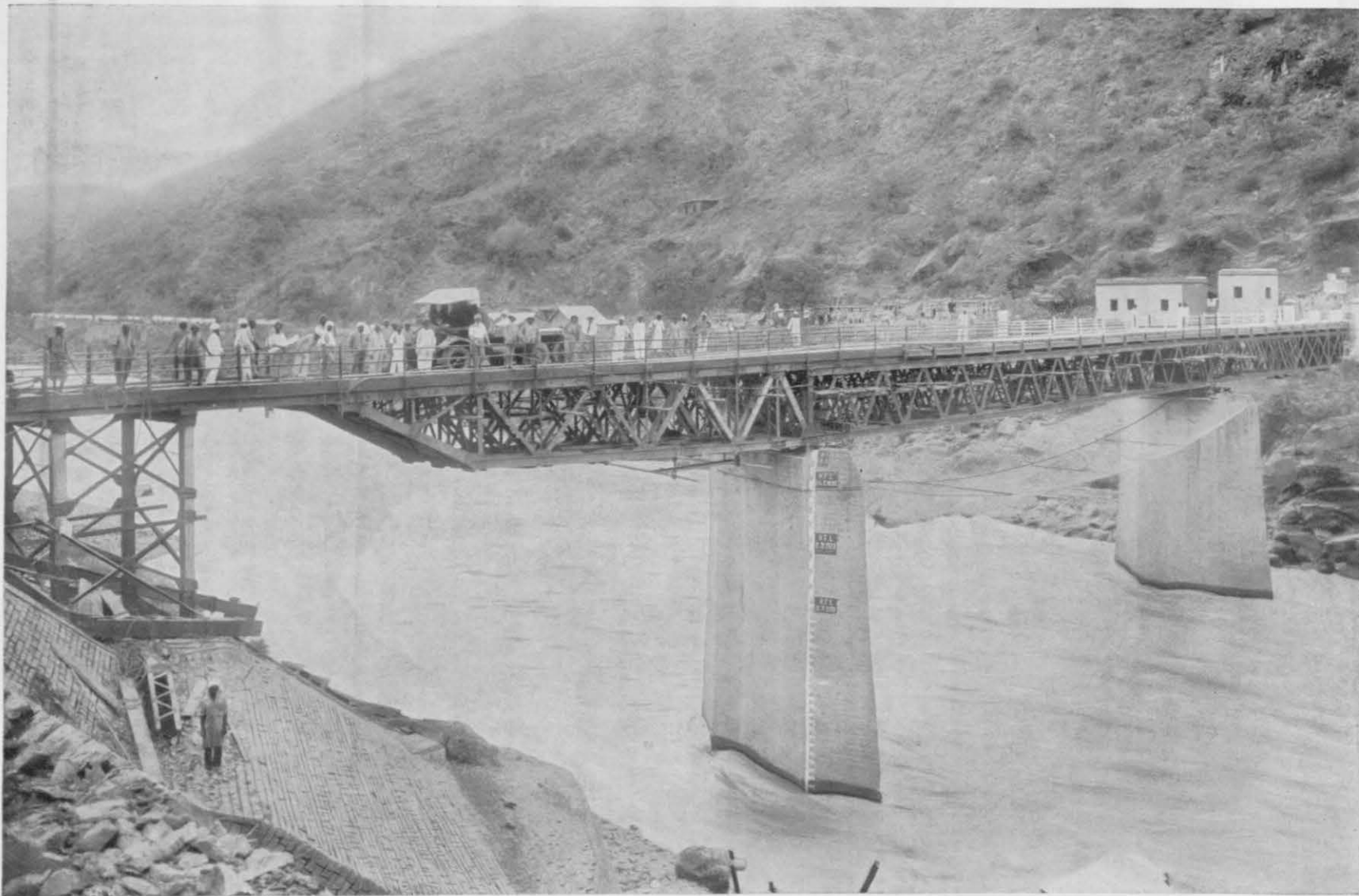
*Section Sirsa-Dabwali.*—The demarcation of the road boundaries together with the widening of the road between Sahuwal and Dabwali, which is being financed from the Central Road Fund, has been completed with an expenditure of Rs. 50,093. The traffic on this portion of the road being insignificant there was no justification at present for doing more than keeping it clear of sand during the winter months.

*Section Dabwali-Malaut.*—The accounts were closed during the year under review, the metalling having been completed in 1930.

*Section Malaut-Abohar.*—Only Rs. 2,469 have so far been spent in connection with the widening of this section of the road, which is at present unmetalled. In view, however, of the very light traffic on the road and the fact that it runs parallel to the railway, there is no economic justification for metalling it, except in the first 5 miles in the vicinity of Abohar, where the traffic is greatest and the soil sandy. The road has been realigned and the new alignment does not coincide with that of the old road, hence land acquisition proceedings for an area of 46.03 acres, based on an 80 feet width, have been started.

*Section Abohar-Fazilka.*—The metalling of this section was completed in 1928 and the year under review has been occupied with negotiations in connection with assessments for the acquisition of land.





KOHALA BRIDGE ON THE RAWALPINDI-KASHMIR ROAD.

VIEW SHOWING COMPLETED BRIDGE TAKEN FROM LEFT BANK PRIOR TO TESTING ON 30-7-32.



*Section Fazilka-Suleimanke.*—The metalling of this section is still in progress and has been completed up to mile 261 (3 miles short of Suleimanki) and a soling coat has also been collected and laid in the first three furlongs of mile 263. Further progress has been postponed on account of difficulties which have arisen in connection with the alignment in the vicinity of the Suleimanki Headworks.

*Arterial No. 11.—Rawalpindi-Murree-Kashmir.*

(The bridge over the river Jhelum at Kohala was damaged by the floods of 1929. The work of reconstruction was commenced on the 21st April 1932, and completed on the 27th July 1932, the bridge being opened to traffic on the 1st August 1932. The major portion of the work was executed by the Bridge Department of the North-Western Railway and the Public Works Department is largely indebted to Mr. W. T. Everall, O.B.E., M.Inst. C.E., Deputy Chief Engineer, Bridges, North-Western Railway, for the interest, and resourcefulness shown by him in designing and carrying out the work.) Briefly, the scheme comprised the strengthening of the middle span by an additional girder and the prolongation of this triple grillage of girders as cantilevers for an overhang of some 73 feet, on the right bank of the river. From the end of the cantilevers a light structure, supported on a trestle tower, spans the intervening gap of 46 feet to the top of the bank. Thus the difficulty of founding an abutment on the proved unstable bank, was obviated. The hillside above the road at this point has been drained, and, it is hoped, rendered immune from slips. A system of extensive protection works will, it is hoped, prevent erosion from below, even during the severest floods. If, however, damage should occur, only the light span of 46 feet should be affected, and the main cantilever should remain intact. The decking is of wood and on the light span all steel members are merely bolted, thus facilitating dismantlement and re-erection, if ever necessary.

The cost of the work was approximately Rs. 52,000. As soon as the bridge was opened on August 1st, 1932, the toll was sold for Rs. 41,000 and for the ensuing year the Civil Department realized a sum of Rs. 60,000 which figures demonstrate clearly the commercial value of the undertaking.

*Arterial No. 12.—Jhelum-Sohawa-Talagang.*

Improvements to the Chakwal to Talagang section of this road were undertaken, and nearly all the earthwork in road formation, hill-cutting and construction of six large culverts was completed. Further work is held in abeyance for want of funds.

The expenditure incurred so far on the improvements amounts to Rs. 38,287 against a sanctioned estimate of Rs. 1,97,860.

*Arterial No. 15.—Pathankot-(Chakki)-Dalhousie.*

Owing to very heavy rains, the Chakki-Dalhousie Road was badly damaged and several retaining walls and culverts collapsed. The damage was set right at an approximate cost of Rs. 30,000.

The width of metalling in some of the miles is 12 feet, and in the others only 9 feet. This is a source of trouble and inconvenience in these days of fast motor traffic. It is, therefore, hoped, when funds permit, to widen the metalled surface to a uniform width of 12 feet throughout. An estimate for Rs. 33,100 was administratively approved for further cutting away the steep conglomerate cliffs in mile 34, but work was postponed indefinitely for want of funds.

*Arterial No. 17.—Ferozepore-Fazilka.*

Further work on the widening and metalling the Ferozepore-Jalalabad Section of this road was held up for want of funds. A total expenditure of Rs. 39,369 has so far been incurred on this work against a sanctioned estimate of Rs. 5,73,821.

Further work on the widening and metalling of the Jalalabad-Fazilka Section, miles 33-54.32 was also held up for want of funds.

*Arterial No. 18.—Jullundur-Hoshiarpur-Dharmasala.*

Remetalling of miles 26, 27 and 28 of this road in Hoshiarpur district, commenced on the 17th November 1930, was completed on the 1st March 1932, at a cost of Rs. 30,677 against a sanctioned estimate of Rs. 58,371. The accounts were finally closed in the year under review. The land valued at Rs. 12,844 for an 80 feet road width, provided for in the estimate, has not so far

been acquired, for want of funds. The accounts will be re-opened when the necessity arises. The work of improving and widening this road, between Ranital and Kangra, commenced on the 17th February, 1930, is still in progress, the execution of the work being regulated according to the extent that funds are available during each year. Work to the extent of Rs. 58,529 has been carried out so far, against the sanctioned estimate of Rs. 1,41,100.

*Arterial No. 20.—Ambala-Simla-Tibet.* ✕

*The Ghaggar Ferry.*—During the year under review there was a particularly heavy monsoon and the Ghaggar river was in flood no less than 38 times. The first flood appeared as early as 25th May, 1932, and the highest recorded flood was 15 feet on the 17th August 1932. The ferry was worked for 57 days and 1,305 cars and lorries were ferried across from the 25th of May to the 3rd of October. The maximum interruption to traffic occurred between the 17th and 18th of August and the 7th and 11th of September.

The two ferry boats are operated when the depth of water varies between the limits of one and-a-half and three feet. Traffic can cross the stream without the aid of boats when the water is less than the lower limit but at depths of more than 3 feet, the velocity is too great for safe navigation. As long as the stream does not split itself up into more than two channels, and there is no large difference in the depth and velocity in these channels, little difficulty is experienced in the operation of the ferry. During last summer, however, the stream not only split up into four channels, but the intervening sand banks became very soft, and remained so for many hours after the high flood had subsided. The two ferry boats were of little use and traffic was held up for hours on several occasions. The number of ferry boats is now being increased to four. In addition to this, improvements have been effected in order to keep the public better informed of the behaviour of the river. Notice boards have been erected at suitable places at Ambala, Kalka, Kasauli and Simla which indicate whether the Ghaggar is passable or not. It is hoped that in the next financial year, inconvenience to the public will be very much decreased.

A new cart halting place was built at Kandaghat, on the Kalka-Simla section of this road, as a deposit work at an expenditure of Rs. 19,078 (Rs. 16,032 as contribution, and Rs. 3,046 as grant-in-aid) against the sanctioned estimate of Rs. 26,673, being finished on the 14th October 1931, except for the water-supply which was completed on the 31st May 1933.

Some of the retaining walls on this section (Kalka-Simla) were damaged by heavy rains during the year. These were restored at a cost of Rs. 2,444 under a special repair estimate. Damage was also done by heavy rains and snow to the road beyond Simla, the section affected being between Thanedar, mile 51, and Bhera Khud, mile 58. This too was restored at a cost of Rs. 2,000 out of the grant for annual repairs for the year under report.

*Arterial No. 28.—Lyallpur-Sargodha.* ✓

A number of estimates for improvements of various sections of this road have already been sanctioned and work started, but as there was no grant against these estimates during the year under report, no progress could be made. This road connects two District headquarters and big markets, and is now being much used, since the opening to traffic of the Chenab Bridge, near Chiniot. The whole road requires metalling.

*Arterial No. 31.—Lahore-Moga.* ✓

This road is being constructed section by section. The metalling of the section Bhikiwind to Harike including the branch road to Patti, was completed last year with the exception of the last three and-a-quarter miles on which a soling coat covered with earth is laid at present. The collection and metalling of the wearing coat on these miles is held over till the financial position improves. The remaining portion of the road from Harike to Moga can hardly be regarded as a work of urgency, as Moga is already connected with Lahore and elsewhere by the Lahore-Ferozepore-Ludhiana road on which it lies. Moreover, its completion will involve the construction of a boat bridge across the Ravi, with boats from a dismantled bridge at Khushab for which greater use is likely to be found.

Arterial No. 34.—Amritsar-Sialkot.

This road was taken over from the district boards concerned during the years 1927-28 and 1928-29. An estimate was sanctioned, during 1930-31, for constructing the section Ram Das to Basantar Nallah, at a cost of Rs. 3,70,600; and the necessary bridges and culverts were completed last year. The cost of the work carried out up to the end of the year under review, amounted to Rs. 85,297. Speedy progress has not been possible, as this has had to be regulated in accordance with the funds available each year.

A considerable saving in the cost of land acquisition was effected by reducing the land width required from 110 feet to 80 feet, in the Gurdaspur District.

Other Roads.

A three-hinged steel arched bridge was constructed last year over the river Beas on the road from Katrain to Naggar—a link road to the Kulu-Rotang Pass Road—with a floor width of 3 feet 6 inches. As this width was found to be too narrow, the floor was widened to 6 feet during the year under review and the bridge completed.

A three-pinned arch bridge over the river Chandra at Koksar in mile 42/6 of the road from Kulu to Lahaul was also started on 6th May 1932, and practically completed, with the exception of fixing the floor planks which will be done next year.

Communications in the Nili Bar.

The following major works on communications, relating to the Nili Bar Colony, were completed under the Major Head "60—Civil Works, Capital Expenditure":—

Name of work.	Estimate.	Expenditure.
	Rs.	Rs.
1. Constructing a metalled road from Montgomery to Arafwala .. .. .	6,27,379	6,54,555
2. Constructing bridges and culverts in the Nili Bar Colony .. .. .	1,46,882	1,28,754

Items 1-2.—The accounts were closed during March 1932, Supplementary.

The following was in progress:—

Name of work.	Estimate.	Expenditure during 1932-33.
	Rs.	Rs.
Acquisition of land for Nili Bar Communications in Multan District .. .. .	3,70,530	—7,466

This estimate will now be closed as all further acquisitions of land are to be provided for, in the road estimates concerned.

This expenditure will be adjusted in March 1933, Supplementary.

Quarries.

Warcha Quarry.—This quarry siding was laid by the Railway Department at the cost of the Public Works Department. Loading charges per truck have hitherto been levied at the rate of Rs. 6 per wagon. The Railway Department have lately raised the point that in accordance with the agreement between the Railway

and the Public Works Department, Rs. 12 per truck are payable for the trucks loaded at this siding. This works out to an average of Rs. 2-12-0 per cent. cubic feet of stone loaded, which raises the cost of metal so high that there is little or no possibility of this siding at Warcha being made use of, and the Department is considering the question of closing it down.

The metal booked from this quarry for various Departments was as follows :—

	C.ft.
(1) Secretary, Municipal Committee, Montgomery .. .. .	2,453
(2) Public Works Department works at different places .. .. .	1,22,144
(3) Multan Provincial Division .. .. .	5,658

*Taraki Quarry.*—Only 1,02,604 c.ft. of stone was supplied from this quarry during the year and as the position has not improved, the quarry is likely to be closed down as a Government concern, at an early date. Proposals are, however, being considered for the leasing of the quarry on a royalty basis.

*Chandigarh Stone Quarry.*—During the year under report the total output from this quarry was 5,35,583 c.ft. of stone metal, 25,996 c.ft. of boulders and 2,69,146 c.ft. of bajri.

As a result of extensive tarring, the quantity of metal needed for renewals will become less and less as time goes on, and eventually will almost disappear. Further, as tarring is now the generally accepted practice, it is quite possible and advisable, in the interests of durability, to make use of as hard a metal as is available at a reasonable rate; therefore, Delhi, Pathankot, Mukerian and Jaijon stone is now being used in areas previously served by the Chandigarh Quarry. Hence, as far as road metal is concerned, this quarry is gradually falling into disuse, the main demand being for bajri, of which the probable annual requirements are estimated at about 3 lacs c.ft.

Proposals have been put forward to close down the quarry, and the whole question is under consideration by Government.

#### *Tools and Plant.*

The sentinel tractors purchased some time back have not been a success under present conditions on account of the cheap bullock cart transportation available now-a-days. Steps are, therefore, being taken to dispose of them.

Three tandem rollers, bought about six years ago for work in the Nili Bar, have also given much trouble mainly because they are fitted with vertical boilers. As an experiment, the makers, have at their own expense, replaced the vertical boiler in one of these rollers with a horizontal one, with beneficial results. Negotiations are on foot to carry out similar alterations to the other tandem rollers.

### CHAPTER III.—Buildings.

#### A.—BUILDINGS—SUPERINTENDING ARCHITECT.

1. During the year the Superintending Architect's office was occupied with the following works :—

(a) *Lady Willingdon Hospital, Lahore.*—The Operation Block was opened by Lady Willingdon on the 12th of March, 1933, which event marked the completion of the whole scheme. At the opening ceremony the hospital was named after Lady Willingdon.

The scheme as built consists of a Main Block containing 56 beds arranged in four wards and 8 single-bed private wards. There is an Administration Block containing, besides administrative offices, a Dispensary arranged for ready access from the City, accommodation for the Resident Medical Officer and quarters for students on the first floor. The Operation Block contains two labour rooms on the ground floor and two operation rooms on the first floor with their subsidiary rooms and offices. The Nurses' Home contains quarters for the Matron, Sisters, House-keeper, and Nurses with common dining and sitting room. In front of this building is a lawn for recreation. In addition to these buildings there are quarters for dais, laundry, an ambulance garage, gate lodge and quarters for servants.

The total cost of the project, exclusive of equipment provided by the Medical Department, amounts to Rs. 10,76,420 of which Rs. 3,02,209 is the cost of the sanitary, water, electrical, heating and air conditioning services, the remaining Rs. 7,74,211 being the cost of the fabric, gardens and roads.

(b) *High Court, Lahore.*—The working drawings of all the buildings of the High Court extensions were completed. The estimates were also put in hand but as the Superintending Architect now only has one estimator, and as great urgency existed for the preparation of estimates for the New Legislative Council Chamber, the High Court estimates were temporarily put on one side. The project will cost about Rs. 9,25,000.

(c) *Civil Hospital at Gujranwala.*—Working drawings of the furniture for this hospital were supplied.

(d) *General Improvements over Part " B " of the Gazetted Officers' Residences Estate, Lahore.*—The working drawings and detailed estimate of this project were completed. When carried out, the improvements to the whole estate will be finished. The amount of the estimate is Rs. 47,574, but at present no funds are available to carry out the work.

(e) *Erection of the New Legislative Council Chamber at Lahore.*—Government decided in November 1932 to proceed with this building on the Charing Cross site at a cost of approximately Rs. 9,00,000. It was hoped that the working drawings and estimates would be ready by December 1933 and the structure completed by about December 1935. This building which will be one of very considerable architectural beauty, will form the first stage in a scheme, which includes on this site, a completely new Civil Secretariat with subsidiary local government offices. This scheme, however, is unlikely to materialise for many years to come.

(f) *Additions and alterations to the temporary Legislative Council Chamber, Lahore.*—As the new constitution will be formed before the new Legislative Council Chamber can be ready, it became necessary to make additions and alterations to the existing temporary Chamber to increase the seating from 96 to 200, and to add increased gallery and vestibule accommodation and other items. Working drawings and estimates were put in hand for this work. The alterations and additions will be completed by October 1933. The work will cost Rs. 39,000.

(g) *Deputy Commissioner's house, Lahore.*—Drawings and estimates were prepared for alterations to the Deputy Commissioner's house at No. 7, Golf Road, on the Gazetted Officers' Residences Estate, Lahore.

(h) *House on site 44 of the Gazetted Officers' Residences Estate, Lahore.*—Working drawings and a detailed estimate were prepared for a type III-A house for all-the-year-round occupation.

