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MADRAS RECORD OFFICE.**Government of Madras.***P. W.***DEPARTMENT.**

G.O. No. <u>1139</u>	Press
<u>214-5</u>	Mis.
Dated <u>16-4-</u>	<u>1868</u>

Not to be folded or roughly handled

Proceedings of the Madras Government, Public Works Department.
16th April 1868.

No. 214. Read the following letter from the Consulting Engineer for Railways, to the Secretary to Government, Public Works Department, dated Madras, 23rd March 1868, No. 97 :—

1. I have the honor to submit the following report upon the progress of the works on the North-West Line of the Madras Railway, which I have lately inspected in company with the Agent and Manager. The Acting Chief Engineer also accompanied us over part of the works.

2. The line is at present available for traffic as far as Moodanoor, to which point it was opened on the 1st August 1866; the distance from Madras being 196 miles.

3. As the Government are aware, the whole of the works upon the remainder of the North-West Line, including the Bellary branch, have been, from time to time, made over to different Contractors; a list of whom is given in an appended statement, in which are specified the dates upon which sanction was accorded to the contracts for the several portions of the line, and the dates upon which, according to the agreements, the works upon each portion should be completed.

4. It will be seen that the approval of Government to the introduction of the contract system was first given on the 10th May 1865; and the subsequent rapid growth of the system, which resulted in placing, within eighteen months, the whole of the works in progress on the North-West Line, over a distance of 190 miles, in the hands of Contractors, is chiefly due to the action of the Company's late Chief Engineer, Mr. Smart, who was strongly of opinion that the execution of the works, if intrusted to Contractors, would be cheaper, better, and quicker, than if carried out in the old method by the Company's Engineers, upon what has been termed the departmental system.

5. The confidence with which Mr. Smart regarded the working of the contract system was not, however, shared by the Deputy Chief Engineer upon Construction, Mr. Beresford Anderson, who, placed as he was in direct supervision of all the works in progress, ought to have possessed ample opportunities to enable him to judge of the degree of success which had attended the change of system. Mr. Anderson, on more occasions than one, placed his doubts upon record; especially in his report for the quarter ending the 31st March 1867, in which, after citing several notable instances of bad workmanship, he made some pertinent comments upon certain circumstances which had attended the introduction of the contract system, and which, in his opinion, imported elements of danger. This report of Mr. Anderson's was published in the "Madras Railway Gazette" for the month of May 1867 by the Chief Engineer, with remarks appended to it, which had the undoubted tendency to depreciate Mr. Anderson's opinion, and to weaken his authority. As the "Railway Gazette" is officially circulated to all Engineers on the line, it is hardly surprising that this injudicious act of Mr. Smart's caused a misunderstanding between himself and Mr. Anderson, which led, a few months later, to the latter gentleman's resignation, and which has recently eventuated in the termination of Mr. Smart's agreement, under orders from the Board of Directors.

6. I have mentioned these facts in detail, as I found it necessary, when inspecting the works in progress, to make constant reference to the opinions which have been recorded by Messrs. Smart and Anderson as to the character of the workmanship and material supplied by the Contractors. The subject is one which

* No. 401, 13th September 1867.

„ 405, 6th December „

the Board of Directors, in their recent letters to the Agent, have discussed at considerable length; and I think it

right to preface this report with a brief statement of the facts. I do not feel that I am called upon to give here my opinion as to the comparative merits of the two systems of executing Railway works in this Presidency, viz., by the agency of the Company's Engineers on the one hand, and of Contractors on the other; but I consider it due to Mr. Anderson to state that the results of my late inspection have thoroughly convinced me that his anxiety as to the character of the work in

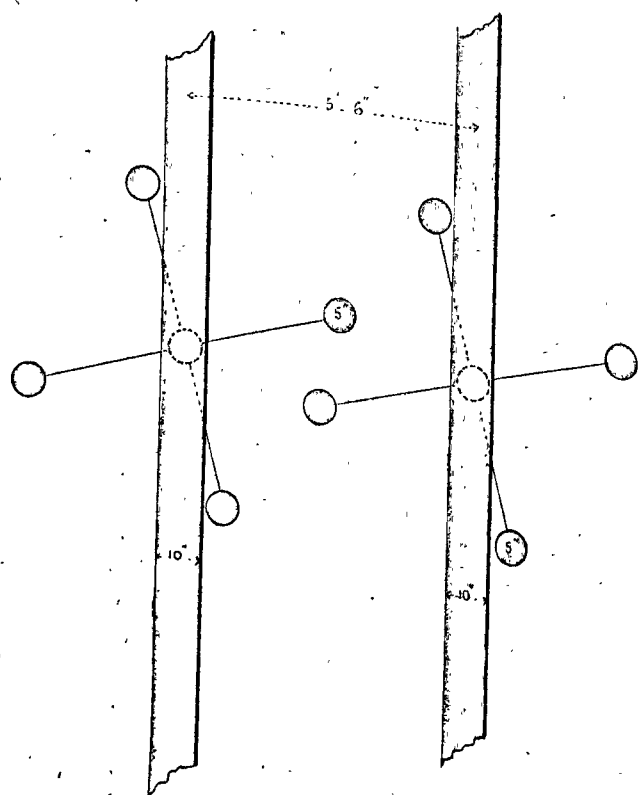
progress was by no means unfounded, that, when he drew attention to the subject, much of the work was of a very unsatisfactory nature, and deserving of strong censure, and that he is fairly entitled to the credit of the improvement which I am glad to say has since become manifest.

7. I first inspected the works on the main line between Moodanoor and Raichoor, and afterwards the Bellary branch. I will report upon them in that order, taking them according to the Engineering Districts into which they have been divided.

8. DISTRICT VIII.—The work upon this district, which has been let to Mr. Barnett, is almost completed. As far as the Chittravatty river the road is now in excellent order, and, with the exception of some fencing, which will soon be finished, is ready for traffic.

* Distant from Madras 210½ miles.

The bridge over the Chittravatty river, which was visited by His Excellency the Governor during January, consists of forty girder openings, each of 70 feet from centre to centre. Owing to the great depth of sand in the river bed, it was found advisable to construct nineteen piers, in the centre of the river, of screw piles, the rest being built of blue lime-stone. The piles are arranged so as to form trestles, each trestle consisting of five piles, and two trestles forming the pier for the single line of the rails. Owing to this arrangement, the inner piles of the two adjoining



trestles necessarily cross each other, as shown roughly in the margin; a fact which seems to have been overlooked in the drawings sent from England. As the thickness of each pile is only five inches, this would not make much difference, provided that the two piles were screwed close to each other; but I regret to say that in some of the piers in this bridge there is a most unnecessary space, in some cases of about 15 inches, between the piles in question; and the consequence is that the girders, instead of resting directly upon three piles in each trestle, rest upon the centre pile only, and in being rolled into position, have exerted a leverage which has tended to twist the upper portions of the trestles, and to move the piles slightly from their proper positions. I made a careful examination of the bridge with the Chief Engineer, and we came to the conclusion that it would be well to lift the weight of the girders off the piles, in order to bring the latter into their true positions. Upon our return we found that this was being carried out by Mr. West,

the Company's Engineer in charge. It will be necessary to unscrew comparatively few piles, only those which have been bent; and the necessary work will probably be finished before June. In the meantime the temporary line of rails across the river bed is being used for the conveyance of material trains, &c.

