Most Urgent

Public Works (1899) Department.

RAILWAY BRANCH.

G.O., No. 1164-65 Ry

DATED 16th Octr 99.

Proof

120/2/20/60/1

T.C.C
5 in the docket

[Despatch Abstract.]

Inspection Report of the Ry system

ordered that the —— for the half-year ending the 30/6/99, with the remarks by the Senior Govt. Inspector of Rys, be commund to the Agent & Manager for info & the necessary action; and a copy of the Proc forwarded to the Govt of India.

Forwarding a Copy of the Proc embodying the —— for the half-year ending the 30/6/99 with the remarks by the Senior Govt Inspector of Railways.

[P. W. 26. 200—30-3-99.]

Indexed.

Indexed.

[P. W. Ry.

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

RAILWAY.

Government {1899} of Madras.

PUBLIC WORKS.

Recd.
Regd. } 1899.

Enclosures
Spare copies

G.O., Nos. 1164, 1165 Ry., 16th October 1899.

OCTOBER.

Inspection Report of the Madras Railway System

Forwarding a copy of the proceedings embodying the — for the half-year ending the 30th June 1899, with the remarks by the Senior Government Inspector of Railways, Madras.

Indexed.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Railway.

Read the following paper:—

MADRAS RAILWAY.

STANDARD, 5′ 6″, GAUGE.

Total mileage open to traffic 853·22 miles.

INSPECTION REPORT FOR THE HALF-YEAR ENDING 30TH JUNE 1899.

1. The inspection was made between the 7th and 12th August and 22nd August to 2nd September. The Agent and Chief Engineer accompanied the party throughout, the Traffic Manager during a portion of the time and the Locomotive Superintendent during part of the inspection and his Deputy for the remainder.

2. *Formation.*—Banks and cuttings are well maintained throughout, the failure of the June rains would account for the absence of any weak places in the formation. For instance, the Tungabhadra bank, over which the running is not usually up to the usual standard, was on this occasion in very good running order. Pitching of the slopes of banks on the Arcot branch was in progress.

3. *Bridges and Culverts—Tungabhadra Bridge.*—The new girders have arrived for this bridge. Some doubts were expressed as to the advisability of starting work before the question of the allocation of the expenditure has been settled. I do not see why this question should be allowed to delay the commencement of operations. I informed the Agent that in my opinion sufficient sanction had already been accorded to authorize him in putting the work in hand at once. *Bridges on Nilgiri Branch.*—The work of strengthening the bridges on this branch by putting in intermediate piers has been completed. *Tirur Bridge.*—This is one of the bridges, the strengthening of which it is intended to take in hand at an early date, but as the bridge is only just outside Tirur station at which all trains stop, I am of opinion that the strengthening may very well wait the settlement of the scheme for strengthening all bridges which appear weak when calculated by the present rules. *Other Bridges.*—I inspected several other bridges, some of which do not come up to the standard of strength now considered necessary, on these the speed of all trains is restricted.

4. *Painting of Girders.*—I was able to gather very little information during my inspection on the efficacy of the various kinds of paints. The girders on the Madras Railway are after erection painted with a mixture of tar and kerosine oil. This appears to require renewal after about 7 years. The proportions of the ingredients is not laid down, it appears to depend upon the consistency of the tar supplied. All these girders were painted in England before despatch with a coating of linseed-oil and one of red lead. These coats appear never to be renewed in India.

5. *Rails.*—In my inspection report for the half-year ending 30th June 1898 I gave the results of running at high speeds over the rails with a large radius table, similar to the State Railway section, which had been laid between Katpadi and Jalarpet. The general opinion at that time was that the excessively bad oscillation which occurred in trains running at high speeds and which was constantly complained of by passengers was caused by the wheel tires not fitting the table of the rails. With this opinion I was not disposed to unreservedly agree, as it appeared to me that good running could not be expected where a pot sleeper road previously laid with 20-foot