(i) *Office accommodation for the Electricity Branch of the Public Works Department.*—Instructions were received to examine the suitability of a site in McLeod Road for this building. The necessary information has been collected and a report is in hand for issue early in April.

(j) *Gazetted Officers' Residences Estate, Lahore.—Block of four Flats.*—This project, prepared long since, was re-examined with a view to ascertaining at what cost it could now be built. The old estimates were rechecked and fresh figures prepared.

(k) *Cosmopolitan Club, Lahore.*—Revised drawings were prepared of the elevations of extensions to this building, which stands in the Lawrence Gardens.

## 2. *Town Planning and Improvement Schemes :—*

(a) Revised plans of Mandi at Narang were prepared and sent to the Commissioner, Lahore, for final examination.

(b) Levels are still being taken over the whole of the Shahdara Area which is to be developed and a system of bunds to prevent flooding from the Ravi, is being considered in consultation with the Public Health Circle, which is working them out. On receipt of the drawings of the bunds and levels the plans will be prepared.

(c) Drawings have been provided to assist the Automobile Association of Northern India in constructing road directions signs.

*Lahore Improvement Committee.*—The Superintending Architect continued as Secretary and technical officer of this Committee. It prepared and issued to the Commissioner, Lahore, a set of bye-laws covering the erection of notices, placards and bills on public and private land and buildings. Fifteen cases came before it and advice was given regarding buildings and sizes of compounds, in many of which improvements resulted. It undertook to prepare certain proposals for improvements along the Mall, but nothing materialised owing to delay in receiving the necessary information from the Lahore Municipal Committee.

8. *Earnings.*—A sum amounting to Rs. 3,294-14-0 was received by the Punjab Government on account of work prepared by the Superintending Architect for private bodies.

## B.—BUILDINGS—SUPERINTENDING ENGINEERS.

### 50—MILITARY ENGINEER SERVICES.

No Military works were carried out during the year under review.

### 41—CIVIL WORKS—CENTRAL.

No works were carried out during the year under this head.

### PROVINCIAL CIVIL WORKS.

#### 41—CIVIL WORKS—PROVINCIAL.

##### A.—Land Revenue.

##### B.—Excise.

##### C.—Stamps.

##### D.—Forests.

##### E.—Registration.

No works of any importance were carried out under any of these sub-heads.



*F.—(a) General Administration (Transferred).*

The following major work was in progress :—

Name of Work.	Estimate.	Expenditure.
	Rs.	Rs.
Constructing metalled roads and surface drains in Fort Land Area, Lahore	89,529	88,251

This work was completed last year with the exception of a small portion on the site occupied by the Infectious Diseases Hospital of the Lahore Municipal Committee. Work on this site, which was cleared by the Lahore Municipality last year, was resumed.

*F.—(b) General Administration (Reserved).*

*G.—Administration of Justice.*

*H.—Jails and Convict Settlements.*

*I.—Police.*

*J.—Scientific.*

No work of any importance was carried out under these sub-heads.

*K.—Education, other than European and Anglo-Indian.*

The following major works were completed :—

Name of work.	Estimate.	Expenditure.
	Rs.	Rs.
1. Additions and alterations to the DeMontmorency College at Shahpur to provide for the teaching of Science	29,232	27,488
2. Constructing a Normal and Middle School and Boarding House for Girls at Hoshiarpur	1,76,517	1,50,321

*Item 1.*—The work was commenced on the 1st September, 1932, and practically completed during the year under report. The final bill of the contractor is under preparation and the accounts will be closed shortly.

*Item 2.*—The work was commenced on the 8th February, 1930, and completed on the 29th March, 1932. The accounts will be closed in March 1933, Supplementary.

*L.—Education, European and Anglo-Indian.*

No work of any importance was carried out under this sub-head.

*M.—Medical.*

The following major work was in progress :—

Name of work.	Estimate.	Expenditure.
	Rs.	Rs.
Additions and alterations to Tehsil Headquarters Hospital at Rupar in Ambala district	31,266	26,153

The work was stopped in 1931-32 owing to the Municipal Committee, Rupal, refusing to hand over the Hospital building to Government. The Hospital building having been provincialized and possession of the land and building taken by this department on 22nd December, 1932, the work was restarted on 19th January, 1933, and completed on the 30th April, 1933.

*N.—Public Health.*

*O.—Agriculture.*

No work of any importance was carried out under these sub-heads.

*P.—Industries.*

The following was completed :—

Name of work.	Estimate.	Expenditure.
	Rs.	Rs.
Special Industrial School for teaching metal work at Sialkot .. .. .	73,570	75,850

The work was practically completed last year, so far as this Department was concerned, but its accounts could not be closed until the cost of steel gates, to be supplied by the Industries Department, was adjusted. The accounts will be closed in March 1933, Supplementary.

*Q.—Civil Works.*

The following major work was in progress :—

Name of work.	Estimate.	Expenditure.
	Rs.	Rs.
Constructing a workshop for the Maclagan Engineering College, Moghalpura .. .. .	26,534	9,847

Work was started on the construction of a workshop at the Maclagan Engineering College, Moghalpura, at an approximate cost of Rs. 26,534. This workshop will help considerably in the practical training of the students. The cost covers the following items of work :—

	Rs.
(i) Preparation of site .. .. .	3,000
(ii) Cost of building .. .. .	10,152
(iii) Plant and machinery including water supply and electric installation .. .. .	13,382

*R.—Stationery and Printing.*

*S.—Miscellaneous Departments.*

No work of importance was carried out under these sub-heads.

*U.—Miscellaneous.*

In progress :—

Name of work.	Estimate.	Expenditure.
	Rs.	Rs.
Opening of South wall of the Old Fort, Lahore ..	1,12,310	1,05,958

## 43—FAMINE RELIEF.

No famine relief works were opened by the Public Works Department during the year.

## 60—CIVIL WORKS (CAPITAL EXPENDITURE).

A.—Land Revenue.

B.—Excise.

C.—Stamps.

D.—Forests.

E.—Registration.

F.—(a) General Administration (Transferred).

F.—(b) General Administration (Reserved).

G.—Administration of Justice.

H.—Jails and Convict Settlements.

I.—Police.

J.—Scientific.

K.—Education, other than European and Anglo-Indian.

L.—Education, European and Anglo-Indian.

No work of any importance was carried out.

M.—Medical.

The following was completed :—

Name of work.	Estimate.	Expenditure.
Constructing a residence for the Civil Surgeon at Ludhiana	27,025	81,145

The work was commenced on the 21st April, 1928, and completed on the 30th January, 1929. The large excess over the estimate is due to Government having been forced, under orders of the Civil Court, to acquire an additional three acres of land together with an old house standing thereon in excess of the land originally acquired for the work. The accounts will be closed as soon as the appeal filed by Messrs. Hans Raj and Brothers, for enhancement of compensation of land occupied by Government for the construction of the residence, is decided by the High Court of Judicature at Lahore.

In progress :—

Name of work.	Estimate.	Expenditure.
	Rs.	Rs.
1. Constructing an Operation Block in the Lady Willingdon Hospital, Lahore.	99,269	99,071
2. Constructing metalled roads and laying out ground plots in the Lady Willingdon Hospital, Lahore	12,088	12,071

*Item 1.*—The work is practically complete except for certain finishing touches which will be carried out in the next year.

*Item 2.*—The work is practically complete, and the accounts are being closed.

## Deposit Works.

In progress :—

Name of work.	Estimate.	Expenditure.
	Rs.	Rs.
1. Constructing Main Block of the New Civil Hospital at Gujranwala	77,212	75,515
2. Constructing quarters for 6 compounders, 6 menials, 3 sweepers, 3 kitchens and one Infectious Ward and latrines at the New Civil Hospital, Gujranwala	29,584	297

The administrative approval for the entire scheme which includes the above works amounts to Rs. 2,55,504 and a sum of Rs. 1,52,024 was deposited as contribution money by the Municipal Committee, Gujranwala.

The undermentioned sub-works have since been completed at a cost of Rs. 94,474.

	Rs.
(a) Constructing Assistant and Sub-Assistant Surgeons' quarters ..	18,926
(b) Main Block .. .. .	75,548
Total .. .. .	94,474

Besides, funds, as detailed below, were earmarked for Sanitary and Electric Installations :—

	Rs.
(c) Sanitary Installation .. .. .	42,976
(d) Electric Installation .. .. .	6,816
Total .. .. .	1,44,266

After meeting the above expenditure there was a saving of about Rs. 7,758 against the contribution of Rs. 1,52,024.

The undermentioned sanctioned sub-works had to be deferred till an additional contribution is deposited by the Gujranwala Municipality :—

Name of sub-work.	Estimated cost.	Net cost after deducting contractor's abatement.
	Rs.	Rs.
(i) Constructing quarters for 6 Compounders, 6 Malis, 3 Sweepers, 3 kitchens, infectious wards and latrine	29,584	25,230
(ii) Constructing 2 quarters for Chowkidars, 1 godown, 1 ambulance garage, drains, culverts, fencing, gates and mortuary .. .. .	7,135	6,015
(iii) Constructing Dhobi Ghât, bathing platform, grassing and gardens, roads, paths, temporary wire fencing and boundary gate .. .. .	11,798	9,945
(iv) Certain additions required by the Inspector-General, Civil Hospitals, Punjab, to the Sub-Assistant Surgeon's quarters .. .. .	714	714
(v) Equipment, etc. .. .. .	2,204	1,994
Total .. .. .	51,435	43,898

The Municipal Committee, Gujranwala, was asked to deposit a further sum of Rs. 41,000 in order to complete the above mentioned sub-works but, pending receipt of the additional contribution, the work on item (ii) above was put in hand against the saving of Rs. 7,758. It was, however, stopped because the Inspector-General desired to start work first on item (i) above and the family wards.

A meeting consisting of the Inspector-General of Civil Hospitals, Punjab, the Superintending Engineer, Third Circle, the Civil Surgeon, Gujranwala, the President, Municipal Committee, Gujranwala, and the Deputy Commissioner, Gujranwala, was convened at Gujranwala, on the 11th February, 1933, to discuss the affairs of this hospital and also all points relating to the financial condition of the Municipal Committee. A fresh programme of buildings which should be constructed immediately was drawn up. It was also decided, in order to secure a further saving in cost, to use old materials, because, in addition to the above mentioned works, one female ward for 12 beds and two family wards, both being outside the scope of the original administrative approval, were proposed to be constructed. At the same time it was suggested that the siting of some of the buildings still to be constructed, should be altered. This necessitated the preparation of a revised lay-out plan. This question is under consideration and, pending a decision thereon, the execution of further sub-works has been withheld.

## CHAPTER IV.—Public Health Engineering.

1. Twenty-two preliminary and detailed major projects, 208 minor projects and more than 225 estimates for maintenance and operation of water supply and sanitary installations, estimated to cost in the aggregate Rs. 17,33,301 were prepared during the year. About four hundred and forty visits were made to various towns, villages and other places in connection with water supply and other sanitary schemes and to give advice to local bodies on various questions connected with public health. Five new schemes were commenced and 11 completed during the year.

2. *Borings*.—Five borings were undertaken during the year out of which three were successful and approved as sources of water supply. Brief descriptions of some of these are given in the following paragraphs.

3. *Works*.—The following works remained in progress during the year :—

### (a) Government Works—

- (1) *Water borne sewerage in Civil Secretariat and adjoining offices, Lahore, Rs. 23,029.*—The estimate for this work was sanctioned administratively but no funds have been provided for the work so far.
- (2) *Proposed extramural drainage and sullage disposal in Borstal Institution, Central Jail and Female Jail, Lahore, Rs. 83,565.*—The scheme was completed during 1931-32. Extra customs duty on pumps has been paid during the current year. Accounts could not, however, be closed as the Executive Electrical Engineer has not yet raised the debit for the extra customs duty to be paid by him on the electrical plant.
- (3) *Providing additional Tubewell at the Borstal Institution, Lahore, Rs. 14,448.*—This scheme provides an independent tubewell water supply for the institution. The new tubewell has been put in, pump chamber built, and the pumping plant erected. The scheme is practically completed, but the accounts have not been closed.
- (4) *Water supply, drainage and sanitary installation at Lady MacLagan Normal and High School for Women, Lahore, Rs. 40,411.*—A tubewell has been sunk and the chamber nearly completed. One tank equivalent to half the capacity provided in the estimate has been erected. The pumping machinery is on order.
- (5) *Sewerage Scheme in Main and Anatomical Block, New Medical School, Amritsar, Rs. 10,187.*—The work consists of a small system of sewers with septic tank and a booster pumping set. The scheme was completed during last year and the accounts have now been closed.
- (6) *Sewerage Scheme, Maclagan Engineering College, Moqhalpura, Lahore, Rs. 86,516.*—The internal drains and sewers of this scheme were almost finished in 1929-30 and the disposal works have been completed during the year under review. The electrical connections to the machinery have been made and the plant will be in running order by the middle of April, 1933. Sanitary fittings have also been installed, and little only now remains to be done.
- (7) *Providing a Tubewell and Water Supply for Fort Terraces, Old Fort, Lahore, Rs. 12,905.*—This work consists of a tubewell with electrically driven pumping plant and delivery pipeline for the supply of water to the Fort Terraces on the south side of the Old Fort and also to the Additional Police Lines in the Fort. The scheme has been completed and the accounts will be closed in March Supplementary accounts.
- (8) *Water Supply, Lady Willingdon Hospital, Lahore, Rs. 25,102.*—Direct water connection has been laid to the feed tank on the Nurses Home. In view of the opening ceremony of the Hospital the direct connection to the tank in the Administration Block could not be completed. Pipes for this connection have, however, been indented for.

(9) *Heating installation in Block "B", Lady Willingdon Hospital, Lahore, Rs. 10,920.*—This is a low pressure hot water central heating system with radiators, designed to use steam for heating the circulating water by means of calorifiers. The installation is working satisfactorily. The accounts have been closed.

(10) *Completing steam supply, sanitary installation and air-conditioning plant in Block "C", Lady Willingdon Hospital, Lahore, Rs. 1,06,414.*—This scheme includes the provision of water supply, sanitary and hospital fittings on the water carriage system, oil fired steam boiler equipment for the supply of steam for sterilization, heating, hot water supply and laundry purposes for the whole hospital, together with a refrigerative air conditioning, cooling and heating system for Block "C."

The boiler and the air conditioning plant have been erected. The former is in running order. As the running of these plants has to be tested for a year, final payments could not be made.

Except for a few minor items the sanitary installation is also complete.

(11) *Trial borings (Government works)*—

(i) *Vehari Trial boring—estimated cost Rs. 2,400.*—Boring to a depth of 300 feet below ground was done. Spring level was found to be 50 feet below ground. Good water bearing sand strata were not found.

(ii) *Boring in existing wells, Rs. 5,395.*—Boring was done in 2 wells at the Multan Jails, and in one well at the Dera Ghazi Khan District Jail to increase the existing supply. The results have been very satisfactory.

(iii) *Sinking tubewell in Rajpura well, Rs. 2,370.*—A tubewell has been completed though a poor water bearing stratum was found. It was proposed to sink a small well to increase the depth of water, but the well began to sink; hence work had to be stopped.

(b) *Contribution works*—

(1) *Nankana Sahib Drainage Scheme, Rs. 58,380.*—This is a surface drainage scheme consisting of a "skeleton" intramural and intercepting drainage system for the town, with outfall and disposal works and pumping station equipped with oil engine driven sullage pumping plant to lift the effluent on to a sullage farm for disposal by broad irrigation.

Work on the intramural and intercepting drains has almost been completed, while the work on the outfall and disposal works has been started. Reference has been made to the Executive Electrical Engineer regarding pumping machinery and it will be ordered on receipt of his views.

(2) *Sheikhupura Old Town Drainage Scheme, Rs. 41,224.*—Work was commenced late in February, 1933.

(3) *Improvements to the old well at Hoshiarpur, Rs. 14,372.*—This scheme is in connection with improvements to the flushing installation for the Hoshiarpur Drainage Works. A 12-inch bore has been carried out to a depth of 70 feet and four 3-inch borings have been done around it. Arrangements are being made to develop the above as a gravel developed tubewell.

(4) *Murree Waterworks Extension Reservoir at Dunga Galli, Rs. 5,25,236.*—The work was completed satisfactorily at the end of September, 1932, and was finally taken over from Messrs. Braithwaite & Co., Ltd., at the end of November, 1932.

(5) *Sanitary Installation, Gujranwala Civil Hospital, Rs. 42,976.*—The work has been completed and is functioning satisfactorily.

- (6) *Hafizabad and Garhi Awan Drainage Scheme and dewatering of ponds, Rs. 1,19,502.*—This scheme was taken in hand and works costing about Rs. 40,000 have been completed. The balance of the work is proceeding.
- (7) *Trial borings in eight villages in Attock district for rural water-supplies, Rs. 18,161.*—Only two trial bores, at a cost of Rs. 17,143 were carried out through the agency of the Agricultural Department, but unfortunately in both the cases no water was found.
- (8) *Choa and Katas Water Supply improvements, Rs. 31,232.*—The first part of the improvements, i.e., the lining of the storage tank was completed in 1931-32. The second part which consisted of the construction of a new filter, sheds over boilers and pumps, etc., was taken in hand during this year and practically 90 per cent. of the work was completed.
- (9) *Thal Ilaqa Water Supply Scheme, Rs. 1,48,043.*—This scheme has been completed and is working well.
- (10) *Tamman Water Supply, Attock District, Rs. 78,894.*—This scheme has been completed and, on test, has worked satisfactorily. As, unfortunately, no funds for its maintenance were forthcoming from the District Board, the scheme has not functioned since the tests were carried out.
- (11) *Sialkot Drainage Scheme, Rs. 4,49,881.*—This scheme has been practically completed. No settlement has yet been reached by the Municipal Committee as regards the final alignment of the Imam Sahib section of the intercepting drain. As soon as this is done, the remaining work will be taken in hand.
- (12) *Multan Waterworks Scheme, Rs. 12,57,637.*—This scheme was completed in 1928-29 and has been maintained by this Department ever since. The average daily supply during the last financial year amounted to 179,551 gallons. No house connections have been given so far. It is proposed to sink another tubewell during 1933-34.
- (13) *Multan Drainage Scheme, Part I, Rs. 22,976.*—The scheme was completed last year and worked only for a month when it had to be stopped due to the failure of the Multan Municipality to supply funds for its maintenance.
- (14) *Multan Drainage Scheme, Part II, Rs. 1,37,747.*—This work, consisting of a main egg-shaped sewer, a similar outfall sewer, disposal works, storm water channels, irrigation carriers and an outfall pumping station, equipped with electrically driven sewage pumping sets for lifting the sullage collected in the sullage tanks, was completed and tested.

No further work can be carried out due to the Municipality's failure to supply funds for its maintenance.

- (15) *Dera Ghazi Khan Waterworks—Duplicate set of pumping plant, Rs. 29,790.*—The newly erected 26 B. H. P. "National" cold starting horizontal engine, driving a "Worthington" ram pump, has been working satisfactorily.

The new cast iron suction main connecting the old waterworks to the new ones has been laid and tested, and is giving good service.

- (16) *Isakhel Water Supply, Rs. 1,36,844.*—This scheme, consisting of a percolation well and a pumping station equipped with Ruston and Hornsby Oil Engine and "Worthington" ram pumps was completed in 1931, and was working satisfactorily.

During the river Indus floods of July, 1932, the pump house and the well were washed away. All machinery, door leaves, and everything which could be removed, was saved.

It is now proposed to build the pump house on Pontoons.

- (17) *Ferozepur Drainage Extension, Rs. 82,944.*—The drainage of Bastis has been completed, and the storm water channels are nearing completion.