9. DISTRICT IX.—The work upon this district has also been let to Mr. Barnett, and the greater part is well advanced. The earthwork is almost finished, and so is the greater part of the smaller masonry works. At one or two places the work in progress was not of a satisfactory kind: especially at one of the largest pieces of masonry in the district, a bridge of eight 30-foot arches, where the material and workmanship were by no means what the Company had a right to expect from the Contractor. Instructions were given for the inferior work to be removed, and it was satisfactory upon our return to see a marked improvement.

* Distant from Madras 227½ miles.

At the Tadputry* station the platform wall is built, and the foundations for the station-house, goods-shed, and salt-store are finished. There has been some difficulty about the water arrangements at this station, and it was at one time proposed to stop trains for water at the Pennair river, six miles further westward; but this would have been an unsatisfactory arrangement in many ways, and it is now decided to bring water in iron pipes from the nearest point of the river, a distance of barely half a mile. Judging from the rate at which the work is now progressing, I see no reason why the line should not be opened for traffic to Tadputry in the course of about four months.

A vegetable fence of aloes has been planted along the whole of this district, but it has been by no means uniformly successful, and an iron fence is now being put up as rapidly as possible.

† Distant from Madras 233½ miles.

‡ Vide G. O., 19th April 1866, No. 1,220.

§ G. O., 13th March 1867, No. 753.

I was much disappointed with the progress made at the Pennair† bridge since I visited it,‡ two years ago: indeed nothing seems to have been done since the date of Colonel Anderson's inspection§ last year. Scarcely one-half of the masonry has yet been completed, and eleven of the piers have still to be founded. Upon our return, however, there was a much greater show of activity at the bridge; and as Mr. Barnett has taken the work under his immediate superintendence, I trust that its future progress will be more satisfactory.

10. DISTRICT X.—The first section of this district was let to a Mr. Horgan, but upon his failure the contract was handed over to Mr. Barnett. The earthwork is almost finished, as is also the masonry, the greater part of which is of excellent quality. The largest bridge in this section, one of six 30-foot girder openings, is however an exception to the rule, and some of the work was so inferior that it was necessary to order eight courses to be removed over the whole of the bridge. This was one of the works to which Mr. Anderson took special exception when it was being built a year ago; but his objections were overruled by Mr. Smart, under whose orders the work was passed and taken over from the Contractors, so that the cost of removing and rebuilding the condemned work will fall upon the Company.

* Distant from Madras 242½ miles.

At the Royalcherroo* station the platform wall has been built, and the foundations for the station buildings were being put in at the date of my visit.

The second section of District X was let to Messrs. Moonesawmy Chetty & Co., but after the work had gone on for months in an unsatisfactory manner, it was recently taken out of their hands, and arrangements have been now made for carrying it on by departmental agency. This section is the only part of the North-West Line upon which the work is not now in the hands of Contractors; and although the improvement in the quality of the work, since Mr. Scott undertook the management, is most marked, I see no reason to suppose that the cost will be greater. In other respects also I look with satisfaction upon the late change in the execution of the works on this portion of the line. There still remains more than enough under execution by contract to thoroughly test that system, and the re-introduction of the departmental system over even a few miles will tend to produce a wholesome spirit of emulation, and must, I think, produce good results.

Most of the earthwork on this section is completed, but not one-half of the masonry is done, and all the most difficult work has been left untouched. Taken in conjunction with the backward state of the Pennair bridge, the work upon this section is so heavy that I see no reason to expect the line to be opened to Gooty till towards the end of 1869.

11. DISTRICT XI.—The first section of this district has been let to Mr. Fox, and the work is now fairly advanced. Most of the earthwork is finished, and more than half of the masonry, which is in general of a fair quality, though the stone used is of small size. In some parts of this section good water is scarce, a want that is still more severely felt in parts of the line further north, and it is clear that great and constant care on the part of the Company's Engineers is necessary to prevent the workmen from using the mortar too dry.

† Distant from Madras 257½ miles.

The work at the Gooty† station has been commenced, but little has been done beyond building the platform wall.

The second section of District XI has been given on contract to Mr. Barnett, as far as the point where the Bellary branch is taken off. The work upon this portion of the line has evidently suffered from want of proper supervision. The present Engineer in charge suffers much from ill-health, and the gentleman whom he very lately relieved had been for some time unfit for work from illness. That such supervision was necessary is very evident, as some specimens of the work were far from satisfactory. About two-thirds of the masonry, and about half the earthwork, still remain untouched. Nothing has been done at the Goondacul‡ station beyond marking out the site.

‡ Distant from Madras 273 miles.

12. DISTRICTS XIV to XVIII.—These districts carry the line from the Goondacul junction northwards, through the town of Adoni, to within seven miles of the Toongabudra river. The country through which they pass is almost uniform in character, consisting generally of black cotton soil, and the works throughout are in nearly the same state of progress. The whole of these districts have been let

to Mr. Barnett, forming part of the extensive contract which was laid before Government by Colonel Anderson on the 3rd* November 1866.

About one-fifth of the earthwork remains to be executed, and about three-fourths of the masonry. The latter is everywhere of fair quality. The works themselves are generally small, but the stones are carefully selected, and the masonry is good and sound.

DISTRICT XVIII deserves special mention on account of the excellent materials used in the bridges, and the great care which has evidently been taken by Mr. Jones in turning them to the best account. Throughout Districts XIV and XV, there is great scarcity of water, which has at some points to be carted from a distance of three miles. The greatest care on the part of the Engineers is necessary to prevent dry mortar being employed.

† Distant from Madras
280½ miles.
294½ „
307 „
324½ „

The Muddykerra,‡ Auspree, Adoni, and Hoshee stations are situated within these districts, but beyond marking out the enclosures no work has yet been done.

13. DISTRICTS XIX AND XX.—These districts carry the line to Raichoor, the point at which it is to meet the Great Indian Peninsula Line from Bombay; the whole of the work being in Mr. Barnett's hands. Upon District XIX about half the earthwork has been executed, but very little of the masonry, with the exception of what has been done at the bridge over the Toongabudra. Upon district XX about one-eighth of the earthwork has been executed, but no masonry.

§ Distant from Madras 333½ miles.

