Public Works (189) Department.

RAILWAY BRANCH.

G.O., No. 1174 A & 1175 Ry

DATED 27th September 1898.

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G.O. No. 1156 Ry dated 27th September 1898.

1175

[Despatch Abstract.]

Locomotive Arrangements on the Bezwada-Madras Railway Letter to the Govt of India furnishing the views of the Madras Railway Company on the Subject of Engine-changing Stations south of Vizianagram Station on the East Coast Railway on the assumption that that Company will be called upon to work the line.

[P. W. 26. 200-30-8-98.]

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RAILWAY.

Government {1898} of Madras.

PUBLIC WORKS.

Recd. } 1898. *Enclosures*

Regd. } *Spare copies*

G.O., No. $\frac{1174}{A}$ Ry., 27th September 1898.

SEPTEMBER.

Locomotive arrangements on the Bezwada-Madras Railway

Letter to the Government of India furnishing the views of the Madras Railway Company on the subject of engine-changing stations south of Vizianagram station on the East Coast Railway on the assumption that that Company will be called upon to work the line.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Railway.

Read the following papers :—

From—The Engineer-in-Chief, East Coast Railway.
To—The Joint Secy. to the Govt. of Madras, P.W. Dept., Railway Branch.
Dated—Waltair, 5th October 1892, No. 7057/553.

For standard gauge engine running the most economical run consistent with practical conditions of men and machinery is somewhere between 125 and 135 miles. Runs of 100 miles are uneconomically short, and runs of 80 and 83 miles, like those arranged for on the East Coast Railway, are extremely and wastefully short. A short engine run implies an unnecessarily heavy staff of drivers and other locomotive servants, and too little work is got out of the engines. There are, moreover, extra expenses, for fuel in drawing fire, for lighting up, and for other matters, petty enough when taken singly but running in the gross to a very important share of the locomotive expenditure of a railway and, moreover, annually recurring for all time.

2. When the East Coast Railway was designed, the idea doubtless was that the Godavari bridge would never be built. Another idea apparently also was that the northern terminus of the line would be at Naraj on the Mahanadi. These conditions are now changed, and there will be a through run north from Bezwada across the Godavari without a break. The northern main station for engine homing purposes will, as I hope to show, be not at Naraj but at the junction, Khurda road or Chatipur, of the East Coast Railway with the Puri branch and with the Bengal-Nagpur Railway. Another and most important consideration which cannot be lost sight of is that sooner or later the present 500-mile section of the East Coast Railway is bound to be extended southward and northward. Things must, therefore, be so arranged now that when these extensions are made there shall be as little dislocation as possible of existing and expensive arrangements.

3. The great future engine stations of the Calcutta-Madras direct railway will be somewhat as follows :—

(1) Madras or its neighbourhood.
(2) Bezwada or Guntur, the former by preference.
(3) Waltair.
(4) Chatipur, the junction with the Bengal-Nagpur Railway.
(5) Diamond Harbour or Midnapur, according to the alignment adopted.

These will be *roughly* average about 250 miles apart, dividing the thousand miles of railway into four sections as approximately equal as is practicable ; the points of division, moreover, are all critical points either of traffic, such as Waltair, or of junction with other railways, such as Bezwada and Chatipur. I may note here that I shall later on go into accurate mileage, but for the moment I merely want to convey to Government a broad general view of the matter.

4. Midway, or nearly midway, between these main engine homing stations there ought to be the cheapest possible running sheds for engines, and running rooms for drivers. It is in no way essential that these running shed stations should be located at important centres.

5. As this is, I presume, a large enough question to come before one or more individual members of Government who are not railway experts, and as I desire, if possible, to ensure that my view of this matter shall be accepted, I think it necessary to explain that the engines of a railway have their permanent stables at certain great

engine stations, at each of which a responsible man is in charge, and at each of which there are all the necessary facilities for repairs of a minor sort. The army of drivers, firemen and other running staff have their own and their families' permanent quarters at these main engine centres, and each such place becomes in course of time a very important colony.

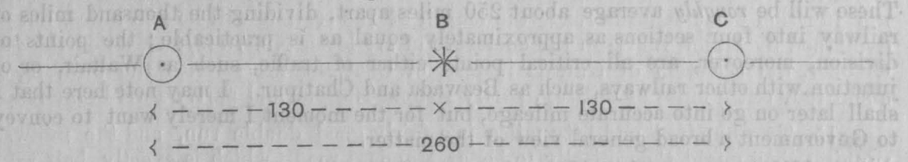
6. From these, their permanent stables, the engines run out with their trains to some point about midway between their own and the next stables on this side and on that. This run is supposed to be a fair day's work for a man ; and at the place where he hands his train over to another man from the next stable the driver and his engine sleep for the night, returning next day with another train to their own regular head-quarters, and so on.

7. This sleeping place, which ought obviously to be about midway between two main engine stations, grades and speeds being allowed for, is the proper place for a running shed, or sort of out-stable, for the engines, and for a running room, or sort of rest-house, for the drivers and guards where they may find facilities for resting and for feeding. I repeat that I go into these details not with a view of teaching you any thing, but because, arguing as I am against arrangements which have been already designed, I foresee that I shall probably have to convince the non-professional members of Government if I am to carry my point.

8. Now when it is considered that the length of the day's engine run, that is, the distance from main-engine-station to running-shed-station is the measure of the day's work of each engine, it is obvious that the longer this run can be made, consistently with practical conditions the greater is the economy which is secured in quite a large number of the items which compose the locomotive expenses of a railway. One practical condition which, so long as each engine has its own driver, strictly limits the length of these runs is the day's work that a man can do. On some of the American lines they get round this by passing their engines on from driver to driver, but as this is not yet the practice in England or in India, the length of an eight or ten hours' run is the practical limit. If all the engine runs on a railway are too short, the result is not only numerous minor sources of waste in working, but that one or more additional main engine stations will be needed at a cost of many lakhs ; but worse even than this is the capitalized cost of the steady annual loss due to the extra army of drivers and other servants that must be kept up.

9. Amongst other locomotive authorities whom I have consulted before venturing to propose an alteration of the designed arrangements, I referred the matter, as a general question, to Mr. A. W. Rendel, who is, as you know, the Locomotive Superintendent of the East Indian Railway and admittedly the highest authority on such a matter in India. Mr. Rendel writes as follows :—

I think for broad gauge engines, changing stations should average 130 miles apart ; a little more or less makes very little difference. I think it is a great mistake, however, to spend a lot of money on changing stations unless you are perfectly certain that the centre is an important one and one at which engines must be stationed. For instance, I may have two important centres of trade at A and C, 260 miles apart from which traffic is expected : I should, of course,



station the engines at these centres and make B quite a minor consideration dependent entirely on local circumstances. I should make it a rule never to make any permanent arrangements at any points the importance of which was not fully established ; and all points like B to which the engines only ran, and at which no engines were stationed, I should equip in the most scanty manner possible and await the development of traffic. Provided the stations at which the engines are actually housed or homed are fairly well equipped, the stations to which they run are of little importance and can wait the development of the line. I should make my mir or running sheds entirely of corrugated iron, and arrange so that they could be easily transferred without much loss of labour or material.

10. Now Mr. Rendel's stations A and C are typical of the five main homing or housing stations enumerated in para. 3. Mr. Rendel's station B is typical of the four running shed stations which I wish to locate somewhere midway between the main five.

11. I shall omit for the present all reference to the Madras and Calcutta extensions and shall deal only with the existing 500 miles. I attach a list of the stations as originally designed, and shall now explain, referring to this list, how I desire to alter them.

12. Bezwada is necessarily, at least so I personally am convinced, a main engine homing station. It is the junction of the Calcutta-Madras direct railway with the Nizam's State Railway, with the Great Southern Mahratta system of railway, and with the Masulipatam branch. Should the metre-gauge system be terminated at Guntur, then Guntur might perhaps be selected as a homing station, but this would involve two junctions with foreign railways instead of one. The next great engine station towards the north is necessarily, for trade and other reasons, Waltair. Here will be situated the principal workshops of the system, and it will apparently be the best place for the administrative centre of all the working departments. To deal first, therefore, with this Bezwada-Waltair section: It is 217 miles long and the intermediate running-shed station, Mr. Rendel's type B, ought to be about midway were all conditions favourable. Owing, however, to the heavier gradients on the northern half of the section, I would recommend that it be built at Samalkot, 124 miles from Bezwada. This place is also the junction of the Cocanada branch and an important centre of trade. The run from Bezwada to Samalkot will be 124 miles and from Waltair to Samalkot 93 miles. Both these are short runs and the latter much too short, but that is an incident of the shortness, only 217 miles instead of the desired 260, of the Bezwada-Waltair section. We cannot secure the best and must only arrange so as to get the nearest practicable approximation to it.