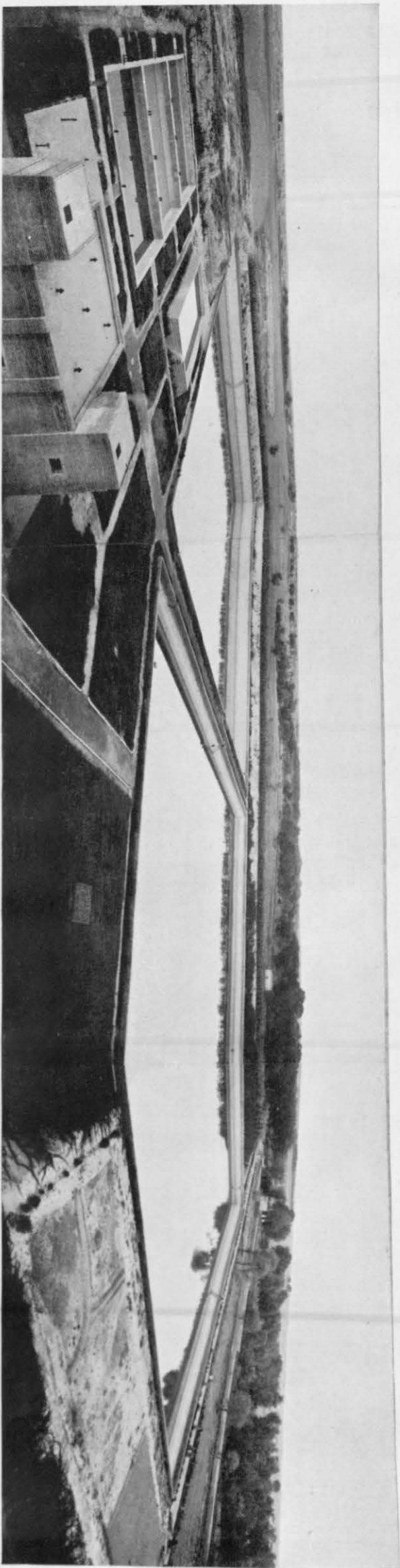
- (18) *Jagraon Mandi Drainage Scheme, Rs. 80,251.*—The scheme as per sanctioned estimate and plans was completed. A supplementary estimate for providing a drain along the road from the Mandi to the Railway Station is under consideration.
- (19) *Karnal Drainage Scheme, Rs. 1,46,851.*—The work has been completed and sanction for the refund of the unspent balance is awaited.
- (20) *Bhiwani Water Supply, Rs. 5,90,267.*—The storage and sedimentation tanks, high level tank, and clear water reservoir have been completed. The filter beds, engine house, service reservoir and city distribution are nearing completion.
- (21) *Special repairs to Rewari Waterworks, Rs. 18,954.*—All works have been completed.
- (22) *Ludhiana Drainage Scheme, Rs. 3,45,009.*—All works have been completed. A supplementary estimate for certain works to be executed out of savings, is under consideration.
- (23) *Trial borings—(Contribution works)—Sakhi Sarwar Trial Boring, Rs. 3,820.*—An open pit was dug to a depth of 165 feet below ground and a 15-inch bore pipe sunk to a depth of 199 feet. The spring level was at 165 feet 9 inches. The District Board has taken over the bore hole and intend to build a well in it.

4. *Maintenance Works.*—A large number of water supply and drainage works were maintained, looked after and operated by the Public Health Circle during the year. The statements annexed give brief particulars of the important ones. The total number of such works maintained was eighty-nine. Out of this, five were maintained on behalf of the Central Government and the rest were Provincial and contribution works.

5. *Government Residential Estates.*—The three Government Estates at Lahore, viz., the Gazetted Officers' Residences Estates, the European Clerks' Cottages (Rivaz Gardens Estate) and the Indian Clerks' Quarters (Chauburji Gardens Estate) were maintained during the year satisfactorily.

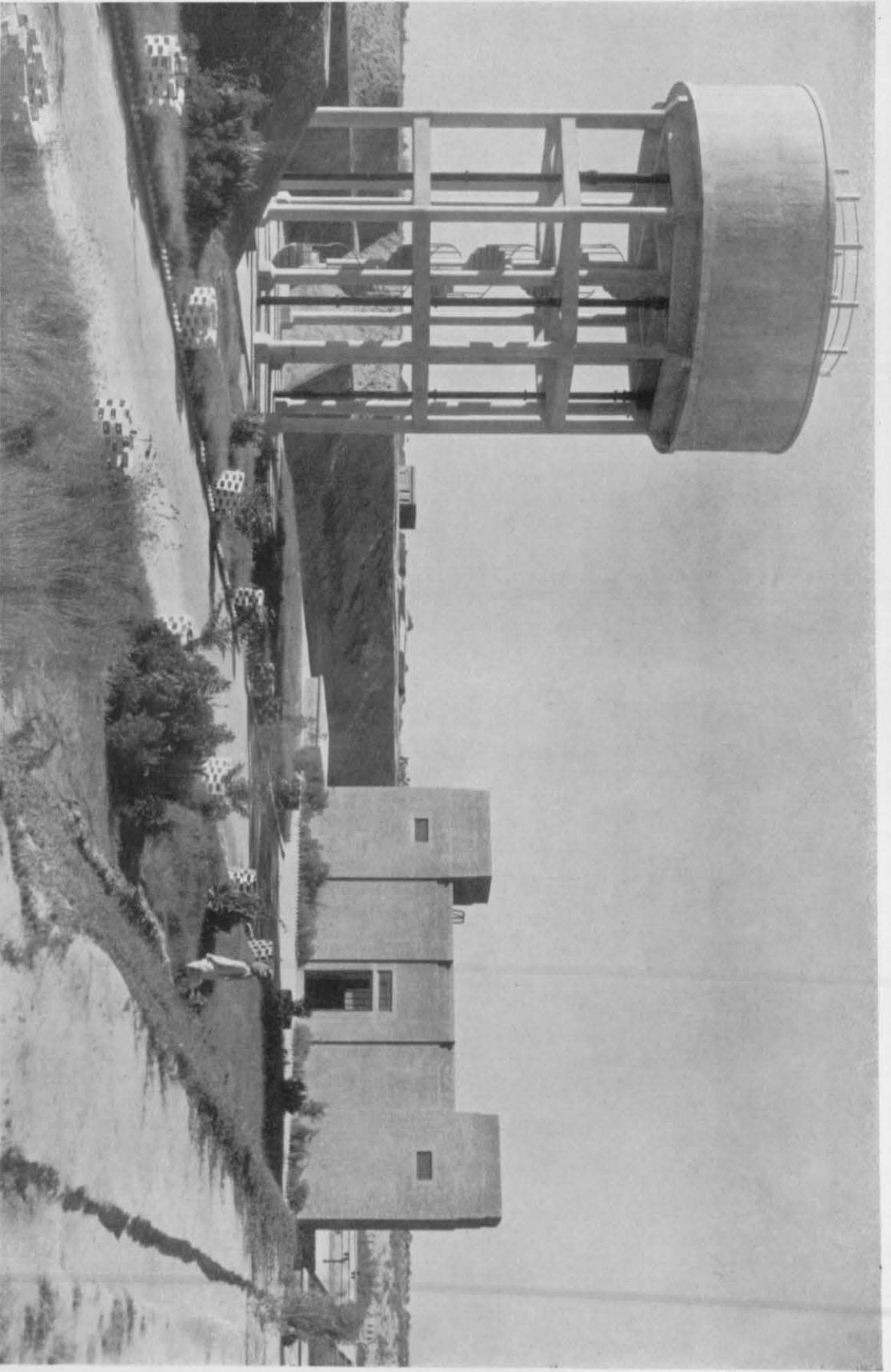
6. *General.*—Due to very heavy retrenchment in the Public Health Circle at the beginning of the year, the activities of this Circle were naturally affected. The gross cost of the Circle to Government for the year was Rs. 1,85,311 while Rs. 1,11,002-7-0 net were earned for Government from Contribution Works only.





BHIWANI WATERWORKS.  
GENERAL VIEW FROM SERVICE RESERVOIR.





BHIWANI WATERWORKS.

SERVICE RESERVOIR AND PUMPING STATION.



STATEMENT SHOWING PARTICULARS OF IMPORTANT DRAINAGE AND SEWERAGE WORKS MAINTAINED IN THE PUBLIC HEALTH CIRCLE, PUBLIC WORKS DEPARTMENT, PUNJAB, FOR THE YEAR ENDING MARCH 31, 1933.

Serial No.	Name of work.	Power used.	Number of pumping units.	Total horse power.	Sewage or sullage pumped during the year.	Method of disposal.	REMARKS.
1	2	3	4	5	6	7	8
					Gallons.		
1	Mental Hospital, Lahore .. ..	Electricity .. ..	4	15/18	12,661,900	Land treatment by broad irrigation.	Provincial work.
2	Central and Female Jails, Lahore .. ..	Ditto .. ..	2	16	13,242,900	Ditto ditto	Ditto.
3	Borstal Institution, Lahore .. ..	Ditto .. ..	2	21	17,562,900	Ditto ditto	Ditto.
4	Government House, Lahore .. ..	Ditto .. ..	2	4	2,919,800	Septic tank and land treatment by sub-soil irrigation.	Ditto.
5	Lady Willingdon Hospital, Lahore .. ..	Ditto .. ..	2	8	3,610,000	Septic tank effluent discharged into Municipal sewer.	Ditto.
6	Queen Mary's College, Lahore .. ..	Ditto .. ..	2	4	2,401,560	Septic tank and land treatment by broad irrigation.	Ditto.
7	Medical School, Amritsar .. ..	Oil engine .. ..	2	8	5,306,701	Land treatment by broad irrigation.	Ditto.
8	New Central Jail, Multan .. ..	Electricity .. ..	2	9	23,003,000	Land treatment .. ..	Ditto.
9	Central Jail, Montgomery .. ..	Oil engine .. ..	1	3	4,822,500	Ditto .. ..	Ditto.
10	Chaurji Gardens Estate, Lahore .. ..	Electricity .. ..	2	15	12,915,000	Septic Tank and land treatment	Ditto.
11	Multan Drainage Scheme.. ..	Ditto .. ..	4	120	Nil	.. ..	Contribution work. Funds to work plant not provided by the Municipality.
12	Shish Mahal Sewerage (from 8th September 1932 to 31st March 1933).	Ditto .. ..	2	26½	10,000,000 (Approx.)	Land treatment .. ..	Contribution work.
	Total .. ..	.. ..	27	253	108,446,261		

STATEMENT SHOWING PARTICULARS OF IMPORTANT WATER-SUPPLY WORKS MAINTAINED IN THE PUBLIC HEALTH CIRCLE, PUBLIC WORKS DEPARTMENT,  
PUNJAB, FOR THE YEAR ENDING MARCH 31, 1933.

Serial No.	Name of work.	Power used.	Number of pumping units.	Total horse power.	Water supplied during the year.	Source of water-supply.	REMARKS.
1	2	3	4	5	6	7	8
					Gallons.		
1	Central Jail, Montgomery .. ..	Oil engines and air lift .. ..	2	24	19,911,016	1 tubewell .. ..	Provincial work.
2	Multan Water-Supply .. ..	Electricity .. ..	4	96	65,536,216	4 tubewells .. ..	Contribution work.
3	New Central Jail, Multan .. ..	Ditto .. ..	2	26	51,678,300	2 tubewells .. ..	Provincial work.
4	Old Central Jail, Multan .. ..	Oil engines .. ..	3	24	37,968,000	2 Percolation wells .. ..	Ditto.
5	District Jail, Multan .. ..	Electricity .. ..	2	6	9,374,850	Percolation well with tube sunk in it.	Ditto.
6	New Civil Hospital, Multan .. ..	Ditto .. ..	1	3	2,802,200	Percolation well .. ..	Ditto.
7	Jhang Jail Water-Supply .. ..	Oil engines .. ..	2	10	3,520,000	Tubewell .. ..	Ditto.
8	Shahpur Jail Water-Supply .. ..	Ditto .. ..	2	7	3,200,000	Percolation well .. ..	Ditto.
9	Mianwali Jail Water-Supply .. ..	Ditto .. ..	2	17	4,493,000	Ditto .. ..	Ditto.
10	Isakhel Waterworks, District Mianwali .. ..	Ditto .. ..	2	12	1,320,000	Ditto .. ..	Contribution work. Water-supply washed away in August 1932.
11	Musakhel Waterworks, District Mianwali .. ..	Ditto .. ..	1	12	3,830,000	Tubewell .. ..	Contribution work.
12	G. O. R. Estate, Lahore .. ..	Electricity .. ..	2	12	5,685,690	Ditto .. ..	Provincial work.
13	Chauburji Gardens Estate, Lahore .. ..	Ditto .. ..	2	13	17,280,150	2 Tubewells .. ..	Ditto.
14	Rawalpindi Jail .. ..	Oil engines .. ..	2	14	10,552,250	Percolation well .. ..	Ditto.
15	Jhelum Jail .. ..	Ditto .. ..	2	7	3,348,470	Ditto .. ..	Ditto.
16	Gujrat Sub-Jail .. ..	Ditto .. ..	2	10	7,763,717	Tubewell .. ..	Ditto.

17	Sialkot Jail .. .. .	Ditto .. .. .	2	7	3,199,875	Percolation well .. ..	Ditto.
18	Attock Fort Camp Jail .. ..	Steam .. .. .	2	20	1,408,640	River Indus .. .. .	Ditto.
19	Campbellpur Jail .. .. .	Oil engines .. .. .	1	8	11,711,005	Percolation well .. ..	Ditto.
20	Pind Dadan Khan Waterworks .. ..	Ditto .. .. .	1	8	10,194,999	Ditto .. .. .	Contribution work.
21	Murree Waterworks .. .. .	Gravity (springs B and C) and steam pumping (spring A).	1	10	48,074,513	Springs and catchment area .. ..	Ditto.
22	Choa and Katas Water-supply .. ..	Steam .. .. .	2	16	500,000	Springs .. .. .	Ditto.
23	Jhelum High School .. .. .	Oil engine .. .. .	1	5	4,910,175	Percolation well .. ..	Provincial work.
24	Deputy Commissioner's Residence, Jhelum .. ..	Electricity .. .. .	1	2	60,000 (approximate.)	Ditto .. .. .	Ditto.
25	Lawrence College, Ghora Galli .. ..	Oil engine .. .. .	1	18	2,187,200	Springs .. .. .	Ditto.
26	Thal Ilaqa Water-supply .. .. .	Gravity .. .. .	..	..	36,500,000 (approximate.)	Do. .. .. .	Contribution work.
27	Nurpur Fair Water-supply (Rawalpindi District).. ..	Do. .. .. .	..	..	7,000,000 (approximate.)	Do. .. .. .	Ditto.
28	Tret Water-supply .. .. .	Do. .. .. .	..	..	1,095,000 (approximate.)	Do. .. .. .	Central works.
29	Ambala Waterworks, Sarangpur Installation .. ..	Steam .. .. .	2	16	41,144,800	Percolation well .. ..	Provincial work.
30	Maintenance Water-supply, Government College, Rohtak.	Oil engine .. .. .	1	4	1,580,492	Ditto .. .. .	Ditto.
31	Maintenance District Jail, Hissar—						
	(a) Outer engine .. .. .	Ditto .. .. .	1	4	2,798,960	Ditto .. .. .	Ditto.
	(b) Inner engine .. .. .	Ditto .. .. .	2 (with single elevator).	7	2,788,400	Ditto .. .. .	Ditto.
32	Maintenance Water-supply, Government College, Ludhiana.	Oil engine and Centrifugal pump	1	9	21,874,141	Tubewell .. .. .	Ditto.
33	Maintenance Water-supply, District Jail, Ludhiana	Oil engine with Boulton elevator.	2	7	2,777,250	Percolation well .. ..	Ditto.
	Carried over .. .. .		54	434	448,069,309		

STATEMENT SHOWING PARTICULARS OF IMPORTANT WATER-SUPPLY WORKS MAINTAINED IN THE PUBLIC HEALTH CIRCLE, PUBLIC WORKS DEPARTMENT,  
PUNJAB, FOR THE YEAR ENDING MARCH 31, 1933—CONTINUED.

Serial No.	Name of work.	Power used.	Number of pumping units.	Total horse power.	Water supplied during the year.	Source of water-supply.	REMARKS.
1	2	3	4	5	6	7	8
	Brought forward ..	..	54	434	Gallons. 448,069,309		
34	Mental Hospital, Lahore .. ..	Electricity .. ..	4	16	29,262,390	1 tubewell .. .. 1 percolation well	Provincial work.
35	Central Jail, Lahore .. ..	Ditto .. ..	2	10	31,911,400	1 tubewell .. ..	Ditto.
36	Borstal Institution, Lahore .. ..	Ditto .. ..	3	18	29,926,550	Ditto .. ..	Ditto.
37	Vaccine Institute, Lahore .. ..	Ditto .. ..	1	2	1,842,347	1 percolation well .. ..	Ditto.
38	Lawrence Gardens, Lahore .. ..	Ditto .. ..	2	11	3,929,433	1 percolation well .. .. 1 tubewell.	Ditto.
39	Government House, Lahore .. ..	Ditto .. ..	4	16	19,643,100	Ditto .. ..	Ditto.
40	High Court, Accountant-General's Office and Sessions Court, Lahore.	Ditto .. ..	2	18	12,096,930	Ditto .. ..	Joint, Central and Provincial works.
41	Mayo School of Arts Boarding House, Lahore .. ..	Ditto .. ..	1	7	4,847,690	Ditto .. ..	Provincial work.
42	Council Chamber, Lahore .. ..	Ditto .. ..	2	11	105,263	Ditto .. ..	Ditto.
43	Government Press, Lahore .. ..	Ditto .. ..	1	3	3,739,625	1 percolation well .. ..	Ditto.
44	Veterinary College and Hostel, Lahore .. ..	Ditto .. ..	2	18	26,223,500	1 tubewell .. ..	Ditto.
45	Government College and Hostel, Lahore .. ..	Ditto .. ..	4	28	31,946,940	2 tubewells .. ..	Ditto.
46	Central Training College, Lahore .. ..	Ditto .. ..	2	11	6,872,800	1 tubewell .. ..	Ditto.
47	Taxali Gate Cemetery, Lahore .. ..	Ditto .. ..	1	3	5,007,000	1 percolation well .. ..	Central work.
48	Lady Willingdon Hospital, Lahore .. ..	Ditto .. ..	2	12	12,311,990	1 tubewell .. ..	Provincial work.