The Toongabudra§ bridge is to consist of 58 girder openings, measuring each 70 feet from centre to centre, or 64 feet in the clear. The length of the bridge will be more than three-quarters of a mile. The point chosen for crossing the river is most favorable, a bed of gneissose rock stretching from bank to bank. This rock is intensely hard, and much heavy work is entailed in levelling its surface to obtain foundations for the piers. Till lately there has been much discussion with the Contractor as to the description of work to be used in the piers, and considerable difficulty has been experienced by the Engineer in charge, Mr. Robinson; but a more satisfactory specification has now been drawn up in detail, and the work, upon our return, was being carried on in accordance with its provisions. Of the fifty-seven piers, seventeen on the south side, and twenty-one on the north side are in progress, more or less advanced. The stone now being used is of a very fine description. I visited two of the quarries from which it is brought; one yields stones varying from 12 to 18 inches in thickness, the material being a fine granite, worked entirely by hand; while from the other is obtained an excellent basalt, which breaks readily with a beautifully square cleavage. In the deep bed of the river, the piers will stand about 40 feet above ground; and when finished, the bridge will be the largest and the most important work in the Railway system of this Presidency.

To the north of the Toongabudra the line has been laid out by Mr. Robinson with great care and judgment, and the masonry works will be few in number, and of small dimensions.

14.. The position of the Junction Station at Raichoor has been the subject of

* Distant from Madras 351½ miles.

some discussion, as the Government are aware. The site* originally chosen was objected to, as being too near the old fort; and several proposals were subsequently made to obviate the objection. I have already† reported that

† Vide No. 85, dated 12th instant.

after a careful examination of the country, the best site is, in my opinion, to be found at about 1½ miles to the north of the present Junction, on the Great Indian Peninsula Line. The town lies entirely to the north and north-east of the fort, and a station built to the south would be very inconveniently situated as regards the requirements of the local traffic: while the two lines of main road which cross at Raichoor, that running east and west between Lingasoooor and Kurnool, and that running north and south between Hyderabad and Bellary, lie close to the site recommended by me, and which in all other respects seemed unobjectionable.

15. From Raichoor I visited the Kistna, to enable me to form an opinion as to the progress of the Great Indian Peninsula works, and the probable time when they will be completed to Raichoor. The crossing originally fixed on, to which Colonel Anderson alluded in paragraph 9 of his letter, dated the 22nd February 1867, No. 50, has been abandoned on account of the deep water which would have been encountered in founding the piers, another crossing has been selected about two miles higher up the Kistna, close below the point where it is joined by the Beema. It has, I believe, been proposed to cross the river here with iron girders, in spans of 100 feet, the piers to be formed of iron cylinders seven feet in diameter, resting on masonry basements. At the time of my visit nothing had been done on the spot beyond the collection of material.

The change in the site of the bridge has necessitated the abandonment of several miles of the old line, principally earth-work, upon either side of the river.

16. Bellary branch. Districts XI, XII, and XIII. The works upon the second section of District XI, westward of the Goondacul junction, have been let to Bala-kistnamah Naidoo. This portion of the line is short, being under four miles in length, and the work is well advanced. Almost all the earth work is finished, and half of the masonry, which is of excellent quality.

Districts XII and XIII carry the line into Bellary. The work here has been let to Mr. Ross, and is fairly advanced. Most of the earth-work is done, and about a quarter of the masonry. I regret to say that in several cases the latter did not come up to the standard which, in my opinion, the Company have a right to demand. The Contractor has considerable difficulties to encounter, especially in the carriage of materials, which have to be brought from great distances, but these difficulties cannot be accepted in palliation of bad work.

‡ Distant from Madras 191 miles.

§ Do. do. 296½ miles.

The Joladarashy‡ station has not yet been commenced.

The bridge § over the Huggry river is also uncommenced. It will consist of twenty-four girder openings, each measuring 70 feet from centre to centre. The girders will rest upon screw piles, arranged similarly to those at the Chittravatty bridge, as described above in paragraph 8.

‡ Distant from Madras 305 miles.

At the Bellary‡ station, which will, for the present at least, be the terminus of the line in this direction, no work has been done beyond the collection of stone, which is available within the station enclosure in any quantity, and of excellent quality. The site for the station has been judiciously chosen. It occupies a large open space, immediately to the east of the fort, and readily accessible from all parts of the town.

17. As regards the time when the completion of the successive sections of the line may be expected, I have already stated that Tadputry will probably be reached in about four months, and Gooty towards the end of next year.

It is of course as yet impossible to calculate with any approach to certainty the date when the line will be opened throughout to Raichoor, but I regret to say that I see no reason to expect it before the close of 1871; and, from what I could learn, I do not anticipate that Raichoor will be reached by the Great Indian Peninsula line even by that date. If through communication between Madras and Bombay is effected early in 1872, I shall be agreeably disappointed.

18. The Government will observe that the dates which I have named as those upon which the successive sections of the line will probably be opened are considerably later than those named in the agreements with the respective Contractors. In reply to a reference which I made to know whether it was intended to exact from the Contractors the stipulated penalties for non-performance of their agreements, the Agent quotes as follows from a communication received from the Acting Chief Engineer, in which he expresses his entire concurrence:—"Considering how entirely we are committed to the contract system on the unopened portion of the North-West Line, and how seriously the interests of the Company are involved in the success or failure of the Contractors, I am not prepared to recommend a step that would in all probability be productive of financial embarrassment, and would therefore tend to delay still more the completion of the works. The power to exact the stipulated penalties should still be retained to protect the Company against any further undue delay." This is an unsatisfactory state of matters, as it amounts to a confession that the penal clauses in the agreements are comparatively useless; but under the circumstances I am obliged to acquiesce in the propriety of the Chief Engineer's decision.

19. During my late tour I was strongly impressed with the undesirability of a place so important as Gooty has now become, being permanently left in its present unprotected state; and, looking to the almost certain extension of the Railway during next year, I think it right to allude to the subject. It has been laid

down* by the Government of India that the necessary protection of the principal Railway stations will be a main consideration in distributing the army; and, without adverting to its geographical position, I would respectfully urge that Gooty will soon be a place of far greater importance than hitherto.

* To Cuddapah.
Kurnool.
Adoni.
Bellary.
Bangalore.

Besides being the point at which five main lines* of road meet, it will ere long have the Railway passing at the foot of its rock fort; and although it is true

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that this famous old fortress has been nominally dismantled, the most cursory inspection is enough to show that the work of destruction has been merely nominal, and that in a few days it might be restored to its former strength. Many of the buildings within the fort are almost intact, and a small outlay would suffice to render them again available for use. With all due respect I venture to urge the far greater importance, under present circumstances, of stationing a garrison at Gooty than at Kurnool.

20. With the exception of the short road leading from Gundaloor to the Condapoor station, which is being placed in excellent order, I was unable to learn that any of the lines of road mentioned by Colonel Anderson in paragraph 11 of his letter, dated the 22nd February 1867, is being proceeded with. Of these by far the most important at present is the line which is to connect Anantapoor with Tadputry. As I have already remarked, Tadputry will become the terminus of the North-West Line in the course of a few months, and will probably remain so for more than a year. The station is situated in the middle of a plain of black cotton soil, and unless a road be soon made, it will be inaccessible during rainy weather. The attention of the Superintending Engineer has already been drawn to the great need of this road, and I would urge the importance of pushing on the work as quickly as possible.