13. If this view of the case be accepted, it follows that Rajahmundry, as a main engine station, must be abolished. As I said before, when Rajahmandri was first designed as an engine station there was no question of the bridging of the Godavari, nor can I learn that since the bridge project was agreed to has any alteration of the original conditions of engine stations been proposed. The 124 mile run over the level country between Bezwada and Samalkot will be an easy run; the shortness of the Samalkot-Waltair run will be qualified by the stiffness of its gradients. There will, moreover, be secured the very important advantage of only one intermediate centre of locomotive working between the two main homing stations instead of two. This completes what I want to say about the Bezwada-Waltair section.

14. Now to pass on to the section north of Waltair. I have explained why I think that the northern main engine homing-station should be at Chatipur, mile 467·20, the proposed junction with the Bengal-Nagpur railway and with the Puri branch. The length of this section, 250 miles, though still short of Mr. Rendel's 260, is yet a more economical length than that between Bezwada and Waltair. Should the junction be at Khurda road, the length of the section will be 255 miles, but as explained by Major White in the enclosure of my letter No. 7023/493, dated the 4th October, the selection of Khurda instead of Chatipur necessitates the building of about four extra miles of railway, partly Bengal-Nagpur and partly Puri branch.

15. Two hundred and fifty miles is a fairly good double run, and the midway running shed ought theoretically to be at Mandasa road, which is exactly half way. As, however, Kasibuga has already been designed as a watering station, and as it is a place of some importance, it may be argued that the running shed should be built there. To this, however, I object for this reason, that one of the two runs—Kasibuga to Chatipur—is rather long, 133 miles; moreover, I do not think that the position of the type B station need be in any way affected by considerations of traffic and of trade. I desire to put the running-shed and running-room at Mandasa road station, and I want permission to abolish the two proposed engine stations of Thelara and Berhampur.

16. For the present, pending the completion of the Mahanadi bridge and the extension of the railway northwards to either Midnapur or Diamond Harbour, the section north from the Chatipur junction to the Mahanadi at Naraj must be worked out and in by engines from the Chatipur homing station. There will be little goods traffic on this section until the extension has been carried out. Perhaps the best temporary arrangement for this section and for the Puri branch would be a separate service from Naraj to Puri, 59 miles, in contact at Chatipur with the main services. This would be a good enough arrangement pending the completion of the Mahanadi bridge and of the Calcutta extension.

17. I may now proceed to summarise all that I have been arguing for. The following are my proposals: (1) abolish the following engine stations: Rajahmandri, Thelara, Berhampur and Naraj; (2) let the main engine homing stations and railway servants' colonies be at Bezwada, Waltair, and Chatipur or wherever is the junction of the Bengal-Nagpur Railway; (3) locate running sheds, Mr. Rendel's class B, at the following stations: Samalkot and Mandasa road.

18. Naraj is nothing; it is a mere geographical expression. Once the Mahanadi is bridged, Naraj will become as Kothala, or as Sher Shah, or as Balawala,—a once thriving bridge colony but thereafter scarcely worth the cost of a fourth-class station. The section between Chatipur (or Khurda) and Midnapur will not be found to be too long; neither, if the northern extension should terminate on a Diamond Harbour ferry, with access to the Calcutta and south-eastern branch of the Eastern Bengal Railway, will the section between the ferry and Chatipur (or Khurda) be found to be too long for economical working in a very easy country. The Madras-Bezwada section also is of about the right economical length with a B type station about midway. Taking all things that suggest themselves to me into careful consideration, I believe that the arrangements now put forward for the approval of Government are good arrangements—good for the working of the 500 mile section now under construction and good for the working hereafter of the 1,000 mile line between Madras and Calcutta.

19. I may add that the designed arrangement of the watering stations does not commend itself to my judgment any more than that of the engine station. They are, as a rule, much too far apart in the opinion of locomotive experts whom I have consulted. This question, however, will form the subject of a separate communication.

Enclosure.

Schedule of stations as at present designed, 1892, on the East Coast Railway.

Stations.	Mileage.	Distance between stations.	Distance between watering stations.	Length of engine run.	Remarks.
Bezwada .. .. W. & E.S.	..	..	..		
Gannavaram	12·36	12·36	..		
Nuzvid	25·39	13·03	..		
Ellore .. .. .. W.	37·01	11·62	37·01		
Bhimadol	48·70	11·69	..	92·52	
Chebrol	57·45	8·75	..		
Thadipalli .. .. .. W.	66·39	8·94	29·38		
Nidadavol	78·80	12·41	..		
Rajahmandri .. .. W. & E.S.	92·52	13·72	26·13		
Kaddiam	98·73	6·21	..		
Dwarapudi	104·93	6·20	..		
Bikavol	113·07	8·14	..		
Samalkot .. .. .. W.	123·80	10·73	30·28		
Cocanada	..	10·50	..		Branch line.
Samalkot	123·80	..	..		
Pithapuram	131·11	7·31	..	124·89	
Kottapilli	146·45	15·34	..		
Tuni .. .. W.	156·85	10·40	33·05		
Narsapatam	170·54	13·69	..		
Yellamanchilli .. .. .. W.	181·51	10·97	24·66		
Anakapalli	194·86	13·35	..		
Simachalam	212·79	17·93	..		
Waltair	217·41	4·62	35·90		

Schedule of stations as at present designed, &c.—*cont.*

Stations.	Mileage.	Distance between stations.	Distance between watering stations.	Length of engine run.	Remarks.
Waltair .. .. W. & E.S.	217·41	4·62	35·90		
Vizagapatam	219·54	2·13	..		
Simachalam	222·79	3·25	..		
Kottavalsa	224·00	1·61	..		
Allamanda	234·53	10·53	..		
Vizianagram .. .. W.	245·56	11·03	37·39	83·33	Branch line to Vizagapatam.
Sodaram	257·66	12·10	..		
Chipurapalli	264·57	6·91	..		
Pandur .. .. .. W.	279·10	14·53	33·54		
Aidalvalsa	288·58	9·48	..		
Thelara .. .. W. & E.S.	300·74	12·60	21·64		
Naupada road	314·37	13·63	..		
Pata Tekkali	326·24	11·87	..		
Kasibuga .. .. .. W.	333·87	7·63	33·13	80·21	Water reported suitable for watering station.
Mandasa road	342·02	8·15	..		
Kanchili .. .. .. W.	353·55	11·53	19·68		
Ichapur	364·64	11·09	..		
Berhampur .. W. & E.S.	380·95	11·31	27·40		
Chatrapur	393·23	12·28	..		
Huma	398·77	5·54	..		
Rambha .. .. .. W.	408·70	8·93	27·75		
Balugaon	428·45	17·75	..		Berhampur was selected as a better site for an engine station by the Madras Government although Chatrapur would divide the run better. Junction with B.N. and Puri branch.
Tangi road .. .. .. W.	445·95	17·50	37·25	119·70	
Tappang	461·70	15·75	..		
Chatipur	467·20	..	..		
Khurda road .. .. W.	472 70	11 00	26·75		
Bhubaneswar	484·70	12·00	..		
Cuttack road	495 45	10·75	..		
Naraj .. .. W. & E.S.	500 65	5·25	27·95		

Note.—The distances shown in this statement are correct mileages as far as Thelara; from that point they are given as accurately as at present known and are within a very small fraction of the correct mileage.

Telegram—From the Joint Secy. to the Govt. of Madras, P.W. Dept., Ry. Branch.
To—The Engineer-in-Chief, East Coast Railway
Dated—Madras, 15th October 1892, No. A/80.

Your letter No. 7057, 5th instant. Want sketch plan showing the position of proposed shops, engine changing stations, running sheds, &c., with mileage.

From—The Engineer-in-Chief, East Coast Railway.
To—The Joint Secy. to the Govt. of Madras, P.W. Dept., Railway Branch.
Dated—Waltair, 1st November 1892, No. 7722/553.

In reply to your telegram No. A/80, and with reference to my No. 7057 of the 5th October 1892, I have the honour to forward, herewith, a sketch plan showing the position of the proposed engine changing stations and running sheds.

The position of the engine changing stations at which permanent arrangements should be made for housing the engines and the running staff is marked by a double red circle, while that of the intermediate running shed stations is denoted by a single red circle.

The mileage of each run is marked on the plan in red figures.

The chief workshops of the complete system would be at Waltair as designed for the 500 mile section which is now under construction.

Order—No. 23 Ry., dated 11th January 1893.

The Government approves generally of the engine changing stations and running sheds proposed by the Engineer-in-Chief, East Coast Railway.

2. A copy of these Proceedings will be forwarded for the information of the Government of India.

Endorsement—No. 24 Ry., dated 11th January 1893.