49	Hazuri Bagh, Lahore .. ..	Ditto .. ..	2	11	4,793,600	1 percolation well ..	Central work.
50	Old Fort, Lahore .. ..	Ditto .. ..	2	22	13,810,250	1 tubewell .. ..	Ditto.
51	Dental Hospital, Lahore .. ..	Ditto .. ..	3	6	1,842,000	Ditto .. ..	Provincial work.
52	Mayo Hospital and King Edward Medical College, Lahore.	Ditto .. ..	5	35	55,523,690	3 tubewells .. ..	Ditto.
53	King Edward Medical College Hostel, Lahore ..	Ditto .. ..	2	16	10,200,940	1 tubewell .. ..	Ditto.
54	Lahore College for Women .. ..	Ditto .. ..	2	5	3,870,300	Ditto .. ..	Ditto.
55	Forest Office, Lahore .. ..	Ditto .. ..	1	2	1,218,499	1 percolation well ..	Ditto.
56	Queen Mary's College, Lahore .. ..	Ditto .. ..	2	6	4,909,900	Ditto .. ..	Ditto.
57	Police Lines Qilla Gujar Singh, Lahore ..	Ditto .. ..	2	9	3,217,800	1 tubewell .. ..	Ditto.
58	Maclagan Engineering College, Lahore ..	Ditto .. ..	2	12	13,254,870	Ditto .. ..	Ditto.
59	Shalamar Gardens, Lahore .. ..	Oil engine .. ..	1	3	3,936,700	1 percolation well ..	Central work.
60	Lady Maclagan Girls' School, Lahore ..	Electricity .. ..	1	1	2,106,750	Ditto .. ..	Provincial work.
61	Zoological Gardens, Lahore .. ..	Ditto .. ..	2	7	1,582,052	Ditto .. ..	Ditto.
62	Central Model School, Lahore .. ..	Ditto .. ..	1	2	1,108,483	Ditto .. ..	Ditto.
63	Public Works Department Offices, Moleod Road, Lahore.	Ditto .. ..	1	1	1,165,641	Ditto .. ..	Ditto.
64	Office of Director of Industries, Lahore ..	Ditto .. ..	1	2	1,983,600	Ditto .. ..	Ditto.
65	Industrial Buildings, Shahdara .. ..	Ditto .. ..	2	17	12,271,150	1 tubewell .. ..	Ditto.
66	Jahangir's Tomb, Shahdara .. ..	Steam .. ..	1	14	27,685,500	1 percolation well ..	Central work.
67	New Sub-Jail, Kasur .. ..	Oil engine .. ..	2	7	14,207,000	1 tubewell .. ..	Provincial work.
68	New Medical School, Amritsar .. ..	Ditto .. ..	2	20	9,748,400	Ditto .. ..	Ditto.
69	Pathankot Water-supply .. ..	Ditto .. ..	2	30	22,039,636	1 percolation well ..	Contribution work.
70	Jawalamukhi Water-supply .. ..	Gravity .. ..	..	..	5,475,000	Springs .. ..	Ditto.
71	Government High School, Gurdaspur ..	Oil engine .. ..	1	4	630,430	1 percolation well ..	Provincial work.
	Carried over .. ..	.. ..	127	850	884,318,458		

**STATEMENT SHOWING PARTICULARS OF IMPORTANT WATER SUPPLY WORKS MAINTAINED IN THE PUBLIC HEALTH CIRCLE, PUBLIC WORKS DEPARTMENT,  
PUNJAB, FOR THE YEAR ENDING MARCH 31, 1933—CONCLUDED.**

Serial No.	Name of work.	Power used.	Number of pumping units.	Total horse power.	Water supplied during the year.	Source of water-supply.	REMARKS.
1	2	3	4	5	6	7	8
	Brought forward ..	..	127	850	Gallons. 884,318,458		
72	District Jail, Jullundur .. ..	Electricity .. ..	3	8	4,306,500	1 percolation well 1 tubewell.	Provincial work.
73	Government High and Normal School, Jullundur	Ditto .. ..	1	5	2,343,000	1 percolation well	Ditto.
74	Civil Hospital, Jullundur .. ..	Ditto .. ..	1	3	571,250	Ditto .. ..	Ditto.
75	District Court, Jullundur .. ..	Ditto .. ..	1	2	1,317,800	Ditto .. ..	Ditto.
76	Sub-Jail, Shahpur .. ..	Oil engine .. ..	2	9	1,347,194	Ditto .. ..	Ditto.
77	Civil Hospital, Shahpur .. ..	Ditto .. ..	1	4	2,898,000	Ditto .. ..	Ditto.
	Total ..	..	136	881	897,102,202		

## CHAPTER V.—Electrical Engineering.

1. During the year under review estimates were prepared for electrifying all Government buildings in fifteen towns covered by the Uhl River Hydro-Electric Project and also in the towns of Montgomery and Sargodha.

*Renala.*—Throughout the year the working of this installation was entirely satisfactory and although the plant has been in almost continuous operation since March, 1925, no serious breakdowns occurred. Recent inspections, however, show that the condition of some of the heavy parts of the plant (pump impellers, etc.) is seriously affecting the efficiency of operation and that such parts will need replacing in the near future.

With a view to eliminating the number of interruptions to the supply (due to birds perching on pole cross arms) a new earthing device is being installed and will shortly be in operation. A further improvement is the provision of Integrating Watt Hour Meters at all Sub-Stations and the Power House, to measure accurately the amount of energy supplied to the Irrigation Branch.

The cost of generation remains at approximately the same figure as last year, the expenditure and revenue being as follows:—

Units generated.	Cost per unit.	Total.
3,972,237	at 3·66 pies app. (exclusive of depreciation, etc.)	Rs. 75,605
Units sold.		
3,440,839	at 12·62 pies app. per unit	Rs. 2,26,188

*Simla.*—In comparison with previous years this installation was very heavily worked during the year under review. This resulted from a serious shortage of water in the river supplying the Municipal Power House at Chaba.

The Government Power House was, therefore, called upon to work to its full capacity, in one instance for a period of 93 hours continuously and for 184 hours intermittently. Although the intervals during the latter period were insufficient to allow of any of the usual inspections and maintenance work to be undertaken, the engines functioned satisfactorily throughout.

The engines are in excellent condition and are still capable of working to guaranteed figures without undue effort.

Details of revenue and expenditure are as follows:—

Units generated.	Cost per unit.	Total.
674,440	0·97 annas approximately (excluding capital charges).	Rs. 40,960
Units sold.		
658,204	2·82 annas approximately	Rs. 1,16,188

*Multan.*—The high tension sub-station at the New Central Jail functioned quite satisfactorily throughout the year.

*Shahdara.*—Twenty-nine thousand nine hundred and eighty two units were generated at the Shahdara Power Station at an average cost of 3·16 annas per unit excluding capital and supervision charges.

*Ghoraqali.*—Fourteen thousand two hundred and seventy nine units were generated at the small power station at the Lawrence School at an average cost of 4·6 annas per unit excluding capital and supervision charges.

*Lady Willingdon Hospital, Lahore.*—The Operation Block of the hospital was completed during the year. This block is cooled and heated by a "Carrier" Air Conditioning Plant which consists of oil fired boilers and a series of motors ranging from 1 H. P. to 46 H. P. for driving various compressors, pumps, coolers, etc. A few emergency ceiling fans are installed in some rooms. Up-to-date illumination has been provided.

The operating theatres are provided with special shadowless lights one of which can be switched over to a battery supply in emergencies.

Before the Operation Block was in existence the approximate annual current consumption amounted to 43,450 units. This figure will now be considerably increased owing to the installation of the new cooling and heating apparatus.

2. *Maintenance of Electric Installations.*—During the year the following numbers of lights, fans, etc., were installed in Government buildings :—

(1) Lights .. .. .	385
(2) Fans .. .. .	70
(3) Motors .. .. .	3
(4) Wall socket points other than heater points .. .. .	78
(5) Heater points .. .. .	43
(6) Heaters .. .. .	6
(7) Call bells .. .. .	5

The capital expenditure incurred during the year on Government electric installations in the Province amounted to Rs. 9,29,432, including debit of the Renala Installation, thus bringing the total capital expenditure to the end of the year to Rs. 30,87,667.

The revenue earned by both the Electrical Divisions from fees, etc., recovered for work done during the year, and from other miscellaneous receipts amounted to Rs. 3,60,309.

3. *Works.*—Expenditure on Major and Minor Works, Central and Provincial, by units of appropriation was as follows :—

(a) *Central Buildings*—

(1) Archaeological .. .. .	Rs. 18
<b>Total</b> .. .. .	<b>18</b>

(b) *Provincial Buildings*—

(1) General Administration, Transferred and Reserved .. .. .	Rs. 2,070
(2) Administration of Justice .. .. .	5,395
(3) Jails and Convict Settlements .. .. .	5,479
(4) Police .. .. .	6,904
(5) Education (other than European & Anglo-Indian) .. .. .	1,652
(6) Medical .. .. .	1,351
(7) Agriculture .. .. .	1,924
(8) Industries .. .. .	1,926
(9) Civil Works .. .. .	8,556
(10) Stationery & Printing .. .. .	1,697
(11) Communications .. .. .	206
(12) U.-Miscellaneous .. .. .	856
<b>Total</b> .. .. .	<b>38,016</b>

The total expenditure incurred on Original Works during the year was :—

41.—*Civil Works*—

Major Works .. .. .	Rs. 8,85,586
Minor Works .. .. .	40,279
Contribution Works .. .. .	678

*Tools and Plant*—

Major Works .. .. .	Rs. Nil
Minor Works .. .. .	872
<b>Total</b> .. .. .	<b>872</b>

## 60.—Civil Works—Capital Expenditure.—

	Rs.
Major Works .. .. .	8,85,682
Minor Works .. .. .	2,148
Total ..	8,87,830

4. *Maintenance.*—The expenditure on "Maintenance" during the year was as follows:—

	Rs.
(a) Archaeological .. .. .	18
Total ..	18
(b) Provincial Repairs, Transferred Voted and Reserved Voted	1,58,282
(c) Contribution Repairs .. .. .	433
(d) Tools and Plant Repairs and Carriage .. .. .	1,105
Total ..	1,59,820

A statement of Major Works carried out during the year is given below:—

Serial No.	Name of work.	Amount of Estimate.	Expenditure during 1932-33.
		Rs.	Rs.
<b>41—CIVIL WORKS—PROVINCIAL—TRANSFERRED—(VOTED).</b>			
1	Providing electric installation in 98 houses, type I, Chauburji Gardens Estate, Lahore .. .. .	23,391	—120
2	Providing electric installation in the New Central Jail, Multan .. .. .	1,21,961	24
	Total ..	..	—96
<b>60—CIVIL WORKS—CAPITAL EXPENDITURE.</b>			
1	Purchasing plant and machinery and distribution mains at the Renala Hydro-Electric Power House from Irrigation Branch .. .. .	8,85,682	8,85,682

5. *Supply of energy.*—The Public Works Department, Buildings and Roads, Electrical Division No. 2 paid for the energy consumed in Public Works Department non-residential buildings in Lahore an amount of Rs. 13,031 for 63,219 units. The cost of energy supplied to other Provincial buildings was met from the respective grants of the offices concerned.

## CHAPTER VI.—The Maclagan Engineering College, Moghalpura, Lahore.

*Number of students.*—There were 250 students at the commencement of the 10th academic year in October, 1932 :—

	' A ' Class.	' B ' Class.
1st Year .. .. .	15	35
2nd Year .. .. .	15	38
3rd Year .. .. .	9	38
4th Year .. .. .	10	50
5th Year .. .. .	10	30
Total .. .. .	59	191

*Recruitment.*—In ' A ' Class there are ordinarily ten vacancies each year, but during the year under review 15 new students, exclusive of two extra students who were nominated by Government as a special case, were admitted to the first year ' A ' Class course.

The number of admissions to ' B ' Class was—

External candidates .. .. .	18, plus one as a special case.
Railway candidates .. .. .	15

In spite of the reduction in stipends, competition for admission to ' B ' Class continues to be keen ; about 200 candidates competed for 35 vacancies.

*External Examinations.*—The college is now the examination centre for the following British Institutions :—

- (a) Institution of Mechanical Engineers, London,
- (b) Institution of Electrical Engineers, London,
- (c) Institution of Structural Engineers, London,
- (d) Institution of Automobile Engineers, London,

and many candidates from various parts of the Punjab and Northern India, in addition to the students of this college, presented themselves for examinations. A considerable number of the ' A ' Class students have been successful in the examinations of one or more of the above mentioned Institutions.

*City and Guilds London Examinations.*—Ten students of this college were successful in one or more subjects in these examinations.

*Engineering Examinations of the Punjab University.*—The ' A ' Classes are affiliated to the Punjab University, 18 students sat for the B. Sc., degree in Engineering of the Punjab University last year and 13 were successful.

*Health.*—The general health of both the students and the staff has been fairly satisfactory and credit is due to the Hostel Superintendents for their care and attention. Dr. F. Carroll of the North Western Railway also occasionally visited the college hostels and his services are equally worthy of note.

*Recreation and Sports.*—Almost all the students take a part in games, and the popularity of tennis, cricket, football and hockey with the students has undoubtedly contributed to their good health. In addition to grounds for general sports, 15 tennis-courts are maintained and this number appears likely to be insufficient to cope with the increasing demand. The annual sports of the college were held in the last week of February, 1933, and were a great success.

*Finance.*—A summary of the details of expenditure incurred and revenue realised for the period under review is given below:—

<i>Finance—</i>		<i>Income, 1932-33.</i>
		Rs.
Hostel and Tuition Fees	.. .. .	18,094
Fines	.. .. .	710
Rent of shops	.. .. .	150
Balance of Entrance Examination	.. .. .	928
Miscellaneous	.. .. .	193
Recoveries of expenditure	.. .. .	57
House and Electric Rent	.. .. .	4,397
Fees for tests and analysis	.. .. .	149
Less Refund	.. .. .	—64
	<b>Total</b> .. .. .	<b>24,614</b>
		<i>Expenditure.</i>
		Rs.
<i>Pay of Officers—</i>		
Pay	.. .. .	17,171 Non-voted.
		77,886 Voted.
Leave salary	.. .. .	6,734 Non-voted.
	<b>Total Pay of Officers</b> .. .. .	<b>23,905 Non-voted.</b>
		77,886 Voted.
<i>Pay of Establishment—</i>		
Pay	.. .. .	37,557
Leave salary	.. .. .	1,917
	<b>Total Pay of Establishment</b>	<b>39,474</b>
<i>Travelling Allowance—</i>		
Other Travelling Allowance	.. .. .	154 Non-voted.
		143 Voted.
<i>Other Allowances and Honoraria —</i>		
Payment to ' B ' Class students	.. .. .	72,768 Voted.
		95 Non-voted.
Fees for marking examination papers	.. .. .	194 Voted.
Compensatory allowance to clerks and peons	.. .. .	94 Voted.
	<b>Total Other Allowances and Honoraria</b>	<b>95 Non-voted.</b>
		73,056 Voted.
<i>Supplies and Services—</i>		
Other Supplies and Services	.. .. .	6,280
<i>Contingencies—</i>		
Other Contingencies	.. .. .	8,000
<i>Stipends and Scholarships—</i>		
Government Scholarships to ' A ' Class students	.. .. .	3,600
	<b>GRAND TOTAL</b> .. .. .	<b>24,154 Non-voted.</b>
		2,07,939 Voted.
Net cost to Government	.. .. .	2,07,479
Average number of students on roll	.. .. .	255
Net cost per student	.. .. .	813·6
Average tuition fee paid by ' A ' Class student per annum..	.. .. .	180
Average tuition fee paid by ' B ' Class student per annum..	.. .. .	Nil.

## CHAPTER VII.—Government School of Engineering, Rasul.

1. *Administration.*—The following officials served on the Advisory Committee during the year :—

- (1) Sir J. B. G. Smith, C.I.E., M.L.C., Chief Engineer and Secretary to Government, Punjab, Public Works Department, Irrigation Branch.
- (2) Mr. R. P. Hadow, A.M.I.C.E., C.I.E., Chief Engineer and Secretary to Government, Punjab, Public Works Department, Irrigation Branch.
- (3) Mr. A. Murphy, O.B.E., Chief Engineer and Secretary to Government, Punjab, Public Works Department, Irrigation Branch.
- (4) Mr. E. L. Crawford, Chief Engineer and Secretary to Government, Punjab, Public Works Department, Buildings and Roads Branch.
- (5) Mr. D. Macfarlane, Chief Engineer and Secretary to Government, Punjab, Public Works Department, Buildings and Roads Branch.
- (6) Lieutenant-Colonel William Macrae, R. E., Chief Engineer, North-Western Railway.
- (7) Mr. R. Sanderson, M. A., Director of Public Instruction, Punjab.
- (8) Mr. Ram Lal, M.B.E., P.C.S., Director of Industries, Punjab.
- (9) Mr. N. H. Charles, B.Sc., A.M.I.M.E., A.M.I.E.E., Superintendent, Central Workshops, Amritsar.

There was no meeting of the committee during the year.

2. *Changes in Staff.*—Lala Nihal Chand, Senior Surveying Instructor, reverted to the Irrigation Branch. His duties were taken over by Sardar Teja Singh, Practical Engineering Instructor, in July, 1932, in addition to his own duties.

Owing to financial stringency, the following posts were abolished :—

- (i) One Workshop clerk, and
- (ii) One Mathematical Instructor.

Mr. F. Haupt, Workshop Superintendent, died at Hazaribagh on the 19th November, 1932, while on leave. The vacancy was not filled on account of financial stringency.

Lala Shiv Charn Dass, Workshop Overseer, has been placed in charge of the Workshops, and of the students under practical training in the shops (under the general supervision of the Vice-Principal), for which duty an allowance of Rs. 40 per mensem has been sanctioned in addition to the Overseer's substantive pay.

Mr. R. F. T. Farrant took over the newly created post of Vice-Principal on the 7th November, 1932, Mr. Farrant is on deputation from the Irrigation Branch.

Jahangir Khan, Physical Training Instructor, reverted to the Punjab Education Department, and his place was filled by *ex. Naik* Mohammad Din from the K. G. O. Bengal Sappers and Miners with effect from the 14th October, 1932.

3. *Overseer and Draftsman Training.*—The number of students attending the classes were as follows :—

		Beginning of the session.	End of the session.
1st Year Overseer Class	.. ..	51	51
2nd Year Overseer Class	.. ..	77	75
1st Year Draftsman Class	.. ..	9	9
2nd Year Draftsman Class	.. ..	11	11
3rd Year Draftsman Class	.. ..	5	5
Total	.. ..	153	151



Of the 2nd Year Overseer Class, one student was expelled and one was accidentally drowned while bathing in the Upper Jhelum Canal.

4. *Results of Examinations.*—In the final examination for overseers at the end of 2nd Year, 42 obtained the higher certificate (12 "Honours" and 30 "Credit") and 26 obtained the lower, or "Ordinary" certificate. Seven failed to qualify in the Mathematics group, but as they had qualified in the aggregate of marks, they were allowed to appear in a retest held on the 21st April, 1933, when all of them qualified.

All the Overseers and Draftsmen in the 1st Year qualified for, and have been admitted to the 2nd Year.

Of the 2nd Year Draftsmen, 11 qualified; 7 with "Credit", the remaining four obtained the "Ordinary" certificate. Four of the former have been admitted to the 3rd Year.

All five students in the 3rd Year Practical course for Draftsmen qualified and did well.

5. *Quality of the Work Done.*—The quality of the work done during the year, as well as the interest taken therein by the students, was at a distinctly high level and the spirit of both staff and students was excellent. There is no doubt that this is very largely attributable to the discipline and realism instilled by the "Fieldworks" classes, which have now been extended to every detail of the School curriculum, and to the "Block" system tried for the first time in the preceding session. By this, each "Year" goes into "School" and to "Practice" for 3 weeks alternately. During the Practice period (or "Block") one week is spent continuously at each of Fieldworks, Surveying and Workshop Practice. Considerable concentration and saving of time are brought about by this arrangement.

It is felt that the greatly improved practical training, and the development of individuality and initiative of the student arising from the fieldworks courses and the new system of training is destined to show a marked improvement in the quality of the overseers turned out.

6. *Outside Examiners.*—No papers were set by outside examiners during the session, firstly as it was desired to save the fees involved, owing to the necessity for economy, and secondly because under the new system of examination under the "Block" system by which the students are tested in stages, such papers become unnecessary.

7. *Recruitment of Classes.*—The annual competitive examination for admission to the 1st Year course in the 1933-34 session was held in November, 1932. The number of admissions was 55 altogether, viz:—

*Overseer Class—*

From the British Punjab	..	..	..	..	39
From the North Western Frontier Province	..	..	..	..	5
From Indian States	..	..	..	..	3
					—
Total	..	..	..	..	47
					—

*Draftsman Class—*

From the British Punjab	..	..	..	..	8
					—
Total	..	..	..	..	55
					—

The numbers admitted were fewer than usual on account of the lack of employment arising from the present financial depression.

The communal proportions admitted to these classes were 40 per cent. Muslims, 40 per cent. Hindus and 20 per cent. Sikhs.

*Number of candidates.*—The total number of candidates was 113. This was much fewer than usual, doubtless because the present lack of employment acted as deterrent. The quality, however, of the candidates was satisfactory and those admitted were fully up to the usual standard. This is evidently due to youths only coming forward at the present time who are keen on the calling and have prepared for the examination.

It is satisfactory to note that for the second year sufficient Muslims qualified to fill the 40 per cent. quota.

