

CIRCULAR MEMO. No. 3787.

Government of Punjab,
PUBLIC WORKS DEPARTMENT,
GENERAL BRANCH.

Rev 22/10/84 (8) *Encl.*

To

The Secretary to Govt. Madras
Public Works Department

Dated 15th October 1884.

FORWARDS, for information, / copy of
the Annual Administration Report of the
Public Works Department, Punjab, for the
year 1883-84.

D. LIMOND, COLONEL, C.B., R.E.,
Secy. to Govt., Punjab, P. W. D.

No 2638 N. 27th Oct 1884
Recorded

F.C. *Cd.* *W.*
22.10 *23.10.84*
G.O. 803017 N-16-12-85

Oct 1883/10 *22/10*
20.10.84 *22.10.84* *23/10*

PUBLIC WORKS DEPARTMENT, PUNJAB.

ADMINISTRATION REPORT

OF THE

GENERAL BRANCH

FOR THE YEAR 1883-84.



LAHORE:
PUNJAB GOVERNMENT PRESS,
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improvements over the Province generally; works like the Pesháwar city canal and new drainage, upon which the Municipality has altogether spent upwards of 4 lakhs, being brought to completion, and works like the extra-mural drainage of Amritsar, estimated to cost nearly 2 lakhs, being taken in hand. Extensions and repairs of jails, again, absorbed about 1.72 lakhs; Police buildings, 1.84 lakhs; and administrative and kindred buildings, over 3 lakhs.

4. The principal work of course has been the Provincial Railway from Amritsar to Pathánekot, the cost of which is met from Loan Funds. Two sections of this were opened during the year, and the third some three months subsequently, but any review of its financial results must necessarily be deferred for another year.

In remarking on the principal items on which progress has been made during the year, it will be convenient as before to adhere to the order of Budget heads, although this will obviously by no means be that of their relative importance. To take first works constructed from Imperial funds—

I.—MILITARY.

5. There was an expenditure of Rs 2,39,903, of which Rs. 87,614 was for Original Works, and Rs. 1,03,557 for Repairs, the remainder being charges for Establishments, Tools and Plant, and Barrack Department.

Fortifications.

6. A new outpost at Mamdání, in the Dera Gházi Khan District, to replace the one destroyed by floods, was commenced.

Accommodation for Troops.

7. At Dera Ismail Khan the conversion of the lines of a Field Battery into lines for a Mountain Battery begun in 1882; a combined hospital for Cavalry and Artillery, and another for the Left Native Infantry lines, were all completed. At Bannu the reroofing of the hospital in Fort Dalípgarh was finished, and at Mardán a new hospital, with out-buildings for 90 men, was well advanced. At Abbottabad five more barracks in the Right Native Infantry lines were reconstructed and reroofed, while ten more were in different stages of progress.

The remaining works are of too minor a character to require detailed notice.

II.—IMPERIAL CIVIL BUILDINGS.

8. The total expenditure under this head was Rs. 94,299, of which Rs. 57,926 was on Original Works, and Rs. 21,944 on Repairs, the usual percentages being charged for Establishments and Tools and Plant.

Postal and Telegraph.

9. The new Telegraph Office at Amritsar was completed. Some additions were made to the Telegraph building at Lahore, but the work on the 3rd block of the signallers' quarters was suspended by order of the Director-General of Telegraphs, the building not being at present required.

10. The works in connection with the various Postal buildings were all petty.

Political.

11. A sarai at Kohát for the reception of tribal deputations was built at a cost of Rs. 3,445. About Rs. 7,500 was spent in the collection of material for the Political Officer's quarters at Jamrud in the Khyber; but

owing to an objection by the Government of India, in the Military Department, on a question raised by the Defence Committee regarding the site which had not been finally settled at the close of the year, no progress in the actual construction of the building could be made, and the balance of the grant lapsed.

Coal Explorations near Attock.

12. An addition was made to this Budget for the above purpose, but the work was carried out by the officers of the State Railway Department, unsuccessfully as regards the finding of any useful seam of coal.

Archæological and Historical Buildings.

13. In pursuance of the measures inaugurated last year for the better preservation of the most important of the many buildings of historical and archæological interest in the Province, the Government of India allotted a sum of Rs. 20,000, which was further supplemented by the sum of Rs. 11,000 from Provincial Funds; and under the supervision of the officer in charge of the Historical Buildings Sub-Division, the following works were carried out during the year.

14. A partial restoration of the principal of the black marble mosaics that once covered the wall at the back of the canopy and throne in the Díwán-i-Am or hall of audience in Shah Jahán's palace at Delhi was commenced. These mosaics, originally the work of Austin de Bordeaux, a European who sought refuge at the Mughal Emperor's Court, were to a great extent destroyed at the time of the mutiny. Some of the panels were removed, and are still to be seen in the Indian Museum at South Kensington. From these and from a number of coloured drawings made by Delhi artists before 1857, a drawing has been prepared, and the work of restoration can be carried out from time to time as funds may be available.

15. The Kila Kohnah Masjid in the citadel of the Delhi of Sher Shah (now known as the Purána Kila), by whom it was built about 1541, is deservedly considered one of the finest, if not the finest, specimen of the late Pathán or Afghán period in Northern India.

Arrangements were made for the better conservation of this building, which of late years has been a good deal neglected. The fallen *chajjas* were renewed, the floor and some of the blue stone and marble mosaics repaired, and the leaks in the dome repaired. Some works that still remain to be done are being carefully examined.