Forwarded.

Telegram from—The Joint Secy. to the Govt. of Madras, P.W. Dept., Railway Branch.
To—The Secretary to the Government of India, Public Works Department.
Dated—Simla, 12th August 1898, No. 8/A.

Regret plans estimates for locomotive arrangements for working Madras-Bitragunta section, Bezwada-Madras Railway, from Madras, through Madras Railway Agency not quite ready for your Railway Conference but estimated 141 thousand.

From—The Secretary to the Government of India, Public Works Department.
To—The Joint Secy. to the Govt. of Madras, P.W. Dept., Railway Branch.
Dated—Simla, 18th August 1898, No. 1206 R.C.

With reference to your telegram No. 8/A., of 12th August 1898, regretting that plan and estimates for locomotive arrangements on the Bezwada-Madras Railway are not ready for the Conference, I am directed to inform you that the Conference deals with administrative questions only, not with executive details such as that referred to, which can be disposed of by the Director of Railway Construction and the Engineer-in-Chief, Bezwada-Madras Railway.

2. At the same time I am directed to state that the Government of India will be glad to know the views of the Madras Railway Company on the whole subject of engine changing stations south of Vizianagram station on the East Coast Railway, on the assumption that they may be called upon to work the line as far as some point not yet fixed but which will probably be either Vizagapatam, Waltair, or Vizianagaram, and I am, therefore, to request that you will, with the permission of His Excellency the Governor in Council, obtain and submit the same as soon as possible.

3. In this connection, I am to forward, herewith, copy of extract from a note on the subject by Major Constable, Manager East Coast Railway, giving his views on the question, and I am at the same time to inform you that the arrangements ordered by the late Director-General of Railways (Colonel T. Gracey, R.E.) contemplated Bitragunta and Samalkot as "homing" stations, and Madras, Bezwada, (or one of its suburbs) and Waltair, or Vizianagram, as "running" stations, and that unless accommodation sufficient for working the new line already exists at Madras in excess of present requirements, this arrangement seems more suitable than that proposed in letter, No. 2024 dated 14th July 1898, from the Senior Government Inspector to the address of the Engineer-in-Chief, Bezwada-Madras Railway, and has been sanctioned by the Government of India in letter, No. 830 R.C., of 11th June 1896, to the Director-General of Railways.

Enclosure.

Extract from note by Major W. V. Constable, R.E., on the position of the Locomotive Stations on the East Coast line between Madras and Calcutta.

I am strongly in favour of the following programme :—

Stations.	Mileage from Madras.	Mileage from last Locomotive Station.	Class of station.
Madras (Perambore)	..	....	Homing station.
Bitragunta	131¼	131¼ from Madras ..	Running station.
Sitanagram (Sitanagram, Tadepalli and Bezwada may be considered as one station).	266½	135½ from Bitragunta ..	Homing station.
Rajahmandri or Samalkot ..	361¼	94¾ from Sitanagram ..	Running station.
	392¼	125¼ from Sitanagram ..	
Waltair	485¼	93 from Samalkot ..	Homing station.
		124 from Rajahmandri.	
Palasa, formerly called Mandasa road. ..	611¼	126 from Waltair ..	Running station.
Khurda road	748¼	137 from Palasa ..	Homing station.
Intermediate between Khurda road and Midnapore (Khargpur) (*a*)	859¼	111 from Khurda road.	Running station.
Midnapore (Khargpur)	951¾	92½ from Soro ..	Homing station.
Calcutta or Hugli	1,021¾	70 from Khargpur ..	Running station probably.

(*a*) Soro has been taken as the intermediate station.

2. The chief advantages of this arrangement are :—

(1) That Waltair, *i.e.*, Vizagapatam, where it is hoped considerable traffic will originate or terminate, will be the Locomotive Railway Colony, as it should be a decided advantage to

have the staff and stock of engines at such a place. This argument applies equally well, in my opinion, to the advantage of having the home station at a junction. Here the traffic converges and it is undoubtedly convenient to have the engines and running staff permanently located at the place where the traffic is, so that on sudden rushes of traffic occurring it is not necessary to send for power and staff. There are good quarters already built sufficient, counting the offices, for years to come both for officers and subordinates and drivers and guards, and the place is the coolest and healthiest on the line. It will be quite easy to have, if considered desirable, separate engine sheds and locomotive accommodation for the two Companies; and if found necessary, as I think should be done now, the branch line can be doubled as far as Waltair (the banks and bridges up to girder level are already built).

* * * * *

(3) Sitanagram can easily be made into a homing station. For some years to come the only additions necessary would be, say, two sets of quarters and an addition to the engine shed; Rs. 30,000 should suffice for this. I admit Sitanagram and Tadepalli should have been at Bezwada where I agree with Mr. Spring there is ample room by a re-arrangement of the yard for both works; but that is too late to alter now. There is really no difficulty about the water-supply at Tadepalli or Sitanagram. It is merely a question of money being spent in putting piping down to the canal or river, and I am getting out alternative estimates for the work. As a matter of fact, Sitanagram is supplied from the canal with plenty of good water throughout the year, excepting for a period of six weeks when the canal is dry, and water can then be got from the canal by bunding it up and leading it from the anicut; but failing this it can be supplied from the Kistna, just as Bezwada is now being supplied. It is a common thing to go 2 or 3 miles out for water at a locomotive station. There will be just as much running backwards and forwards between Tadepalli and Sitanagram and Bezwada under either proposal, *i.e.*, whether Sitanagram be a homing or a running station only. As pointed out before, Tadepalli and Bezwada, which include Sitanagram, form an important junction, and in my opinion it is the place for the homing station.

(4) I have before advocated Rajahmandri instead of Samalkot as the next running room station. The water is equally good and copious at both places and the distance is within a few miles exactly the same, the only difference being that the runs to the north and south are of course differently spaced—a matter of indifference. The Samalkot-Cocanada branch can perfectly well be worked *as it is now* with the engine shed at Coconada, and arrangements are now in progress towards improving the artesian water-supply at the latter place. I think, with all due respect to the decision of Government, that for the general reasons before given, it is wrong to give up a good place like Rajahmandri where there is a nice civil station and a good permanent running shed to go to the jungle at Samalkot, where at present nothing is provided. Practically no more accommodation will be required at either place until the Godavari bridge is completed. If Samalkot is then finally selected as the running room station, some quarters and an engine-shed will be required. Until the Godavari is bridged Rajahmandri must remain the running room station.

(5) Palasa is being provided with a good water-supply and it is suitable for a running room station. It is in the jungle and nothing more is wanted now.

(6) Khurda road is a nice station and a healthy spot. It is the junction for the Puri branch and will be the junction for the connection with the Raipur-Vizianagram line. It has a good water-supply, possesses already a fair amount of quarters, and with *very* little extra expense can be made into an excellent homing station. In my opinion it is eminently suited geographically, as far as railway lines are projected, to be the home station. It is a popular station with the staff and is now almost complete in requirements as a homing station barring insufficient living accommodation. A few more quarters and a slight addition to the running shed may be required a year or two hence.

(7) I am not in a position to deal with the location of the engines north of Khurda, but I give my opinion that Midnapore is the natural home for the workshops and should be the home station.

(8) It is quite possible that mail engines may be able to run from one homing station or one running room station to another, in which case a running room might be required at some stations. On the Rajputana-Malwa Railway, the mail engines have for the last 15 years run from Ajmere to Abu road and back, a distance of 180 miles.

From—The Joint Secy. to the Govt. of Madras, P.W. Dept., Railway Branch.
To—The Secretary to the Government of India, Public Works Department.
Dated—Ootacamund, 31st August 1898, No. 1106 Ry.

In reply to your letter No. 1206 R.C., dated the 18th August 1898, I am directed to say that the opinion of the Madras Railway Company's Agent shall be submitted as soon as possible. I am meanwhile instructed to invite a perusal of this Government's Proceedings which reached you under cover of my letter No. 24 R., dated the 11th January 1893.

From—The Consulting Engineer for Railways, Madras.
To—The Agent and Manager, Madras Railway.
Dated—Ootacamund, 1st September 1898, No. 131/O.

In compliance with the instructions conveyed in the accompanying extract from a letter from the Government of India, No. 1206 R.C. dated the 18th August 1898, I have the honour to invite an early expression of your opinion on the question of the locomotive running lengths and engine homing and running stations on the section of the East Coast Railway, which there seems reason to believe will soon be made over to your Company to work.

2. In this connection I have the honour to invite your perusal of the accompanying copy of a G.O., No. 23 R., dated the 11th January 1893, in which, when Engineer-in-Chief of the East Coast Railway, I formulated the principles which, as it then seemed and still seems to me, ought to govern the selection of both sorts, the *homing* and the *running* sort, of engine station. The accompanying extracts from my note on the South Indian Railway running length may also be of interest.