rails had just been relaid with 30-foot rails thus necessitating the respacing of the pots. I understood, however, that the administration had completely condemned the rails for fast running and that they had all been removed to sections where steep grades or other considerations necessitated a restriction of speed. On this inspection I was informed that 60 miles of these rails still remained on the section and were daily run over by the fast mail trains from Madras to Bangalore and Mettupalaiyam and *vice versâ* and that latterly no complaints had been received from passengers. Before noting the impressions received by me on this inspection it is well to briefly summarize the results obtained on last year's inspection which were, that in either a four-wheeled or six-wheeled carriage the oscillation at speeds exceeding 45 miles an hour was excessive and at a speed of 54 miles an hour, the greatest speed attained on that occasion, the oscillation was such as to make it extremely difficult to keep one's seat in the carriage and very likely to make a timid passenger extremely nervous, to say nothing of the discomfort. On the present occasion the train in places attained a speed of 59 miles an hour and the oscillation was almost unnoticeable; in one or two places, it is true, a sudden oscillation was set up, reminding me very forcibly of last year's experience, but the carriage almost immediately regained its previous steadiness and continued steady for the remainder of the run. The theory was then advanced that the train ran steady on the present occasion, because we were running against the grades, whereas on the previous inspection we had been running with the grades and in support of this theory it was pointed out that all the complaints which had been made had been received from passengers travelling from Bangalore or Mettupalaiyam to Madras, that is, with the grades. We had an opportunity of testing the truth or otherwise of this theory on our return at the end of the inspection. We were to run over the section laid with the new rails at night and the driver was instructed to run fast over a portion of the new rails. My personal impression was that the oscillation was inconsiderable on all parts of the line, but complaints were made the next morning by other members of the inspection party about the excessive oscillation on the section between Jalarpet and Vaniyambadi. A glance at the section in the possession of the Chief Engineer, giving the different types of rails laid, showed us that the section complained of had recently been laid with 30-foot steel rails of a pattern very closely approximating to the old Madras Railway pattern and not with rails of the State Railway pattern. Personally I am now fairly well satisfied that the Madras Railway vehicles will run smoothly over a rail of the State Railway section and that the substitution of a rail of different length for the old rail on a pot sleeper road will always cause the running of fast trains over it to be exceedingly bad until the road is thoroughly well set and the columns of earth which always form beneath the sleeper are thoroughly consolidated. The running over the old 65 lb. rails was, as usual, a bit rough, owing to the hammering at the joints caused by the sag due to the weakness of the fish plates.

6. *Ballast.*—The following table shows the progress made in covering the sand ballast with broken stone:—

	Covered to date.	Not yet covered.
	MILES.	MILES.
Madras to Mettupalaiyam	327·33	*nil.*
Podanur to Calicut, including Palghat Branch (This includes about 41 miles of laterite ballast)	50·28	63·34
Jalarpet to Bangalore	53·36	34·06
Arkonam to Raichur	224·20	84·08

7. *Stations—Central Station.*—Quarters for the stationmaster have been built and are now practically ready for occupation. The traverser at the end of the platforms is not giving satisfaction, it is said to be constantly jamming, it is probable that the whole road requires relaying. A cross-over road is said to be required between the two gas-works sidings, it appeared to me that this would diminish the already restricted standing room and it seemed possible to curve the outside line into the inner one so as to form a loop. *Salt Cotaurs.*—The wagon turntables of the goods shed have all been condemned and new ones indented for. The present shunting neck is only of sufficient length to hold half a train and the result is that shunting is carried on on the

