

(1) Number of Pages 6.
(2) Date of repair 24. 7. 67
(3) Initials of the Referencer 30.1.68

MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Revenue DEPARTMENT

G.O. No.	13.	Press
B.P. No.		Mis.
Dated	2. 11. 1874.	196.

Not to be folded or roughly handled

No. 194A. Read the following letter from W. J. ADDIS, Esq., C. E., Surveyor
G. W. WALKER, R. E., Secretary to Government, Public Works
Department, Madras, dated Bombay, 4th April 1874:—

I HAVE the honor to lay the following before you for the Government's most favorable consideration.

2. My attention was attracted some time ago to the want so much felt by the *bona-fide* inhabitants of Ootacamund, Coonoor, Jackattalla, and other stations on the Neilgherry Hills, as well as by the annual visitors, or casual tourists, of a cheap and efficient mode of conveyance to and from the foot of the ghauts.

3. Up to the present, however, I could not devote to that really important question the time and attention required, and was therefore obliged to defer its consideration to another time.

4. The advantages which a cheap and comprehensive mode of conveyance offers to the Hills are manifold, and need not be re-enumerated to you; but I beg to draw your attention to two of them, I refer to the cheapening—that must ensue the introduction of the tramway system—of all articles of consumption and wear and, its natural consequence, the decrease of wages for labor.

5. It is a well known fact that competition in trade is an almost unknown thing in the Hills. I am not referring merely to the shops containing articles of European manufacture, but also to the other and more essential trades of grain of all kinds, coffee, tea, cloths, and other articles of country-produce or manufacture. Competition in these articles of daily want is a thing almost unknown, or rather unattempted, owing to the difficulty, but very partly removed by the Carrying Companies, of conveying these articles up those ghauts by other means than that of Brinjarry bullocks, which mode of conveyance is more or less monopolised by a certain class of merchants.

6. The introduction of the tramway from the foot of the ghauts to Ootacamund and its further extension, a fact that must ensue its introduction, will remove this great evil, and secure to the inhabitants of the Neilgherries the results of a healthy competition in trade, and to the inhabitants of the plains a comparatively cheap and easily got at sanitarium.

7. I shall now endeavour to lay before you some of the working arrangements with reference to the tramway. I guarantee that each passenger van will carry from thirty to forty passengers, and each goods truck from 3 to 3½ tons. I further engage to carry up the passengers and goods from the Railway terminus at the foot of the ghaut to Ootacamund at an average rate of speed of ten miles an hour if steam power is employed.

8. The outlay required for constructing rolling stock, etc., of the tramway from and to the above mentioned places, including all intermediate stations, will not exceed three lakhs of rupees, which, taking the length to be twenty-five miles, gives an average of Rupees 12,000 per mile. This naturally diminishes the rates of fare per ton to a minimum. This cheapness, coupled with the speed attainable, renders this mode of conveyance far more preferable than all those in use at the present time.

9. You will from the foregoing statement be able to perceive that the amount of goods the tramway will be able to pour into Coonoor, Ootacamund,

etc., every day, will be such as must greatly influence the market, and thus ensure the desired result of cheapness. This, therefore, surely deserves the patronage of Government.

10. I also beg to state that the construction of the tramway will in no way whatever curtail the breadth of the road, by unfitting it for the use of ordinary vehicles. The rails will be laid flush with the road now in existence, so that any kind of conveyance can pass over it without detriment to itself or the rails.

11. I will not dwell longer on this subject, nor point out any further benefits accruing to the planters of tea, coffee, and vegetables, etc., nor shall I refer to the relief offered to the sick but poor Europeans, who, owing to the present dearness of living on the Neilgherries, as well as to the expense of getting there, find it impossible to do so.

12. These and several other points must have suggested themselves to you, and will, I trust, be favorably viewed by Government when they take my projected undertaking into consideration.