3. As much of your future economy of working will depend on the decision which you now may arrive at, I hope that the matter will be carefully considered.

From—The Agent and Manager, Madras Railway.
To—The Consulting Engineer for Railways.
Dated—Madras, 12th September 1898, No. 874.

I have the honour in replying to your No. 131/O. of the 1st instant to submit for your information copy of a letter I have received from this Company's Locomotive Superintendent on the subject of engine homing and running stations for the section of the East Coast Railway it is proposed to transfer to this Company to work.

2. The Government of India in the letter of which you have been good enough to send me an extract refer to "Vizagapatam, Waltair, or Vizianagram" as possible points up to which the Madras Railway may be called upon to work the new railway, and I therefore think the Locomotive Superintendent has properly fixed upon Waltair as the Northern homing station. If we have to work the line further north, a very inexpensive running shed at Vizianagaram will, in my opinion, be all that is wanted.

3. The question of erecting an engine-shed and houses for the locomotive staff of the East Coast Railway at Madras is one that should receive the very early consideration of the Government.

Enclosures.

From—The Locomotive Superintendent, Madras Railway.
To—The Agent and Manager, Madras Railway.
Dated—10th September 1898, No. 1076/940 B.

[Your No. 9138/8616 of the 6th instant.]

The several stations referred to, with their respective distances, appear to be as follows:—

Stations.	Mileage.	Distance between stations.
Madras	0	...
Bitragunta	131¼	131¼ miles.
Bezwada	266¾	135½ "
Rajahmandri	361¼	94½ "
Samalkot (junction for Cocanada)	392¼	31 "
Waltair (junction for Vizagapatam)	485¼	93 "
Vizianagram	512¾	27 "

and apart from any question of climatic or other convenience of site or of existing buildings, and assuming Vizianagram to be the dividing point between the two working Companies, there is, I think, no doubt but that the engine stations should be arranged as follows:—

Engine Homing Stations—

Madras. | Bezwada. | Waltair.

Engine Running Stations—

Bitragunta. | Samalkot. | Vizianagram.

This arrangement would give the following runs:—

	MILES.
Madras to Bitragunta	131¼
Bezwada to do.	135½
Bezwada to Samalkot	125½
Waltair to do.	93
Waltair to Vizianagram and back	54

The run from Waltair to Vizianagram is of itself rather short, but it is most probable that if the train service were so arranged as to allow of this it would be possible for engines to make double trips from Waltair to Vizianagram and back daily, which would give a daily run of 108 miles, and this would be sufficient to secure economical working.

I observe from the note by Major Constable that certain expenditure has already been incurred at Rajahmandri and that for other reasons he advocates the continuance of this station as a running station instead of Samalkot. The question is not, I think, of very much importance, since if Rajahmandri were retained it would mean a short run of 94 miles from Bezwada to Rajahmundry and a longer one of 124 miles to Waltair, while if the running station be located at Samalkot the runs would be from there to Bezwada a long one of 125 miles, and a short one in the other direction to Waltair of 93 miles.

3. If, as is stated, money has been spent at Rajahmandri and it is in other respects so much superior as a site to Samalkot, the running station might remain there, but without further particulars it is difficult to speak definitely on this point, although, as I have said, I do not think it is one of very material importance.

4. With regard to the question as to the location of the homing station at Bezwada, Tadepalli or Sitanagram, I understand that these three places are only a few miles apart and may be all contained in the one locality of Bezwada. The engine station will therefore, I presume, if it is the case that money has been spent already here, have to remain at Sitanagram; though if this station is at any great distance from Bezwada, say more than a mile or so, the location of the engine sheds away from the main Bezwada station may possibly lead to inconvenience in the future, and this point should therefore be carefully considered before extensions are made. I gather also that the water-supply at Sitanagram is not very good, while at Bezwada water is plentiful. The locomotive depot at this spot will be a very large and important one, and water will be required in large quantities for engines working in both directions over the East Coast Railway, as well as for Southern Mahratta engines, which I assume will also come in here; an ample water-supply is therefore of primary importance.

Order—No. $\frac{1174}{A}$ R., dated 27th September 1898.

The Government of India will be addressed.

From—The Joint Secretary to the Government of Madras, P.W., Dept., Ry. Branch.
To—The Secretary to the Government of India, Public Works Department.
Dated—Ooty, 27th September 1898, No. 1175 Ry.

In reply to your letter No. 1206 R.C., dated the 18th August 1898, I am directed to forward a copy of a letter No. 874, dated the 12th September 1898, from the Agent, Madras Railway, and of its enclosure from his Locomotive Superintendent, in which preference is expressed for Madras, Bezwada, and Waltair, as engine homing stations, with Bitragunta and Samalkot (or Rajahmandri) as running stations. These conclusions are in accordance with those recorded by this Government in the Proceedings which accompanied my No. 24 R.P.W., dated the 11th January 1893, except that at that time the question of the precise site of the running station between Madras and Bezwada had not become ripe for consideration, and that Samalkot was definitely preferred in place of Rajahmandri for reasons then expressed.

2. As regards the question of the Madras Railway Company extending their working beyond the Port of Vizagapatam to the inland non-commercial town of Vizianagram, this Government cannot consent to depart from the position already very strongly taken up in the correspondence ending with my No. 603 Ry., dated the 22nd April 1898, viz., that failing the Secretary of State's agreement to Khurda road being fixed on as the point of junction between the two agencies for working the East Coast Railway, Vizagapatam Port, and not the unimportant inland town of Vizianagram 30 miles away, is the proper point of junction; with Waltair (practically the Port) as the Locomotive homing station.

3. Naturally enough the Agent, Madras Railway, is willing to take over the working of the 30 mile section to Vizianagram, for the sake of the Manganese ore traffic. But it is of no interest to this Government who gets this traffic in comparison with the very great interest, to the producer, the exporter, and all concerned, that an important seaport, and not a petty inland town, should be the joint terminus of the two railway Companies.

4. As regards the question of the exact position of the engine homing station at or in the neighbourhood of Bezwada, this Government is of opinion that, so long as the existing semi-temporary houses and appliances at Sitanagaram can be made to serve, they should be utilized; but that whenever the time comes for erecting permanent buildings, Bezwada will be the proper place for the locomotive homing station.

5. Enquiries are now in progress about the transfer of a certain piece of Military Department land near Madras for use for the engine homing station. The matter shall be dealt with in due course. Meanwhile, it may suffice to say that the provision of any large number of houses for drivers and guards at Madras is not found to be necessary, as the men can home themselves.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Railway.

Read the following papers :—

From the Engineer-in-Chief, East Coast Railway, to the Joint Secretary to Government, Public Works Department, Railway Branch, dated Waltair, 5th October 1892, No. 7057/553.

For standard gauge engine running the most economical run consistent with practical conditions of men and machinery is somewhere between 125 and 135 miles. Runs of 100 miles are uneconomically short, and runs of 80 and 83 miles, like those arranged for on the East Coast Railway, are extremely and wastefully short. A short engine run implies an unnecessarily heavy staff of drivers and other locomotive servants, and too little work is got out of the engines. There are, moreover, extra expenses for fuel, in drawing fire, for lighting up and for other matters petty enough when taken singly, but running in the gross to a very important share of the locomotive expenditure of a railway and, moreover, annually recurring for all time.

2. When the East Coast Railway was designed, the idea doubtless was that the Godávari bridge would never be built. Another idea apparently also was that the northern terminus of the line would be at Naraj on the Mahanadi. These conditions are now changed, and there will be a through run north from Bezváda across the Godávari without a break. The northern main station for engine homing purposes will, as I hope to show, be not at Naraj but at the junction, Khurda road or Chatipur, of the East Coast Railway with the Puri branch and with the Bengal-Nagpur Railway. Another and most important consideration which cannot be lost sight of is that sooner or later the present 500 miles section of the East Coast Railway is bound to be extended southward and northward. Things must, therefore, be so arranged now that when these extensions are made there shall be as little dislocation as possible of existing and expensive arrangements.

3. The great future engine stations of the Calcutta-Madras direct railway will be somewhat as follows :—

(1) Madras or its neighbourhood.
(2) Bezváda or Guntur, the former by preference.
(3) Waltair.
(4) Chatipur, the junction with the Bengal-Nagpur Railway.
(5) Diamond Harbour or Midnapur, according to the alignment adopted.

These will be *roughly* average about 250 miles apart, dividing the thousand miles of railway into four sections as approximately equal as is practicable; the points of division, moreover, are all critical points either of traffic, such as Waltair, or of junction with other railways, such as Bezváda and Chatipur. I may note here that I shall later on go into accurate mileage, but for the moment I merely want to convey to Government a broad general view of the matter.