16. At Shahdara, near Lahore, some works in connection with repairs to the tomb of Jahángír were carried out. Anything like an attempt at restoration of this great mausoleum and its surrounding buildings would be out of the question. The pilfering of marble dome and trellis-work, commenced by Aurangzeb and carried on in a wholesale way by Ranjít Singh and the Sikhs, could only be made good at an expenditure of lakhs; but much is required to make the site secure, to free the remaining mosaics and tile-work of dirt and to clear the gardens and grounds.

An experimental relaying of a portion of the mosaic flooring of the upper terrace, and an experimental restoration of some fresco painting in one of the passages, was carried out. The brick-work of a portion of the enclosed wall of the garden was extensively underpinned and some excrescent buildings erected by the Railway Company, who at one time occupied the adjacent sarai as an engine-shed, removed; but to carry out even the most necessary works will require considerable funds, and must per force be spread over a number of years.

17. To the Shálimár Gardens of Shah Jahán a reference was made last year

regarding the necessity of repairs and better supervision. During this year the sand-stone flooring of the principal entrance was renewed; the hamám buildings were repaired, a marble dado in the central báradari was partially restored, and arrangements made for repairing one of the kiosks. To carry out all that is required, and to put the grounds and buildings of what may fairly be considered an Imperial work in good order would, however, involve an expenditure of Rs. 50,000. The Municipality do not appear as yet to have taken any steps in regard to the better regulation of the garden, which is still a crowded nursery—in fact a jungle of indifferent fruit trees that under more scientific direction might be rendered both attractive and profitable.

18. At Nakodar the restoration of the two Mahomedan tombs referred to last year was nearly completed.

19. Photographs of most of the above buildings were taken at different stages of progress. A revised list of all the archæological and historical buildings of interest in the Province is also under preparation.

III.—PROVINCIAL CIVIL BUILDINGS.

Administration.

20. Additions of more or less importance were made to the District Court buildings at Rohtak, Gurdáspur, Ludhiána, Pesháwar and Jhang. At Mooltan new court rooms for the Deputy Commissioner and the Judicial Assistant, with a new guard room, were added, as were two rooms for the Deputy Commissioner's Court at Muzaffargarh, and a detached Treasury and Assistant Commissioner's Court at Jhelum.

A site was cleared and the collection of materials commenced for a new District Court house at Simla.

21. The new tahsíl at Attock was completed; those at Kuláchi in the Derajat and Umballa nearly so; while good progress was made on the combined tahsíl and thánah at Banjur in Kulu, the tahsíl at Dera Gházi Khan, and the reroofing of the one at Sultánpur.

22. Certain improvements were made to the subsidiary buildings attached to the Government Houses at Simla and Lahore, including a new ice-house at the former.

A double-storeyed block of servants' houses was constructed in connection with the "Ellerslie" Secretariat building at Simla.

Law and Justice.

23. There was a further collection of material in connection with the Chief Court at Lahore, the new designs for which have now been completed, with the exception of the detailed estimates, which are still in hand.

Ecclesiastical.

24. Nearly Rs. 4,000 were expended in providing a roof for the Amritsar Church.

Jails.

25. The Provincial expenditure under this head was, as usual, very considerable, amounting to nearly 1½ lakhs, of which Rs. 1,35,000 was upon Original Works. The temporary Central Jail at Mooltan, which is capable of accommodating 1,500 prisoners, commenced in November 1882, was, with its necessary

subsidiary buildings, completed in November 1883, at a cost of Rs. 87,000. As it may be many years before any more permanent structure is built, an estimate for additions and alterations to the present building, in order to give increased superficial area per man in sleeping barracks and fit it for more permanent use, is now under consideration. Two barracks were reroofed, and one of the two passages in the Central Jail at Lahore was converted into a store-room for carpets. Considerable expenditure was incurred in the restoration of, and additions to, the District Jails of Delhi, Rohtak, Gurgaon, Umballa, Ludhiána, Hoshiárpur, Jhang, Jhelum, Ráwalpindi, and Pesháwar. A project for a water-supply to the Jail at Umballa was put in hand, and the Leper Jail at Tarn Taran, in the Amritsar District, nearly completed.

Police.

26. On Police buildings were spent Rs. 1,69,000 from Provincial funds and Rs. 14,800 from Municipal and District funds—a total which exceeds that of last year by some Rs. 12,500. Among the principal works completed during the year may be instanced the Imperial Police lines at Simla; first class stations at Barsar, Bahádur Khel and Nárowál; second class stations at Mubárákpur, Karrak, and Kálka; renewal of those at Shahabád, Máhilpur and Sahiwál; reroofing Police Hospital at Amritsar; and the barracks for 12 Sergeants, 60 Constables and 2 Deputy Inspectors at Abbottabad. And among those in progress, the reroofing and additions to the station at Batána in the Karnál District; construction of first class Police Stations at Rewári and Dagshai; a second class one at Subáthu; renewing the station at Chappar; reconstructing the Police lines at Dera Gházi Khan; and the construction of a combined lock-up for European prisoners with quarters for an Inspector of Police at Ráwalpindi.

Educational.

27. There was an expenditure of some Rs. 5,000 from Provincial funds on improvements and additions to the buildings of the Lawrence Military Asylum at Sanáwar, and upwards of Rs. 10,000 upon other items; but the bulk of the expenditure upon Educational buildings has been met from District and Municipal Funds. The total outlay from all sources during the year amounting to nearly Rs. 95,000, of which Rs. 10,000 were on the District School at Gujránwála, a building nearly completed; the remainder being distributed generally over the Province.

Medical.

28. The new Medical School at Lahore was finally completed at a cost of Rs. 1,17,076, and certain additional works, with the necessary furniture for the School, not provided for in the original estimate, were added at a cost of Rs. 10,000, the institution being also connected with the water-works system.