8. *Health.*—The health of the staff and students was excellent. Amongst them there was no outbreak of infectious disease and the incidence of minor complaints was exceptionally low. A few cases of small-pox, however, occurred amongst the menials but none proved fatal. All were at once isolated and every precaution was taken to prevent the disease from spreading.

9. *Games and Drill.*—Every student attended physical drill every other morning and games every evening. He was required to play hockey and football each, twice every week. The usual keenness was shown.

10. *Annual Prize-giving.*—This was held on the 26th March, 1933. Mr. D. Macfarlane, Chief Engineer, Buildings and Roads Branch, presided. A fairly large number of official and non-official visitors were present, including the Honourable Sardar Sir Jogendra Singh.

After the Prize-giving ceremony the visitors inspected the School premises and workshops, the inspection being followed by a display of physical drill and a march past by the students.

In the afternoon the students gave a display of bridge erecting by working parties. This, together with the physical drill and march past in the morning, was done with considerable precision which was much appreciated.

11. *Annual Sports.*—The annual sports were held a week earlier than the Prize-giving. Some good events were witnessed. Keen interest and a good sporting spirit were displayed. The prizes were distributed by Brigadier R. H. Anderson, Commanding the 3rd (Jhelum) Infantry Brigade.

The Chief Engineer's medal for the best athlete (presented by Mr. D. Macfarlane) was won by Ghulam Sarwar Khan, a student of the 2nd Year Overseer Class.

12. *Visits to Works and Survey Camp.*—The survey camp was pitched at Jaggu on the Upper Jhelum Canal. The level crossing, torrent bed and the surrounding broken country presented a useful area for surveying practice with all instruments.

The camp was held for three weeks at the end of October and beginning of November and was followed by the annual visit to works. For this, excursions were made from the survey camp to Mangla Headworks and Upper Jhelum Canal level crossings, etc., the new Reinforced Concrete Bhimber Bridge, Road making and tarring operations on the Grand Trunk Road, Jhelum Bridge, Bakrala Reinforced Concrete Bridge, Taraki Quarry, Haro Bridge and the Cement Works at Wah.

The Principal is grateful to the Irrigation officers and to the manager of the Cement Works at Wah for the facilities given in connection with these visits.

13. *Mechanical Workshop.*—As mentioned in paragraph 11 of the last year's report a series of progressive practices are done in each shop, *i.e.*, the Carpenters, Blacksmiths and fitting shop and the foundry. Every student has to pass a test in each practice before he is permitted to take the next. When he has passed all the tests he is considered to have been trained in all the essential practices in the said shops and is then given productive work to do. The system has continued to give gratifying results.

14. *Employment of Qualified Students.*—Out of the 75 overseer students who qualified at the end of the session, 15 were State students, 5 were from North West Frontier Province, and 2 from Delhi Province. They are dependant for employment on their respective Governments.

Of the remaining 53 students from the British Punjab, 13 obtained permanent appointments on probation in the Subordinate Engineering Service. Two have been employed in the Mechanical Engineering Service. On account of the recent retrenchment of subordinates there appears little chance of the majority of the remainder obtaining employment on regular establishment at present, but some are getting work-charged employment to carry on with. This is probably the most useful start they could have and will make good men of them in the long run.

It is noteworthy that of the men in this batch who have not yet obtained regular employment, 15 are Muslims and of them 5 have the A grade certificate. These men are likely to find employment soon, as the indents received since the recent retrenchments are generally for Muslims. It is also of interest that this is the first year in which there is a surplus of Muslims with the A grade certificate after filling the Subordinate Engineering Service vacancies.

Of the 5 draftsman students who qualified in the 3rd Year class, two have been employed by the Irrigation Branch.

Of the 7 students who qualified in the 2nd Year draftsman class, but were not taken into the 3rd Year class, 1 has been employed.

Seeing the need that is still felt by Engineers for trained draftsmen it is hoped that these men will soon find employment.

15. *Concrete Department—Reinforced Concrete Class.*—The annual course in Reinforced Concrete was held from the 19th September, 1932, until the 12th of January, 1933. The Chief Engineers detailed 12 subordinates but only 9 of them attended the course.

Buildings and Roads Branch	..	..	..	..	1
Irrigation Branch	..	..	..	..	6
North-Western Railway	..	..	..	..	2
					9
			Total	..	9

The five 3rd Year Draftsmen also took the whole of this course in the 2nd term. All the Overseers and Draftsmen successfully completed the course and showed keenness and concentration. The marks gained in the test papers set at the end of the course are given in table No. IV. Qualifying marks are 40 per cent. in each subject and 50 per cent. in the aggregate.

Eleven members of the class with the Lecturer in Reinforced Concrete visited the Cement Works at Wah.

16. *Testing Laboratory.*—Owing to there being practically no works in progress on account of depression, very little testing work was sent to the laboratory during the year, but a good deal of research in various directions was in hand.

The fees earned for testing during the year amounted to Rs. 445.

17. *Equipment.*—One D. C. motor, one blower for the workshop smithy, two lawn mowers, one small Petter engine, one tent and four shouldaries were added to the stock during the year. The total outlay under head Tools and Plant was Rs. 4,253.

18. *Buildings and Grounds—Major Works.*—None were executed during the year.

19. *Minor Works.*—A list of Minor Works executed during the year and their cost is given in Table VI.

20. *Maintenance of Buildings.*—These were maintained in good order throughout at the cost noted below—

	Rs.
School Buildings	3,275
Residential Buildings	429

21. *Special Repairs.*—None were executed during the year.

22. *Grounds.*—These were kept in good order.

23. *Financial Working.*—The financial working of the School during 1932-33 is given in Table V.

Under the head "Education" the net expenditure was Rs. 75,479 against Rs. 83,010 last year. Every effort was made to reduce the expenditure, the decrease is largely due to the 10 per cent. cut which was in force throughout the year.

The gross receipts were Rs. 33,686 against Rs. 41,222 last year. The reduction is partly due to the smaller amount realised from registration fees, owing to the smaller number of candidates that appeared in the admission examination, and partly due to the smaller amount realised from tuition fees from the reduced number of students in the classes.

Including all expenses and deducting all receipts the net expenditure was Rs. 78,238. Dividing this by 151, the number of students who attended the classes, after deducting the cost of training 9 members of the Reinforced Concrete class, the net cost per student was Rs. 504 against Rs. 487 last year.

TABLE I.

RESULTS OF FINAL EXAMINATIONS OF THE OVERSEER AND DRAFTSMAN CLASSES, HELD DURING THE FIVE YEARS 1928—1933.

Year.	Number appeared.	Number Qualified.	Highest marks percentages.	Average marks percentages.	REMARKS.
<b>OVERSEER CLASS.</b>					
1928-29 .. .. .	68	66	85	70	51 qualified by the higher standard of whom 19 obtained "Honours," 15 qualified by the lower standard.
1929-30 .. .. .	66	64	84	67	37 qualified by the higher standard of whom 15 obtained "Honours," 27 qualified by the lower standard.
1930-31 .. .. .	74	71	84	68	44 qualified by the higher standard of whom 16 obtained "Honours," 27 qualified by the lower standard.
1931-32 .. .. .	58	57	80	65	24 qualified by the higher standard of whom 5 obtained "Honours," 33 qualified by the lower standard.
1932-33 .. .. .	75	75	84	74	42 qualified by the higher standard of whom 12 obtained "Honours," 33 qualified by the lower standard.
<b>DRAFTSMAN CLASS.</b>					
1928-29 .. .. .	13	13	78	68	7 qualified by the higher standard.
1929-30 .. .. .	15	15	75	63	7 qualified by the higher standard.
1930-31 .. .. .	9	8	75	66	5 qualified by the higher standard.
1931-32 .. .. .	14	14	80	67	7 qualified by the higher standard.
1932-33 .. .. .	11	11	77	66	7 qualified by the higher standard.

Table II.

PARTICULARS OF RELIGION, CASTE, ETC., OF STUDENTS IN THE GOVERNMENT SCHOOL OF ENGINEERING, PUNJAB, RASUL, DURING THE FIVE YEARS 1928-1933.

Session.	CASTE.							RELIGION.							NAME OF CIVIL DIVISIONS AND INDIAN STATES TO WHICH STUDENTS BELONG.										REMARKS.			
	Brahmins.	Khatris.	Non-Brahman Hindus.	Mohammedans.	Sikhs.	Hindus.	Mohammedans.	Sikhs.	Sikhs.	Ambala Division.	Jullundur Division.	Lahore Division.	Rawalpindi Division.	Multan Division.	North-West Frontier Province.	Delhi Province.	Kashmir State.	Jairpur State.	Patiala State.	Bahawalpur State.	Nabha State.	Kapurthala State.	Pardikot State.	Mandi State.		Malerkotla State.	Simla Hill States.	
1928-29 ..	16	35	52	35	31	103	35	31	14	42	38	18	22	3	..	1	2	12	7	2	3	2	2	1	..	2	..	
1929-30 ..	19	24	66	35	34	109	35	34	11	45	41	21	23	3	..	3	1	9	16	1	1	1	1	..	1	..		
1930-31 ..	23	21	50	44	29	94	44	29	6	45	45	17	21	3	..	3	..	5	19	1	2	..	..	..	..	..	..	
1931-32 ..	19	28	44*	48	26	91*	48	26	9*	51	31	20	13	6	2	6	..	4	20	..	3	..	..	..	..	..	..	
1932-33 ..	13	26	35*	51	26	74*	51	26	11*	30	36	14	17	5	3	5	1	5	13	..	1	..	..	..	1	..	..	
																											*1 Jain.	*1 Jain.

Table III.

SHOWS IN WHAT PROVINCE, DEPARTMENTS, ETC., QUALIFIED STUDENTS FROM RASUL HAVE RECEIVED THEIR FIRST APPOINTMENTS DURING THE FIVE YEARS 1929-1933.

Year of qualification.	Number of students, who gained certificates.	EMPLOYED IN GOVERNMENT SERVICE.			Indian States non in es and subject's.	Employed in M. E. S., Delhi Pro ince Electricity Branch, District and Municipal Boards or other offices in the Punjab.	REMARKS.
		Punjab.		N.-W. F. Province.			
		Irrigation.	B. & R.	Irrigation.			
OVERSEER CLASS.							
1929	66	45	2	5	14	..	
1930	64	21	3	..	16	15	9 unemployed.
1931	71	13	1	1	12	4	40 unemployed.
1932	57	12	..	..	14	2	29 unemployed.
1933	75	13	1	5	15	2	39 unemployed.
DRAFTSMAN CLASS.							
1929	13	4	1	..	..	8	
1930	15	6	6	..	..	1	2 unemployed.
1931	8	4	..	..	..	1	3 unemployed.
1932	14	4	1	..	..	1	8 unemployed.
1933	11	1	..	..	..	..	4 undergoing 3rd Year's course in Practical design, and 6 unemployed.

Table IV.

SPECIAL COURSE IN REINFORCED CONCRETE CONSTRUCTION AND DESIGN, SESSION 1932-33.

Name.	Applied work during the course and upkeep of note books.	TEST PAPERS.				Total.
		Calculations.	Materials.	Control of concrete.	Construction.	
OVERSEER AND DRAFTSMEN.						
Full marks	..	100	100	75	50	400
Qualifying marks	..	40	40	30	20	200
OVERSEERS FROM THE BUILDINGS AND ROADS BRANCH.						
1. Thakar Pradhana Ram	..	75	77	56	27	280
OVERSEER FROM THE IRRIGATION BRANCH.						
2. B. Labh Singh	..	70	80	54	35	296
3. Lala Sushil Kumar	..	75	75	60	30	293
4. Lala Gopal Chand	..	70	76	60	30	289
5. Lala Harbhagwan Das	..	72	75	52	25	271
6. B. Joginder Singh	..	62	61	53	21	241
7. Mian Allah Dad Khan	..	60	53	47	20	220
NORTH-WESTERN RAILWAY.						
8. Mr. B. L. Malik	..	73	76	58	30	290
9. Mr. Tulsi Dass Wadhvani	..	72	76	54	26	280
3RD YEAR DRAFTSMEN.						
1. Lala Jagat Ram Wadhwa	..	75	85	62	37	316
2. Lala Amar Nath Khurana	..	75	83	56	36	298
3. Lala Piarey Lal	..	72	78	58	36	295
4. Lala Mehar Chand Kataria	..	65	71	53	28	261
5. Lala Baldev Pershad	..	62	57	49	20	226

Table V.

 FINANCIAL STATEMENT SHOWING RECEIPTS AND EXPENDITURE AT THE GOVERNMENT  
 SCHOOL OF ENGINEERING, PUNJAB, RASUL, FOR THE FINANCIAL YEAR 1932-33.

Serial No.	Description of expenditure or receipts.	Amount.	Total amount.	Grand total.	REMARKS.
		Rs.	Rs.	Rs.	
<b>EDUCATION.</b>					
<i>Receipts.</i>					
1	Admission examination fees .. .. .	1,140			
2	Tuition and Hostel fees .. .. .	14,950			
3	Capitation fees .. .. .	14,802			
4	Rents .. .. .	2,662			
5	Miscellaneous receipts .. .. .	132			
			33,686	33,686	
<b>EXPENDITURE.</b>					
<i>Salaries.</i>					
1	Gazetted Officers (Non-voted) including Overseas pay.	24,353			
2	Gazetted Officers (Voted) Permanent ..	17,433			
3	Gazetted Officers (Voted) Temporary ..	4,030			
4	Instructors Establishment, Permanent ..	12,597			
5	Instructors Establishment, Temporary ..	3,780			
6	Clerical Establishment, Permanent ..	5,391			
7	Workshop Establishment, Permanent ..	1,474			
8	Concrete Section Establishment, Permanent	5,795			
9	Workshop Establishment, Temporary ..	3,905			
10	Boarding House Establishment, Permanent..	360			
11	Menial Establishment (Peons and Daftri) ..	1,266			
			80,384		
12	Pensionary charges 3/16th item 1 plus 1/6th items 2, 4, 6, 7, 8, 10 and 34, plus 1/16th item 11.	11,880			
			11,880		
<i>Allowances.</i>					
13	Travelling Allowance (Non-voted) ..	491			
14	Travelling Allowance (Voted) .. .. .	1,154			
15	Other Allowances and Honoraria (Non-voted)				
16	Other Allowances and Honoraria (Voted) ..				
			1,645		
<i>Supplies and Services.</i>					
17	Books and Periodicals .. .. .	286			
18	Prizes and Medals .. .. .	465			
19	Materials for Workshop and Field works classes	2,973			
20	Visits to Works .. .. .	202			
21	Convocation charges .. .. .	331			
			4,257		
<i>Contingencies.</i>					
22	Pay of Menial Establishment .. .. .	5,822			
23	Stationery and Printing .. .. .	15			
24	Postage and Telegraph charges .. .. .	506			
25	Hot weather Establishment and cold weather charges.	163			
26	Railway freight on stationery and other Government records, parcels, etc. .. .. .	224			
27	Electricity charges .. .. .	221			
28	Miscellaneous .. .. .	559			
			7,510		
<i>Equipment—New Supplies.</i>					
29	Machinery and Tools and Plant .. .. .	3,221			
30	Mathematical Instruments .. .. .	328			
31	Furniture .. .. .	56			
32	Camp Equippage .. .. .	648			
			4,253		
<i>Repairs and Carriage of Tools and Plant.</i>					
33	Repairs to Machinery, furniture, etc. ..	2,957			
			2,957		
<i>Medical.</i>					
34	Salaries (Permanent) .. .. .	360			
35	Salaries (Contingent) .. .. .	144			
36	Allowances .. .. .	360			
37	Stores .. .. .	372			
			1,236		
<i>Suspense.</i>					
38	Suspense .. .. .	—4,957	—4,957	1,09,165	
	Less Receipts .. .. .			33,686	
	Net Expenditure .. .. .			75,479	
<i>Maintenance.</i>					
1	Buildings, Grounds, Establishment, Water-Supply, Approach Road and Water-course.	3,704	3,704	3,704	

Table V—CONCLUDED.

		MANUFACTURE.			
Item No.	RECEIPTS.	Amount.	Item No.	EXPENDITURE.	Amount.
	Description of items.			Description of items.	
		Rs.			Rs.
	<i>Workshop.</i>				
1	Value of work done and stores issued during the year.	18,470	1	Stock in hand on 1st April 1932 ..	13,676
2	Establishment recoveries on Deposit works.	69	2	Value of stores received during the year.	12,011
3	Tools and Plant charges on Deposit works.	6	3	Wages of special establishment ..	1,684
4	Storage charges on stock sold ..	21			
5	Value of stock in hand on 31st March 1933.	8,901			
	Total ..	27,467		Total ..	27,371
	Less Expenditure ..	27,371			
	Profit ..	96			
	<i>Electricity.</i>				
1	Outturn on account of electricity ..	3,283	1	Diesel oil .. .. .	1,349
			2	Costor oil .. .. .	150
			3	Kerosene oil Chakkar Brand ..	531
			4	Mobil oil .. .. .	213
			5	Petty Stores .. .. .	200
			5	Work charged labour including repairs to Power plant and belts, etc.	146
	Total ..	3,283		Total ..	2,589
	Less Expenditure ..	2,589			
	Gross profit ..	694			
	Less Depreciation ..	368			
	Net Profit ..	326			
	<i>Motor Vans.</i>				
1	Outturn on account of Motor Lorries hire.	747	1	Petrol, Mobil oil and other petty stores.	441
			2	Work charged labour and repairs to Motor Vans and Rail Motor, etc.	151
	Total ..	747		Total ..	592
	Less Expenditure ..	592			
	Gross Profit ..	155			
	Less Depreciation ..	120			
	Net Profit ..	35			

Net Expenditure—		Rs.	Rs.
Education .. .. .		75,479	
Maintenance .. .. .		3,704	
			79,183
Less net profits from—			
Manufacture—			
Workshop .. .. .	Rs.	Rs.	
Electricity .. .. .	96		
Motor Vans .. .. .	326		
	35		
Depreciation—		457	
Power Plant .. .. .		368	
Motor Vans .. .. .		120	
		488	
		945	945
Net Expenditure .. .. .			78,238
Less—			
Cost of training 9 members of the Reinforced Concrete Class at Rs. 250 each ..			2,250
			75,988
Number of students who completed the year's training—			
Overseer Class .. .. .			126
Draftsmen Class .. .. .			25
			151
Net cost to Government per student for the year ..			75,988
			Rs. 504
			151



Table VI.

STATEMENT SHOWING EXPENDITURE ON MINOR WORKS AND REPAIRS EXECUTED AT THE GOVERNMENT SCHOOL OF ENGINEERING, PUNJAB, RASUL, DURING THE FINANCIAL YEAR 1932-33.

Serial No.	Name of Estimate.	Expenditure during 1932-33.
<b>MINOR WORKS.</b>		
1	Fencing and levelling the land acquired in 1930 .. .. .	691
2	Proposed settling tanks for the cooling water of the Diesel Engines at the Government School of Engineering, Rasul .. .. .	544
3	Losses on Stock of pig iron .. .. .	837
	<b>Total .. .. .</b>	<b>2,072</b>
<b>REPAIRS.</b>		
1	Annual repairs to School Buildings, Grounds, etc. .. .. .	3,275
2	Annual repairs to Residential Buildings .. .. .	429
	<b>Total .. .. .</b>	<b>3,704</b>

## CHAPTER VIII.—The Communications Board, Punjab.

*Constitution.*—The Honourable Minister for Agriculture continued to be the President and the Board comprised the following members:—

### (a) Official (9 members).

1. The Financial Commissioner (Development), Punjab.
2. The Chief Engineer, Punjab, Public Works Department, Buildings and Roads Branch.
3. The Chief Engineer, Punjab, Public Works Department, Irrigation Branch.
4. The Secretary to Government, Punjab, Finance Department.
5. The Secretary to Government, Punjab, Transferred Departments.
6. The Director of Agriculture, Punjab.
7. The Chief Conservator of Forests, Punjab.
8. The Agent, North-Western Railway, Lahore.
9. The Senior Government Inspector of Railways, North-Western Railway.