21. Before concluding this report I wish to make a few remarks upon the very great importance of the works now in progress on the North-West Line, and the impossibility, under present arrangements, of giving to them that amount of supervision and close inspection to which they are, in my opinion, entitled. The work now in progress is spread over an area of 190 miles, and the cost will not be far short of two millions sterling. When it is remembered how intimately the interests of the State, both direct and indirect, are connected with the success of the undertaking, there can, I think, be no doubt that it would be well to provide for supervision of a more frequent and thorough nature than is now possible.

* Vide G. O., No. 57 dated 22nd Feb. 1856.

22. The present strength* of this department was fixed twelve years ago, when the Railway system in this Presidency was in its infancy. There was then not one mile of line opened for traffic, work was in progress upon only a short portion of the South-West Line, the North-West Line was not commenced, while the Great Southern of India Railway and the Tramway Company's line had not been even proposed.

The length of open line in this Presidency now exceeds 830 miles, and the proper inspection of the works should occupy, upon an average, from a fortnight to three weeks in every month. Surveys for additional lines are being pushed forward in different directions, and I have been called upon to submit a report upon the general extension of the Railway system in the Presidency. When it is borne in mind that the current duties of the Office necessitate the almost constant presence of either myself or my Deputy in Madras, I trust that the Government will see the impossibility of giving to the works under construction on the North-West Line the attention which they require. These works extend to a distance of more than 350 miles from Madras, and a thorough and satisfactory inspection of them cannot be made, under favorable circumstances, in less than two months. The fact that the works are being carried out by contract increases the necessity for close and constant supervision.

Under the circumstances, it is my duty to represent that the strength of this department is not now adequate to the due performance of the important duties which devolve upon it, and to recommend the appointment of another Deputy Consulting Engineer, a recommendation which I earnestly trust will meet with support from Government.

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16th April 1868.

Summary of the various Contracts given out on the North-West Line.

† District.	Date of sanction.	Name of Contractors.	Time of completion.	Remarks.
<i>Main Line.</i>				
District 8, Section 2	20th May 1865	Mr. E. W. Barnett	1st September 1866.	Contract taken over by Mr. Barnett, 12th July 1866. Contract resigned; work being carried on by Engineering depart- ment.
Chittravutti bridge	1st December,	Do.	31st August 1867.	
District 9, Section 1	5th March 1866	Do.	1st July "	
Do. 9, do. 2	17th December 1866.	Do.	1st January 1868.	
Do. 10, do. 1	9th August 1865	Mr. G. W. Horgan	1st January 1867.	
Do. 10, do. 2	9th February 1866	Moonesawmy Chetty & Co.	1st February 1868.	
Do. 11, do. 1	7th March "	Mr. J. T. Fox	1st July 1868.	
Do. 11, do. 2, from 11 to 18 55	13th March 1867	Mr. E. W. Barnett	31st December 1868.	
Do. 14 to 20	20th November 1866.	Do.	31st December 1869.	
<i>Bellary branch line.</i>				
District 11, Section 2, from 18 55 to 22 47 15	13th March 1867	Balakistnamah Naidoo & Co.	30th September 1868.	
Do. 12, Sections 1* and 2†	*30th Aug. 1866 †25th January 1867...	Mr. Milbourne Ross	30th July 1868.	
Do. 13,	25th January "	Do.		

(Signed) J. H. M. SHAW STEWART, Major, R. E.,
Consulting Engineer for Railways.

MADRAS,
23rd March 1868.

Proceedings of the Madras Government, Public Works Department,
16th April 1868.

No. 215. ORDER THEREON, 16th April 1868, No. 1,139.

RAILWAY, No. 14.

1. The Government have perused this report with much interest. They are glad to observe that the works on the North-West Line are on the whole favorably progressing, but they regret to learn that the Railway as far as Gooty and Raichoor which they were originally led to believe would be opened for traffic in July 1867 and July 1869, respectively, is not likely to be completed, in the former case before the end of 1869, and in the latter before the close of 1871 or the early part of 1872.

2. The attention of the Company's Chief Engineer should be specially drawn to the defective character of the work which is being executed in some of the districts, and all possible care should be taken to ensure the employment everywhere of material and workmanship of unexceptionable quality.

Referred to in paragraph 14.

3. The Consulting Engineer's letter of the 12th March 1868, No. 85, has been separately disposed of.

4. The suggestion in paragraph 19 will be referred for consideration in the Military Department.

5. Paragraph 20 will be communicated to the Revenue Department. The Government note that money has been allotted from Local Funds for the under-mentioned Railway feeders:—

	Allotment for 1867-68.	Allotment for 1868-69.
1. Road from Gundaloor to Condi- poram. Estimate Rupees 12,900.	7,000	
2. Road from Anantapoor to Tada- patree. Estimate Rupees 42,600.	23,000	19,600
3. Road from Adony to Gooty. Esti- mate Rupees 15,990	10,000	5,000
4. Road from Chippagiry to Madi- kara	10,000	
5. Road to the Aspri station		1,000
6. Road from Halvy to Rachumurry, via Hosghee... ..		4,000

Plans and estimates for the three latter lines, as well as for the other Railway feeders recommended by the Consulting Engineer, should be submitted for sanction as early as practicable, and no unnecessary delay should be permitted to occur in carrying on the works to completion as soon as the requisite funds are made available.

6. The Government have given the subject of paragraphs 21 and 22 of the Consulting Engineer's report their most careful attention, and, looking to the present magnitude of the Railway system in this Presidency, as well as to the great extension which it is probable will be given to it, and considering the absolute necessity for the closest possible supervision on the part of the Officers of Government especially over the works under construction, they are satisfied that the duties devolving upon the Consulting Engineer's Department are more onerous than

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can be efficiently performed by two Officers, and that the establishment sanctioned in 1856 is no longer sufficient. Entertaining these views, and believing that the addition of an Assistant Consulting Engineer for Railways will be attended with most beneficial results, His Excellency in Council will be prepared to address the Government of India upon the subject on the receipt from the Consulting Engineer of the usual tabular statement in the prescribed form.

(True Extract.)

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

To the Consulting Engineer for Railways.
.. Revenue Department.
.. Military Department.
.. Superintending Engineer, 3rd Division.

Exd. S. T. Augustin.

Summary of the various Contracts given out on the North West Line.

District	Date of Sanction	Name of Contractors	Time of Completion	Remarks.
Main Line				
District 8 Section 2	20 th May 1865	Mr. W. Barnett	1 st September 1866	Contract taken over by Mr. Barnett. 12 th July 1866. Contract resigned - work being carried on by Engineering Department.
Chittramuthy bridge	1 st December 1865	Do	31 st August 1867	
District 9. Section 1	5 th March 1866	Do	1 st July "	
" 9 " 2	17 th December 1866	Do	1 st January 1868	
" 10 " 1	9 th August 1865	Mr. G. W. Hargrave	1 st January 1867	
" 10 " 2	9 th February 1866	Mr. G. W. Hargrave	1 st February 1868	
" 11 " 1	7 th March 1866	Mr. G. W. Hargrave	1 st July 1868	
" 11 " 2 From 11 to 18-55	13 th March 1867	Mr. G. W. Hargrave	31 st December 1868	
District 14 to 20	20 th Nov ^r 1866	Do	31 st December 1869	
Bellary Branch Line				
District 11 Section 2. from 18-55 to 22-47-15	13 th March 1867	Mr. K. S. Nair	30 th September 1868	
" 12 Sections 1 and 2	30 th Aug ^r 1866 - 25 th Aug ^r 1867	Mr. K. S. Nair	30 th July 1868	
" 13	25 th January 1867	Do		

Madras
23rd March 1868

Warranted Major R.E.
Consulting Engineer for Railways

Railway Department

15
Consulting Engineer's office.

N^o. 97.