main line and across a level-crossing, this is most objectionable and will be further dealt with under the head level-crossings. *Washermanpet.*—Pending settlement of the situation for a joint engine shed near this station, it would be well if building on land likely to be required could be prevented. The land on which the present plague camp is situated will probably be required. *Royapuram.*—A carriage dock for the East Coast Railway has been built. A platform for the beach extension has been completed. Coal now comes in considerable quantities down the East Coast Railway, at present this has to be shunted into the stores sidings to be weighed and consequently these sidings are often blocked. If it is intended to continue dealing with this coal at Royapuram, coal sidings might be laid west of the Mill road over-bridge, where land is available and a weigh bridge erected. A stand pipe is stated to be necessary for filling the East Coast Railway carriage tanks. The building of the new audit rooms over the printing office is in progress, the second floor rooms are complete and only the third floor remains under construction. *Avadi.*—There is a large passenger traffic at this station, 11,000 passengers were booked during June, mostly to Madras, the line being a double one, an overbridge would be a convenience even if it is not an absolute necessity. *Tinnanur.*—Waste land abuts right against the platform on the north-west side. The station compound might be squared off by taking up some of this land. *Mosur.*—A station-house and stationmaster's quarters are to be built here. *Ponpadi.*—The station-house is being built in a catch water drain, there is sufficient land to divert this drain through, though a better job of it could be made by acquiring a narrow extra strip. *Taduku.*—A trial station situated in cutting on a curve, it is not a nice place for a station, but it is on the only bit of level available. *Renigunta.*—Engines continue to stable here, partly owing to the lack of staff quarters at Nandalur and partly owing to the difficulty of arranging a suitable time-table. As soon as these difficulties are removed, a portion of the engine shed will be demolished and the materials taken to Nandalur to enlarge the shed there. *Nandalur.*—The platform line which has previously been reported as low has not yet been raised. Signaller's bungalow and signaller's office in station are required. Another entrance to the engine shed would be a great convenience, the engine shed is situated near the north of the station and the entrance leaves the through siding at the south end. *Cuddapah.*—Now that this has ceased to be an engine-changing station the turntable, siding and engine shed lines can all be taken up. *Yerrayudipad.*—This is a new station similar to several other stations not long opened, trains cannot cross, but there is a laybye for wagons, the points lever and the signals (two arms on one post) are both locked by a Whitney's point bolt lock. Only one key is used. This key cannot be removed from the signal lock unless the signals are at danger nor can it be removed from the point lock except when the points are locked to main line. This arrangement is now preferred to and being substituted for the ordinary Annetts' lock. *Wallajah Road*, late Arcot station. There is a cross over road from the main line to the new Arcot branch, the points of which are efficiently interlocked with the signals. An overbridge for passengers appears necessary between the up and down main line platforms, the down platform being an island platform which also serves the branch. There is a siding between the two platform lines which is used for stabling wagons on and thus often blocks the rail level-crossing. *Arcot.*—This station is now complete with the exception of the goods loading bank which requires widening, ramping at the Arcot end and a fence to prevent carts from going down the slopes. *Jalarpet.*—It is proposed to gradually enclose by a wall the portion of the new land on the south side which is close to the public road running through the station compound. A length of 100 feet will be budgeted for per annum. A number of huts have been built close up to the station boundary, indeed, this seems likely to become a village of some importance. Great complaints are made by the railway people concerning the sanitary condition of these huts and the road which runs through them.—*Lokur.*—As no good water-supply can be obtained here, the scheme for stabling the ghât engines at this station instead of Mallapuram must, I am afraid, be given up. As it is a crossing station for passenger trains, a latrine is stated to be required. *Annangur.*—The receipts justify the building of a platform here. *Totiyapalaiyam.*—A platform has been sanctioned, and present receipts point to the necessity for a station-house and latrine. Land on the