4. Midway, or nearly midway, between these main engine homing stations there ought to be the cheapest possible running sheds for engines and running rooms for drivers. It is in no way essential that these running shed stations should be located at important centres.

5. As this is, I presume, a large enough question to come before one or more individual members of Government who are not railway experts, and as I desire, if possible, to ensure that my view of this matter shall be accepted, I think it necessary to explain that the engines of a railway have their permanent stables at certain great engine stations, at each of which a responsible man is in charge, and at each of which there are all the necessary facilities for repairs of a minor sort. The army of drivers,

firemen and other running staff have their own and their families' permanent quarters at these main engine centres, and each such place becomes in course of time a very important colony.

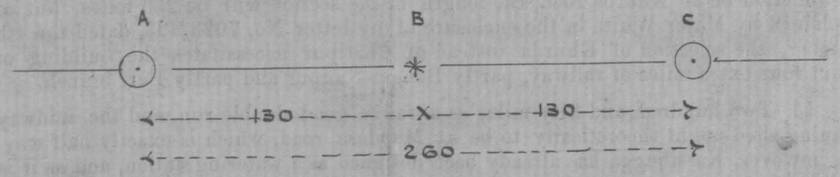
6. From these, their permanent stables, the engines run out with their trains to some point about midway between their own and the next stables on this side and on that. This run is supposed to be a fair day's work for a man, and at the place where he hands his train over to another man from the next stable the driver and his engine sleep for the night, returning next day with another train to their own regular head-quarters and so on.

7. This sleeping place, which ought obviously to be about midway between two main engine stations, grades and speeds being allowed for, is the proper place for a running shed or sort of out-stable for the engines and for a running room or sort of rest-house for the drivers and guards where they find facilities for resting and for feeding. I repeat that I go into these details not with a view of teaching you any thing, but because arguing, as I am, against arrangements which have been already designed, I foresee that I shall probably have to convince the non-professional members of Government if I am to carry my point.

8. Now when it is considered that the length of the day's engine run, that is, the distance from main engine station to running shed station is the measure of the day's work of each engine, it is obvious that the longer this run can be made consistently with practical conditions the greater is the economy which is secured in quite a large number of the items which compose the locomotive expenses of a railway. One practical condition which, so long as each engine has its own driver, strictly limits the length of these runs is the day's work that a man can do. On some of the American lines they get round this by passing their engines on from driver to driver, but as this is not yet the practice in England or in India, the length of an eight or ten hours' run is the practical limit. If all the engine runs on a railway are too short, the result is not only numerous minor sources of waste in working, but that one or more additional main engine stations will be needed at a cost of many lakhs; but worse even than this is the capitalized cost of the steady annual loss due to the extra army of drivers and other servants that must be kept up.

9. Amongst other locomotive authorities whom I have consulted before venturing to propose an alteration of the designed arrangements, I referred the matter, as a general question, to Mr. A. W. Rendel, who is, as you know, the Locomotive Superintendent of the East Indian Railway and admittedly the highest authority on such a matter in India. Mr. Rendel writes as follows:—

> I think for broad gauge engines changing stations should average 130 miles apart; a little more or less makes very little difference. I think it is a great mistake, however, to spend a lot of money on changing stations unless you are perfectly certain that the centre is an important one and one at which engines must be stationed. For instance, I may have two important centres of trade at A and C, 260 miles apart from which traffic is expected: I should, of course, station the engines at



> these centres and make B quite a minor consideration dependent entirely on local circumstances. I should make it a rule never to make any permanent arrangements at any points the importance of which was not fully established; and all points like B to which the engines only ran, and at which no engines were stationed, I should equip in the most scanty manner possible and await the development of traffic. Provided the stations at which the engines are actually housed or homed are fairly well equipped, the stations to which they run are of little importance and can wait the development of the line. I should make my minor running sheds entirely of corrugated iron, and arrange so that they could be easily transferred without much loss of labour or material.

10. Now Mr. Rendel's stations A and C are typical of the five main homing or housing stations enumerated in para. 3. Mr. Rendel's station B is typical of the four running shed stations which I wish to locate somewhere midway between the main five.

11. I shall omit for the present all reference to the Madras and Calcutta extensions and shall deal only with the existing 500 miles. I attach a list of the stations as originally designed, and shall now explain, referring to this list, how I desire to alter them.

12. Bezváda is necessarily, at least so I personally am convinced, a main engine homing station. It is the junction of the Calcutta-Madras direct railway, with the Nizam's State Railway, with the Great Southern Mahratta system of railway and with the Masulipatam branch. Should the metre-gauge system be terminated at Guntur, then Guntur might, perhaps, be selected as a homing station, but this would involve two junctions with foreign railways instead of one. The next great engine station towards the north is necessarily, for trade and other reasons, Waltair. Here will be situated the principal workshops of the system, and it will apparently be the best place for the administrative centre of all the working departments. To deal first, therefore, with this Bezváda-Waltair section: It is 217 miles long and the intermediate running-shed station, Mr. Rendel's type B, ought to be about midway were all conditions favorable. Owing, however, to the heavier gradients on the northern half of the section, I would recommend that it be built at Sámalkót, 124 miles from Bezváda. This place is also the junction of the Cocanada branch and an important centre of trade. The run from Bezváda to Sámalkót will be 124 miles and from Waltair to Sámalkót 93 miles. Both these are short runs and the latter much too short, but that is an incident of the shortness, only 217 miles, instead of the desired 260 of the Bezváda-Waltair section. We cannot secure the best and must only arrange so as to get the nearest practical approximation to it.

13. If this view of the case be accepted, it follows that Rajahmundry, as a main engine station, must be abolished. As I said before, when Rajahmundry was first designed as an engine station, there was no question of the bridging of the Godávari, nor can I learn that since the bridge project was agreed to has any alteration of the original conditions of engine station been proposed. The 124 mile run over the level country between Bezváda and Sámalkót will be an easy run; the shortness of the Sámalkót-Waltair run will be qualified by the stiffness of its gradients. There will, moreover, be secured the very important advantage of only one intermediate centre of locomotive working between the two main homing stations instead of two. This completes what I want to say about the Bezváda-Waltair section.

14. Now to pass on to the section north of Waltair: I have explained why I think that the northern main engine homing station should be at Chatipur, mile 467·20, the proposed junction with the Bengal-Nagpur railway, and with the Puri branch. The length of this section, 250 miles, though still short of Mr. Rendel's 260, is yet a more economical length than that between Bezváda and Waltair. Should the junction be at Khurda road, the length of the section will be 255 miles, but as explained by Major White in the enclosure of my letter No. 7023/493, dated the 4th October, the selection of Khurda instead of Chatipur necessitates the building of about four extra miles of railway, partly Bengal-Nagpur and partly Puri branch.

15. Two hundred and fifty miles is a fairly good double run, and the midway running shed ought theoretically to be at Mandasa road, which is exactly half way. As, however, Kassibugga has already been designed as a watering station, and as it is a place of some importance, it may be argued that the running shed should be built there. To this, however, I object for this reason, that one of the two runs—Kassibugga to Chatipur—is rather long, 133 miles; moreover, I do not think that the position of the type B station need be in any way affected by considerations of traffic and of trade. I desire to put the running-shed and running room at Mandasa road station, and I want permission to abolish the two proposed engine stations of Thebra and Berhampore.

16. For the present, pending the completion of the Mahanadi bridge and the extension of the railway northwards to either Midnapur or Diamond Harbour, the section north from the Chatipur junction to the Mahanadi at Naraj must be worked out and in by engines from the Chatipur homing station. There will be little goods traffic on this section until the extension has been carried out. Perhaps the best temporary arrangement for this section and for the Puri branch would be a separate service from Naraj to Puri, 59 miles, in contact at Chatipur with the main services. This would be a good enough arrangement pending the completion of the Mahanadi bridge and of the Calcutta extension.

17. I may now proceed to summarise all that I have been arguing for. The following are my proposals: (1) abolish the following engine stations:—Rajahmundry, Thebra, Berhampore and Naraj; (2) let the main engine homing stations and railway servants' colonies be at Bezváda, Waltair and Chatipur, or wherever is the junction of the Bengal-Nagpur Railway; (3) locate running sheds, Mr. Rendel's class B, at the following stations: Sámalkót and Mandasa road.

