

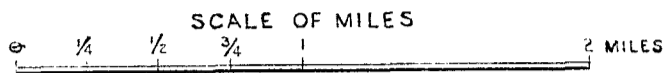


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CONTENTS.

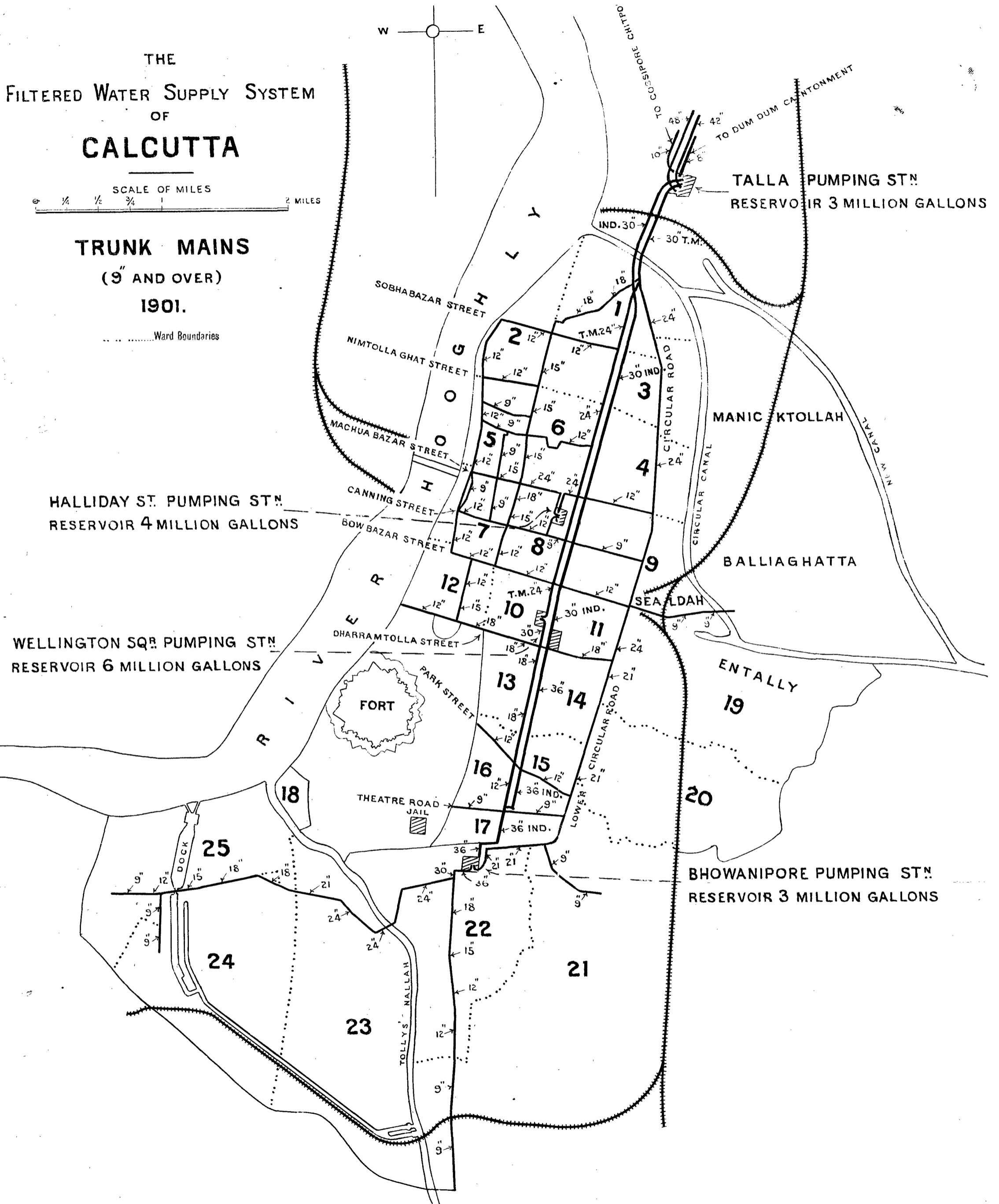
1. Calcutta Water Works. Report on the Introduction
of a System of Continuous supply. By R.B.
Buckley and A.E.Silk. 1901. pp.1-14.
D.85.261CC. NO16 D1
2. Report of the Engineering Committee on a Lower
Ganges Bridge, Aug.1908. (Chairman: The Hon.
Mr. Inglis.) 1908. D.116.253. NO8t D8 pp.15-21.
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tion Committee, 1917. (Chairman: F. G. Sly.) pp. 21-84.
D.2.N1t E7.1
4. Govt. of Bihar and Crissa. Public Works Dept.
Annual Administration Reports for Roads and
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5. dto dto D.253r 1918-19. E9 pp. 105-134
6. dto dto D.253r 1919-20. F0 pp. 135-154
7. dto dto 1920-21 . F1 pp. 155-171.
D.253r
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THE
 FILTERED WATER SUPPLY SYSTEM
 OF
CALCUTTA