north side will be required. *Ingur.*—The receipts of this station justify the building of a platform, but as the present site is on a high bank, it is proposed to shift the station to begin at mile 255/10, where the grade is 1 in 659, and the station will be in slight cutting. *Mettupalaiyam.*—The Nilgiri Railway begins to curve away before it reaches the end of the straight platform, and it has been suggested that the portion of the platform from the point where the line begins to curve should be fenced off. I do not consider this either necessary or advisable. A road is stated to be required to the transhipping platform; this can easily be made at the back of the buffer stops. Quarters are required for the Locomotive Department, and land for these should be acquired on the west of the line. The available land to the east will all be required for the traffic staff. *Olavakkot.*—Complaints have been received from passengers about the want of shelter on the portion of the platform which serves the Palghat branch. One hundred feet length of shed on single rail-posts, similar to the Connur shed, might be erected. *Tirur.*—The goods shed here is to be raised. Some extra land might be acquired on the south side of the platform; it is lying waste. *Kallaye.*—The timber traffic appears to be increasing, and more siding and shed accommodation is required. *Bangalore City.*—The extra land to the north of the station has been handed over and is to be enclosed by a wall. An overbridge for the public road will have to be built. The approach road to the west side of the station has been widened. It is proposed to take up a portion of the so-called garden at the back of the police station, clear away the trees and metal it. *Bowringpet.*—An estimate will be submitted for draining this station yard—apparently a very necessary work. *Nine Reefs.*—On the new alignment of the Kolar Gold Fields branch just opposite mile 5 of the present line will be placed a new station to be called "Nine Reefs." A plan of the proposed station has been prepared, and the ground was marked off for the inspection. The arrangements will, I think, require considerable modification. The station site is on sidelong ground with a nullah to be bridged at the west end and a deep cutting at the east. A road exists crossing the centre line almost at right angles near the east boundary. The proposed plan showed the passenger platform on the south or up-stream side of the line and the sidings on the north or down-stream side, but the Agent suggested, and I think rightly, reversing these positions. It will be much easier to extend sidings on the up-stream side. It will also probably be found convenient to carry the existing road over the railway on an overbridge as the cutting will be deep where the road now runs.

8. *Signals.*—Some time ago a train over-ran Timmancherla station, and I gathered from the evidence given at the joint enquiry that mixed trains do not always stop at certain stations; the driver may get instructions that he is to stop at a certain station or that he is to run through it, or he may not. In the latter case, as both distant and home signals are lowered whether he is to stop or not, he has nothing to guide him until he sights the starter. If this is at danger, it must often be too late for him to stop his train at the platform, especially if he has made up his mind that he is to run through. I do not say that this was the cause of the driver overrunning Timmancherla the other day, in fact, I believe it was not, but as considerable discussion has lately been going on about the best system of signalling, I think it is well to note any defects which may be brought to light in a joint inquiry or otherwise. At *Guntakal*, the home signals which used to be located on the roof of the station building have been removed. The two so-called auxiliary home signals are to have double arms put on, one for the main and one for the loop. The signal controlling the exit from the tranship yard remains as previously reported. I do not think there will be any danger of a driver mistaking it for the home signal when the latter is furnished with two arms. *At Bowringpet*, I noticed three starting signals to control trains leaving to the south, one electric starter for main line trains, one ordinary starter for Kolar Gold Fields trains, and one which was apparently the starter for the main line trains before the electric signal was erected,—the last should be removed. I also noticed that the engine of a train waiting for its signal to proceed on the Kolar Gold Fields line was some way in front of its starter. I very much doubt if this starter is ever used, if such a signal is thought necessary it should be placed farther away. I do not see that it matters a bit whether it fouls the cross-over road or not.

9. *Level-crossings.*—The question of the crossing of several roads within the limits of Madras City must soon be taken up. At *Elephant Gate crossing*, a footbridge for passengers has been erected. The new extension of the Madras Tramway Company now runs along this road: at the time of my inspection the tram lines were laid up to the railway on each side and the completion was only waiting the laying of the timber trestles by the Railway Company. I have not heard any complaints about the stoppage of road traffic at this station, although this traffic appears considerable. *Basin Road level-crossing.*—Constant complaints have been made about the delay caused to road traffic by the shunting of trains over this crossing which is close to Salt Cotaurs goods station. There is a shunting neck which is not of sufficient length to hold a full train, and trains therefore shunt on the main line and are constantly blocking the road. As, however, the shunting neck cannot be lengthened without crossing the road, its lengthening would not help matters. I am of opinion that the only way out of the difficulty is to build a main road overbridge and this should, I think, be designed to cross four lines of rails. It is certainly wrong to have a level-crossing fouling the shunting neck of the busiest goods station on the railway. *Crossing opposite Massey & Co.'s works.*—The crossing here is only about 9 feet wide, and the confusion which reigns when the gates are opened with a block of traffic at each side may be imagined. The Railway authorities have agreed to put in double gates and double the width of the crossing. This should be done at once. *Mill Road.*—This road, which is just outside Ráyapuram station, is carried over the railway on an overbridge, and this will block railway developments at Ráyapuram in connection with the Beach and East Coast Railway traffic. The Agent suggests removing this bridge and in its place constructing a bridge for the Monegar Choultry Road which is stated to be the busier thoroughfare of the two. I am, however, afraid that if this was agreed to, it might happen that this road would be in the way of shunting goods trains and we might find ourselves in the same difficulty as we now are at the Salt Cotaurs. The matter requires being gone carefully into. *Level-crossings on Arcot branch.*—Just outside Arcot station the line curves away through deep cutting and there is an overbridge at mile 3/10 in the middle of the cutting, in addition to this there is a level crossing at mile 3/7 just at the end of the cutting. Inquiries might be made as to the possibility of closing this level-crossing and diverting the traffic over the bridge. In the event of this being impossible, I think it would be well to interlock the level-crossing gates with the starting signal or to arrange that the stationmaster cannot start a train without having some indication that the gates are closed across the road.