13. It is my intention to construct a tramway from the foot of the ghauts to the Neilgherries. This, I find, I cannot do without the aid of Government, and therefore have the honor to solicit the favor of the following concessions:—

1st.—Six feet of the public road leading from the terminus of the Railway at the foot of the ghauts to Ootacamund, *via* Coonoor and Jackattalla. It is immaterial what portion of the road I obtain, whether the middle or either of its sides.

2nd.—A guarantee of 3 per cent. on all monies laid out on construction, purchase of rolling stock, etc., etc.

14. In conclusion, I am led to hope that the real substantial benefits the introduction of the tramway will bring to the Neilgherries, and by reversion to the plains, will weigh with the Government, and ensure to me the concession I have now the honor to solicit.

No. 194B. From W. J. ADDIS, Esq., C. E., to Colonel G. W. WALKER, R.E., Secretary to Government, Public Works Department, Madras, dated Bombay, 18th April 1874.

I HAVE the honor to acknowledge the receipt of your letter under date the 9th instant, No. 237, and beg to submit, as requested, all detail information with reference to my proposed tramway from the Mettapolliem terminus to Ootacamund, *via* Coonoor and Jackattalla.

2. Although I have not seen the Coonoor Ghaut since its completion in 1870, yet I have based my scheme for the projected tramway from the knowledge I had of the old road. The present line, no doubt, will be more in favor of the tramway both as regards gradients and curves; hence I anticipate no difficulty whatever as regards these two points.

3. The engine I purpose introducing is that of Mr. Fairlie's. I have already been in communication with this gentleman on the subject, and am prepared to adopt his system of locomotive, more so as you are doubtless aware his wheels are on the bogie principle, and will adapt themselves to the sharpest curves.

12. The rail is a single one, combining a longitudinal sleeper and fish-plate, all of wrought iron; this enables chairs and spikes to be dispensed with. The iron sleepers are rolled to a curve (as shown in the full size drawing which accompanies this letter), and when set and fixed would present three curved surfaces; the rails are then fixed to the sleepers by means of bolts passing through them and the web of the rail, the jaws of the sleepers formed at the upper junction being of a suitable shape to embrace the single headed rail weighing 20 lb. to the yard.

13. The sleepers are formed in lengths of 18 inches, and fixed at a distance of 3 feet from centre to centre; but in places where the ends of rails meet a sleeper of a larger dimension is introduced in order to suit the requirements of a fish-plate.

14. I further beg to submit estimates for 25 miles of tramway, showing cost of construction and maintenance, together with rolling stock necessary for the length proposed.

15. In conclusion, I trust I have sufficiently explained all details in connection with my proposed scheme; should, however, any further information be required I shall be happy to furnish it, or, if necessary, shall be glad to wait upon you either at Coonoor or Ootacamund in order that I may be able to place before you certain models in connection with the tramway.

No. 194C.

ORDER THEREON, 10th September 1874, No. 2,564A.

CIVIL WORKS, No. 15A.

THE concessions required by Mr. Addis on which he would be prepared to construct a tramway from Mettapolliem to Ootacamund, by the new ghaut and road, a distance of 33 miles, are not in themselves such as the Government of Madras would object to, were they satisfied as to the sufficiency of his estimates to provide adequate working power, and to lay down the line. But it does not appear that Mr. Addis has sufficiently appreciated the power necessary to carry the traffic to the Neilgherries up many miles of incline averaging 1 in 18 in gradient at the rate of ten miles an hour; or the cost of supplementing the road accommodation to be given, by bridges and drains of more solid construction than those in existence; by tunnels or other expedients necessary to get round the numerous zigzags; and by strengthening the outer edge of the road to ensure its not giving under the weight brought upon it. Under these impressions, His Excellency the Governor and Council must decline to entertain Mr. Addis' proposals.