From

Major J. W. M. Shaw Stewart R.E.
Consulting Engineer for Railways

To

Colonel C. A. Orr R.E.
Secretary to Government
Public Works Department
Port Saint George

Sir,

I have the honour to submit
the following report upon the progress of
the works on the North-West Line of the
Madras Railway, which I have lately
inspected in company with the Agent and
Managers. The acting Chief Engineer also
accompanied us over part of the works.

2.
The line is at present avail-
-able for traffic as far as Moodanoor, to
which point it was opened on the 1st August

1866;

1866; the distance from Madras being 196 miles.

3. As the Government are aware, the whole of the works upon the remainder of the North-West Line, including the Bellary branch, have been, from time to time, made over to different Contractors; a list of whom is given in an appended statement, in which are specified the dates upon which sanction was accorded to the contracts for the several portions of the line, and the dates upon which, according to the agreements, the works upon each portion should be completed.

4. It will be seen that the approval of Government to the introduction of the Contract system was first given on the 10th Aug. 1865; and the subsequent rapid growth of the system, which resulted in placing, within 18 months, the whole of the works in progress on the North-West Line, over a distance of 190 miles, in the hands of Contractors

Contractors, is chiefly due to the action of the Company's late Chief Engineer, Mr. Smart, who was strongly of opinion that the execution of the works, if intrusted to Contractors, would be cheaper, better, and quicker, than if carried out in the old method by the Company's Engineers, upon what has been termed the Departmental system.

5. The confidence with which Mr. Smart regarded the working of the Contract system was not, however, shared by the Deputy Chief Engineer upon Construction, Mr. Messersford Anderson, who, placed as he was in direct supervision of all the works in progress, ought to have possessed ample opportunities to enable him to judge of the degree of success which had attended the change of system. Mr. Anderson, on more occasions than one, placed his doubts upon record; especially in his report for the quarter ending the

the 31st March 1867, in which, after citing several notable instances of bad workmanship, he made some pertinent comments upon certain circumstances which had attended the introduction of the Contract system, and which, in his opinion, imported elements of danger. This report of Mr. Anderson was published in the Madras Railway Gazette for the month of May 1867 by the Chief Engineer, with remarks appended to it which had the undoubted tendency to depreciate Mr. Anderson's opinion, and to weaken his authority. As the Railway Gazette is officially circulated to all Engineers on the line, it is hardly surprising that this injudicious act of Mr. Smart's caused a misunderstanding between himself and Mr. Anderson, which led, a few months later, to the latter gentleman's resignation, and which has recently eventuated in the termination of Mr. Smart's agreement, under orders from the Board of Directors.

19
6. I have mentioned these facts in detail as I found it necessary when inspecting the works in progress, to make constant reference to the opinions which have been recorded by Messrs. Smart and Anderson as to the character of the workmanship and material supplied by the Contractor. The subject is one which the Board of Directors, in their recent letter to the Agent, have discussed at considerable length; and I think it right to preface this report with a brief statement of the facts. I do not feel that I am called upon to give here my opinion as to the comparative merits of the two systems of executing Railway works in this Presidency, viz. by the agency

12401 - 13th Feb 67/67
1105 - 6th Dec 67

agency of the Company's Engineers on the one hand, and of Contractors on the other; but I consider it due to Mr. Anderson to state that the results of my late inspection have thoroughly convinced me that his anxiety as to the character of the work in progress was by no means unfounded, that, when he drew attention to the subject, much of the work was of a very unsatisfactory nature and deserving of strong censure, and that he is fairly entitled to the credit of the improvement which I am glad to say has since become manifest.

7. I first inspected the works on the main line between Choodanoor and Raichoor, and afterwards the Bellary

21
Bellary branch. I will report upon them in that order, taking them according to the Engineering Districts into which they have been divided.

8. District VIII. The work upon this district, which has been let to Mr. Barnett, is almost completed. As far as the Chithravatty river, the road is now in excellent order, and, with the exception of some fencing which will soon be finished, is ready for traffic.

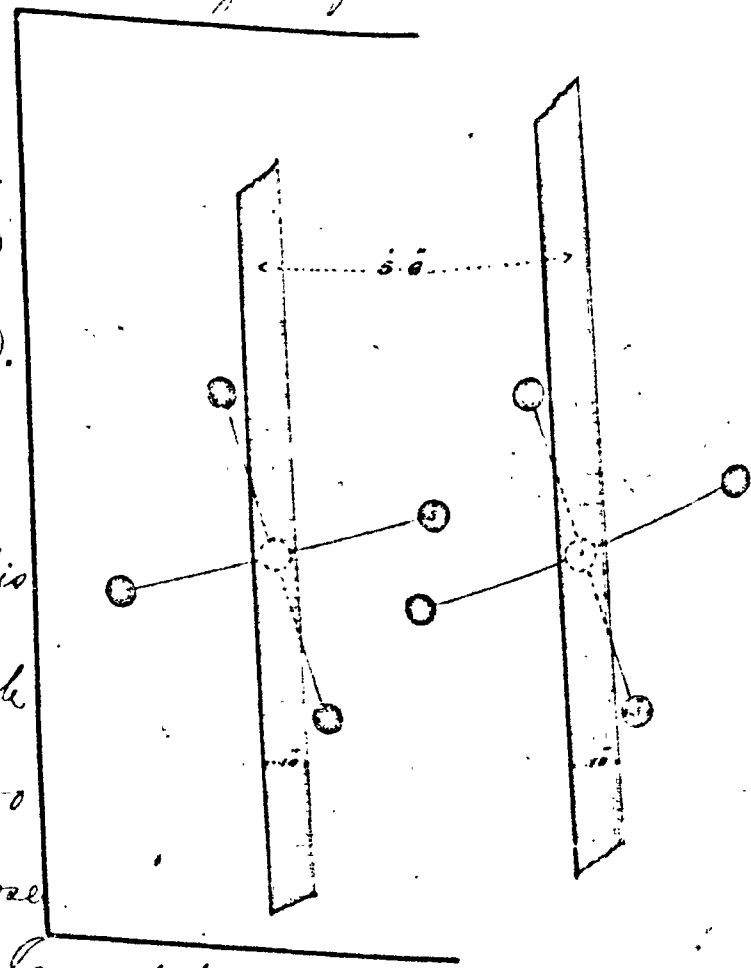
The Condapoor station is in this district, and the work is well advanced.