TRUNK MAINS
 (9" AND OVER)
 1901.

.....Ward Boundaries



CALCUTTA WATER WORKS.

ent

REPORT

ON

THE INTRODUCTION OF A SYSTEM

OF

CONTINUOUS SUPPLY.

BY

Mr. R. B. BUCKLEY, CHIEF ENGINEER

AND

Mr. A. E. SILK, SANITARY ENGINEER.

Calcutta, November 1901.



Calcutta:

PRINTED AT THE BENGAL SECRETARIAT PRESS.

1901.

D85.261CC.No16

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APPENDIX A—contd.

| Service Heads. | Original Works. | | Repairs. | | Total. | |
|---|------------------|------------------|------------------|------------------|------------------|------------------|
| | Grants. | Outlay. | Grants. | Outlay. | Grants. | Outlay. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. |
| Brought forward .. | ... | ... | ... | ... | ... | 3,28,458 |
| PROVINCIAL. | | | | | | |
| 4.—MAJOR WORKS—WORKING EXPENSES. | | | | | | |
| Works ... | 1,35,606 | 36,731 | 5,60,190 | 6,18,764 | 6,95,796 | 6,58,495 |
| Establishment ... | ... | ... | ... | ... | 8,41,964 | 9,52,718 |
| Tools and Plant ... | ... | ... | ... | ... | 22,040 | 28,473 |
| Refunds of Revenue ... | ... | ... | ... | ... | 5,200 | 6,001 |
| Suspense ... | ... | ... | ... | ... | ... | 38 |
| Total Major Works ... | 1,35,606 | 36,731 | 5,60,190 | 6,18,764 | 15,65,000 | 16,42,720 |
| 43.—MAJOR WORKS AND NAVIGATION. | | | | | | |
| Works for which Capital and Revenue Accounts are kept. | 7,904 | 5,517 | ... | ... | 10,954 | 7,521 |
| Works for which Revenue Accounts are kept. | ... | ... | 25,000 | ... | 40,530 | 35,234 |
| Works for which neither Capital nor Revenue Accounts are kept. | ... | ... | 3,120 | 21,368 | 7,095 | |
| Agricultural works for which neither Capital nor Revenue Accounts are kept. | 51,680 | 52,681 | 2,65,348 | 2,50,295 | 4,15,421 | 3,65,345 |
| Reserve ... | ... | ... | ... | ... | ... | ... |
| Total, Minor Works and Navigation | 59,484 | 58,198 | 2,93,468 | 2,71,663 | 4,74,000 | 4,08,100 |
| 45.—CIVIL WORKS. | | | | | | |
| Civil Buildings ... | 30,91,152 | 31,68,996 | 5,49,799 | 5,42,467 | 37,40,951 | 41,11,463 |
| Communications ... | 2,37,988 | 1,24,610 | 7,05,102 | 6,67,870 | 9,43,090 | 7,92,480 |
| Miscellaneous Public Improvement | 4,33,973 | 2,74,664 | 4,9,930 | 37,175 | 4,82,908 | 3,11,829 |
| Establishment ... | ... | ... | ... | ... | 12,97,506 | 12,33,278 |
| Tools and Plant ... | ... | ... | ... | ... | 1,28,907 | 1,26,363 |
| Suspense ... | ... | ... | ... | ... | ... | —38,037 |
| Total, Civil Works ... | 37,68,113 | 34,68,270 | 13,98,831 | 13,47,512 | 63,93,351 | 63,37,386 |
| Carried over ... | ... | ... | ... | ... | ... | 89,16,664 |

(a) Includes grants for Establishment and Tools and Plant.