### (b) Non-official (9 members).

1. Lieutenant Sardar Nau Nihal Singh Man, of Mananwala, District Sheikhpura.
2. Rai Bahadur Raja Pandit Hari Kishen Kaul, C.S.I., C.I.E.
3. Major Nawab Malik Talib Mehdi Khan, M.L.A., of Darapur, District Jhelum, up to 20th November, 1932.
- Syed Mubarak Ali Shah, Shah Jiwana, District Jhang, from 21st November, 1932.
4. Pir Syed Muhammad Hussain of Shergarh, District Montgomery, up to 5th February, 1933.
- Lala Joti Parshad, B.A., LL.B., M.L.C., Pleader, Hissar, from 6th February, 1933.
5. Sardar Sahib Sardar Randhir Singh, Honorary Magistrate, Sialkot Cantonment, up to 5th February, 1933.
- Sardar Gurbachan Singh, M.L.C., Jagirdar of Alawalpur, District Jullundur, from 6th February, 1933.
6. Rai Bahadur Lala Sewak Ram, M.L.C., Bar-at-Law, Lahore, up to 12th May, 1932.
- Khan Bahadur Sardar Habib Ullah, M.L.C., Lahore, from 16th July, 1932.
7. Rai Bahadur Lala Mohan Lal, M.L.C., Simla, up to February, 1933.
- Seth Maha Narain, Manager, Ganesh Flour Mills, Lyallpur, from 2nd March, 1933.
8. One representative of the Punjab and the Northern India Chambers of Commerce in rotation for one year—
  - (i) The Hon'ble Rai Bahadur Lala Ram Saran Dass, C.I.E., up to 14th December, 1932.
  - (ii) Lala Binda Sarn of Messrs. Dina Nath-Sheopershad, Lahore, from 2nd March, 1933.
9. P. H. Guest, Esquire, representative of the Automobile Association of Northern India.

Sardar Bahadur Sardar Gurbakhsh Singh, B.A., M.B.E., held charge of the office of the Secretary to the Board in addition to his own duties as Superintending Engineer, Third Circle, Lahore, till the forenoon of the 15th October, 1932, when he was relieved by Rai Bahadur Lala Sant Ram, who remained in charge of the combined offices till the close of the year under review.

*Business.*—During the year the Board held two regulate meetings and one Sub-Committee meeting. The Board accorded administrative approval to one project of the value of Rs. 41,300, advised Commissioners to accord administrative approval to 43 projects to the value of Rs. 68,940 and, through its Engineer Secretary, accorded technical sanction to 47 projects, amounting to Rs. 1,60,138. The Engineer Secretary also tendered advice to certain district boards in the matter of preparing estimates for the maintenance of class II roads, generally sanctioned by the District Engineers themselves. Funds to the extent of Rs. 3,23,091 were distributed as grants-in-aid to all district boards in the Punjab except Lyallpur, which, owing to its sound financial position, receives no grant-in-aid.

The Board continued its activities in connection with the general development and co-ordination of communications in the Province and watched the interests of road traffic; but, as, owing to acute financial stringency, there was hardly any expansion of Irrigation or Railway communications in the Province, its activities were mainly confined to the detailed consideration of the development and maintenance of class II roads under district boards and the distribution of grants.

*Railways.*—No new railway lines were opened to public traffic during the year under review.

#### *Class I (Arterial) Roads.*

These are dealt with separately in Chapter II of this Report.

#### *Class II (Main) Roads.*

At the end of the year under review, there were 1201·58 miles of metalled and 6895·50 miles of unmetalled roads of this class in charge of the district boards. The number of miles in each district is given in Table VI. These roads are improved and maintained with grants-in-aid from the Communications Board.

*Improvement.*—The activities in this direction were very much restricted by the amount of funds available both at the disposal of the Communications Board and the district boards themselves. The latter depend largely on the measure of assistance which the former can afford by way of grants-in-aid, which are based on percentages varying from 25 to 100 per cent. of the total cost of the work. Such of the district boards as come forward with proposals for road development and can also provide their share of the cost, stand the first chance of getting a grant-in-aid.

Due to the inability of district boards to provide for the efficient maintenance of their existing metalled mileage, the Communications Board has been averse from considering applications for the metalling of any more roads, except where absolutely necessary. During the year under review six and a half miles were added to the metalled mileage; *i.e.*, four and a half miles in Sheikhpura, and two miles in Amritsar. Almost the whole of the grant promised to these district boards for metalling was paid during the previous year.

As already mentioned in the administration reports for the previous two years, the Communications Board, due to acute financial stringency, has not been able to resume its programme of systematic improvement of the remaining class II roads by means of road grading outfits. The little work of improvement and maintenance that was actually in hand, was considerably hampered by the difficulties experienced in obtaining skilled tractor drivers, and spare parts for replacements, in cases of break-down. The Board was allotted only Rs. 25,000 for the improvement of roads, and out of this sum Rs. 23,091 were distributed to district boards as grants for the works detailed in Table II.

*Maintenance.*—The total expenditure on the maintenance of class II roads by district boards during 1931-32 amounted to Rs. 10,29,887 and the Communications Board share, at the fixed percentages, amounted to Rs. 4,22,646, but, on account of financial stringency, only Rs. 2,77,955 were paid, —*vide* details in Table III.

*Special Repairs.*—This consists of repairs to roads necessitated by floods and heavy rains, etc. During the year, Rs. 22,045 were paid under this head as shown in Table IV.

*Tools and Plant.*

*Road Grading Outfits.*—There is no change in the number of road grading outfits possessed by the Communications Board and the various district boards, as reported in the last year's administration report.

*Motor Transport.*—During the year under report registration of 1,097 new motor vehicles was effected, as against 1,550 vehicles in the previous year.

*Establishment.*—The Superintending Engineer, 3rd Circle, Lahore, continued to perform the duties of the Secretary to the Board, in addition to his own duties. During the year, however, the Board passed a resolution to the effect that the post of a whole-time Secretary should be revived in the interests of efficient supervision of the work and activities of the Board and the matter is under the consideration of Government.

During the year one of the two posts of Assistant Engineer was reduced. The necessity for a second Assistant Engineer is being increasingly felt, as one Assistant Engineer is insufficient for supervision.

The expenditure during the year under this head, of salaries, travelling allowances of staff and members of the Communications Board and contingencies amounted to Rs. 14,991. If this amount is computed against the total amount of grants-in-aid distributed, the overhead charges work out to 4·7 per cent. as against 5·7 per cent. last year. If the overhead charges are computed against the total expenditure of Rs. 10,99,782 on all class II roads by the district boards and the Communications Board, they come to a nominal figure of 1·4 per cent. as against 1·8 per cent. in the previous year.

**Table I.**

ABSTRACT OF EXPENDITURE BY COMMUNICATIONS BOARD AGAINST TOTAL ALLOTMENT DURING THE FINANCIAL YEAR 1932-33.

Head of Account.	Budget provision.	Modified Grant.	Expenditure during 1932-33.	REMARKS.
	Rs.	Rs.	Rs.	
41—CIVIL WORKS.				
I.—Minor Head X—Grants-in-aid—				
(i) Bridges and Roads ..	25,000	25,000	23,091	
(ii) Maintenance of class II roads and special repairs ..	3,00,000	3,00,000	3,00,000	
II.—Tools and Plant .. ..	800	840	706	
III.—Establishment .. ..	20,430	15,660	14,991	

Table II.

GRANTS GIVEN BY THE COMMUNICATIONS BOARD TO DISTRICT BOARDS DURING THE FINANCIAL YEAR 1932-33 FOR DEVELOPMENT OF ROADS.

District.	Name of estimate.	Amount of estimate.	Percentage.	Communications Board share.	Grant paid in previous year.	Grant paid in 1932-33.	Total.
		Rs.		Rs.	Rs.	Rs.	Rs.
Rohtak ..	Construction of a bridge over the Sahibi Nadi near Lohari Village.	1,173	50	586	..	150	150
Gurgaon ..	Improving mile 8 of Nuh-Palwal Road.	208	100	208	155	17	172
Karnal ..	Improving—						
	(1) Kaithal-Jind and Kaithal-Assaundh Roads.	29,564	50	41,360	30,301	3,773	34,074
	(2) Kaithal-Ghulla Road ..	10,238					
	(3) Bhagal-Pehawa Road ..	7,554					
	(4) Assaundh-Rajaund-Pundri Road.	10,713					
	(5) Bhagal -Ghulla Road ..	3,324					
	(6) Remodelling of certain bridges on Thanesar-Pehawa Road.	21,329					
	Total ..	82,722					
	(1) Earthwork on Dhand-Pehawa Road.	2,019	50	1,009	..	1,600	1,600
	(2) Constructing seven culverts on Shahabad-Ladwa, Karnal-Assaundh, Karnal-Indri and Karnal-Dhand-Pehawa Road.	1,845	50	922			
	Total ..	3,864	..	1,931			
Ambala ..	(1) Providing bujri surfaced diversion at Manimazra Naddi in mile 18 of Kurali-Chandigarh Road.	1,240	75	930	881	97	978
	(2) Improving Rugar-Bharatgarh Road.	2,658	75	1,994	..	1,950	1,950
	(3) Culvert on Jagadhri link Road.	698	100	698	..	639	639
	(4) Construction of a culvert on Abdullapur-Buria Road.	420	100	420	..	420	420
Hoshiarpur ..	(1) Cutting sharp corners of hills and constructing walls on the Hoshiarpur-Una Road in Una Tahsil.	1,723	75	1,292	..	2,680	2,680
	(2) Cutting sharp corners of hills and constructing walls on the Hoshiarpur-Una Road in Hoshiarpur Tahsil.	1,100	75	825			
	(3) Construction of a 80 feet long gap in mile 9 of the Garhshankar-Balachaur Road.	845	75	634			
	Total ..	3,668					
	Carried over ..			50,878	31,337	11,326	42,663

Table II—CONTINUED.

GRANTS GIVEN BY THE COMMUNICATIONS BOARD TO DISTRICT BOARDS DURING THE FINANCIAL YEAR 1932-33 FOR DEVELOPMENT OF ROADS—CONTINUED.

District.	Name of estimate.	Amount of estimate.	Per-centage.	Communi-cations Board share.	Grant paid in previous year.	Grant paid in 1932-33.	Total.
		Rs.		Rs.	Rs.	Rs.	Rs.
	Brought forward ..	..	..	50,878	31,337	11,376	42,663
Lahore ..	Metalling of Khem Karn-Bhikiwind Road.	1,54,710	50	77,355	77,252	57	77,309
Amritsar ..	Metalling miles 1 and 2 of Raya-Baba Bakala Road.	17,756	50	8,878	6,723	681	7,404
Gurdaspur ..	(1) Improving the bridge in mile 13 of Gurdaspur-Dera Baba Nanak Road.	2,271	50	1,135	887	217	1,104
	(2) Constructing a culvert at R. D. 2,620 in mile 5 of Batala-Dera Baba Nanak Road.	500	50	250	..	180	180
	(3) Covering sandy portion of mile 14 of Batala-Dera Baba Nanak Road.	504	50	252	..	408	408
	(4) Filling in low lying portion in mile 10 of Batala-Bhet Road.	499	50	250	..		
Sialkot ..	(1) Construction of certain unmetalled roads in the district.	14,014	25	3,503	2,700	300	3,000
	(2) Construction of 2, 6 span culverts in place of temporary wooden bridge in mile 19 of the Sialkot-Phulkian Road via Chaprar.	1,756	50	878	..	1,442	1,442
	(3) Construction of 50' gan in mile 6, Narowal-Zaffarwal Road near Dabliwala.	394	50	197	..		
	(4) Construction of one 6' span culvert in mile 13, Badiana-Chawinda-Dugri-Zaffarwal Road near Sodhrika Village.	831	50	415	..		
	(5) Filling central drain of the double track of Narowal-Zaffarwal Road in miles 16 and 17.	621	50	310	..		
Gujrat ..	Improving Jalalpur Jattan-Karianwala Road.	301	75	226	154	17	171
Jhelum ..	(1) Improving Choa-Katas Road.	2,491	50	1,245	702	89	791
	(2) Blasting and Jumper work on the Kherwa-Choa Road.	2,325	50	1,162	..	1,000	1,000
	Carried over ..			1,46,934	1,19,755	15,717	1,35,472

Table II—CONCLUDED.

GRANTS GIVEN BY THE COMMUNICATIONS BOARD TO DISTRICT BOARDS DURING THE FINANCIAL YEAR 1932-33 FOR DEVELOPMENT OF ROADS—CONCLUDED.

District.	Name of estimate.	Amount of estimate.	Per-centage.	Communi-cations Board share.	Grant paid in previous year.	Grant paid in 1932-33.	Total.
		Rs.		Rs.	Rs.	Rs.	Rs.
	Brought forward ..			1,46,934	1,19,755	15,717	1,35,472
Rawalpindi ..	(1) Providing causeway and retaining walls on Mandra-Chakwal Road.	8,199	50	4,099	6,399	180	6,579
	(2) Constructing retaining walls and cross walls, etc., on Mankiala-Kallar Road.	6,806	50	3,403			
	(3) Improving Lower Topa Ban Road.	4,238	50	2,119			
	(4) Supplying and spreading shingle on Rawalpindi-Maira Road.	853	50	426			
	(5) Constructing a retaining wall and causeways on Kahuta-Chak Pandori Road.	1,787	50	893			
Attock ..	(1) Improvements to Hasan Abdal-Fatehjang Road.	1,765	75	1,324	4,050	1,792	5,842
	(2) Providing parapet walls to Hume pipe culverts, retaining walls and Armeo Culverts Galli-Majhad Road.	4,426	75	3,320			
	(3) Improving Rawalpindi-Talagang Road.	2,072	75	1,554			
	Replacing the old iron decking of a 10' bridge in mile 5 of the Campbellpur-Hajishah Road.	453	100	453	408	43	451
	Improving road and approaches of Reshi Nullah on Jand-Pindigheb Road.	700	100	700	..	1,143	1,143
	Blasting rock in miles 17 and 18 of Hasan-Abdal-Fatehjang Road.	800	100	800			
	(1) Improvements to Rawalpindi-Talagang Road (Chakral to Dhadumber).	1,000	Lump sum Rs. 1,000	1,000	..	900	900
	(2) Improvements to Galli-Majhad Road.	672					
	(3) Constructing certain new causeways on Galli-Majhad Road.	432					
Multan ..	Completion of metalling of the Mian Channu-Pakhi Mian Road.	3,278	50	1,639	..	1,313	1,313
D. G. Khan ..	(1) Improving Jampur-Dajal Road.	1,479	50	739	..	1,003	1,003
	(2) Earthwork on Kotla Nasir-Rojhan Road.	167	50	84			
	(3) Construction of an Irish bridge in mile 18 of Kotla Nasir-Rojhan Road.	780	50	390			
	Total ..	..	..	1,60,877	1,30,612	23,091	1,53,703

Table III.

STATEMENT SHOWING THE EXPENDITURE INCURRED BY THE DISTRICT BOARDS  
DURING THE FINANCIAL YEAR 1931-32 ON THE MAINTENANCE OF CLASS II  
ROADS AND GRANT PAID BY THE COMMUNICATIONS BOARD  
DURING THE FINANCIAL YEAR 1932-33.

No.	District.	Total expenditure accepted after audit.	Communications Board share.	District Board share.	REMARKS.
		Rs.	Rs.	Rs.	
1	Hissar .. ..	8,360	3,093	5,267	
2	Rohtak .. ..	52,272	18,323	33,944	
3	Gurgaon .. ..	23,194	4,372	18,822	
4	Karnal .. ..	36,023	7,961	28,062	
5	Ambala .. ..	91,002	32,533	58,469	
6	Simla .. ..	270	270	..	
7	Kangra .. ..	22,306	3,624	18,682	
8	Hoshiarpur .. ..	44,609	9,859	34,750	
9	Jullundur .. ..	92,367	31,821	60,546	
10	Ludhiana .. ..	62,015	22,170	39,845	
11	Ferozepore .. ..	1,23,524	40,948	82,576	
12	Lahore .. ..	49,675	11,301	38,374	
13	Amritsar .. ..	57,015	12,600	44,415	
14	Gurdaspur .. ..	22,458	4,087	18,371	
15	Sialkot .. ..	20,522	3,335	17,187	
16	Gujranwala .. ..	11,481	1,866	9,615	
17	Sheikhupura .. ..	20,831	3,335	17,446	
18	Gujrat .. ..	33,524	7,845	25,679	
19	Shahpur .. ..	48,516	14,191	34,325	
20	Jhelum .. ..	13,067	2,972	10,095	
21	Rawalpindi .. ..	41,505	11,331	30,174	
22	Attock .. ..	14,204	2,308	11,896	
23	Mianwali .. ..	1,429	357	1,072	
24	Montgomery .. ..	38,458	7,249	21,209	
25	Lyalpur .. ..	..	..	..	
26	Jhang .. ..	30,632	5,177	25,455	
27	Multan .. ..	49,280	10,570	38,710	
28	Muzaffargarh .. ..	10,074	2,077	7,997	
29	Dera Ghazi Khan .. ..	11,274	2,325	8,949	
	Total .. ..	10,29,887	2,77,955	7,51,932	



Table IV.

STATEMENT SHOWING PAYMENTS MADE TO DISTRICT BOARDS FOR SPECIAL REPAIRS DURING THE FINANCIAL YEAR 1932-33.

District.	Name of estimate.	Amount of estimate.	Percentage.	Communications Board share.	Grant paid up to 1931-32.	Grant paid in 1932-33.	Total.
		Rs.		Rs.	Rs.	Rs.	Rs.
Gurgaon ..	Special repairs to Nuh-Taoru Bahora Road.	1,295	100	1,295	930	103	1,033
Karnal ..	Improving curve in mile 18 of Thanesar-Pehawa Road.	1,437	50	718	312	158	470
Ambala ..	(1) Special repairs to Bharatgarh-Anandpur Road.	3,680	70	2,576	2,407	257	2,664
	(2) Special repairs to Rupar-Bharatgarh Road.	1,696	75	1,272	..	1,303	1,303
	(3) Reconstruction of Gadaula Gap in mile 33 of Saahabad-Jagadhri Road.	1,595	75	1,196	}	1,315	1,315
	(4) Reconstruction of Bambauli Gap in mile 35 of the above Road.	352	75	264			
	(5) Special repairs to Kharwan bridge on Jagadhri-Buria Road.	411	Lump sum.	400	..	360	360
	(6) Special repairs to Jagadhri Bilaspur-Sadhawra Road.	1,033	Do.	1,000	..	882	882
	(7) Providing new iron decking to Chotaung bridge on Ambala-Jagadhri Road.	4,729	Do.	3,000	..	2,700	2,700
	(8) Special repairs to mile 16, Ambala-Naraingarh Road.	1,420	100	1,420	..	1,136	1,136
Kangra ..	I. (1) Special repairs to a bridge in mile 8 of the Pathankot-Dhanga-Indaura Road.	343	}	}	}	}	}
	(2) Retaining walls in miles 2 and 10 of Nurpur-Sadhwan-Malakwal-Badoni Road.						
	II. (1) Special repairs to Thakardwara-Bhawarna-Alampur Road.	2,884	}	}	}	}	}
	(2) Special repairs to Palampur-Dadh-Dharsala Road.						
	III. (1) Special repairs to Ranital-Jawalamukhi.	2,873	}	}	}	}	}
	(2) Dhera-Haripur-Harsar ..						
	(3) Dhera-Jawalamukhi ..						
	(4) Dhera-Dada-Siba-Talwara Road.						
	IV. Special repairs to Dharmasala-Palampur-Shahpur-Chamba Road.	1,641	}	}	}	}	}
Hoshiarpur ..	Reconstructing two span culvert in mile 20 of Hoshiarpur-Una Road.	6,186					
	Carried over ..			23,587	8,875	10,804	10,679

Table IV—CONCLUDED.