The bridge over the Chithravatty river, which

* Distance from
Madras 210 $\frac{1}{4}$ miles.

which was visited by His Excellency the Governor during January, consists of 40 girder openings, each of 70 feet from centre to centre. Owing to the great depth of sand in the river bed, it was found advisable to construct 19 piers in the centre of the river of screw piles, the rest being built of blue lime-stone.

The piles are arranged so as to form trestles, each trestle consisting of five piles, and two trestles forming the pier for the single line of the rails. Owing to this arrangement, the inner piles of the two adjoining trestles necessarily cross each other, as shown roughly in the margin; a fact which seems to have been overlooked in the drawings sent from England.



As the thickness of each pile is only 5 inches, this would not make much difference, ^{provided} that the two piles were screwed close to each other; but I regret to say that in some

13
of the piers in this bridge there is a most unnecessary space, in some cases of about 15 inches, between the piles in question; and the consequence is that the girders, instead of resting directly upon three piles in each trestle, rest upon the centre pile only, and in being rolled into position, have exerted a leverage which has tended to twist the upper portions of the trestles, and to move the piles slightly from their proper positions. I made a careful examination of the bridge with the Chief Engineer, and we came to the conclusion that it would be well to lift the weight of the girders off the piles, in order to bring the latter into their true positions. Upon our return we found that this was being carried out by Mr West, the Company's Engineer in charge. It will be necessary to unscrew comparatively few piles, only those which have been bent; and the necessary work will probably be finished before June.

The

river to 100 ft, over in the

In the meantime the temporary line of rails across the river bed is being used for the conveyance of material trains, &c.

9. District IX.— The work upon this district has also been let to Mr. Barrett, and the greater part is well advanced. The earthwork is almost finished, and so is the greater part of the smaller masonry works. At one or two places the work in progress was not of a satisfactory kind: especially at one of the longest pieces of masonry in the district, a bridge of eight 30 feet arches, where the material and workmanship were by no means what the Company had a right to expect from the Contractor. Instructions were given for the inferior work to be removed, and it was satisfactory upon our return to see a marked improvement.

At the Padputry station the platform wall is built, and the foundations for the station house, goods shed, and salt store, are finished. There,

* Distance from Seemas
227 1/2 miles.

There has been some difficulty about the water arrangements at this station, and it was at one time proposed to stop trains for water at the Pennair river, 6 miles further westward, but this would have been an unsatisfactory arrangement in many ways, and it is now decided to bring water in iron pipes from the nearest point of the river, a distance of barely half a mile. Judging from the rate at which the work is now progressing, I see no reason why the line should not be opened for traffic to Padputry in the course of about 4 months.

A vegetable fence of aloes has been planted along the whole of this District, but it has by no means uniformly succeeded, and an iron fence is now being put up as rapidly as possible.

I was much disappointed with the progress made at the Pennair bridge since I visited it two years ago: indeed nothing seems to have been

* Distance from Seemas
227 1/2 miles.

* Vide G. O. 19th April
1866. No 1220.

been done since the date of Colonel Anderson's inspection last year. Scarcely one half of the masonry has yet been completed, and eleven of the piers have still to be founded.

Upon our return, however, there was a much greater show of activity at the bridge; and as Mr Barnett has taken the work under his immediate superintendence, I trust that its future progress will be more satisfactory.

10. District X.—The first section of this district was let to a Mr Morgan, but upon his failure the contract was handed over to Mr Barnett. The earthwork is almost finished, as is also the masonry, the greater part of which is of excellent quality. The largest bridge in this section, one of six 30 feet girder openings, is however an exception to the rule, and some of the work was so inferior that it was necessary to order 8 courses to be removed over the whole of the bridge. This was one of the works

* G. O. 13th March
1867. N^o 753.

* (Distance from Chadda
242 $\frac{3}{4}$ miles.

works to which Mr Anderson took special exception when it was being built a year ago; but his objections were overruled by Mr Smart, under whose orders the work was passed and taken over from the Contractors, so that the cost of removing and rebuilding the condemned work will fall upon the Company.

At the Royalcherroo station the platform wall has been built, and the foundations for the station buildings were being put in at the date of my visit.

The second section of District X was let to Messrs Moonesawmy Chetty & Co; but after the work had gone on for months in an unsatisfactory manner, it was recently taken out of their hands, and arrangements have been now made for carrying it on by Departmental Agency. This section is the only part of the North West Line upon which the work is not now in the hands of Contractors; and although the improvement

in the quality of the work; since Mr. Scott undertook the management, is most marked, I see no reason to suppose that the cost will be greater. In other respects also I look with satisfaction upon the late changes in the execution of the works on this portion of the line. There still remains more than enough under execution by contract to thoroughly test that system; and the re-introduction of the Departmental system over even a few miles will tend to produce a wholesome spirit of emulation; and must I think produce good results.

Most of the earthwork on this section is completed, but not one half of the masonry is done, and all the most difficult work has been left untouched. Taken in conjunction with the backward state of the Pennair bridge, the work upon this section is so heavy that I see no reason to expect the line to be opened to Gooty till towards the end of 1869.

11. District XI. — The first section of

* Distance from Madras
257 $\frac{1}{4}$ miles

of this district has been let to Mr. Fox, and the work is now fairly advanced. Most of the earthwork is finished, and more than half of the masonry, which is in general of a fair quality, though the stone used is ~~generally~~ of small size. In some parts of this section good water is scarce, a want that is still more severely felt in parts of the line further north, and it is clear that great and constant care on the part of the Company's Engineers is necessary to prevent the workmen from using the mortar too dry.

The work at the Gooty station has been commenced, but little has been done beyond building the platform wall.

The second section of District XI has been given on contract to Mr. Barnett, as far as the point where the Bellary branch is taken off. The work upon this portion of the line has evidently suffered from want of proper supervision. The present

Engineer

not to say, and in the

Engineer in charge suffers much from ill health, and the gentleman whom he very lately relieved had been for some time unfit for work from illness. That such supervision was necessary is very evident, as some specimens of the work were far from satisfactory.

About two thirds of the masonry, and about half the earthwork, still remain untouched. Nothing has been done at the Goondacul station beyond marking out the site.

12. Districts XIV to XVIII.—

These districts carry the line from the Goondacul junction northwards, through the town of Adoni, to within 7 miles of the Poongabudra river. The country through which they pass is almost uniform in character, consisting generally of black cotton soil, and the works throughout are in nearly the same state of progress. The whole of these districts have been let to Mr. Barnett, forming part of the extensive contract which was laid before Government

* Distant from Channarayana
27 3/4 miles.

* Vide G.O. 17th
November 1866.
No 3674.

Government by Colonel Anderson on the 3rd November 1866.

About one-fifth of the earthwork remains to be executed, and about three-fourths of the masonry. The latter is everywhere of fair quality. The works themselves are generally small, but the stones are carefully selected, and the masonry is good and sound.

District XVIII deserves special mention on account of the excellent materials used in the bridges, and the great care which has evidently been taken by Mr. Jones in turning them to the best account. Throughout districts XIV, and XV, there is great scarcity of water, which has at some points to be carted from a distance of 3 miles. The greatest care on the part of the Engineers is necessary to prevent dry mortar being employed.