The Dispensary buildings at Sonapat in the Delhi, Sohna and Farukhnagar in the Gurgaon, Phulkián in the Siálkot Districts, and the Egerton Hospital at Pesháwar, the last named costing over Rs. 66,000, were also completed and Rs. 5,000 were expended on the Municipal dispensary at Chársadda in the Pesháwar District. The Ripon Hospital and Dispensary at Simla, which is being constructed from Municipal funds, aided by private contribution, was pushed rapidly forward.

Miscellaneous.

29. At Lahore two temporary barracks were provided to afford additional accommodation to the Government Central Press. The reading room in connection with the Lawrence and Montgomery Halls was improved by widening a part of the connecting passage.

IV.—COMMUNICATIONS.

30. The expenditure upon these from the three sources, *viz.*, Provincial allotment, District and, to a limited extent, from Municipal funds, has during the year amounted to Rs. 17,96,334, the greater part, as usual, being necessarily devoted to repairs, which absorbed over 13½ lakhs of the total; the balance, Rs. 4,37,381, being spent on Original Works, as against Rs. 3,90,131 last year.

Metalled Roads.

31. As noticed in the Report of last year, the completion of the combined railway and road bridge over the River Indus at Attock necessitated a costly diversion of the Grand Trunk Road along both the steep rocky banks from the Lower Fort to the Railway and back to Khairabad. The road on the right bank, a distance of nearly two miles, was completed to formation level, and eleven culverts of different spans put in; on the left approach, a distance of nearly one-and-a-half miles, the work completed consisted of heavy embankments from 20 to 60 feet in height, with cuttings through hard rock up to 30 feet in depth; the erection of culverts of different spans; and the construction of a temporary road round the Mallahitolla village to the Lower Fort. In both cases the metalling, protective railings and dressing of some of the banks to easier slopes still remain to be carried out, but the work was pushed forward so as to admit of its being opened for traffic as an unmetalled road soon after the close of the year. The expenditure during the year on this work amounted to Rs. 1,72,569.

32. The preliminary survey of the new Murree-Kohála cart-road was commenced in December 1883; levels were taken, and a survey made along the entire length of the present road, and before the close of March 1884 some 12 miles of the proposed cart-road was aligned. Military working parties are to be employed in the construction of a portion of the work.

33. About 6 miles of the Simla and Kálka road were remetalled, retaining and parapet walls being erected where necessary. In the Beas Valley nearly Rs. 7,000 were expended in completing certain flood escapes on the Grand Trunk Road; but, owing to want of funds, a good deal that is still required had to stand over.

In addition to Rs. 6,000 given in 1882-83, a further grant-in-aid of Rs. 4,000 was made to the portion of the Ferozepore and Farídkot road situated in British territory. The road between Jhang and Dera Ismail Khan was further improved, some miles being metalled, and fair progress made in improving the difficult road through the Pezu Pass.

34. In connection with the improvement to railway feeder roads may be instanced the Nábha road in the Ludhiána district, and the portion of the Phillour and Nagar roads passing through the Jullundur district which were metalled throughout. Good progress was made in metalling the Chánga Mánga road in the Lahore and the Gurgaon and Sohna road in the Gurgaon districts respectively. A number of minor approaches were also metalled during the year.

Unmetalled Roads.

35. The length of unmetalled roads kept in repair or renewed during the year by the agency either of the Public Works Department or the District Officers from Provincial and District funds aggregated nearly 16,000 miles, and the expenditure incurred was Rs. 3,84,000, of which District funds contributed

Rs. 36,000 for new roads, and Rs. 1,96,000 for the repairs of old ones. The principal improvements are indicated under their respective districts in the table below :—

Delhi District	...	...	...	Road Najafgarh and Azádpur remetalled.
Gurgaon District	...	...	...	Sohna and Núh and Firozpur and Ulwar roads metalled.
Karnál District	...	...	...	Completing and improving the Pánipat and Safidon and the Kaithal and Patiála roads.
Rohtak District	...	...	...	Rohtak and Bhiwáni road, 4½ miles metalled. Rohtak and Jhajjar road, 6 " "
Hissar District	...	...	...	Roads to Railway Station and to encamping-ground metalled.
Ludhiána District	...	...	...	Road from Bágrián to Nábha improved and partly metalled. Feeder road from Cháwa to Grand Trunk Road metalled.
Simla District	...	...	...	Special repairs were executed to the Hindustán and Tibet road.
Kángra District	...	...	...	Repairs to dry stone revetment walls and extensive blasting operations were carried out on the Hoshiárpur, Dhamsála and Kángra Valley cart-roads. A survey of the latter was put in hand and half finished. The new road from Mandi to Phagwára was finished.
Gurdáspur District	...	...	...	Feeders to the Gurdáspur, Sohal, China and Dháriwál, wholly or in part, metalled.
Kohát District	...	...	...	Six miles of new roads were constructed.
Hazára District	...	...	...	A new feeder road from the Hazára Trunk Road to the Hasan Abdál Station, on the Punjab Northern State Railway, was constructed.
Pesháwar District	...	...	...	Special repairs were carried out on the Naushahra and Mardán road.
Jhang District	...	...	...	Fifty-four miles of the Chichawatni and 31½ of the Bahrerri roads in the Jhang District were maintained in an efficient state of repair.
Montgomery District	...	...	...	The work of raising the Okára and Fázilka road was in progress.
Muzaffargarh District	...	...	...	The construction of a new road from Kínjar to Jatop in the Muzaffargarh District was put in hand and completed before the close of the year.

Bridges.