APPENDIX A—*contd.*

| Service Heads, | Original Works, | | Repairs, | | Total | |
|--------------------------------------|-----------------|----------|----------|----------|---------|---------------|
| | Grants. | Outlay. | Grants. | Outlay. | Grants. | Outlay. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Brought forward ... | Rs. ... | Rs. ... | Rs. ... | Rs. ... | Rs. ... | Rs. 89,16,664 |
| LOCAL FUNDS. | | | | | | |
| Other Local Funds ... | ... | 8,39,317 | ... | 1,23,813 | ... | 9,66,145(a) |
| District Funds ... | ... | ... | ... | ... | ... | 59,32,554† |
| Total Local Funds ... | ... | ... | ... | ... | ... | 67,98,699 |
| CONTRIBUTION. | | | | | | |
| Imperial ... { Military ... | ... | ... | ... | ... | ... | ... |
| Imperial ... { Civil ... | ... | ... | ... | ... | ... | ... |
| Provincial ... { Civil Buildings ... | ... | 2,58,001 | ... | 21,649 | ... | 3,23,523* |
| Provincial ... { Irrigation ... | ... | ... | ... | ... | ... | ... |
| Minor Works and Navigation ... | ... | 1,143 | ... | 811 | ... | 2,225* |
| Total Contribution ... | ... | 2,59,144 | ... | 22,451 | ... | 3,26,148 |
| Grand Total ... | ... | ... | ... | ... | ... | 1,60,41,511 |

*Includes charge for Establishment and Tools and Plant.

† Includes Rs. 9,09,778 for Establishment and Rs. 1,27,147 for Tools and Plant.

(a) Includes Rs. 2,53,668 for Establishment and Tools and Plant.

APPENDIX B.

Statement showing the length of road communication, excluding village roads, maintained by the public authorities in Bihar and Orissa during the year 1920-21.

[This statement does not include roads and street within Municipal limits, and maintained from Municipal Funds.]

| Name of Division. | Name of District. | Length in miles of metalled roads maintained by the Public Works Department. | Length in miles of unmetalled roads maintained by the Public Works Department. | Length in miles of metalled roads maintained by Local authorities. | Length in miles of unmetalled roads maintained by Local authorities. | Total of metalled roads. | Total of unmetalled roads. | Grand Total. |
|-------------------|-------------------------|--|--|--|--|--------------------------|----------------------------|--------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Patna | Patna | 48 | ... | 157 | 455 | 205 | 455 | 660 |
| | Gaya | 67 | ... | 209 | 734 | 269 | 734 | 1,003 |
| | Shahabad | 58 | ... | 198 | 458 | 256 | 453 | 714 |
| Tirhut | Saran | ... | ... | 261 | 827 | 201 | 827 | 1,083 |
| | Champanah | ... | ... | 37 | 1,176 | 38 | 1,176 | 1,214 |
| | Muzaffarpur | ... | ... | 162 | 1,179 | 162 | 1,180 | 1,342 |
| | Darbhanga | ... | ... | 69 | 1,175 | 69 | 1,177 | 1,276 |
| | Bhagalpur | ... | ... | 101 | 1,716 | 101 | 1,716 | 1,817 |
| Bhagalpur | Monghyr | ... | ... | 151 | 1,347 | 151 | 1,317 | 1,469 |
| | Purnea | ... | ... | 159 | 1,548 | 159 | 1,548 | 1,707 |
| | Santal Parganas | ... | ... | 48 | 835 | 48 | 835 | 883 |
| Orissa | Cuttack | 78 | ... | 133 | 412 | 210 | 412 | 622 |
| | Puri | 118 | ... | 128 | 122 | 244 | 122 | 366 |
| | Bal asore | 104 | 2 | 68 | 463 | 172 | 462 | 634 |
| | Angul | 51 | 17 | ... | ... | 51 | 77 | 128 |
| | Sambalpur | 100 | 21 | 4 | 164 | 104 | 165 | 269 |
| | Orissa Feudatory States | 47 | 53 | ... | ... | 47 | 53 | 100 |
| | Ranchi | 151 | 72 | 14 | 704 | 165 | 776 | 941 |
| Chota Nagpur | Palamur | ... | 8 | 18 | 507 | 18 | 510 | 528 |
| | Hazaribagh | 213 | 17 | 98 | 612 | 309 | 639 | 938 |
| | Manbhum | 145 | ... | 119 | 648 | 264 | 649 | 813 |
| | Singhbhum | 84 | ... | ... | 503 | 84 | 503 | 587 |
| | Total | 1,265 | 246 | 2,092 | 15,642 | 3,357 | 15,691 | 19,248 |