18. Naraj is nothing; it is a mere geographical expression. Once the Mahanadi is bridged, Naraj will become as Kothala, or as Sher Shah, or as Balawala, a once thriving bridge colony, but thereafter scarcely worth the cost of a fourth-class station. The section between Chatipur (or Khurda) and Midnapur will not be found to be too long; neither, if the northern extension should terminate on a Diamond Harbour ferry with access to the Calcutta and south-eastern branch of the Eastern Bengal Railway, will the section between the ferry and Chatipur (or Khurda) be found to be too long for economical working in a very easy country. The Madras-Bezváda section also is of about the right economical length with a B type station about midway. Taking all things that suggest themselves to me into careful consideration, I believe that the arrangements now put forward for the approval of Government are good arrangements—good for the working of the 500 mile section now under construction and good for the working hereafter of the 1,000 mile line between Madras and Calcutta.

19. I may add that the designed arrangement of the watering stations does not commend itself to my judgment any more than that of the engine station. They are, as a rule, much too far apart is the opinion of locomotive experts whom I have consulted. This question, however, will form the subject of a separate communication.

ENCLOSURE.

SCHEDULE of stations as at present designed, East Coast Railway.

Stations.		Mileage.	Distance between stations.	Distance between watering stations.	Length of engine run.	Distance between engine stations.	Remarks.
Bezváda .. .. W. & E.S.		..	..	..	..	..	
Gunnavaram		12·36	12·36	..	..	..	
Núzvid		25·39	13·03	..	..	..	
Ellore .. .. .. W.		37·01	11·62	37·01	..	..	
Bhimdal		48·70	11·69	..	..	..	
Chebral		57·45	8·75	..	..	..	
Thadipalli .. .. .. W.		66·39	8·94	29·38	..	..	
Nidadavol		78·80	12·41	..	..	..	
Rajahmundry .. W. & E.S.		92·52	13·72	26·13	92·52	..	
Kaddium		98·73	6·21	..	..	..	
Dwarampudi		104·93	6·20	..	..	..	
Biccavole		113·07	8·14	..	..	..	
Sámalkót .. .. .. W.		123·80	10·73	30·28	..	..	
Cocanada		..	10·5	..	..	..	Branch line.
Sámalkót		123·80	..	..	..	..	
Pithápuram		131·11	7·31	..	..	..	
Kottapilli		146·45	15·34	..	..	..	
Tuni .. .. .. W.		156·85	10 40	33·05	..	..	
Narsapatam		170·54	13·69	..	..	..	
Yellamanchilli .. .. W.		181·51	10·97	24·66	..	..	
Anakápalle		194·86	13·35	..	..	..	
Simachalam		212·79	17·93	..	..	..	

Schedule of stations as at present designed, &c.—*cont.*

Stations.		Mileage.	Distance between stations.	Distance between watering stations.	Length of engine run.	Distance between engine stations.	Remarks.
Waltair .. .. W. & E.S.		217·41	4·62	35·90	124·89	..	Branch line to Vizagapatam.
Vizagapatam		219·54	2·13	..	..	..	
Simachalam		212·79	..	..	..	..	
Kottavalsa		224·0	11·21	..	..	..	
Allamunda		234·53	10·53	..	..	..	
Vizianagrum .. .. W.		245·56	11·03	37·39	..	..	
Sodaram		257·66	12·10	..	..	..	
Chipúrupalle		264·57	6·91	..	..	..	
Pendoor .. .. .. W.		279·10	14·53	33·54	..	..	
Aidulvalsa		288·58	9·48	..	..	..	
Thebra .. .. W. & E.S.		300·74	12·60	21·64	83·33	..	Water reported suitable for watering station.
Naupada road		314·37	13·63	..	..	..	
Pata Tekkali		326·24	11·87	..	..	..	
Kasibugga .. .. .. W.		333·87	7·63	33·13	..	..	
Mandasa road		342·02	8·15	..	..	..	
Canchily .. .. .. W.		353·55	11·53	19·68	..	..	
Itchápur		364·64	11·09	..	..	..	
Berhampore, Ganjam .. W. & E.S.		380·95	11·31	27·40	80·21	..	Berhampore was selected as a better site for engine station by Madras Government although Chatrapur would divide the run better.
Chatrapur		393·23	12·28	..	..	..	
Hooma		398·77	5·54	..	..	..	
Rambha .. .. .. W.		408 70	8·93	27·75	..	..	
Balugaon		428·45	17·75	..	..	..	
Tangi road .. .. .. W.		445·95	17·50	37·25	..	..	
Tappang		461·70	15·75	..	..	..	
Chatipur		467·20	..	..	..	..	Junction with B.N. and Puri branch.
Khurda road .. .. W.		472·70	11·00	26·75	..	..	
Bhubaneswar		484·70	12·0	..	..	..	
Cuttack road		495·45	10·75	..	..	..	
Naraj .. .. W. & E S.		500·65	5·25	27·95	119·70	..	

NOTE.—The distances shown on this status are correct mileages as far as Thebra; from that point they are given as accurately as at present known and are within a very small fraction of the correct mileage.

Telegram from the Officiating Joint Secretary to Government, Public Works Department, Railway Branch, to the Engineer-in-Chief, East Coast Railway, Waltair, dated 15th October 1892, No. A/80.

Your letter No. 7057, 5th instant. Want sketch plan showing the position of proposed shops, engine changing stations, running sheds, &c., with mileage.

From the Engineer-in-Chief, East Coast Railway, to the Joint Secretary to Government, Public Works Department, Railway Branch, dated Waltair, 1st November 1892, No. 7722/553.

In reply to your telegram No. A/80, and with reference to my No. 7057 of the 5th October 1892, I have the honour to forward, herewith, a sketch plan showing the position of the proposed engine changing stations and running sheds.

The position of the engine changing stations at which permanent arrangements should be made for housing the engines and the running staff is marked by a double red circle, while that of the intermediate running shed stations is denoted by a single red circle.

The mileage of each run is marked on the plan in red figures.

The chief workshops of the complete system would be at Waltair as designed for the 500 mile section which is now under construction.

ORDER—dated 11th January 1893, No. 23 R., Public Works.

The Government approves generally of the engine changing stations and running sheds proposed by the Engineer-in-Chief, East Coast Railway.

2. A copy of these Proceedings will be forwarded for the information of the Government of India.

[Here enter No. 24 R., Public Works, dated 11th January 1893.]

(True Extract.)

(Signed) F. B. WALKER,
Offg. Joint Secy. to Govt., P.W.D.,
Railway Branch.

To the Consulting Engineer for Railways.
" Engineer-in-Chief, East Coast Railway.
" Examiner, East Coast Railway Accounts.

ENDORSEMENT—dated 11th January 1893, No. 24 R., Public Works.

Forwarded.

(By Order.)

(Signed) F. B. WALKER,
Offg. Joint Secy. to Govt., P.W.D.,
Railway Branch.

Exd. S. J. Pereira.
Spare Copies

RAILWAY.

Govt. of {1893} Madras.

PUBLIC WORKS.

Dated January, 11th.

Recd. *Encl.*

G.O., 11th Jan. 1893, Nos. 23, 24 R.

JANUARY.

Engine Changing Stations and Running Sheds

Forwarding copy of Proceedings approving generally of the — proposed by the Engineer-in-Chief, East Coast Railway.

R. Form No. 7.

SERIAL No. 11

TELEGRAM ~~Urgent~~ ~~Ordinary~~ Deferred

From

To

R. Works Simla

No. 8. A/-

Regret plans estimates for locomotive arrangements for working Madras Bitragunta section, B'Ry. from Madras through Madras Railway agency not quite ready for your Railway Conference but estimated 141 thousand

—

12/8/93

All communications should be addressed to the Secretary.

No. 1206 R.C.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

RAILWAY CONSTRUCTION.

To

The Joint Secretary to the Government of Madras,
Public Works Department, Railway Branch.

JOINT SECRETARY TO GOVT. OF MADRAS
RECEIVED
24 AUG. 1898

Simla, the 18th August 1898.

Sir,

With reference to your telegram No.8 A., of ~~13~~ 12th August 1898, regretting that plan and estimates for Locomotive arrangements on the Bezwada Madras Railway are not ready for the Conference, I am directed to inform you that the Conference deals with Administrative questions only, not with executive details such as that referred to, which can be disposed of by the Director of Railway Construction and the Engineer-in-Chief Bezwada Madras Railway.

2. At the same time I am directed to state that the Government of India will be glad to know the views of the Madras Railway Company on the whole subject of engine changing stations south of Vizianagram station on the East Coast Railway, on the assumption that they may be called upon to work the line as far as some point not yet fixed but which will probably be either Vizagapatam, Waltair or Vizianagram, and I am, therefore, to request that you will, with the permission of His Excellency the Governor in Council, obtain and submit the same as soon as possible.

3.