36. The expenditure during the year under this head aggregated Rs. 82,000. Among the most important of the works constructed during the year may be instanced—an iron girder bridge over the Nalloah drainage cut in the 67th mile of the Amritsar and Pathámkot road, consisting of 2 spans of 50 feet each, with an 18 feet roadway; bridges at Karála in the Hoshiárpur District; Nakhmal on the Jummoo and Zafarwál road in the Siálkot District; and Nánowál on the Batála and Mukerián road.

Boat-bridges.

37. The principal boat-bridges maintained by the Public Works Department at a cost of Rs. 1,80,000 during the year are exhibited in the following statement :—

LOCALITY OF BRIDGE.	DATE OF		NUMBER OF		Length of bridge.
	Dismantling.	Re-opening.	Government boats.	Hired boats.	
Over the Jumna at Māmārpur	15-6-83	15-10-83	...	14	120 feet.
Do. Do. at Chaunsa	Do.	Do.	...	15	120 "
Do. Do. at Sanauli	30-6-83	1-11-83	The contractors use their own boats on their bridges.	186	186 "
Do. Do. at Mirghona	Do.	29-10-83			186 "
Do. Do. at Rājghāt near Jagādhrī ...	16-6-83	16-6-83	...	26	409 "
Do. Sutlej at Phillour	1-6-83	9-10-83	32	7	1,984 "
Do. Beas at Dera Gopīpur	27-5-83	1-10-83	14	...	400 "
Do. Ravi at Shahdara (Lahore)	Maintained throughout the year.		30	...	1,184 "
Do. Sutlej at Ferozepore	31-3-83	10-10-83	16	2	558 "
Do. Ravi at Chīchawatni	Maintained throughout the year.		17	...	868 "
Do. Chenab at Wazirabad	16-5-83	Abandoned by order of Government.			
Do. Do. at Kādirabad	31-3-83	10-10-83	16	2	558 "
Do. Do. at Trimmu Ghāt	11-4-83	27-9-83	...	54	1,910 "
Do. Jhelum at Jhelum	...	...	6	25	1,300 "
Do. Do. at Pind Dādan Khan	17-4-83	4-10-83	...	...	2,400 "
Do. Indus at Attock	8-5-83	Was not re-established owing to opening of the Railway bridge.			
Do. Do. at Khushālgarh	28-6-83	11-9-83	16	...	1,000 feet.
Do. Do. at Dera Ismail Khan	27-4-83	8-10-83	30	41	3,310 "
Do. Kabul River at Naushahra	Open throughout the year.		16	...	740 "
Do. Do. at Abazai	22-4-83	2-10-83	6	26	703 "

An expenditure, amounting to Rs. 3,116, was incurred in providing new superstructure for the boat-bridge at Jhelum, which was re-established under the orders of the Government of India last winter. The boats and superstructure belonging to the dismantled Attock bridge have for the most part been distributed between the Naushahra and Dera Ismail Khan bridges. In place of the abandoned boat-bridge at Wazirabad a ferry has been established.

38. Some of these bridges yield a direct profit to Government, as for instance, the one at Phillour, the net earnings on which during the year amounted to Rs. 2,636, while upon the one at Trimmu Ghāt a deficit of Rs. 2,109 was reported.

The total cost of these boat-bridges as borne by the Public Works Department is as follows :—

	Rs.
For repairs and maintenance	1,74,581
For original works	5,128
Total	1,79,709

The gross income received during the year amounted to Rs. 1,03,400, and after paying the charges for toll collection and establishments the net revenue amounted to Rs. 71,600. This latter sum is, however, all credited to the General Provincial Revenues in the Civil Department.

Minor Ferries.

39. Three hundred and ninety-one minor ferries were maintained in the Province during the year, of which 365 were leased to contractors, 23 kept under direct management, one maintained by the Meerut District authorities in the North-Western Provinces, and two by the boatmen themselves.

Accommodation for Travellers.

40. Nearly Rs. 16,000 was expended from Provincial and District funds in constructing, reroofing and rebuilding certain supply-houses, sarais, &c. The supply-houses at Chappar, Dhakka, Shahabad, Khanna and Jagraon were reroofed; a new supply-house was constructed at Ludhiāna, and fair progress made with sarais at Daska in the Siālkot and Miānwāli in the Bannu District. New wells in the encamping-grounds at Akorah and Khairabad on the road from Attock to Peshāwar were completed at a cost of Rs. 3,600, for which funds were provided by the Punjab Northern State Railway.

Arboriculture.

41. Some Rs. 79,500 were expended on the planting and renewal of trees along the several lines of road, regarding which a detailed report is now submitted annually to the Conservator of Forests.

River Protective Works.

42. The danger which, owing to the heavy floods passing down the Indus in 1882, menaced the city and cantonment of Dera Ghāzi Khan, and the measures taken to avert this danger, were described in last year's Report. The Government of India in the Military Department, as then pointed out, having ultimately declined to bear any portion of the outlay on the necessary protective works, two-thirds of the expenditure incurred has been a charge to Provincial Funds, together with the entire cost of the repair to the cantonment bund.

The total expenditure on these works has amounted to Rs. 1,06,471, of which Rs. 74,374, or in round numbers $\frac{3}{4}$ of a lakh of rupees, has been borne by the Province, Rs. 55,000 being paid during the year under review, and the remainder by the Irrigation Branch.

43. As no imminent danger from the encroachments of the river threatened the cantonment of Dera Ismail Khan during 1883-84, it was decided, with the concurrence of the Government of India, Military Department, not to adopt any further special protective measures until actual necessity arose. Instructions were, however, issued to the Executive Engineer concerned to carefully watch the vagaries of the river, by laying down some erosion lines and periodically measuring them.

