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MADRAS RECORD OFFICE.

Government of Madras.

Public works **DEPARTMENT.**

G.O. No. 297 Press Mis.

603-64

Dated 30 · 1 1867.

Not to be folded or roughly handled

Proceedings of the Madras Government, Public Works Department,
30th January 1867.

No. 603. Read the following Circular from the Secretary to the Government of India, Public Works Department, (Civil Works—Communications), to the Secretary to the Government of Madras, Public Works Department, dated Fort William, 15th January 1867, No. 5 :—

1. I am directed to forward the accompanying set of questions, proposed by a Committee appointed to enquire into the cost of the construction of roads in Ceylon, and to request that you will furnish replies to them as early as practicable.

2. Questions 7, 8, 13, 14, 82, 83, 85, 86, 100, 101, and 105, being of a general nature, have been replied to by this Office. These need not be noticed again.

No. 604. ORDER THEREON, 30th January 1867, No. 297.

CIVIL WORKS, No. 121.

Communicated to the Superintending Engineers, with reference to the Proceedings of Government No. 96, dated 11th January 1867.

(True Extract.)

Colonel, R. E.,
Secretary to Government.

To the Superintending Engineers.

Rxd. S. T. Augustin.

Enclosure to Circular No. 5 Public Works.

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 1864-65-66 *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 metalling?
4. Is it usual to adopt any substratum differing in character, or material, from the surface metalling?—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 metalling,—sub-divided under the following heads, *viz.*:—
   - *a.* Earth-works (including retaining walls and rocks).
   - *b.* Side drains.
   - *c.* Cross drains or culverts.
   - *d.* Bridges.
   - *e.* Metalling.
   - *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 percentage 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 foot-paths?

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?

METALLING.

22. Describe the general character of the metalling, and the materials of which it is composed?
23. What is the average thickness of metalling?
24. What is the average cost for superficial yard of metalling?
25. How is metalling 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 metalling, *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 elephats 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?

Labour.

53. What rates are paid to skilled Artisans of different kinds?
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 insure 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 cost 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 than 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?

CIRCULAR No. 5 PUBLIC WORKS.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

CIVIL WORKS.

Communications.

To The Secretary to the Govt of Madras
Public Works Department

FORT WILLIAM, JANUARY 15, 1867.

SIR,

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2. Questions 7, 8, 13, 14, 82, 83, 85, 86, 100, 101 and 105, being of a general nature, have been replied to by this Office. These need not be noticed again.

I have the honour to be,
SIR,
Your most obedient Servant,
(Signed) C. H. DICKENS, *Lieut.-Col., R. A.,*
Secy. to the Govt. of India.

Captain, R. E.,
Asst. Secy. to the Govt. of India.

Pro: of Govr for January 1867 298

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

CIVIL WORKS.

To The Secy. to Govt

CIRCULAR No. 5 PUBLIC WORKS.

Dated January 15, 1867.

Received 28

Encl one

Forwards set of questions proposed by a Committ appointed to enquire into the cost of the constr tion of roads in Ceylon.

No. 297 - 30th Jany 1867.

With enclosure

No 603-604

Let Lett Enclosure noted in margin

297

No. 297

Commd to the Supg Engrs, with ref -rence to the Proc: of Govt No 96, of 11th January 1867 —

To the Supg Engrs

Govt Secy

30th Jany 1867

Recd 31/1/67