The Muddykerra, Auspree, Adoni, and Hoogee stations are situated within these districts, but beyond marking out the enclosures no work has yet been done.

* Distant from Channarayana
280 1/2 miles
294 1/2 "
307 "
324 1/4 "

18. Districts XIX and XX —

These districts carry the line to Raichoor, the point at which it is to meet the Great Indian Peninsula line from Bombay; the whole of the work being in Mr. Barnett's hands. Upon district XIX about half the earthwork has been executed, but very little of the masonry, with the exception of what has been done at the bridge over the Soongabudra. Upon district XX about one eighth of the earthwork has been executed, but no masonry.

The Soongabudra bridge is to consist of 58 girder openings, measuring each 70 feet from centre to centre, or 64 feet in the clear. The length of the bridge will be more than ^{three quarters} of a mile. The point chosen for crossing the river is most favourable, a bed of gneiss rock stretching from bank to bank. This rock is intensely hard, and much heavy work is entailed in levelling its surface to obtain foundations for the piers.

Vill.

* Distance from Meerut
333 $\frac{1}{4}$ miles.

Vill. lately there has been much discussion with the Contractor, as to the description of work to be used in the piers, and considerable difficulty has been experienced by the Engineer in charge, Mr. Robinson, but a more satisfactory specification has now been drawn up in detail, and the work, upon our return, was being carried on in accordance with its provisions. Of the 57 piers, 17 on the south side, and 21 on the north side are in progress, more or less advanced. The stone now being used is of a very fine description. I visited two of the quarries from which it is brought; one yields stones varying from 12 to 18 inches in thickness, the material being a fine granite, worked entirely by hand; while from the other is obtained an excellent basalt which breaks readily with a beautifully square cleavage. In the deep bed of the river, the piers will stand about 40 feet above ground; and when finished,

the

The bridge will be the largest, and the most important work in the Railway system of this Presidency.

To the north of the Poongabudra the line has been laid out by Mr. Robinson with great care and judgment, and the masonry works will be few in number, and of small dimensions.

14. The position of the junction station at Raichoor has been the subject of some discussion, as the Government are aware. The site^{*} originally chosen was objected to, as being too near the old Port; and several proposals were subsequently made to obviate the objection. I have already re-[†]ported that, after a careful examination of the country, the best site is, in my opinion, to be found at about $1\frac{1}{4}$ miles to the north of the present junction, on the Great Indian Peninsula line. The town lies entirely to the north and north-east of the Port, and a station built to the south would be very inconveniently situated as regards the requirements of

^{*} Distance from Madras
 $351\frac{1}{4}$ miles

[†] Vide No. 85 of
12th Instant

of the local traffic:— while the two lines of main road which cross at Raichoor, that running east and west between Lingasoojer and Hurnool, and that running north and south between Hydahad and Bellary, lie close to the site recommended by me, and which in all other respects seemed unobjectionable.

15. From Raichoor I visited the Kistna, to enable me to form an opinion as to the progress of the Great Indian Peninsula works, and the probable time when they will be completed to Raichoor. The crossing originally fixed on, to which Colonel Anderson alluded in paragraph 9 of his letter dated the 22^d February 1867, No. 50, has been abandoned on account of the deep water which would have been encountered in founding the pier, and another crossing has been selected about 2 miles higher up the Kistna, close below the point where it is joined by the Reema. It has I believe been proposed to

to cross the river here with iron girders, in spans of 100 feet; the piers to be formed of iron cylinders 7 feet in diameter, resting on masonry basements. At the time of my visit nothing had been done on the spot beyond the collection of materials.

The change in the site of the bridge has necessitated the abandonment of several miles of the old line, principally earthwork, upon either side of the river.

16. Bellary Branch. Districts XI, XII, and XIII. The works upon the second section of District XI, westward of the Goondaul junction, have been let to Balakistnamah Naider. This portion of the line is short, being under 4 miles in length, and the work is well advanced.

Almost all the earthwork is finished, and half of the masonry, which is of excellent quality.

Districts XII and XIII carry the line into Bellary. The work here has been let to

to Mr. Ross, and is fairly advanced. Most of the earthwork is done, and about a quarter of the masonry. I regret to say that in several cases the latter did not come up to the standard which in my opinion the Company have a right to demand. The Contractor has considerable difficulties to encounter, especially in the carriage of materials, which have to be brought from great distances; but these difficulties cannot be accepted in palliation of bad work.

The Joladarachy station has not yet been commenced.

The bridge^x over the Huggly river is also uncommenced. It will consist of 24 girder openings, each measuring 70 feet from centre to centre. The girders will rest upon screw piles, arranged similarly to those at the Chittravatty bridge, as described above in paragraph 8.

At the Bellary^x station, which will, for the present

^xDistance from Chittravatty
291 miles.

^xDistance from Chittravatty
296 $\frac{3}{4}$ miles.

^xDistance from Chittravatty
305 miles.

present at least, for the terminus of the line in this direction, no work has been done beyond the collection of stone, which is available within the station enclosure in any quantity, and of excellent quality. The site for the station has been judiciously chosen. It occupies a large open space, immediately to the east of the Fort, and readily accessible from all parts of the town.

17. As regards the time when the completion of the successive sections of the line may be expected, I have already stated that Sadpur will probably be reached in about four months, and Gooty towards the end of next year.

It is of course as yet impossible to calculate with any approach to certainty the date when the line will be opened throughout to Raichoor, but I regret to say that I see no reason to expect it before the close of 1871; and, from what I could learn, I do not anticipate that Raichoor will be reached

18. reached by the Great Indian Peninsula line even by that date. If through communication between Madras and Bombay is effected early in 1872, I shall be agreeably disappointed.

18. The Government will observe that the dates which I have named as those upon which the successive sections of the line will probably be opened are considerably later than those named in the agreements with the respective Contractors. In reply to a reference which I made to know whether it was intended to exact from the Contractors the stipulated penalties for non-performance of their agreements, the Agent quotes as follows from a communication received from the Acting Chief Engineer, in which he expresses his entire concurrence:— "Considering how
" entirely we are committed to the Contract
" system on the unopened portion of the
" North West Line, and how seriously the
" interests of the Company are involved in

"The success or failure of the Contractors,
 "I am not prepared to recommend a step
 "that would in all probability be productive
 "of financial embarrassment, and would
 "therefore tend to delay still more the completion
 "of the works. The power to exact the sti-
 "=pulated penalties should still be retained
 "to protect the Company against any further
 "undue delay." This is an unsatisfactory
 state of matters, as it amounts to a confession
 that the penal clauses in the agreements
 are comparatively useless; but under the
 circumstances I am obliged to acquiesce
 in the propriety of the Chief Engineer's
 decision.

19. During my late tour I was
 strongly impressed with the undesirability
 of a place so important as Gooty has now
 become being permanently left in its present
 unprotected state; and, looking to the almost
 certain extension of the railway during next
 year, I think it right to allude to the sub-
 =ject. It has been laid down by the

* Vide Proceedings of
 Government of India
 No. R.
 5783 dated 6th
 Government - December 1864.