10. *Engine fuel.*—Successful experiments have been made with engines burning liquid fuel, from Borneo, instead of coal. If this fuel is properly used it gives no sparks or smoke, an advantage which would, I am sure, be greatly appreciated by the travelling public, I would not, however, recommend the introduction of this fuel until not only is it proved to be economical at its present market price, but also satisfactory guarantees can be obtained that its price is likely to remain stationary or at any rate not to arise above certain maximum.

11. *Watering arrangements.*—Although the rainfall of the districts through which the railway passes was very much below the average there were not so many complaints as usual about scarcity of water for locomotive purposes. At *mile* $\frac{8}{5}$, where in previous years a great scarcity of water has been experienced, a permanent supply has now been found in the bed of the stream; on the date of the inspection this water was being baled out by picottahs and led into the old well from which it has to be pumped. A more satisfactory scheme, whereby the water can be pumped direct to the tank, should now be got out. At *Kamalapuram* the tank house has been raised. At *Kondapuram* there is some difficulty about water, but no proposals have been made for improving the supply; it would be an expensive matter to lead water from the river. At *Gooty*, the station well water is at present augmented by pumping from an auxiliary well close to a nullah at the north of the station. The water of this auxiliary well is exceedingly bad and cannot be used except when mixed with the station water. A scheme has been matured for pumping water from the river distant one mile to the north of the station. At *Adoni* the loco well was very low, proposals will, I understand, be submitted for tapping the bed of a nullah which runs close by. At *Kosgi* there was very little water in the well, but there is a good supply at Tungabhadra and the run from *Adoni* to the latter station is not excessive. At *Olavakkot* I was informed that water sometimes failed and that a scheme would be prepared for pumping from the river; there were 22 feet of water in the well on the date of inspection.

12. *Intercommunication between Passengers and Drivers of Trains.*—At present communication is affected between the guards and drivers of trains by means of Winter's patent system. By this arrangement electrical communication is effected by means of the side chains of the vehicles and 1st and 2nd class carriages are allowed access to this line of communication. In each of these carriages a button is placed which on being pressed makes contact and causes a ring on a bell placed on the engine. The buttons are protected by brass circular boxes with glass faces. A passenger in order to communicate with the driver is obliged to break the glass face and then press the button, this makes contact and causes the engine bell to give a single stroke. It is not generally known that the bell only gives a single stroke, no matter what length of time the button is kept pressed. The chief objections to this system are—

(1) That the oscillation of the engine sometimes causes the bell to ring. With a single stroke bell it is impossible for the driver to distinguish between such rings and *bonâ fide* calls by passengers who, being unacquainted with the code of signals used by the staff, usually call up the driver by giving a prolonged press to the button, thus causing a single beat on the bell. It is worthy of note also that this signal, when used by the guard simply means "attention" to be followed by some other signal, not necessarily the signal to stop, which is three regular beats. Under such conditions a driver can hardly be blamed if he ignores a signal or answers it only by asking the guard if all is right.

(2) The difficulty of breaking the protecting glass before pressing the button. This as I can answer for from experience is a serious difficulty, and in the absence of a stick or other weapon the operation is likely to seriously injure a passenger's hand.