APPENDIX "C"

List showing in order of urgency, the new lines of Railways in Bihar and Orissa, which should take an early place in the programme of construction for the year 1922-1923.

| Order of importance. | Name of Project. | Existing railway with which the project is connected at initial point. | Initial and terminal points. | Whether surveyed or not. | Gauge. | Length in miles. | Estimated cost. |
|---|--|--|--|--------------------------------------|--------|------------------|-----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| <i>A.—List showing new lines urgently required for the development of the Province.</i> | | | | | | | |
| 1 | Ramgarh—Manoharpur, with its continuation to Hazaribagh Road through Hazaribagh. | Bengal-Nagpur Railway. | Ramgarh and Manoharpur and Hazaribagh. | Not surveyed ... | 5' 6" | ... | Lakhs of Rs. |
| 2 | Kapilas Road—Sambalpur Railway. | Ditto ... | Kapilas Road and Sambalpur. | | 5' 6" | ... | ... |
| 3 | Mohuda—Daltonganj Railway with a siding to Hutar Coalfields. | Ditto ... | Mohuda Junction and Daltonganj. | Surveyed in 1889-1890 and 1897-1898. | 5' 6" | 171 | 1,68,00 |
| 4 | Daltonganj—Jubbulpur Railway. | East Indian Railway. | A point on the Daltonganj Branch and a point on the Jubbulpur line near Katni. | Not surveyed... | 5' 6" | ... | ... |
| <i>B.—List showing new lines which are important but not urgent.</i> | | | | | | | |
| 1 | Lohardaga Extension | Bengal Nagpur Railway. | Lohardaga and Longa | Surveyed in 1916-1917. | 2' 6" | 25 | 10,20,00 |
| 2 | Sambalpur—Sonpur-Saintela. | Ditto ... | Sambalpur and Sonpur and Saintela. | Surveyed in 1891-1892 and 1897-1898. | 5' 6" | 238 | 267 62 |
| 3 | Ramgarh Gola—Jhalda Railway with the broadening of the present narrow gauge between Jhalda and Puruha. | Ditto ... | Ramgarh Gola and Jhalda. | Not surveyed ... | 5' 6" | ... | ... |
| 4 | Hazaribagh Road—Hazaribagh Railway. | East Indian Railway. | Hazaribagh Road and Hazaribagh. | Surveyed in 1914. | 2' 6" | 41 | 14 58 |
| 5 | Bhadrak—Chandbali Railway. | Bengal-Nagpur Railway. | Bhadrak and Chandbali. | Surveyed in 1915. | 5' 6" | 29 | 25 55 |
| <i>C.—List showing subsidiary and feeder lines of local importance.</i> | | | | | | | |
| 1 | Gaya—Sherghati Railway. | East Indian Railway. | Gaya and Sherghati | Surveyed in 1912. | 5' 6" | 22 | 12 80 |
| 2 | Thakurgaon—Purnea Railway. | Eastern Bengal Railway. | Thakurgaon in the projected Siliguri-Kishanganj line and Purnea. | Not surveyed ... | 3' 3½" | ... | ... |
| 3 | Bausi—Baidyanath Railway. | East Indian Railway. | Bausi and Baidyanath or Deoghar. | Surveyed in 1899. | 5' 6" | 44 | 32 35 |
| 4 | Bhagalpur—Nalhati (or Ahmadpur) Railway. | Ditto ... | Bhagalpur hand Nalhati or Ahmadpur. | Surveyed in 1895-1896. | 5' 6" | ... | ... |
| 5 | Laheria Sarai, Singhia—Shakarpura Extension. | Bengal and North-Western Railway. | Laheria Sarai and Stakarpura. | | 3' 3½" | ... | ... |
| 6 | Muzaffarpur—Darbhanga Railway. | Ditto ... | Muzaffarpur and Darbhanga. | Surveyed in 1906-1907. | 3' 3½" | 38 | 32 70 |
| 7 | Tewara—Sitamarhi Railway. | Ditto ... | Tewara and Sitamarhi. | Ditto ... | 3' 3½" | 30 | 16 53 |