Cuddapah.
 Gurnool.
 Adoni.
 Bellary.
 Mangalore.

Government of India that the necessary pro-
 =tection of the principal Railway stations
 will be a main consideration in distributing
 the Army; and without adverting to its
 geographical position, I would respectfully
 urge that Gooty will soon be a place of far
 greater importance than hitherto. Besides
 being the point at which five main lines
 of road meet, it will ere long have the
 railway passing at the foot of its Rock
 Fort; and although it is true that this
 famous old fortress has been nominally
 dismantled, the most cursory inspection is
 enough to show that the work of destruction
 has been merely nominal, and that in a
 few days it might be restored to its
 former strength. Many of the buildings
 within the Fort are almost intact, and
 a small outlay would suffice to render
 them again available for use. With all
 due respect I venture to urge the far
 greater importance, under present circum-
 =stances, of stationing a garrison at Gooty
 than

than at Hurnool.

20. With the exception of the short road leading from Gundaloor to the Condapoor Station, which is being placed in excellent order, I was unable to learn

that any of the lines of road mentioned by Colonel Anderson in paragraph 11 of his letter dated the 22nd February 1867 is being proceeded with. Of these by far the most important at present is the line which is to connect Anantapoor with Tadputry. As I have already remarked, Tadputry will become the terminus of the North-West Line in the course of a few months, and will probably remain so for more than a year. The station is situated in the middle of a plain of black cotton soil, and unless a road be soon made, it will be inaccessible during rainy weather. The attention of the Superintending Engineer has already been drawn to the great need of this road, and I would urge the importance of pushing on the work as quickly as possible.

21. Before concluding this report

I wish to make a few remarks upon the very great importance of the works now in progress on the North-West Line, and the impossibility, under present arrangements, of giving to them that amount of supervision and close inspection to which they are in my opinion entitled. The work now in progress is spread over an area of 190 miles, and the cost will not be far short of two millions sterling. When it is remembered how intimately the interests of the State, both direct and indirect, are connected with the success of the undertaking, there can I think be no doubt that it would be well to provide for supervision of a more frequent and thorough nature than is now possible.

* Vide G.O.
10577 22nd Feby 1856.
1257 2nd May 1856.
2167 8th July 1856.

22 The present strength of this Department was fixed 12 years ago, when the Railway system in this Presidency was in its infancy. There was then not one mile of line opened for traffic, work was in progress upon only a short portion of the South-West Line, the North-West Line was not commenced, while the Great Southern of India Railway and the Tramway Company's line had not been even proposed.

The

The length of open line in this Presidency now exceeds 830 miles, and the proper inspection of the works should occupy, upon an average, from a fortnight to three weeks in every month. Surveys for additional lines are being pushed forward in different directions, and I have been called upon to submit a report upon the general extension of the Railway system in the Presidency. When it is borne in mind that the current duties of the office necessitate the almost constant presence of either myself or my Deputy in Madras, I trust that the Government will see the impossibility of giving to the works under construction on the North West Line the attention which they require. These works extend to a distance of more than 350 miles from Madras, and a thorough and satisfactory inspection of them cannot be made, under favourable circumstances, in less than two months. The fact that the works are being carried out by Contract increases the necessity for

close

close and constant supervision.

Under the circumstances it is my duty to represent that the strength of this Department is not now adequate to the due performance of the important duties which devolve upon it, and to recommend the appointment of another Deputy Consulting Engineer, a recommendation which I earnestly trust will meet with support from Government.

Madras
23rd March
1868

I have the honour to be,
Sir,

Your most obedient servant

Montgomery Major R.E.

Consulting Engineer for Railways

1132

Public Works Department.

1139

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the 16th April 1868.

Read the following

From the Chief Engineer
for Railways -

(Here enter No. 97 dated 23rd Mar/68)

The Government have perused this report with much interest. They are glad to observe that the works on the North West Line are on the whole favorably progressing, but they regret to learn that the railway as far as Gooty and ^{originally} Richoor which they were led to believe would be opened for traffic in July 1867 and July 1868 respectively, is not likely to be completed in the former case before the end of 1869, and in the

W. H. N.

1139-1654/68

1139-1654

On the 11th and 12th of April 1868
of the 11th and 12th of April 1868
of the 11th and 12th of April 1868
of the 11th and 12th of April 1868

1139-1654/68
1139-1654/68
1139-1654/68
1139-1654/68

latter, before the close
of 1871 or the early part
of 1872.

2. The attention of
the Company's Chief
Engineer should be specially
drawn to the defective
character of the work
which is being executed
in some of the Dis-
tricts, and all possible
care should be taken
to insure the employment
everywhere of material
and workmanship
of unexceptionable quality.

The Consulting Engineer's
letter of the 12th March
1868, No. 85, has been
separately disposed of.

The suggestion in
para 19 will be referred
for

Referred to in para
14.

119
for consideration in the
Military Department

Para 20 will be com-
municated to the Revenue
Department. The Govt.
note that money has been
allotted from Local Funds
for the unmentioned
Railway feeders.

		Allocation for 1867-68.	Allocation for 1868-69
1	Road from Gundaloor to Bondi. from Am. Estimate Rs. 12900	7000	"
2	Road from Anantapoor to Tada. from Am. Estimate Rs. 42600	23000	19600
3	Road from Adony to Gooty Est. Rs. 15990	10000	5000
4	Road from ~~Madikere~~ to Chippagiri & Kadihara	10000	"
5	Road to the Aspri Station	"	1000
6	Road from Talur to Reichumur via Rosghe	"	4000

Plans and Estimates
for the three latter lines,
as well as for the other
Railway feeders —

recommended by the Consulting Engineer should be submitted for sanction as early as practicable, and no unnecessary delay should be permitted to occur in carrying on the works to completion as soon as the requisite funds are made available.

The Government have given the subject of paras 21 and 22 of the Consulting Engineer's report their most careful attention, and, looking to the present magnitude of the Railway system in this Presidency, as well as to the great extension which it is probable will be given to it, and considering the absolute necessity for the closest possible

See L. O. No. 753 of
13th Mar /68.

possible supervision on the part of the Officers of Govt. ^{especially} over the works and construction, they are satisfied that the duties devolving upon the Consulting Engineer's Department are more onerous than can be efficiently performed by two Officers, and that the Establishment sanctioned in 1856 is no longer sufficient. Entertaining these views, and believing that the addition of an Asst. Cong. Engr. for Railways will be attended with most beneficial results, His Excellency in Council will be prepared to address the Government of India upon the subject, on the receipt from the Cong. Engr. of the usual tabular statement in the prescribed form.

To
The Engineer
for Railways
Rev. Secy
Military Secy
S. Engr 30 Dec

Recd 29/4/68

W. H.

24-5-86

Pub. Works 1868 Dept.

Proc. of Govt. for April

No 1139
Proc. of the Madras Govt.
Of 16th April 1868

Passing orders on the
Consulting Engineer's report upon
the progress of the works on the
N. P. Line of the Madras
Railway.

No. 214 & 215

22 April 1868