STATEMENT SHOWING PAYMENTS MADE TO DISTRICT BOARDS FOR SPECIAL REPAIRS  
DURING THE FINANCIAL YEAR 1932-33—CONCLUDED.

District.	Name of estimate.	Amount of estimate.	Percentage.	Communications Board share.	Grant paid up to 1931-32.	Grant paid in 1932-33.	Total.	
		Rs.		Rs.	Rs.	Rs.	Rs.	
	Brought forward ..			23,587	8,875	10,804	19,679	
Gurdaspur ..	(1) Remetalling and raising low portion of mile 5 of Batala-Dera Baba Nanak Road.	2,202	50	1,101	..	984	984	
	(2) Special repairs to Shikar regulator bridge over Kirn Nullah on Batala Dera Baba Nanak Road.	5,751	50	2,875	..	2,028	2,028	
Sialkot ..	(1) Recambering of class II roads damaged by floods.	7,900	50	3,950	2,526	1,454	3,980	
	(2) Special repairs to bridge and gap in mile 2 and 3 Pasrur-Daska Road.	607	50	303	}	708	708	
	(3) Special repairs to gap No. 1 in mile 10 Sialkot-Jalalpur Jattan Road.	1,124	50	562				
Gujrat ..	Special repairs to Jalalpur-Jattan-Karrianwala Road.	1,256	75	942	784	87	871	
Jhelum ..	(1) Special repairs to Bhaun-Kallar Kahar Road.	2,731	}	50	1,574	1,376	152	1,528
	(2) Special repairs to Chakwal-Kallar-Lilla Road.	417						
Rawalpindi ..	(1) Providing causeway and retaining walls on Mandra-Chakwal Road.	2,555	50	1,277	728	629	1,357	
	(2) Special repairs to Rewat-Mankiala-Kallar Road.	762	..	381	..	254	254	
	(3) Special repairs to a bridge between Nurpur and Saidpur on the Nurpur-Saidpur Road.	1,889	Lump sum.	700	..	630	630	
Attock ..	(1) Special repairs to Hasan Abdal-Fatehjang Road.	88	75	}	2,522	1,688	678	2,366
	(2) Special repairs to Hazro-Gurghasht Road.	795	75					
	(3) Special repairs to Galli-Majhad Road.	1,680	75					
	(4) Special repairs to Rawalpindi-Tallagang Road.	800	75					
	(5) Special repairs to Rawalpindi-Tallagang Road from Chakri to Dhadumpur.	3,388	}	Lump sum.	4,000	..	3,150	3,150
	(6) Special repairs to Galli-Majhad Road.	799						
Mianwali ..	Special repairs to Kalabagh-Isakhel Road.	646	100	646	..	487	487	
	Total ..	..	..	44,420	15,977	22,045	38,022	

Table V.

STATEMENT SHOWING THE TOTAL EXPENDITURE ON CLASS II ROADS WITH COMMUNICATIONS BOARD AND DISTRICT BOARDS SHARE SEPARATELY INCURRED DURING THE FINANCIAL YEAR 1932-33.

Serial No.	District.	TOTAL EXPENDITURE.			Grand Total.	Communica-tions Board share.	District. Board share.
		Develop-ment.	Mainten-ance.	Special repairs.			
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1	Hissar ..	..	8,360	..	8,360	3,093	5,267
2	Rohtak ..	300	52,272	..	52,572	18,478	34,094
3	Gurgaon ..	34	23,194	206	23,434	4,492	18,942
4	Karnal ..	10,746	36,023	316	47,085	13,492	33,593
5	Ambala ..	3,788	91,002	8,935	1,03,725	43,592	60,133
6	Simla ..	..	270	..	270	270	..
7	Kangra ..	..	22,306	773	23,079	4,204	18,875
8	Hoshiarpur ..	3,573	44,609	2,680	50,862	14,549	36,313
9	Jullundur ..	..	92,367	..	92,367	31,821	60,546
10	Ludhiana ..	..	62,015	..	62,015	22,170	39,845
11	Ferozepore ..	..	1,23,524	..	1,23,524	40,948	82,576
12	Lahore ..	114	49,675	..	49,789	11,358	38,431
13	Amritsar ..	1,362	57,015	..	58,377	13,281	45,096
14	Gurdaspur ..	1,610	22,458	6,024	30,092	7,904	22,188
15	Sialkot ..	4,084	20,522	4,324	28,930	7,239	21,691
16	Gujranwala ..	..	11,481	..	11,481	1,866	9,615
17	Sheikhupura ..	..	20,831	..	20,831	3,385	17,446
18	Gujrat ..	23	33,524	116	33,663	7,949	25,714
19	Shahpur ..	..	48,516	..	48,516	14,191	34,325
20	Jhelum ..	2,178	13,067	304	15,549	4,213	11,336
21	Rawalindi ..	2,360	41,505	2,396	46,261	14,024	32,237
22	Attock ..	4,476	14,204	4,054	22,734	10,014	12,720
23	Mianwali ..	..	1,429	487	1,916	844	1,072
24	Montgomery ..	..	38,458	..	38,458	7,249	31,209
25	Lyalpur ..	..	..	..	..	..	..
26	Jhang ..	..	30,632	..	30,632	5,177	25,455
27	Multan ..	2,626	49,280	..	51,906	11,883	40,023
28	Muzaffargarh ..	..	10,074	..	10,074	2,077	7,997
29	Dera Ghazi Khan ..	2,006	11,274	..	13,280	3,328	9,952
	Total ..	39,280	10,29,887	30,615	10,99,782	3,23,091	7,76,691

Table VI.

STATEMENT SHOWING THE LENGTH OF CLASS II ROADS IN CHARGE OF DISTRICT BOARDS ON 31st MARCH, 1933.

Serial No.	District.	CLASS II ROADS.			REMARKS.
		Metalled.	Unmetalled.	Total.	
1	Hissar ..	26	437	463	
2	Rohtak ..	97.32	172	269.32	
3	Gurgaon ..	49.50	237	286.50	
4	Karnal ..	31	323	354	
5	Ambala ..	93.50	174	267.50	
6	Simla ..	..	5	5	
7	Kangra ..	..	316	316	
8	Hoshiarpur ..	54.5	249.5	304	
9	Jullundur ..	117	108.50	225.50	
10	Ludhiana ..	90.62	38	128.62	
11	Ferozepore ..	85.04	209	294.04	
12	Lahore ..	39	243	282	
13	Amritsar ..	..	117	166	
14	Gurdaspur ..	49	198	233.50	
15	Sialkot ..	35.50	198	322.47	
16	Gujranwala ..	4.97	317.50	272	
17	Sheikhupura ..	9	263	272	
18	Gujrat ..	17	275.50	292.50	
19	Shahpur ..	47	288	335	
20	Jhelum ..	86.5	369.5	456.0	
21	Rawalpindi ..	10.50	258.50	269	
22	Attock ..	36.50	263.50	300	
23	Mianwali ..	6	285	291	
24	Montgomery ..	4	82	86	
25	Lyalpur ..	40.7	343.4	393.1	
26	Jhang ..	87	203	290	
27	Multan ..	19	269.5	288.5	
28	Muzaffargarh ..	56.43	331.10	387.53	
29	Dera Ghazi Khan ..	..	374	374	
	Total ..	1201.58	6895.50	8097.08	

## CHAPTER IX.—Miscellaneous.

1. The following paper was written by Mr. J. A. R. Bromage for the Punjab Engineering Congress, 1933 :—

“Pipes and fittings used in water service to buildings.”

2. *Assistance rendered to local bodies during 1932-33.*—During the year under review, projects aggregating Rs. 1,56,124 were scrutinised for local bodies, and others totalling Rs. 55,40,821 were prepared for works, which in some cases were carried out by the Public Works Department, Buildings and Roads Branch :—

YEAR.	Projects scrutinised by Public Works Department (Lakhs of rupees).	Projects prepared by Public Works Department (Lakhs of rupees).	Work done by Public Works Department (Lakhs of rupees).	Fees charged.
				Rs.
1928-29 .. .. .	11·48	22·67	6·19	1,76,298
1929-30 .. .. .	7·11	38·16	9·87	1,98,464
1930-31 .. .. .	3·19	21·13	7·50	1,37,092
1931-32 .. .. .	2·79	44·25	10·77	1,73,877
1932-33 .. .. .	1·56	55·41	6·02	1,17,748

3. *Works of Public Utility.*—Works costing over Rs. 10,000 each were constructed by private individuals during the year 1933 as under—

	Rs.
(1) A pucca Sarai at village Hardi, Una tahsil, Hoshiarpur District by Lala Jodha Mal .. .. .	15,000
(2) A Dharmasala, a Baoli and two Atyalas at Baliana, and a water pipe with tank at Garh in the Kangra District by Lala Reroo Mal .. .. .	60,000
(3) An Eye Hospital at Bhiwani, Hissar District, by Lala Kishan Lal	15,000

## STATEMENT A-1.

LENGTH OF AND EXPENDITURE (BY CIRCLES AND DIVISIONS) ON MAINTENANCE OF ROADS IN CHARGE OF THE PUBLIC WORKS DEPARTMENT, BUILDINGS AND ROADS BRANCH, FOR THE YEAR ENDED 31st MARCH 1933.

CIRCLE AND DIVISION.	LENGTH.				EXPENDITURE.				REMARKS.
	Arterial.		Other.		Arterial.		Other.		
	Metalled.	Un-metalled.	Metalled.	Un-metalled.	Metalled.	Un-metalled.	Metalled.	Un-metalled.	
1	2	3	4	5	6	7	8	9	10
	Miles.	Miles.	Miles.	Miles.	Rs.	Rs.	Rs.	Rs.	
Rawalpindi ..	330·69	164·73	9·02	4·92	6,78,917	19,317	6,774	6,627	The lengths are as on 31st March 1933.
Lyallpur ..	258·29	373·92	4·34	..	3,44,664	52,569	5,661	..	
Multan ..	146·39	213·85	42·51	69·12	1,06,634	39,329	16,384	3,725	
Total 1st Circle ..	735·37	752·50	55·87	74·04	11,30,215	1,11,215	28,819	10,352	
Ambala ..	233·35	..	6·82	35·27	2,96,722	..	11,540	9,165	
Gurgaon ..	352·50	68·89	2·31	..	5,12,538	8,471	495	..	
Jullundur ..	277·04	104·74	0·85	..	4,33,298	19,034	106	..	
Simla ..	54·83	186·45	..	140·08	68,392	37,923	..	18,118	
Total 2nd Circle ..	917·78	360·08	9·98	175·35	13,10,950	65,428	12,231	27,283	
I Lahore ..	223·85	55·50	1·44	..	3,92,617	10,335	782	..	
II Lahore ..	302·60	31·96	25·16	40·30	5,07,825	8,551	40,036	18,724	
Kangra ..	94·71	85·43	3·23	270·52	1,16,293	33,054	1,642	43,010	
Montgomery ..	246·43	87·56	86·49	15·36	2,78,971	22,648	58,645	3,483	
Total 3rd Circle ..	867·59	260·45	116·32	326·18	12,95,706	74,588	1,01,105	65,217	
GRAND TOTAL ..	2,520·74	1,373·03	182·17	575·57	37,36,871	2,51,231	1,42,155	1,02,852	

## STATEMENT A-2.

LENGTH OF AND EXPENDITURE (BY ROADS) ON MAINTENANCE OF ROADS IN CHARGE OF THE PUBLIC WORKS DEPARTMENT, BUILDINGS AND ROADS BRANCH, FOR THE YEAR ENDED 31st MARCH 1933.

Name of Road.	LENGTH.			EXPENDITURE.			RATE PER MILE.		REMARKS.
	Metalled.	Un-metalled.	Total.	Metalled.	Un-metalled.	Total.	Metalled.	Un-metalled.	
1	2	3	4	5	6	7	8	9	10
<i>Arterial Roads.</i>	Miles.	Miles.	Miles.	Rs.	Rs.	Rs.	Rs.	Rs.	
1. Grand Trunk Road.	553.39	4.75	563.14	10,00,881	1,002	10,01,883	1,792	211	The lengths are as on 31st March 1933. The lengths include links connecting the parent road with railway station.
2. Lahore-Nargodha-Mianwali.	131.91	59.62	191.53	1,80,935	6,359	1,87,294	1,372	107	
3. Lahore-Lyallpur-Bhakkar.	82.36	132.61	214.97	1,21,158	16,711	1,37,869	1,471	126	
4. Lahore-Multan-Quetta.	191.61	134.68	326.29	2,11,093	30,308	2,41,401	1,102	225	
5. Lahore-Ferozepore-Ludhiana.	136.61	..	136.61	1,71,883	..	1,71,883	1,258	..	
6. Delhi-Multan ..	289.98	119.61	409.59	4,30,428	19,017	4,49,445	1,484	159	
7. Delhi-Alwar ..	67.07	..	67.07	1,08,157	..	1,08,157	1,613	..	
8. Hatti-Campbellpur-Dhok Pathan.	31.77	38.88	70.65	32,965	4,403	37,368	1,038	113	
9. Rawalpindi (Tarnaul)-Khushalgarh-Kohat.	32.50	35.00	67.50	21,629	2,925	24,554	666	84	
10. Fatehjang-Talagang-Mianwali.	42.92	17.00	59.92	42,345	2,013	44,358	987	118	
11. Rawalpindi-Murree-Kashmir.	66.64	..	66.64	2,05,913	..	2,05,913	3,090	..	
12. Jhelum (Sohawa)-Talagang.	0.40	69.10	69.50	..	8,974	8,974	..	130	
13. Wazirabad-Sialkot-Kashmir.	36.20	..	36.20	44,661	..	44,661	1,340	..	
14. Amritsar-Pathankot-Kulu.	163.65	42.93	206.58	2,24,536	17,904	2,42,440	1,372	417	
15. Pathankot (Chakki)-Dalhousie.	39.54	..	39.54	1,18,859	..	1,18,859	3,000	..	
16. Blank ..	..	..	..	..	..	..	..	..	
17. Ferozepore-Fazilka.	10.87	42.08	52.95	11,117	6,195	17,312	1,023	147	
18. Jullundur-Hoshiarpur-Dharmasala.	42.48	67.01	109.49	65,744	24,612	90,356	1,548	367	
19. Delhi-Muttra ..	48.85	..	48.85	53,298	..	53,298	1,091	..	
20. Ambala-Simla-Tibet.	89.76	186.45	276.21	1,30,673	37,923	1,68,596	1,456	204	
21. Saharanpur-Kurukshetra.	32.70	..	32.70	27,016	..	27,016	826	..	
22. Rohtak-Bhiwani	27.34	..	27.34	21,867	..	21,867	800	..	
23. Sohna-Rewari..	11.19	17.52	28.71	8,247	809	9,056	737	47	
24. Muzaffargarh-Alipur.	27.00	24.62	51.62	11,481	3,992	15,473	425	162	
25. Dera Ghazi Khan-Mithankot.	10.36	66.82	77.18	19,782	11,705	31,487	1,909	175	
26. Montgomery-Arafwala-Kabulah.	34.54	..	34.54	28,564	..	28,564	827	..	
Carried over ..	2,206.64	1,059.64	3,265.32	32,93,232	1,94,852	34,88,034	..	..	

## STATEMENT A-2—CONTINUED.

LENGTH OF AND EXPENDITURE (BY ROADS) ON MAINTENANCE OF ROADS IN CHARGE OF THE PUBLIC WORKS DEPARTMENT, BUILDINGS AND ROADS BRANCH, FOR THE YEAR ENDED 31ST MARCH 1933—CONTINUED.

Name of Road.	LENGTH.			EXPENDITURE.			RATE PER MILE.		REMARKS.
	Metalled.	Un-metalled.	Total.	Metalled.	Un-metalled.	Total.	Metalled.	Un-metalled.	
1	2	3	4	5	6	7	8	9	10
	Miles.	Miles.	Miles.	Rs.	Rs.	Rs.	Rs.	Rs.	
Brought forward ..	2,264	1,584	3,265	32,93,232	1,94,852	34,88,084	..	..	
<i>Arterial Roads—</i>									
<i>concd.</i>									
27. Montgomery-Pakpattan.	26.59	..	26.59	29,671	..	29,671	1,116	..	The lengths are as on 31st March 1933.
28. Lyallpur-Sargodha.	15.67	37.78	53.45	17,152	6,238	23,390	1,095	165	
29. Sambrial-Gujranwala-Pindi Bhattian-Jhang.	56.03	51.93	107.96	1,36,708	9,145	1,45,853	2,439	176	The lengths include links connecting the parent road with railway station.
30. Blank ..	..	..	..	..	..	..	..	..	
31. Lahore-Moga ..	51.40	21.31	72.71	43,514	2,528	46,042	846	119	
32. Jaranwala-Okara	10.95	22.05	33.00	35,483	8,290	43,773	3,240	376	
33. Blank ..	..	..	..	..	..	..	..	..	
34. Amritsar-Sialkot.	43.75	37.65	81.40	1,06,759	8,709	1,15,468	2,440	231	
35. Gojra-Shorkot..	11.14	34.63	45.77	12,503	3,796	16,299	1,122	109	
36. Sonapat-Rohtak	33.44	..	33.44	21,905	..	21,905	655	..	
37. Karnal-Kaithal	38.45	..	38.45	22,054	..	22,054	573	..	
38. Blank ..	..	..	..	..	..	..	..	..	
39. Toba Tek Singh-Chichawatni-Burewala.	17.98	44.50	62.48	12,994	8,483	21,477	728	..	
40. Blank ..	..	..	..	..	..	..	..	..	
41. Kabirwala-Jhang.	..	61.50	61.50	..	8,640	8,640	..	140	
42. Meerut-Sonapat	8.70	3.00	11.70	4,896	550	5,446	563	183	
Total Arterial Roads	2,520.74	1,373.03	3,893.77	37,36,871	2,51,231	39,88,102	1,482	183	
<i>Other Roads.</i>									
1. Taxila-Jaulian..	6.00	..	6.00	3,674	..	3,674	612	..	The lengths are as on 31st March 1933.
2. Murree-Burian..	1.50	4.92	6.42	2,500	6,627	9,127	1,667	1,347	
3. Civil Station Roads (Rawalpindi).	1.52	..	1.52	600	..	600	395	..	
4. Dharmpur-Kasauli.	6.82	..	6.82	11,540	..	11,540	1,692	..	
5. Kalka-Kasauli..	..	8.67	8.67	..	3,660	3,660	..	422	
Carried over ..	15.84	13.59	29.43	1,314	10,287	28,001	..	..	

## STATEMENT A-2--CONTINUED.

LENGTH OF AND EXPENDITURE (BY ROADS) ON MAINTENANCE OF ROADS IN CHARGE OF THE PUBLIC WORKS DEPARTMENT, BUILDINGS AND ROADS BRANCH, FOR THE YEAR ENDED 31ST MARCH 1933--CONTINUED.