*V.—MISCELLANEOUS PUBLIC IMPROVEMENTS.**Town Buildings, &c.*

44. A new Town Hall at Peshāwar was constructed at a cost of Rs. 9,125. Similar buildings at Rewāri and Batāla and the Nicholson Hall at Bannu were in progress.

A site was acquired for the combined Municipal Town Hall, Police Station, and clock-tower at Mooltan, and the building commenced.

Paving Streets, &c.

45. The total expenditure under this head amounted to upwards of Rs. 3,60,000. Among the principal works may be noticed—the improvement and metalling of the circular road at Kaithal in the Karnāl District, and the road at Rewāri in the Gurgaon District, as completed. Two streets were opened

out in the Amritsar city, and 5 miles of metalled roads and streets constructed, at a total cost of Rs. 65,000. Paved streets were improved at Jhang and Ráwalpindi to the extent of Rs. 6,199 and 6,680 respectively, and smaller sums in numerous other towns.

Water-supply.

46. It is satisfactory to notice an increased amount of attention is being given to the importance of efficient water and sanitary works, not only in the case of those constructed, or to be constructed, by provincial funds, but both District and Municipal Bodies appear to have brought forward a much larger number of projects.

47. The water-supply of the city of Delhi may be said to have been under consideration, in one form or other, for the last 15 years, work during recent years having been once or twice actually commenced, but either deficiencies and more or less important omissions in the projects submitted, or difficulties in the matter of finance, have always stood in the way. The last project prepared in 1881, though acceptable as a general scheme, required reduction of cost generally. The Delhi Municipality having expressed a wish to refer this project to a hydraulic expert in England, and in connection with this to depute Mr. Morley, the Assistant Engineer, who had been associated with its preparation, and therefore possessed the needful local knowledge, it was considered deference should be shown to their wishes in the matter, and Mr. Morley was accordingly placed at their disposal for eight months from March 1884.

48. Rupees 55,000, the balance of the Provincial contribution of one lakh for the restoration of the water-works reservoir at Lahore, was paid to the Municipality, and the works were sufficiently completed to admit of their being formally opened by His Honor the Lieutenant-Governor in March 1884.

49. In connection with the water-works at Simla, severe frosts during the winter somewhat delayed building operations on the second reservoir at Sanjauli, but the main and cross walls were completed up to springing of arches, and large quantities of materials were collected, fully utilising all available labor. The entire work will be completed and ready for use before the close of the present calendar year; but it is a matter for consideration whether the growing wants of the station in this respect may not ultimately necessitate a third reservoir.

50. The preparation of the Amritsar water-works project was entrusted to the late Mr. Leslie Clark, but the death of this gentleman, while on sick leave in England, prevented the submission of any complete report. An experimental well, 20 feet diameter, was sunk to a depth of about 35 feet in water and tested, but the yield as ascertained by several observations proved so insignificant as to preclude the acceptance of Mr. Leslie Clark's theory as to the practicability of the well system here affording a sufficient supply, at any rate for any sum that would be within the means of this Municipality. The question is still under consideration.

51. In the case of Umballa city, it was at first thought arrangements might be made for obtaining a supply in connection with the cantonment water-works, but upon further reference this had to be abandoned. Two other sources were next examined, the Ghaggar and Tágra rivers, and the running of trial levels having showed that the spring level along the latter offered the best facilities, a proposal has been made to the Municipality by Government to advance a sum of five thousand rupees from Provincial revenues for trial borings and experiments to be undertaken at a selected spot on this stream, to determine the feasibility of a reliable scheme, on condition that if the estimated cost of the payment is within the financial means of the Municipality, that body should raise a loan to carry out the same, repaying the loan from Provincial funds, or in the event of the scheme proving a failure, the five thousand rupees advanced will be borne by Provincial revenues.

52. In November 1883, the Commissioner submitted a project prepared some years previously by Lieutenant Lindsell, R.E., for providing the town of Ráwalpindi with a water-supply from the Karrang stream. An inspection of the locality, however, showed that, as the Karrang was not a perennial stream, Lieutenant Lindsell's proposal, which had been based on one for Pesháwar, was not feasible, and a project for utilising the sub-soil water for the purpose is at present under consideration in this Department. As soon as this is completed, it is hoped the work, for which funds are already in hand, may be proceeded with.

53. The question of an improved water-supply to stations of the Punjab Frontier Force has been under consideration of this Department for some time past. Several projects for these works have been prepared, but these cannot receive consideration until the financial probabilities of meeting the cost of the scheme is first determined. The following is the estimated cost of providing the much needed supply to the stations named:—

				Rs.
Abbottabad	...	...	...	50,000
Mardán	...	...	...	33,500
Kohát	...	...	...	50,000
Edwardesabad	...	...	...	45,000
Dera Ismail Khan	...	...	...	6,000
Ditto Cantonment	...	...	...	30,000
Dera Gházi Khan	...	...	...	22,500
Rájanpur	...	...	...	10,000
Total	...	...	...	2,47,000

A memorandum regarding the actual state of the various projects has been submitted for the opinion of the Secretary to Government in the Military Department; the main obstacle, however, is the want of funds.

54. The improvements in connection with the Pesháwar city canal, and the provision of a supply of water pure enough for all, save potable purposes, combined with a lower level drainage channel on either side, was this year brought to completion at a total cost of Rs. 1,33,316, the expenditure during the year amounting to Rs. 50,492.