| Order of importance. | Name of Project. | Existing railway with which the project is connected at initial point. | Initial and terminal points. | Whether surveyed or not. | Gauge. | Length in miles. | Estimated cost. |
|---|---|--|----------------------------------|--------------------------|--------|------------------|-----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | | | | | | | Lakhs of Rs. |
| <i>C.—List showing subsidiary and feeder lines of local importance—concl'd.</i> | | | | | | | |
| 8 | Kendrapara—Cuttack Railway. | Bengal-Nagpur Railway. | Kendrapara and Cuttack. | Not surveyed ... | 5' 6" | ... | ... |
| 9 | Jajpur—Cuttack Railway. | Ditto ... | Jajpur and Cuttack | Ditto ... | 5' 6" | ... | ... |
| 10 | Monghyr—Sagrampur via Khargpur Railway. | East Indian Railway. | Monghyr and Sagrampur. | Not surveyed ... | 5' 6" | ... | ... |
| 11 | Bhaptiahi—Bhimnagar Railway. | Bengal and North-Western Railway. | Bhaptiahi and Bhimnagar. | Ditto ... | 3' 3½" | 28 | 16,80 |
| 12 | Kursela—Forbesganj via Damdaha and Raniganj. | Ditto ... | Kursela and Forbesganj. | Ditto ... | 2' 0" | 85 | 39,40 |
| 13 | Mashrak—Thawe Extension via Rajabatti, Barauli and Gopalganj. | Ditto ... | Mashrak and Thawe | Ditto ... | ... | ... | ... |
| 14 | Maharajganj—Darauli Thana Extension. | Ditto ... | Maharajganj and Darauli Thana. | Ditto ... | ... | ... | ... |
| 15 | Savan through Darauli Thana to Manjhi. | Ditto ... | Savan and Manjhi... | Ditto ... | ... | ... | ... |
| 16 | Muzaffarpur—Sitamarhi. | Ditto ... | Muzaffarpur and Sitamarhi. | Ditto ... | ... | 35 | ... |
| 17 | Motipur or Mehsi to Sahebganj. | Ditto ... | Motipur or Mehsi and Sahebganj. | Ditto ... | ... | ... | ... |
| 18 | Hajipur through Malwa or Tajpur to Wani (Pusa Road). | Ditto ... | Hajipur or Tajpur and Wani. | Ditto ... | ... | ... | ... |
| 19 | Sitamarhi—Sonbursa. | Ditto ... | Sitamarhi and Sonbursa. | Ditto ... | ... | ... | ... |
| 20 | Dhang to Motipur or Kanti. | Ditto ... | Dhang and Motipur or Kanti. | Ditto ... | ... | ... | ... |
| 21 | Sugauli Junction to Govindganj. | Ditto ... | Sugauli Junction and Govindganj. | Ditto ... | ... | ... | ... |