Name of Road.	LENGTH.			EXPENDITURE.			RATE PER MILE.		REMARKS.
	Metalled.	Un-metalled.	Total.	Metalled.	Un-Metalled.	Total.	Metalled.	Un-metalled.	
1	2	3	4	5	6	7	8	9	10
	Miles.	Miles.	Miles.	Rs.	Rs.	Rs.	Rs.	Rs.	
Brought forward ..	15·84	13·59	29·43	18,314	10,287	28,601	..	..	
<i>Other Roads— contd.</i>									
6. Dâk Bungalow Road (Kasauli).	..	0·27							
7. Garkhal-S a n a -war.	..	3·12							
8. Garkhal-Sabathu	..	7·89	26·60	..	5,505	5,505	..	207	The lengths are as on 31st March 1933.
9. Sabathu-Haripur	..	4·32							
10. Sabathu-Solon..	..	2·00							
11. Sabathu-Kaithli-ghat.	..	9·00							
12. Dhalli-Mashobra-Sunni.	..	22·31	22·31	..	6,270	6,270	..	281	
13. Narkanda-Luri	..	13·38	13·38	..	1,338	1,338	..	100	
14. Luri-Bera ..	..	7·37	7·37	..	737	737	..	100	
15. Sidhpur-Deo ..	..	64·00	64·00	..	6,456	6,456	..	101	
16. Gaura-Mashnu..	..	7·50	7·50	..	750	750	..	100	
17. Mashobra-C h a -rabra.	..	1·37	1·37	..	100	100	..	74	
18. Kotgarh-Tha n e -dar.	..	2·00	2·00	..	148	148	..	74	
19. Kotgarh-Berari	..	2·00	2·00	..	148	148	..	74	
20. Prospect Hill Road.	..	0·80	0·80	..	281	281	..	351	
21. Mule Link Roads	..	16·38	16·38	..	1,310	1,310	..	80	
22. Shiassu Bridge-Shiassu Rest-House.	..	1·90	1·90	..	285	285	..	150	
23. Boleanganj-J u -togh.	..	1·07	1·07	..	295	295	..	276	
24. Hansi Agricultural Farm Road.	2·31	..	2·31	495	..	495	214	..	
25. Approach Road to Baradari Estate, Jullundur City.	0·85	..	0·85	196	..	196	231	..	
26. Gujranwala Civil Station.	1·44	..	1·44	782	..	782	543	..	
27. S h e k h u p u r a Civil Station.	4·34	..	4·34	5,661	..	5,661	1,304	..	
28. D u n e r a -Dalhousie.	..	23·61	23·61	..	16,283	16,283	..	690	
29. Lahore—Mall ..	3·61	..							
30. Mayo ..	3·05	..							
31. Infantry	0·40	..							
32. Ravi Park	1·19	..	17·16	32,780*	..	32,780	1,910	..	
33. Lawrence Garden.	4·40	..							
34. Jail Road	2·17	..							
35. F o r t Roads.	2·34	..							
Carried over ..	41·94	203·88	245·82	58,223	50,193	1,08,421	..	..	

\*Expenditure for individual roads not available.



## STATEMENT A-2—CONCLUDED.

LENGTH OF AND EXPENDITURE (BY ROADS) ON MAINTENANCE OF ROADS IN CHARGE OF THE PUBLIC WORKS DEPARTMENT, BUILDINGS AND ROADS BRANCH, FOR THE YEAR ENDED 31ST MARCH 1933—CONCLUDED.

Name of Road.	LENGTH.			EXPENDITURE.			RATE PER MILE.		REMARKS.
	Metalled.	Un-metalled.	Total.	Metalled.	Un-metalled.	Total.	Metalled.	Un-metalled.	
1	2	3	4	5	6	7	8	9	10
	Milcs.	Miles.	Miles.	Rs.	Rs.	Rs.	Rs.	Rs.	
Brought forward ..	41·94	203·88	245·82	58,228	50,193	1,08,421	..	..	
<i>Other Roads— concl.</i>									
36. Bhai Pheru-Halla-Pattoki.	8·00	16·69	24·69	7,256	2,441	9,697	907	147	
37. Luri-Oat ..	..	51·37	51·37	..	12,164	12,164	..	237	
38. Kulu-Lingti ..	..	130·77	130·77	..	15,892	15,892	..	121	
39. Kulu-Manali (left bank road).	..	24·53	24·53	..	2,847	2,847	..	116	
40. Kandi-Bajaura	..	9·75	9·75	..	1,196	1,196	..	122	
41. Banjar-Rampur	..	33·31	33·31	..	7,477	7,477	..	224	
42. Kulu-Silbadwani	..	19·50	19·50	..	3,100	3,100	..	159	
43. Dharmasala Civil Station Roads.	3·23	1·29	4·52	1,642	334	1,976	508	259	
44. Civil Station Roads, Pakpattan.	1·83	..	1·83	740	..	740	404	..	
45. Harrappa Railway Station to Protected Area Harrappa.	..	4·25	4·25	..	1,048	1,048	..	247	
46. Fitna-Jamlera-Mana Road.	22·60	3·72	26·32	23,090	887	23,977	1,022	239	
47. Arafwala-Trikhni	7·57	..	7·57	3,493	..	3,493	461	..	
48. Burewala-Luddan.	14·58	..	14·58	13,857	..	13,857	950	..	
49. Burewala-Kamand.	10·78	..	10·78	6,308	..	6,308	585	..	
50. Vehari-Katcha Khu.	12·33	..	12·33	5,090	..	5,090	413	..	
51. Vehari-Luddan	16·80	..	16·80	6,067	..	6,067	361	..	
52. Kasamsar-Pakhi Mian.	..	7·39	7·39	..	1,548	1,548	..	209	
53. Dunyapur-Lal Sago.	21·46	..	21·46	14,969	..	14,969	697	..	
54. Maisi-Tibba	21·05	..	21·05	1,415	..	1,415	67	..	
55. Dunyapur-Basti Maluk.	..	11·98	11·98	..	648	648	..	54	
56. Dunyapur-Kahror.	..	15·15	15·15	..	810	810	..	54	
57. Lodhran-Dunyapur.	..	10·25	10·25	..	540	540	..	52	
58. Lodhran-Jalalpur Pirwala.	..	26·04	26·04	..	1,404	1,404	..	54	
59. Lodhran-Sutlej River.	..	5·70	5·70	..	323	323	..	56	
Total Other Roads ..	182·17	575·67	757·74	1,42,155	1,02,852	2,45,007	780	179	



## STATEMENT B—CONTINUED.

STATEMENT OF PROVINCIAL EXPENDITURE ON PROVINCIAL WORKS DURING  
1932-33—CONTINUED.

Heads.	Original Works.	Repairs.	Total.
	Rs.	Rs.	Rs.
Brought forward ..	3,74,950	9,48,373	13,18,923
<i>Communications—(Transferred).</i>			
<i>Metalled Roads—</i>			
A.—Bridged and drained throughout ..	51,713	85,07,177	85,58,890
B.—Partially bridged and drained throughout.			
<i>Unmetalled Roads—</i>			
A.—Bridged and drained throughout ..	42,745	2,73,157	3,15,902
B.—Partially bridged and drained throughout.			
Central Road Development Fund ..	2,69,571	6,00,000	8,69,571
Boat Bridges and Ferries ..	391	1,19,008	1,19,394
Arboriculture ..	..	..	..
Accommodation for travellers ..	422	9,844	10,266
Miscellaneous ..	330	712	1,042
Total Communications ..	3,65,172	45,09,893	48,75,065
Miscellaneous ..	22,185	77,743	99,928
Grant-in-aid ..	3,23,207	..	3,23,207
Total Original Works and Repairs ..	10,85,514	55,31,009	66,16,523
Establishment ( <i>Pro-Rata</i> Distribution) ..	..	..	(a) 12,92,895
Tools and Plant ( Ditto ) ..	..	..	75,645
Suspense ..	..	..	46,898
Total Transferred and Reserved ..	11,04,658	56,11,950	81,30,546
<i>Deduct—Expenditure in England—</i>			
Par value ..	..	..	95,028
Loss or gain by Exchange ..	..	..	—252
<i>Add—Loss by Exchange ..</i>	..	..	—252
GRAND TOTAL 41—CIVIL WORKS—RESERVED AND TRANSFERRED.	11,04,658	56,11,950	80,95,518
<i>60—Civil Works—Capital Expenditure.</i>			
Buildings Medical ..	84,289	..	84,289
Communications ..	9,318	..	9,318
Miscellaneous ..	8,89,101	..	8,89,101
Total Original Works and Repairs ..	9,82,708	..	9,82,708
Establishment ( <i>Pro-Rata</i> Distribution) ..	..	..	1,91,881
Tools and Plant ( Ditto ) ..	..	..	8,450
Suspense ..	..	..	..
Total ..	..	..	11,83,039
Carried over ..	..	..	11,83,039

(a) This does not include an expenditure of Rs. 4,28,795 on account of Engineering Education.

## STATEMENT B—CONCLUDED.

STATEMENT OF PROVINCIAL EXPENDITURE ON PROVINCIAL WORKS DURING  
1932-33—CONCLUDED.

Heads.	Original Works.	Repairs.	Total.
	Rs.	Rs.	Rs.
Brought forward ..	..	..	11,83,089
<i>Deduct</i> —Recoveries on Capital Account ..	..	..	..
<i>Deduct</i> —Expenditure in England—	..	..	..
(1) Par value .. ..	..	..	..
(2) Loss or gain by Exchange ..	..	..	..
<i>Add</i> —Loss by Exchange .. ..	..	..	..
GRAND TOTAL 60—CIVIL WORKS ..	..	..	11,83,089
<i>Deduct</i> —Amount transferred to 41—Civil Works ..	..	..	11,83,089
Net charged to 60—Civil Works ..	..	..	..
56—Capital on Industrial Development Works ..	1,787	..	1,787
Total Original Works and Repairs ..	1,787	..	1,787
Establishment ( <i>Pro-Rata</i> Distribution) ..	..	..	354
Tools and Plant ( Ditto ) ..	..	..	15
Suspense .. ..	..	..	..
Total .. ..	..	..	2,156
<i>Deduct</i> —Recoveries on Capital Account ..	..	..	..
<i>Deduct</i> —Expenditure in England ..	..	..	..
<i>Add</i> —Net loss by Exchange .. ..	..	..	..
GRAND TOTAL 56-C ..	..	..	2,156
<i>Deduct</i> —Amount transferred to 95-A—Industrial Capital Outlay to be met from Revenue ..	..	..	2,156
Net Total 56-C .. ..	..	..	..
35-A—Industrial Capital Outlay to be met from Revenue ..	..	..	2,156
41-A—Capital expenditure on Civil Works met out of Extraordinary Receipts ..	..	..	..
Amount transferred from 60—Civil Works ..	..	..	11,83,089
GRAND TOTAL ..	20,89,153	56,11,950	92,20,718

## STATEMENT C.

STATEMENT OF EXPENDITURE ON PUBLIC WORKS OTHER THAN PROVINCIAL  
DURING 1932-33.

Heads.	Original Works.	Repairs.	Total.
	Rs.	Rs.	Rs.
<b>WORKS DONE FOR CENTRAL GOVERNMENT AND LOCAL BODIES.</b>			
<i>Central Military Works.</i>			
Works .. .. .	54,948	27,756	82,699
Suspense .. .. .	..	..	..
Expenditure in England .. .. .	..	..	..
Total Military Works ..	54,948	27,756	82,699
<i>41—Central Civil Works.</i>			
<i>Civil Buildings—</i>			
Voted .. .. .	36	..	36
Non-voted .. .. .	..	..	..
Communications .. .. .	..	..	..
Total ..	36	..	36
Suspense .. .. .	..	..	..
Expenditure in England .. .. .	..	..	..
GRAND TOTAL ..	36	..	36
<i>Posts and Telegraphs Works.</i>			
Total Posts and Telegraphs ..	..	..	..
<i>Archaeological Works.</i>			
Monuments and Antiquities .. .. .	..	..	..
Miscellaneous Allowances .. .. .	..	..	..
Total Archæological ..	..	..	..
<i>Works for Local Bodies and Deposit Works.</i>			
Municipal and Local Loan .. .. .	5,30,399	94,714	6,25,113
Private and other Funds .. .. .	17,327	858	18,185
Civil and other Departments .. .. .	829	..	829
Total Deposits ..	5,48,555	95,572	6,44,127
<i>Departmental Charges.</i>			
Military Works (Pro-Rata Distribution) ..	..	..	5,051
Central Works—			
Voted (Pro-Rata Distribution) .. .. .	..	..	7
Non-voted (Pro-Rata Distribution) .. .. .	..	..	..
Posts and Telegraphs .. .. .	..	..	..
Archæological Works .. .. .	..	..	..
Deposit Works and Works for Local Bodies .. .. .	(Percentage Charges).	..	45,681
Total Departmental Charges ..	..	..	50,689
GRAND TOTAL ..	6,03,594	1,23,328	7,77,551

## STATEMENT D. 1932

STATEMENT OF EXPENDITURE ON PUBLIC WORKS BY PUBLIC WORKS DEPARTMENT,  
BUILDINGS AND ROADS BRANCH DURING 1932-33.

Heads.	ORIGINAL WORKS.			Deposits.	Repairs.	Total.
	Revenue.	Capital.	Extraordi- nary Receipts.			
1	2	3	4	5	6	7
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
<i>(i) Works done by Regular Buildings and Roads Divisions.</i>						
1. Provincial (Reserved)—						
Civil Buildings ..	3,161	..	..	..	58,247	61,408
Communications ..	15,783	..	..	..	12,137	27,920
Total ..	18,944	..	..	..	70,384	89,328
Civil Buildings (Transferred) ..	2,69,839	(b) 55,116	..	..	6,81,182	10,06,137
Communi- cations.	Metalled ..	51,713	(b) 9,337	..	35,02,756	35,63,806
	Unmetalled ..	42,745	..	..	2,73,157	3,15,902
	Central Road Development Fund	2,69,571	..	..	6,00,000	8,69,571
	Other sub-heads ..	1,143	(b) —19	..	..	1,29,539
Miscellaneous ..	9,339	(b) 8,87,662	..	..	70,865	9,67,866
Industrial Development ..	..	(a) 1,787	..	..	..	1,787
Total ..	6,44,350	9,53,883	..	..	52,57,519	68,55,752
2. Central Works ..	446	..	..	..	11,719	12,165
3. Deposits and other Works—						
(1) Municipal and Local Loans.	..	..	..	92,117	3,244	95,361
(2) Private and other Funds	..	..	..	14,651	858	15,509
(3) Civil and Other Departments.	..	..	..	829	..	829
Total Deposits and other Works	..	..	..	1,07,597	4,102	1,11,699
Total Buildings and Roads Branch	6,63,740	9,53,883	..	1,07,597	53,43,724	70,68,944
<i>(ii) Works done by Public Health Circle.</i>						
(1) Provincial Civil Works—						
(a) Reserved Civil Buildings.	200	..	..	..	10,557	10,757
(b) Transferred ..	1,17,957	(b) 30,612	..	..	2,73,490	4,22,059
(2) Central Works ..	54,533	..	..	..	16,037	70,570
(3) Deposits and other works ..	..	..	..	4,40,958	91,470	5,32,428
(4) Industrial Departments ..	..	..	..	..	..	..
Total ..	1,72,690	30,612	..	4,40,958	3,91,554	10,36,814
Grants-in-aid ..	(b) 3,23,207	..	..	..	..	3,23,207
GRAND TOTAL ..	11,59,637	9,84,495	..	5,48,555	57,35,278	84,27,965

(a) Expenditure transferred to 35-A—Industrial Capital Outlay to be met from Revenue (*vide* statement B).(b) Expenditure transferred to 41-A—Civil Works (*vide* Statement B).

## STATEMENT D—CONCLUDED.

STATEMENT OF EXPENDITURE ON ESTABLISHMENT BY PUBLIC WORKS DEPARTMENT,  
BUILDINGS AND ROADS BRANCH, DURING 1933-34—CONCLUDED.

Heads.	WORKS OUTLAY.		Deduct charges on which percentages are not permissible.	Balance on which percentage is charged.	Amount establishment charges.	Percentage.
	Original Works.	Repairs.				
1	2	3	4	5	6	7
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
<i>I.—Expenditure on Establishment employed on works and repairs of Regular Buildings and Roads Divisions.</i>						
41—Civil Works Provincial—						
(1) Reserved ..	18,944	70,384	..	89,328	17,702	19.86
(2) Transferred ..	9,67,557	52,57,519	6,323	62,18,753	(a)12,32,963	19.82
(3) Engineering Establishment.	..	..	..	..	..	..
60—Civil Works—Capital Expenditure.	9,52,096	..	..	9,52,096	1,88,667	(c) 19.81
56—Civil Industries ..	1,787	..	..	1,787	354	(b) 19.81
41—Civil Works—Central—						
(1) Voted ..	36	..	..	36	7	19.44
(2) Non-voted ..	..	..	..	..	..	..
50—Military Engineering Service.	410	11,719	299	11,830	1,505	12.072
Account between Civil, Posts and Telegraphs.	..	..	..	..	..	..
Account between Civil and Accountant-General—Central Revenues. (Archaeological Works).	..	..	..	..	..	..
Contribution Works ..	1,07,597	4,102	2,426	1,09,273	16,190	14.81
(Suspense for debit to Military Engineering Service during 1933-34).	..	..	..	..	..	..
Total ..	20,48,427	53,43,724	9,048	73,83,103	14,57,388	..
Net ..	20,48,427	53,43,724	9,048	73,83,103	14,57,388	..

*II.—Expenditure on Establishment employed on works and repairs of Public Health Circle.*

Urban Sanitary Establishment	4,42,260	3,91,554	54,533	9,81,281	68,936	7.02
GRAND TOTAL ..	26,92,687	57,35,278	63,581	83,64,384	15,26,324	..
Deduct—Deposit Works ..	5,48,555	95,572	2,426	83,64,384	36,375	..
GRAND TOTAL EXCLUDING CONTRIBUTION WORKS.	21,44,132	56,39,706	61,155	77,22,683	14,89,949	..
	77,83,838					

(a) Excludes Rs. 4,25,914 on account of expenditure in Engineering Education and Rs. 2,881 on account of scholarship.

(b) Transferred to 35-A—Industrial Capital outlay to be met from Revenues.

(c) Transferred to 41-A—Capital expenditure on Civil Works met out of Extraordinary Receipts.

## STATEMENT E.

STATEMENT SHOWING EXPENDITURE INCURRED ON ENGINEERING EDUCATION AND COMMUNICATIONS BOARD DURING 1932-33.

Heads.	OUTLAY ON		Total.	Establishment.	Total.
	Works.	Repairs.			
1	2	3	4	5	6
	Rs.	Rs.	Rs.	Rs.	Rs.
Maclagan Engineering College ..	9,848	5,925	15,773	2,31,888	2,47,661
Government School of Engineering, Rasul.	2,074	4,249	6,323	94,228	1,00,551
Share of cost of training Punjab student at Roorkee College.	..	..	..	99,798	99,798
Total Engineering Education ..	11,922	10,174	22,096	4,25,914	4,48,010
Total Communications Board ..	..	..	..	14,926	14,926
GRAND TOTAL ..	11,922	10,174	22,096	4,40,840	4,62,936

## STATEMENT F.

STATEMENT SHOWING ESTABLISHMENT CHARGES EARNED BY THE PUNJAB PUBLIC WORKS DEPARTMENT, BUILDINGS AND ROADS BRANCH, BY ESTABLISHMENT EMPLOYED ON ORIGINAL WORKS AND REPAIRS DURING 1932-33.

Serial No.	Heads.	Total fee charged.	REMARKS.
1	2	3	4
	<i>I.—Establishment charges on works done by regular Buildings and Roads Divisions.</i>		
		Rs.	
1	50—Military Engineering Services .. ..	4,812	
2	41—Civil Works—Central (Voted) .. ..	..	
3	41—Civil Works—Central (Non-voted) .. ..	..	
4	Contribution Works (executed by Buildings and Roads Divisions).	16,190	
5	Contribution Works executed by Public Health Divisions. (Buildings and Roads Share).	20,185	
6	56-C—Capital Expenditure on Industrial Works	354	
7	Works of Other Departments done by Buildings and Roads Divisions.	1,286	
8	Works of Other Departments done by Public Health Divisions. (Buildings and Roads Share).	941	
9	Accounts between Civil and Military .. ..	72	
10	State Railways .. ..	397	
11	Accounts between Civil and Civil Accountant-General, Central Revenues.	1,270	
12	Other Adjustments .. ..	2,555	
	Total .. ..	48,012	
	<i>II.—Establishment charges earned by the Public Health Circle.</i>		
1	Work done for Local Bodies .. ..	58,117	
2	Work done for Other Governments .. ..	2,215	
3	Work done for Other Departments of Punjab Government.	504	
	Total .. ..	60,836	
	GRAND TOTAL .. ..	1,08,848	



