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Government of Madras.

Public works DEPARTMENT.

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Proceedings of the Madras Government, Public Works Department,
11th January 1867.

No. 199. Read the following letter from the Colonial Secretary, Colombo, to the Secretary to Government, Public Works Department, Madras, dated Colombo, 6th December 1866, No. 46 :—

1. I am directed by His Excellency the Governor to request that you will be good enough, with the permission of the Right Honorable the Governor of Madras in Council, to favor this Government with the information sought for in the accompanying set of questions proposed by a Committee appointed to enquire into the cost of the construction of roads in Ceylon.

2. His Excellency would be glad if the Right Honorable the Governor would be pleased to direct that these questions be distributed to the different districts of the Presidency, and that answers be furnished as soon as possible.

Questions by the Committee appointed to enquire into the cost of the construction of Roads in Ceylon, compared with other countries.

The following Questions refer more particularly to Metalled Roads, constructed about the years 1864-5-6, *in Hilly districts, on sidelong ground.*

GENERAL CHARACTER OF ROADS.

1. Describe the general character of the Roads in Hilly districts, and the materials of which they are composed.
2. What is the usual type for roads of different widths ?
3. What system is followed in forming the road surface, before laying on the metaling ?
4. Is it usual to adopt any substratum differing in character, or material, from the surface metaling ?—If so, describe it.
5. Are the roads fenced in ?—If so, what description of fencing is used, and what is its cost ?
6. What is the total cost per mile of Roads, with different widths of metaling, —subdivided under the following heads, viz. :—
   - *a.* Earth-works (including retaining walls and rocks).
   - *b.* Side drains.
   - *c.* Cross drains or Culverts.
   - *d.* Bridges.
   - *e.* Metaling.
   - *f.* Miscellaneous.
7. How are the estimates for Roads framed ?
8. What check is there for ascertaining whether the quantities actually executed, agree with the estimated quantities ?
9. What system of drainage is adopted ?
10. What is the average per-centage of rock to earth ? And what are the average quantities of rock and earth per mile ?
11. What is the usual width allowed beyond the metalled portion, and are there footpaths ?

EARTH-WORKS.—12. What is the cost of earth-work per cubic yard ?

13. Does this cost include carrying to embankment ? Or is the cost of embankment formed from cuttings, estimated as a separate item ?
14. How is spoil estimated ?
15. What is the cost of rock cutting per cubic yard ?

16. Are there many boulders?—if so, what is the cost of removing them? Are they estimated as so much rock?
17. Is there much material difficult to be removed by spade or mamotie, but too soft for blasting?—If so, what is the cost of such material per cubic yard?
18. Is rock defined as material which requires blasting?
19. Are retaining walls used extensively as a substitute for earth slopes?
20. If so, what is the character of masonry in such walls?—What is the thickness for different heights of wall, and the cost per cubic yard?
21. What is the average number of cubic yards of retaining wall per mile of road?

METALING.——22. Describe the general character of the metaling, and the materials of which it is composed?
23. What is the average thickness of metaling?
24. What is the average cost per superficial yard of metaling?
25. How is metaling laid?—is it piled at the side of the road, and after being laid, is it watered, stamped, rolled or blinded with gravel?
26. What is the cost of each of the following items in metaling, viz.:—Blasting, Sledging, Breaking, Piling, Stamping, or Rolling.
27. What is the average distance to which metal is conveyed from the quarry?
28. What is the cost of transport of metal for different distances?
29. Is the bushel in use as a measure?—If not, what measure is used for metal?
30. Is the measure heaped or not?
31. How many cubic inches does the measure contain?
32. How many cubic inches should be allowed on the average, if the measure be heaped?
33. How many cubic yards of solid rock are required to make up a given number of measures, say 100 bushels?

CULVERTS.——34. What is the average number of Culverts of different dimensions per mile?
35. What is the general description of masonry of which they are constructed?
36. Is the stone for masonry generally near at hand?
37. Is the stone blasted?—If so, does it laminate with an even bed, or break up with an irregular fracture?
38. What is the cost of procuring stone per cubic yard?
39. What is the cost of lime, delivered on the work?
40. What is the average quantity of lime per cubic yard of masonry?
41. What is the proportion of lime to sand used?
42. What description of lime is chiefly used?—Is it of good quality?
43. Is there hydraulic lime in the district?
44. Are bricks easily obtained?—What are their dimensions, and cost per thousand?
45. What is the cost of brick-work per cubic yard?
46. What is the cost of masonry per cubic yard?
47. What quantity of masonry does each Mason complete per diem?
48. Are Elephants employed to assist in building?
49. What is the average cost per lineal yard of different dimensions of Culverts?—and what is the cost of their faces?
50. What are the rates paid for Masons?

BRIDGES.——51. Give a general description of different Bridges with their cost.
52. What is the average number of bridges per mile?
53. What rates are paid to skilled artisans of different kinds?