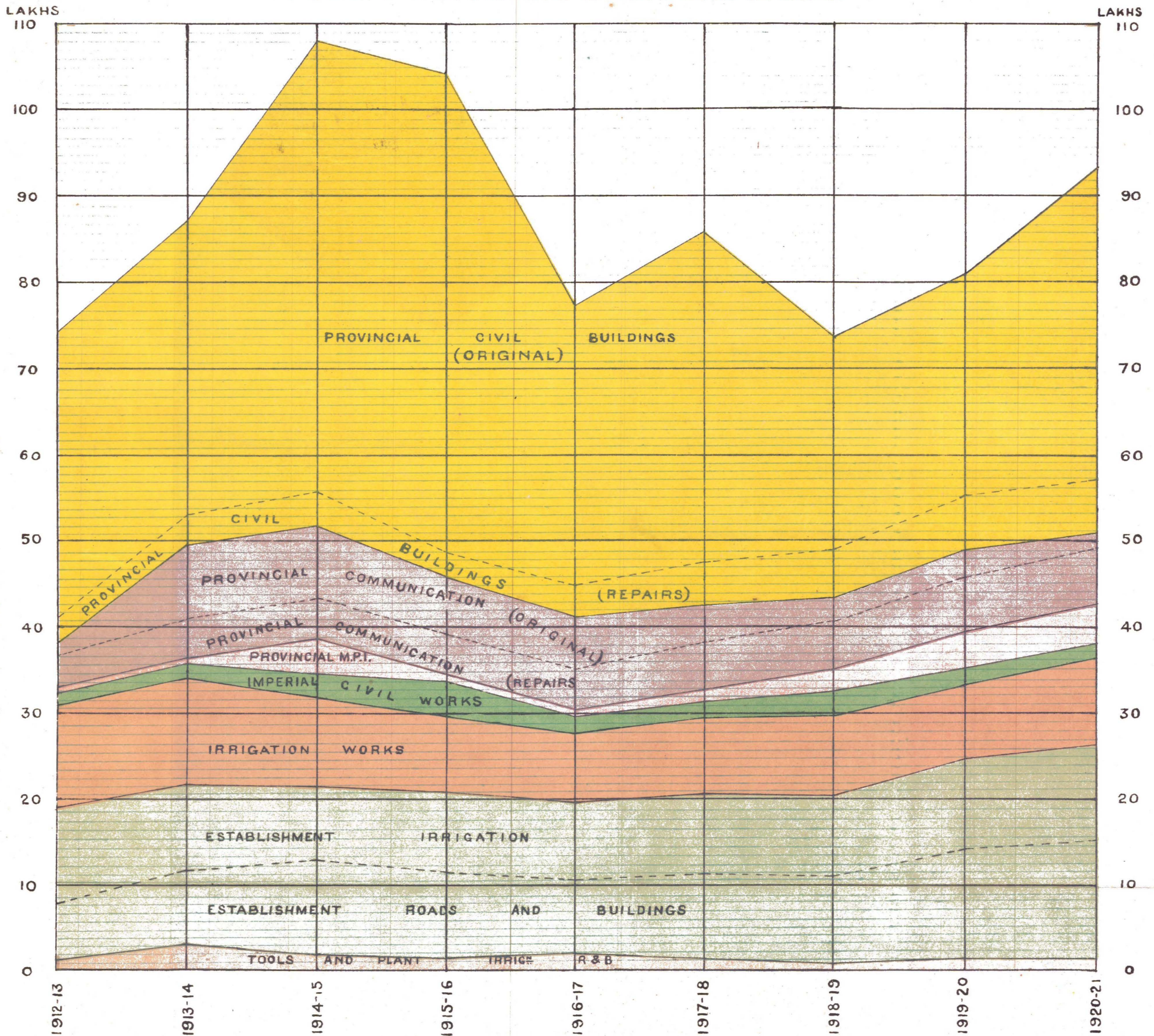
W. S. BREMNER,

Secretary to Government, Public Works Department

RANCHI:

The 22nd June 1921.