55. Among the minor works in connection with the water-supply of the Province may be noticed an additional tank at Siáikot, which, formerly a large unsightly pond on the north-east of the city, has been converted at a cost of Rs. 12,500 (provided partly by private contributions and partly by Municipal fund) into an ornamental tank. An estimate was sanctioned, amounting to nearly Rs. 16,000, to be provided from District funds, for the construction of a bund at Mahpápur, in the Delhi District, and the work was more than half completed. In the same district bunds at Khuki and Gwálpahári were completed at a cost of Rs. 3,238 and 2,984 respectively; a large bund at Kutwana Sarai was commenced, and some 18 others were in various stages of progress. In the Karnál District 12 village tanks in the tracts most affected by drought were completed at a total cost of Rs. 6,770, and 20 others were in progress.

Rupees 1,800 were expended on similar works in the Gurgaon District. The large tank at Georgegarh, in the Rohtak District, was in hand, and a new one was completed at Makhdúm Rashíd in the Mooltan District for the benefit of the visitors to the annual fair held there.

56. Although more properly coming under the head of Irrigation Works, the Inundation Canals in the Fázilka Tahsil of the Sirsa District may be incidentally noticed as works constructed mainly from District funds. The works were carried out by the Ferozepore Canal officers under the supervision of Colonel Grey, the Commissioner of Hissar, acting under the direct sanction of the Local Government; the cost being met from contributions from the Sirsa District funds, the Mamdot Estate, and by the occupants of 37 villages in Fázilka.

The excavation of the Mubárákwah Canal was completed during the year at a cost of Rs. 5,140, while on the Fázilwah Canal, which was practically

completed and opened in 1882-83, some further expenditure was incurred. The total length of these canals, with branches, is 49 and 52 miles respectively, while their irrigating capacity is 20,000 acres each.

Sewage, Drainage and Sanitation.

57. The drainage works in connection with the city of Amritsar comprise the extra-mural and intra-mural projects. The former is being carried out by the Public Works Department. The project has been divided into three separate works, A, B, and C; the total estimate for which amounts to Rs. 1,76,517.

A represents the outfall channel, the new portions of which throughout its entire length of 7 miles were excavated during the year, though not to its final bed. Iron bridges were at site, and the brick-work of another in hand, the outlay to end of March 1884 being Rs. 19,288. Project B consists of the main cut, with two branch channels, excavation of which was commenced wherever crops had not been sown. Several bridges were in hand and one completed; the outlay to end of March 1884 was Rs. 13,204. Project C relates to the drainage of the Tong Dháb, the project for which has since been approved and sanctioned; about 5 lakhs of cubic feet of earth-work being excavated when the progress was interrupted by failure of the contractor.

The intra-mural drainage is to be carried out by the Municipality, the project for which was entrusted to the late Mr. Leslie Clark, but was unfortunately interrupted by the beforesaid death of that gentleman, and will now have to be completed by the officers of this Department.

A project, amounting to Rs. 2,47,308 to be provided from Municipal funds, for filling in the pestilent ditch that surrounds the city of Amritsar, and which for many years has been in a most insanitary state, received the sanction of Government in February 1884, and work to the extent of Rs. 13,000 was carried out.

58. The drainage of the city of Pesháwar, commenced in 1871, was completed during the year. The cost aggregating some Rs. 2,73,000, which has been met from Municipal funds.

59. Over Rs. 12,000 were expended in drainage works in the city of Delhi, including new drains for the Teliwára suburb, which work still continues in progress.

The complete scheme for the sewage of this city is under consideration in conjunction with the water-supply project, and its execution depends mainly on the funds that may be available.

60. The Simla sewage scheme, which had been for some time in abeyance, was again taken up, and the project as finally recommended divided into five sections—

- | | | |
|--------|---|--|
| To 1st | { | I. Boileau-ganj line; |
| water | | II. Barra Simla. |
| fall. | | III. Chota Simla; |
| | | IV. Main Bazár drainage; |
| | | V. Single main, 1st to 3rd water-fall. |

The total cost, inclusive of Establishment and Tools and Plant, amounts to 3½ lakhs of rupees. Of these the Barra Simla line and the main Bazár drainage carried to an outlet at the 1st water-fall have since been sanctioned at a cost of Rs. 1,11,000, exclusive of Establishment and Tools and Plant, which charges will be borne by Provincial funds; the work will now be rapidly pushed forward.

61. About Rs. 5,000 were expended in improving the drainage of Ludhiána; about Rs. 4,000 for the circular drain round the city of Shujabád in the Mooltan District; and Rs. 2,500 at Ráwalpindi: minor improvements being effected in most districts of the Province,

Miscellaneous.

62. Some Rs. 4,500 contributed in equal shares by the Sindh, Punjab and Delhi Railway, the Kapurthala State, and the Provincial Government, were expended in strengthening the bund along the Suha nallah in the Hoshiárpur District in connection with the Beas Valley protective works.

Famine Works.

63. Although there was no serious alarm of famine before the year terminated, there had been a considerable failure of the winter rains in the southern part of the Province, which, coming after several indifferent seasons, occasioned some uneasiness, and preparations were made for the commencement of Famine Works, both under Civil Officers and this Department, in the Delhi and Hissar Divisions. Sanction was given to the enclosure of grass preserves in the Rohtak and Hissar Districts, and to special repairs to the Delhi and Sirsa road at a cost of Rs. 17,000.

An officer was deputed to prepare special and suitable projects in the Gurgaon District, and subsequently a second officer to the Karnál District for a similar purpose.

PROVINCIAL RAILWAYS.

AMRITSAR AND PATHANKOT RAILWAY.

64. The outlay on this work during the year under review was Rs. 26,03,114, against a grant by the Imperial Government of Rs. 26,05,000. The total estimate for the line as revised, and including Rs. 7,05,000 for rolling-stock, which was added under the orders of the Government of India, amounts to Rs. 67,39,851, and up to the close of the year the expenditure amounted to Rs. 47,02,350.