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LABOUR.——54. Whence is labour obtained?—and on what terms?
55. Is any of the labour imported?—If so, at what cost?
56. Is there any system of agreement?—If so, what is the character of such agreement?
57. Is the cost of importation charged to the cost of the Road?
58. Is there any organized body of Road labourers or artisans?
59. Is any labour on the Roads performed by Pioneers or Military?—If so, at what rates?—and to what charged?
60. What is the average daily rate of pay for labourers?
61. Are there different grades?—If so, how are they distinguished and paid?
62. Are women and children employed on the Roads?
63. How are the labourers and others tasked?
64. What system is adopted to enforce discipline? or to ensure the completion of the task?
65. Are the labourers paid when on the march, changing from one place of work to another?
66. Are they paid when sick in Hospital? or when prevented from working by stress of weather?
67. Is medical aid given to the labourers?—If so, how is it charged?—and what is the cost of it?
68. Is Rice issued at a fixed rate?—If so, in what quantities?
69. Is there any loss on the rice thus issued?
70. What other charges beyond the regular pay of the labourer are included in the coast of a Road?
71. How far is labour affected by the proximity to Estates?
72. Do coolies prefer working on Estates to being employed on Roads?
73. Are the wages paid to Road coolies higher that those paid to Estate coolies?
74. Are coolies enticed from the Roads by crimps employed on the Estates?
75. Are there many desertions?
76. What is the general system pursued with regard to labour on Estates?
77. Do the highest rates prevail in those districts in which Estates are most numerous?
78. What is the proportion of non-effectual labour?
79. How far is the Contract system pursued in Road making?
80. What are the rates paid for Contract work?

SUPERVISION.——81. What is the general character of Supervision and Establishment?
82. What proportion of the supervision is borne on the Fixed or Provisional Establishment, and what is charged to the Road under construction?
83. Is any portion supervised by Military Engineers or other Officers?—If so, to what are their pay and allowances charged?
84. To what extent is native supervision employed; and is such supervision attended with satisfactory results?

TRANSPORT.——85. How is the cost of Transport borne?
86. Is there a special vote for Transport? or is the cost of Transport in each case charged to the construction of the Road?
87. Are Elephants, Camels, or Donkeys extensively used in Transport?—If so, what do they cost per mensem or per annum?
88. Are Carts employed?
89. What is the cost of a pair of Bullocks and a driver per diem?
90. What is the contract price of Carts per diem?
91. Are Barrows or Hand Carts in general use?
92. Is any transport performed by men?—if so, at what cost?

CHARACTER OF TRAFFIC.—93. What is the character of the Traffic on different Roads?
94. What description of Carts are used?
95. What is the breadth of the wheels in ordinary use?
96. What weight is carried on a pair of wheels?
97. How many wheels pass over the roads in the course of a day?
98. What is the average duration of each Road?
99. Has any relation been observed between the duration of the Roads, and the number of Carts which have passed over them?

MISCELLANEOUS.—100. How are the supplies from the Workshops charged?
101. Is there a separate vote for Tools, or are the Tools charged to the Roads on which they are used?
102. What is the cost of Lines, or buildings for the accommodation of those employed on the Roads?
103. What is the character of such buildings, and how many are erected for a given length of Road?
104. What is the system of pay? and what time is lost in paying?
105. Are there any general votes bearing upon the construction of Roads, the amounts of which are not charged directly to the cost of Roads?

No. 200. ORDER THEREON, 11th January 1867, No. 96.

CIVIL WORKS, No. 44.

Communicated to the Superintending Engineers, who will furnish answers to the several questions at their earliest convenience.

(True Extract.)

(Signed) CHARLES A. ORR, Colonel, R. E.,
Secretary to Government.

To the Superintending Engineers.

Exd. S. T. Augustin.

QUESTIONS by the COMMITTEE appointed to enquire into the COST OF THE CONSTRUCTION OF ROADS IN CEYLON, compared with other Countries.

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No. 46.

Colonial Secretary's Office
Colombo December 6th 1866

Sir,

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The Secretary to the Government
Public Works Department
Madras

construction of Roads in Ceylon.

His Excellency would be glad if the Right Honble the Governor would be pleased to direct that these questions be distributed to the different Districts of the Presidency and that answers be furnished as soon as possible.

I have the honor to be
Sir
Your most obdt. Servt
William Hay Gibson

P.C. 1866 Department
Pro. of Govt. in Jno. January 5 15 41

From

The Colonial Secretary
Colombo
No. 46

Dated 6th
Recd 18th } December 1866.

Ceylon.

Forwarding a set of questions by a Committee appointed to enquire into the cost of the construction of roads in Ceylon, & requesting to be furnished with answers to them —

No. 96 - 11th Jany. 1867

Wetherall Acting

No. 96

Commd. to the Surveying Engineers, who will furnish answers to the several questions at their earliest convenience.

Fort St George
11th January 1867

Desp. 12th Jan. 1867

No 199 - 200

C. 21st Dec. 1866 Dated 5th Jany 67