3. In this connection I am to forward, herewith, copy of extract from a note on the subject by Major Constable, Manager, East Coast Railway, giving his views on the question, and I am at the same time to inform you that the arrangements ordered by the late Director General of Railways (Colonel T. Gracey, R.E.) contemplated Bitragunta and Samalkotta as "homing" stations and Madras, Bezwada (or one of its suburbs) and Waltair or Vizianagram as "running" stations, and that unless accommodation sufficient for working the new line already exists at Madras in excess of presents requirements, this arrangement seems more suitable than that proposed in letter No.2024 dated 14th July 1898, from the Senior Government Inspector to the address of the Engineer-in-Chief Bezwada Madras Railway, and has been sanctioned by the Government of India in letter No.830 R.C., of 11th June 1896, to the Director General of Railways.

I have the honour to be,

Sir,

Your most obedient servant.

F. Rupcott

Secretary.

Document accompanying:-
Extract from note referred to
in paragraph 3.

S.A.

from note W.V. R.E. 9 S/

Extract by Major Constable on the position of the Locomotive Stations on the East Coast line between Madras and Calcutta.

I am strongly in favour of the following programme:-

Stations.	Mileage from Madras.	Mileage from last Locomotive station.	Class of Station.
Madras (Perambore)	——	——	Home Station
Bitragunta	131¼	131¼ from Madras	Running room station.
Sitanagram (Sitanagram, Tadepalli & Bezwada may be considered as one station)	266¾	135½ from Bitragunta	Home Station.
Rajahmandry or	361¼	94½ from Sitanagram	Running room station.
Samalkot	392¼	125½ from Sitanagram	
Waltair	485¼	93 from Samalkot / 124 from Rajahmandry	Home station.
(a) Palasa	611¼	126 from Waltair	Running room station.
Khurda Road	748¼	137 from Palasa	Home station.
(b) intermediate between Khurda Road and Midnapore(Khargpur)	859¼ (a)	111 from Khurda Road	Running room station.
Midnapore (Khargpur)	951¾	92½ from Soro	Home station.
Calcutta or Hugli	1021¾	70 from Khargpur	Running room station probably.

(a) Soro has been taken as the intermediate Stn.

2. The chief advantages of this arrangement are :-

(1) That Waltair, i.e. Vizagapatam, where it is hoped considerable traffic will originate or terminate, will be the Locomotive Railway Colony, as it should be a decided advantage to have the staff and stock of engines at such a place. This argument applies equally well, in my opinion, to the advantage of having the Home station at a junction. Here the traffic converges and it is undoubtedly convenient to have the engines and running staff permanently located at the place where the traffic

traffic is, so that on sudden rushes of traffic occurring it is not necessary to send for power and staff. There are good quarters already built sufficient, counting the offices, for years to come both for officers and subordinates and drivers and guards and the place is the coolest and healthiest on the line. It will be quite easy to have, if considered desirable, separate Engine sheds and Locomotive accommodation for the two Companies, and if found necessary, as I think should be done now, the branch line can be doubled as far as Waltair (the banks and bridges up to girder level are already built).

x x x x x x

(3) Sitanagram can easily be made into a Home station. For some years to come, the only additions necessary would be, say 2 sets of quarters and an addition to the engine shed Rs.30,000 should suffice for this. I admit Sitanagram and Tadepalli should have been at Bezwada where I agree with Mr.Spring there is ample room by a rearrangement of the yard for both works, but that is too late to alter now. There is really no difficulty about the water supply at Tadepalli or Sitanagram. It is merely a question of money being spent in putting piping down to the Canal or river, and I am getting out alternative estimates for the work. As a matter of fact, Sitanagram is supplied from the Canal with plenty of good water throughout the year, excepting for a period of 6 weeks when the canal is dry and water can then be got from the Canal by bunding it up and leading it from the anicut. But failing this it can be supplied from the Kistna, just as Bezwada is now being supplied. It is a common thing to go 2 or 3 miles out for water at a Locomotive station. There will be just as much running backwards and forwards between Tadepalli and Sitanagram and Bezwada under either proposal, i.e. whether Sitanagram be a Home or a Running Room Station only. As pointed out before, Tadepalli and Bezwada, which include Sitanagram, form

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an important Junction and in my opinion it is the place for the Home Station.

(4) I have before advocated Rajahmandry instead of Samalkote as the next Running Room Station. The water is equally good and copious at both places and the distance is within a few miles exactly the same, the only difference being that the runs to the North and South are of course differently spaced, a matter of indifference. The Samalkote Coconada branch can perfectly well be worked as it is now with the Engine shed at Coconada, and arrangements are now in progress towards improving the Artesian water supply at the latter place. I think, with all due respect to the decision of Government, that for the general reasons before given, it is wrong to give up a good place like Rajahmandry where there is a nice Civil station and a good permanent running shed to go to the Jungle at Samalkote where at present nothing is provided. Practically no more accommodation will be required at either place until the Godaveri bridge is completed. If Samalkote is then finally selected as the Running room station, some quarters and an Engine-shed will be required. Until the Godaveri is bridged, Rajahmandry must remain the Running Room Station.

(5) Palasa is being provided with a good water supply and it is suitable for a Running room station. It is in the Jungle and nothing more is wanted now.

(6) Khurda Road is a nice station and a healthy spot. It is the junction for the Puri branch and will be the junction for the connection with the Raipore-Vizianagram line. It has a good water supply, possesses already a fair amount of quarters, and with very little extra expense can be made into an excellent Home Station. In my opinion it

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12 S/

is eminently suited geographically, as far as Railway lines are projected, to be the Home station. It is a popular station with the staff and is now almost complete in requirements as a Home station barring insufficient living accommodation. A few more quarters and a sliht addition to the Running shed may be required a year or two hence.

(7) I am not in a position to deal with the location of the Engines North of Khurda, but I give my opinion that Midnapore is the natural home for the Workshops and should be the Home Station.

(8) It is quite possible that Mail Engines may be able to run from one Home station or one Running Room station to another, in which case, a Running Room might be required at some stations. On the Rajputana Malwa Railway, the Mail Engines have for the last 15 years run from Ajmere to Abu-Road and back a distance of 180 miles.

(Signed) W.V.Constable,
Major R.E.,
Manager, East Coast Railway.

Simla,
The 4th August 1898.

S.A.

Works

Public (1898) Department.

Railway

SERIAL No. 16

CURRENT No. 1015

From The Govt of India

Order

R.g.O. with view a receipt of a reply from the Agent to the letter despatched by E.R. Meanwhile R addressed Govt in the routine letter despatched. This does not need R.O. as it is mere routine.

7/9
30/8/98

No. 1206 R.C.

Dated 18th August 1898

Received

Registered 24. 8 98

Enclosures 1

Spare copies

SUBJECT.

Locomotive arrangements on the Berwada Madras Ry.

Requesting to be furnished with the views of the Madras Ry Coys on the subject of Engine changing stations South of Vizianagram station on the E&E Ry on the assumption that they may be called upon to work the line as far as some point not yet fixed but which will probably be either Viragapatam, Waltair or Vizianagram.

21
Pub Rly Nos 1016/98

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

R. Form No. 12.

138

No. 1106. Ry

Government of Madras.

PUBLIC WORKS DEPARTMENT,

RAILWAY BRANCH.

22

To

The Secy. to the Govt. of India,

P. W. Department.

Simla

Coty, the 31st Augt 1898.

Sir,

In reply to your letter No. 1206. R. C. dated the 18th Aug. 98. I am directed to say that the opinion of the Madras Ry. Co. Agent shall be submitted as soon as possible. I am meanwhile instructed to invite a perusal of this Govt. Proceedings which reached you under cover of my letter No. 24. R. dated the 11th January 1893

I have &c

[illegible]

30/8/98

1/98

SERIAL No. 23

Form No. 1/A.

No. 131 / 0

Madras, Ootytue 1st Septr 189 8.

From

THE CONSULTING ENGINEER FOR RAILWAYS,

MADRAS,

Reminders.

To

140

THE AGENT AND MANAGER, M. RY.

SIR,

*Reply No.*_____

*dated*_____

In compliance with the instructions conveyed in the accompanying extract* from a letter from the Govt of India No. 1206-R.C. dated the 18th Aug 98. I have the honour to invite an early expression of your opinion on the question of the Locomotive running lengths and engine housing and running stations on the section of the S.C.R. which there seems reason to believe will soon be ready for you to open to work.

2.- In this connection I have the honour to invite your attention to the accompanying copy of a G.O. No. 23-R. dated the 11th Jany 93. in which, when engineering the S.C.R. I formulated the principles which, as it then seemed to me, ought to govern the selection of both sorts, the "housing" and the "running" sort, of engine station. The accompanying extract* from my Note on the S.I.R. running lengths may also be of interest.

3.- So much of your future economy of working will depend on the decision which you may arrive at I hope that the matter will be carefully considered.