2. The importance of facilitating traffic both of goods and passengers to and from the Neilgherry Hills is however so patent that His Excellency the Governor in Council resolves to instruct the Under Secretary to Government in the Department of Public Works to take up the subject during the latter portion of his stay on the Hills. He will ascertain as accurately as possible from the best authorities, official and private, the amount of existing traffic of all sorts, and the charges with which it is burthened. And with these statistics available it will be remitted to the Consulting Engineer for Railways to report as to the probable cost of a tramway laid and worked on some well established principle (such as that

Proceedings of the Madras Government, Public Works
10th September 1874.

4. The engines and brake vans will have all the latest improvements regards brakes, so that there will be no difficulty whatever in case of bringing the train to a dead stand on any part of the ghaut or on any incline.

5. Engines on this principle have already been constructed in England by Messrs. Sharp, Stewart and Co., and are now worked on my system of single rail. The following is a description of the working of the tramway both as regards engines and vehicles on the Lisbon and Cintra line, also from Lisbon to Torres Vedras, a distance of seventy-seven miles. Upon this single rail run engines and carriages having one pair of broad wheels placed central to their length, and running on either side of the rail, and at either end of the bogie frame carrying a double flanged wheel placed central to the width of the carriage working on the rail. In the locomotive, the pair of broad wheels are the drivers, and the small "centric" flanged wheels acting mainly as guides. In the carriages and wagons, however, the exact reverse of this arrangement is introduced, the bearing being taken by the bogie wheels, whilst the outer wheels act simply as guides. The carriages and wagons, in point of fact, are therefore, as will be observed, steadied and prevented from overturning laterally by the outer wheels.

6. The engines are further fitted with an ingenious hydraulic arrangement, by means of which the body of the engine is preserved in a horizontal position when it is either ascending or descending an incline, so that the tubes are not uncovered by the water, the level of which is indicated outside. The power of each of these engines has been tested on this tramway on a level up to 300 tons. The steepest gradient on this line of tramway is 1 in $18\frac{3}{4}$, and the average over the whole length above mentioned is 1 in $22\frac{3}{4}$, and the curves are in places very sharp, averaging from 5 to 10 feet radius.

7. The ordinary working weight of an engine is 13 tons 5 cwt., and of this the driving and supporting wheels are calculated to sustain a maximum weight of about 9 tons, of four tons and a half on each wheel, the balance being distributed over the guiding wheels. But in running over gradient by means of the hydraulic ram, worked by steam and connected with the central mechanism, the weight on the support wheels can be reduced by one-half and transferred to the centre or guiding wheels, which enables a greater speed to be obtained.

8. These engines are capable of drawing 25 tons up these gradients, but the weight of an average train with five vehicles attached is about 18 tons, and the speed, including stoppages, is fifteen miles per hour.

9. Carriages are of three classes, and so constructed for the convenience of passengers that they enter from the sides. The 1st class carriage accommodates sixteen, the 2nd thirty, and the 3rd forty passengers. The backs of the seats are so arranged as to be turned either back to back or *vice versa* in order to save the turning of the carriages.

10. Goods wagons are constructed similar to those of an ordinary railway, but smaller, and capable of conveying from 3 to $3\frac{1}{2}$ tons each.

11. All the guide wheels of the vehicles are constructed on the same bogie system, in order that each and every one may in its turn adapt itself to the sharpest curve on the ghaut. Each vehicle is further fitted with strong brakes on either side.

Proceedings of the Madras Government Public Works Department,
10th September 1874.

developed on the line over Mont Cenis to be undertaken by State agency. It would be well in this view to obtain authentic details of the lines reported by Mr. Addis to be in actual operation between Lisbon and Torres Vedras.

(True Extract.)

(Signed) G. W. WALKER, Colonel, R.E.,

Secretary to Government.

/ True Copy /

Adm. Secy
Major R. E.

Under Secretary to Govt.

P. W. D.

To Mr. Addis, C. E. Extract paragraph 1.
To the Consulting Engineer for Railways.

„ Under Secretary to Government, Public Works Department.

„ Rev. Sept. 1874.

Ed. S. T. Austin.
Spare Copies