DIAGRAM SHOWING YEARLY PUBLIC WORKS EXPENDITURE (IN LAKHS)



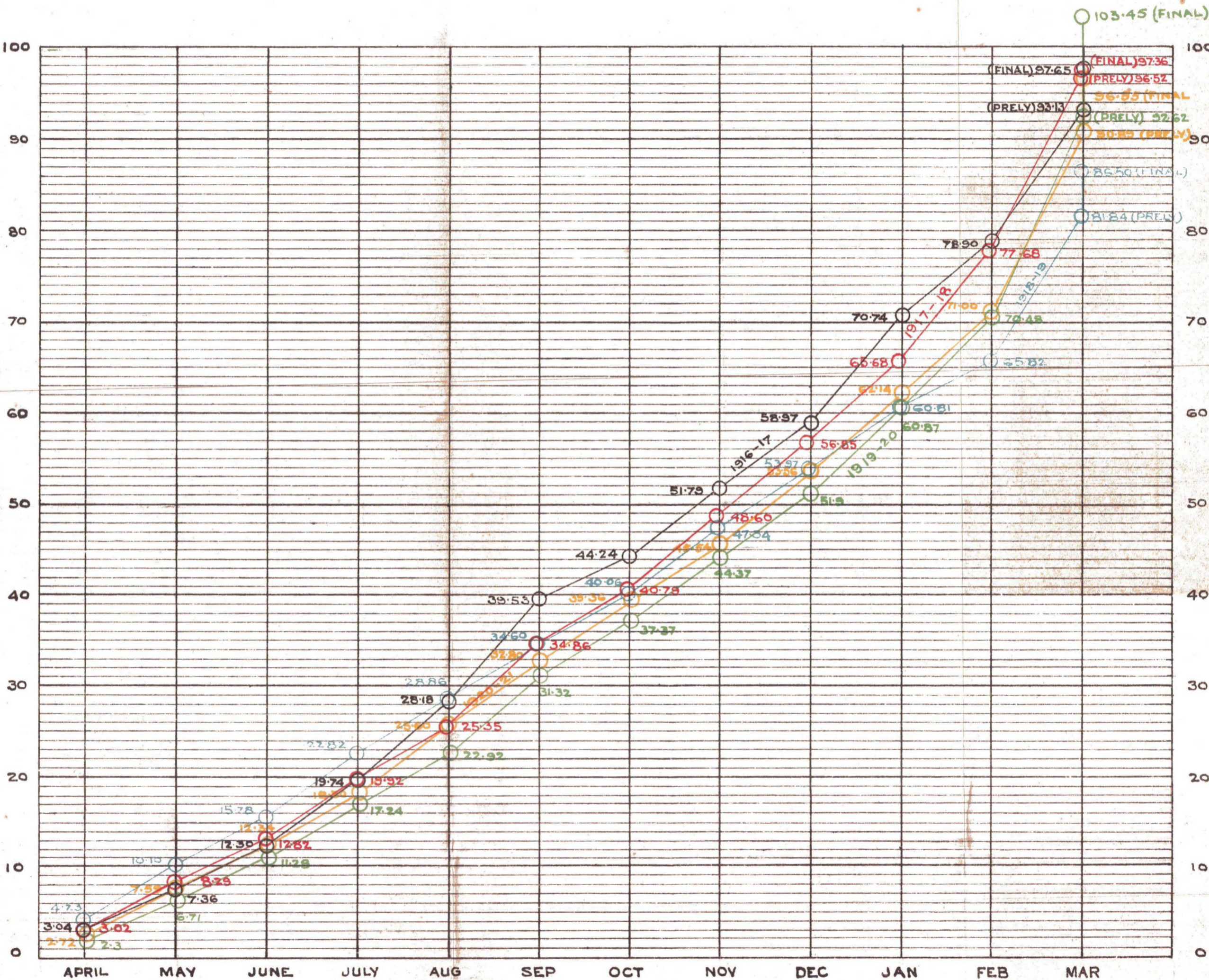
P. W. D.

BIHAR & ORISSA

CURVES SHOWING MONTHLY PERCENTAGE EXPENDITURE UNDER ALL MAJOR HEADS IN THE ROADS & BUILDINGS BRANCH (INCLUDING ESTABLISHMENT, TOOLS & PLANT & SUSPENSE)

PERCENTAGE. 100

100 PERCENTAGE.



REFERENCE
 1916-17 ———
 1917-18 ———
 Reg. No. 11 R-1922

1918-19 ———
 1919-20 ———

1920-21 ———

Zincographed in the B & O D. O. Gulzarbagh