Fifty-one miles from Amritsar to Dínanagar were completed and opened to public traffic on the 1st January 1884. The remaining 15 miles from Dínanagar to Pathámkot were energetically pushed forward. The traffic on the open line to the close of the year was not very encouraging; but until improved feeder roads enable the merchandize to be brought to the railway, and the completion of the Kángra Valley cart-road permits the produce of that rich district to find its way to its natural outlet at Pathámkot, good returns can perhaps hardly be hoped for.

A representation in regard to the last-named much needed work has been made to the Government of India, and it is hoped funds for the construction of the few bridges required to complete this road may be shortly forthcoming.

UMBALLA-KALKA RAILWAY.

65. A revised project for the line called for by the Government of India was prepared and submitted in March 1884, amounting to Rs. 32,34,169 (*i. e.*, Direct charges Rs. 29,59,749; Indirect charges Rs. 2,74,420), exclusive of rolling-stock, which item would bring up the probable expenditure required to about 38 lakhs. The details of the probable traffic were based on statistics registered as long ago as 1878-79, and were even then notoriously incomplete. Such data therefore obviously offered no reliable basis on which to form any calculation as to the probable earnings of the proposed line, and the Government of India in reviewing the project requested further details of traffic might be collected.

SIMLA AND KALKA RAILWAY.

66. In connection with the above-mentioned project, a barometrical reconnaissance of the country between Kalka and Simla was also carried out during the cold season to ascertain whether an extension of the Umballa-Kalka Line to Simla would not at some future time be feasible.

The result of the reconnaissance was to show that a mountain railway to

Simla serving all the Military Depôts in the locality was not only feasible, but could be constructed at much less cost and with less difficulty than was at first anticipated. Two alternative routes were examined, in regard to one of which, and of an alternative one suggested by Mr. Molesworth, the Government of India has now called for a detailed project, and of statistics of the probable traffic such a line might draw, the preparation of which will be now set in hand.

RAJPURA-PATIALA RAILWAY.

67. An amended estimate for this Railway, 16 miles long, amounting to Rs. 12,44,388, having been sanctioned by the Supreme Government, the line was put in hand in December 1883, the Sindh, Punjab and Delhi Railway Company carrying out the work. Fair progress was made during the closing three months of the year, and it is expected the entire length, which presents no Engineering difficulties, will be open for traffic by November 1884.

LUDHIANA-FEROZEPUR RAILWAY.

68. An amended approximate estimate for this Railway on the broad gauge, which, inclusive of rolling-stock, amounted to Rs. 45,00,000, was submitted to the Government of India in February 1884; the Local Government offering to construct the line as a Provincial work on the same terms as were granted in the case of the Amritsar and Pathankot Railway. The project is, however, still under the consideration of the Government of India.

RAWALPINDI-MURREE RAILWAY.

69. The original hope of the promoters of this scheme for raising the necessary capital in India has not been realized, and with the sanction of the Government of India and Secretary of State attempts are understood to have been made to float the Company and raise the requisite capital in England so far apparently with doubtful success. Sanction was also accorded to extend the period in which to form such Company to the 31st December 1884.

TRAMWAYS.

70. Proposals on the part of certain private speculators for tramways in connection with the cities of Lahore and Amritsar were submitted during the year, together with certain draft agreements to be entered into with the respective Municipalities; but, as the construction of such tramways required the authority of a special Act of the Imperial Legislature, these enterprises have had to be held in abeyance for the present.

Statement showing the Expenditure incurred from Imperial Funds on Public Works in the Punjab during the year 1883-84 under the several Heads of Classification.

Details.	Original Works.	Repairs.	Total.
IMPERIAL.	Rs.	Rs.	Rs.
MILITARY WORKS.			
Buildings for accommodation of European Troops ...	...	...	...
Do. do. Native Troops ...	65,232	35,932	1,01,164
Ordnance Works ...	1,014	694	1,708
Commissariat buildings ...	548	6,150	6,698
Staff and Miscellaneous ...	12	332	344
Roads to Hill Stations or lines of Military communications ...	370	6,688	7,058
General Cantonment Works ...	950	35,520	36,470
Stud buildings ...	...	...	...
Fortifications ...	19,488	18,241	37,729
Total Military ...	87,614	1,03,557	1,91,171
Establishments ...	...	...	41,942
Tools and Plant ...	...	...	2,735
Profit and Loss ...	...	...	...
Barrack Department (exclusive of Establishment) ...	1,706	1,985	3,691
Establishment ...	...	...	369
Grand Total Military ...	...	...	2,39,908
IMPERIAL.			
CIVIL BUILDINGS, ROADS AND SERVICES.			
Civil Buildings.			
Salt Buildings ...	...	...	...
Post Offices ...	13,525	16,061	29,586
Telegraph buildings ...	24,833	5,883	30,716
Administration ...	10,929	...	10,929
Total Civil Buildings ...	49,287	21,944	71,231
Miscellaneous Public Improvements.			
Sewage, including Drainage ...	2,000	...	2,000
Total Mis. Public Impts. ...	2,000	...	2,000
Collieries.			
Coal operations ...	6,639	...	6,639
Total Collieries ...	6,639	...	6,639
Total Civil Buildings, Roads and Services ...	57,926	21,944	79,870
Establishments ...	...	...	13,546
Tools and Plant ...	...	...	883
Deduct—Decrease in Balance of Suspense Account— London Invoices ... Rs. 44,100 Less Credits to expenditure in England „ 9,239	...	...	...
Grand Total Imperial Civil Buildings, Roads and Services...	...	...	94,299

Statement showing the Expenditure incurred from Imperial Funds on Public Works in the Punjab during the year 1883-84 under the several Heads of Classification—Concluded.