I have &

7 Hs

30/8/98

Enclos: 4

Despatched on 11/9/98

* Marked A.B.

Also Engineering Note.

* Enter my notes in red on the copy sent.

* 1st 6 paragraphs dealing with S.I.R. Loco Ltd.

1655

Madras Railway

B 1076/940. Locomotive Superintendent's Office

Perambur Works 10th Sept. 1898.

The Agent and Manager.

My dear Sir.

Your No. 9138/8616 of the 6th instant

The several stations referred to with the respective distances appear to be as follows:-

Stations	Mileage	Distances between Stations
Madras	0.00	"
Bitragunta	131 1/4	131 1/4
Bezwada	266 3/4	135 1/2
Rajamundry	361 1/4	94 1/2
Samalkot (Junction for Cocanada)	392 1/4	31 1/4
Waltair (Junction for Vizagapatam)	485 1/4	93
Vizianagram	512 1/4	27

and apart from any question of climatic or other conveniences of site or of existing buildings

(No. 1)

No.

MADRAS RAILWAY.

AGENT AND MANAGERS OFFICE,

Madras, _____ 188

From

Agent and Manager.

To

Consulting Engineer for Railways.

SIR,

12 5/6

buildings, and assuming Vizianagram to be the dividing point between the two working companies there is, I think, no doubt but that the Engine stations should be arranged as follows:-

Engine Homing Stations

Madras
Bezwada
Waltair

Engine Running Stations

Bitragunta
Samalkot
Vizianagram

This arrangement would give the following runs:-

Madras to Bitragunta	131 1/4	Miles
Bezwada to Bitragunta	135 1/2	"
Bezwada to Samalkot	125 1/2	"
Waltair to Samalkot	73	"
Waltair to Vizianagram and back	54	"

The run from Waltair to Vizianagram is of itself rather short but it is most probable that if the train service were so arranged as to allow of this it would be possible for Engines to make double trips from Waltair to Vizianagram and back daily which would

(No. 1)

No.

MADRAS RAILWAY.

AGENT AND MANAGERS OFFICE,

Madras, _____ 188

From

Agent and Manager.

To

Consulting Engineer for Railways.

SIR,

18 S/o

would give a daily run of 108 miles, and this would be sufficient to secure economical working.

I observe from the note by Major Conatable that certain expenditure has already been incurred at Rajahmandry and that for other reasons he advocates the continuance of this station as a Running station instead of Samalkot. The question is not, I think, of very much importance since, if Rajahmandry were retained, it would mean a short run of 94 miles from Bezwada to Rajahmandry and a longer one of 124 miles to Waltair while if the Running station be located at Samalkot, the runs would be from there to Bezwada a long one of 125 miles and a short one in the other direction to Waltair of 93 miles.

3. If, as is stated, money has been spent at Rajahmandry and it is in other respects so much superior as a site to Samalkot, the Running Station might remain there, but without further particulars it is difficult to speak definitely on this point, although

MADRAS RAILWAY.

From

The Agent and Manager.

To

The Consulting Engineer

for Railways.

Dated 188

Recd.

No.

1896

although. as I have said, I do not think it is one of very material importance

4. With regard to the question as to the location of the homing station at Bezwada, Tadepalli or Sitanagram, I understand that these three places are only a few miles apart and may be all contained in the one locality of Bezwada. The Engine station will, therefore I presume, if it is the case that money has been spent already here, have to remain at Sitanagram though, if this station is at any great distance from Bezwada, say more than a mile or so, the location of the Engine sheds away from the main Bezwada Station may possibly lead to inconvenience in the future and this point should therefore be carefully considered before extensions are made. I gather also that the water supply at Sitanagram is not very good while at Bezwada water is plentiful. The Locomotive Depôt at this spot will be a very large and important one and water will be required in large quantities for Engines working in both directions over the East

Coast

MADRAS RAILWAY.

From

The Agent and Manager.

To

The Consulting Engineer
for Railways.

Dated 188

Recd.

No.

Coast Railway, as well as for Southern Mahratta Engines which I assume, will also come in here: an ample water supply is therefore of primary importance

5. The original papers are, as requested, returned herewith.

Yours faithfully
Sd/ C. E. Phipps
Loco: Superintendent

True Copy
A. Edmunds.
for Agent & Manager

E 1 4284 8
874 12.9.98
Am

MADRAS RAILWAY.

From

The Agent and Manager.

To

The Consulting Engineer for Railways.

Dated 188

Read.

No.

(No. II.)

No. 874

MADRAS RAILWAY.

SERIAL No. 25

AGENT AND MANAGER'S OFFICE,

Madras, 12th September 188 98.

4284 14.9.98

From 157

CONSULTING ENGINEER FOR RAILWAYS RECEIVED 14 SEP. 1898 MADRAS.

The *Agent and Manager.*

Madras Railway.

To

The *Consulting Engineer for Railways.*

Madras.

SIR,

flag Q 8 No 28

I have the honor in replying to your 131/0 of the 1st instant to submit for your information copy of a letter I have received from this Company's Locomotive Superintendent on the subject of Engine homing and running Stations for the section of the East Coast Railway it is proposed to transfer to this Company to work.

The Government of India in the letter of which you have been good enough to send me an extract refer to " Vizagapatam, Waltair or Vizia-nagram as possible points up to which the Madras Railway may be called upon to work the new Railway and I therefore think the Locomotive Superinten-dent has properly fixed upon Waltair as the Northern " homing " station. If we have to work the line further north a very inexpensive running shed at Vizianagaram will, in my opinion, be all that is wanted.

The question of erecting an Engine Shed and houses for the Loco: Staff of the East Coast Railway at Madras is one that should receive the very early consideration of the Government.

I have the honor to be,
Sir,
Your Obedient Servant,
Louis Simms
Agent and Manager

MADRAS RAILWAY.

From

The Agent and Manager.

To

The Consulting Engineer

for Railways.

Dated 188

Recd.

No.

R. FORM No. 12.

No. 1175. Ry

Government of Madras.

PUBLIC WORKS DEPARTMENT,

RAILWAY BRANCH. SERIAL No. 26

To

THE SECY. TO THE GOVT. OF INDIA,

P. W. DEPARTMENT.

Ootacamund, the 27th September 189 8.

SIR,

In reply to your letter No. 1206. R. C.

dated the 18th Aug 98. I am directed to forward a copy of a letter No. 874. dated the 12th Sept. 98. from the Agent Madras R. and of its enclosure from the Loco Supt. in which proposals are submitted for Madras, Bezwada and Waltair, as Regular Running Stations, with Bottaguntah, and Samalkotta (or Rajahmundri) as Running Stations. The conclusions are in accordance with those recorded by this Govt in the Proceedings which accompanied my No. 24. R. P.W. dated the 11th Jany. 1893, except that at that time the question of the precise site of the Running Station between Madras and Bezwada had not become ripe for consideration, and that Samalkotta was definitely proposed in place of Rajahmundri for reasons then explained.

2.— As regards the question of the Madras R. Co. extending their working beyond the Port of Vizagapatam to the inland non-commercial town of Vizianagram, this Government cannot

H.E. The Governor.

Draft for approval.

7/9

17/9/98

Appd.

R.S.H

21.9.98

17.9.98

12/9/98

[redacted] dispute from the Junction cheeky my letter
ref in the correspondence ending with my No. 603.R. dated the
22nd April 98. viz. that failing the Govt. of State agreement to
Khandia Road being fixed as the point of junction between
the two Agencies for working the S.E.R., Vizagapatam
Port, and not the insignificant inland town of Vizianagram
30 miles away, is the proper point of Junction; with Waltair
(practically the Port) as the Locomotive Housing Station.

3. — Naturally being the Agent Indian R. is willing
to take over the working of the 30 miles extra to Vizianagram,
for the sake of the Manganese ore traffic. But it is of
no interest to the Govt. who get this traffic in connexion with
the very great interest to the Province, the Exports and all
concerned that an important Railway Junction and not a petty
inland town, should be the terminus of the two Railway
Companies.

4. — As regards the question of the exact position at or in
the neighbourhood of Bezwada (of the Engine Housing Station), this
Govt. is of opinion that as long as the existing semi-temporary houses
and appliances at Satrampad can be made to serve, they should be
utilized; but that, whenever the time comes for erecting permanent
buildings, Bezwada will be the proper place for the Locomotive Housing
Station.

5. — Enquiries are now in progress about the transfer of a certain
piece of Railway Dept. land near Madras for use for the Engine Housing Station.
The matter shall be dealt with in due course. Meanwhile it may suffice to
say that the provision of any large number of houses for clerks and guards at
Madras is not found to be necessary, as the men can house themselves.

Chas. S. Fox. 27/4/98.

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27/4/98