Details.	Outlay to close of 1882-83.	Outlay in 1883-84.	Total.
32. PROVINCIAL RAILWAYS.	Rs.	Rs.	Rs.
<i>Umballa and Kalka Railway.</i>			
Preliminary Expenses	42,017	8,863	50,880
Plant	...	...	...
Establishment	...	...	...
Total Umballa and Kalka Railway	42,017	8,863	50,880
<i>Rawalpindi-Murree Railway.</i>			
Preliminary Expenses	27,138	— 650	26,488
Plant	...	...	...
Establishment	...	...	...
Total Rawalpindi-Murree Railway	27,138	— 650	26,488
Grand Total—32, Railways	69,155	8,213	77,368
37. CAPITAL PRODUCTIVE WORKS—RAILWAYS.			
<i>Amritsar and Pathankot Railway.</i>			
Preliminary Expenses	42,803	1,051	43,854
Land	1,72,276	5,168	1,77,444
Construction of Line	3,49,871	5,43,744	8,93,615
Ballast and Permanent-way	14,07,447	13,49,731	27,57,178
Station Buildings	70,028	2,54,412	3,24,440
Plant	4,122	7,463	11,585
Establishment	52,195	67,038	1,19,233
Rolling Stock	...	3,75,000	3,75,000
Add—Increase in Balance of Suspense Account	494	—493	1
Total Final and Suspense Head	20,99,236	26,03,114	47,02,350
Total Capital Expenditure—37, Railways	20,99,236	26,03,114	47,02,350
Grand Total, Railways	21,68,391	26,11,327	47,79,718
<i>Total Expenditure.</i>			
Umballa and Kalka Railway	42,017	8,863	50,880
Rawalpindi-Murree Railway	27,138	— 650	26,488
Amritsar and Pathankot Railway	20,99,236	26,03,114	47,02,350
GRAND TOTAL	21,68,391	26,11,327	47,79,718

Statement showing the Expenditure incurred under the several Heads of Classification on Public Works in the Punjab from Provincial, Local (Incorporated) District and Municipal Funds during 1883-84.

HEADS.	PROVINCIAL FUNDS.		INCORPORATED DISTRICT LOCAL FUND.		MUNICIPAL FUND.		GRAND TOTAL.	
	Original Works.	Repairs.	Original Works.	Repairs.	Original Works.	Repairs.	Original Works.	Repairs.
<i>Civil Buildings.</i>	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Administration	1,60,362	73,880	...	877	...	...	1,60,362	74,757
Minor Departments	14,356	5,255	...	602	...	...	14,356	5,857
Law and Justice	19,506	15,039	...	...	...	...	19,506	15,039
Ecclesiastical	3,744	14,967	...	...	...	...	3,744	14,967
Jails	1,34,802	39,075	...	...	...	...	1,34,802	39,075
Police	1,12,415	56,669	...	...	9,255	5,556	1,21,670	62,225
Educational	7,412	14,385	25,266	18,079	20,941	9,390	62,619	41,854
Medical	16,524	6,168	21,891	6,789	16,329	7,105	54,744	20,062
Miscellaneous	12,977	11,057	6,023	1,993	...	167	19,000	13,217
Total	4,82,098	2,36,495	53,180	28,340	55,525	22,218	5,90,803	2,87,053
<i>Communications.</i>								
Metalled and bridged roads	2,33,234	7,15,303	60,219	...	3,502	66	2,96,955	7,15,369
Raised and bridged unmetalled roads	16,606	1,36,269	35,462	1,95,880	...	...	52,068	3,32,149
Bridges	...	...	62,861	19,290	...	...	62,861	19,290
Boat-bridges and ferries	5,128	1,74,581	...	30	...	...	5,128	1,74,611
Accommodation for travellers	6,931	22,914	8,400	16,712	2,517	856	17,848	40,482
Arboriculture	...	...	2,521	63,921	373	12,758	2,894	76,679
Total	2,61,899	10,49,067	1,69,463	2,95,833	6,392	13,680	4,37,754	13,58,580
<i>Miscellaneous Public Improvements.</i>								
Town buildings	...	1,656	1,045	52	70,874	35,294	71,919	37,002
Water-supply	63,781	68	93,492	24,605	1,56,724	27,488	3,13,997	52,161
Markets	25	24	...	...	7,317	1,694	7,342	1,718
Paving streets	...	38,928	...	...	1,12,982	2,10,208	1,12,982	2,49,136
Lighting	...	...	...	...	411	180	411	180
Sewage and drainage	80,294	197	473	...	75,393	27,581	1,56,160	27,778
Conservancy	...	...	...	...	20,724	5,708	20,724	5,708
Miscellaneous	...	...	...	1,512	18,068	3,239	18,068	4,751
Total	1,44,100	40,873	95,010	26,169	4,62,493	3,11,392	7,01,603	3,78,434
Total Works	8,88,097	13,26,435	3,17,653	3,50,342	5,24,410	3,47,290	17,30,160	20,24,067
	22,14,532	...	6,67,995	...	8,71,700	...	37,54,227	...
Establishments	5,97,547	...	71,622	...	27,837	...	6,97,006	...
Tools and Plant	8,874	...	2,453	...	5,244	...	16,571	...
Profit and Loss	...	...	...	...	...	...	...	...
Deduct Suspense Balances	2,806	...	...	...	...	...	2,806	...
GRAND TOTAL	28,18,147	...	7,42,070	...	9,04,781	...	44,64,998	...