(3) The absence of an indication to inform the guard of the particular carriage from which the signal has been given. At present there is nothing but the broken glass to indicate the button which has been pressed.

These are the principal defects which have been experienced and now as to the proper remedies. The whole question of communication between passengers and the train officials is now engaging considerable attention both in England and in India and it seems probable that a universal system will be evolved and that all railways in India will be required to introduce this system with perhaps slight modifications to suit existing apparatus. Under these circumstances a railway is naturally averse to going to considerable expense to improve their communication when a short time may see them obliged to replace their present system with something entirely fresh.

The Madras Railway Telegraph Engineer proposes for the present to improve Winter's system as follows:—

(*a*) By replacing the single stroke bells on the engines by trembling bells, which will continue ringing so long as contact continues.

(*b*) By replacing the present glass protected buttons in the first and second class carriages by plungers actuated by handles which when pulled down to make contact will be locked in that position and will thus cause the bell to ring continuously until the guard replaces the plunger by means of a special key. The plunger will also when pulled down disclose a red disc, and a glance into the carriages will be sufficient to detect the particular handle which has been pulled.

I have seen a specimen plunger designed by Mr. Pigott which acted perfectly and was simple and inexpensive.

These improvements can, I am informed be introduced at a small cost and in my opinion they will suffice for present requirements.

Of course brakevans and inspection carriages will continue to be fitted with the present buttons, so that officials will be enabled to signal to drivers by means of the Code. A continued ring on the bell will, of course, mean "stop".

J. C. LYLE,
Government Inspector of Railways.

Remarks by the Senior Government Inspector of Railways, Madras.

The general condition of affairs, as disclosed in the report, is good. I can see nothing now to prevent the work of strengthening of the bridges from going ahead satisfactorily. There is reason to hope that a consensus of opinion in regard to an universal system of signalling may soon be arrived at, and with such a system the Madras Railway Company will doubtless fall into line. The question of an over-bridge for Salt Cottaurs level-crossing has reached an acute stage and will require early settlement. The Telegraph Engineer's proposals for improving Winter's intercommunication system seem sound.

The Agent's attention is invited to the several minor matters brought to notice in the report as demanding attention.

Ootacamund,
2nd October 1899.

Francis J. E. Spring,
Senior Government Inspector of Railways.

Order—No. 1164 Ry., dated 16th October 1899.

Communicated to the Agent and Manager, Madras Railway, for information and necessary action.

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

[Here enter No. 1165 Ry., dated 16th October 1899.]

(True Extract.)

Francis J. E. Spring,
Secretary.

To the Agent and Manager, Madras Railway.
" Consulting Engineer for Railways.

Endorsement—No. 1165 Ry., dated 16th October 1899.

Forwarded.

(By order.)

Francis J. E. Spring,
Secretary.

Exd. C. M. Thumbaswmy.

RAILWAY.

Government {1899} of Madras.

PUBLIC WORKS.

H.E. and enc. A.S.H. 12.10.99 A.S.H. 14.10.99. 14-10-R

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3. *Bridges and Culverts—Tungabhadra Bridge.*—The new girders have arrived for this bridge. Some doubts were expressed as to the advisability of starting work before the question of the allocation of the expenditure has been settled. I do not see why this question should be allowed to delay the commencement of operations. I informed the Agent that in my opinion sufficient sanction had already been accorded to authorize him in putting the work in hand at once. *Bridges on Nilgiri Branch.*—The work of strengthening the bridges on this branch by putting in intermediate piers has been completed. *Tirur Bridge.*—This is one of the bridges, the strengthening of which it is intended to take in hand at an early date, but as the bridge is only just outside Tirur station at which all trains stop, I am of opinion that the strengthening may very well wait the settlement of the scheme for strengthening all bridges which appear weak when calculated by the present rules. *Other Bridges.*—I inspected several other bridges, some of which do not come up to the standard of strength now considered necessary, on these the speed of all trains is restricted.

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rails had just been relaid with 30-foot rails thus necessitating the respacing of the pots. I understood, however, that the administration had completely condemned the rails for fast running and that they had all been removed to sections where steep grades or other considerations necessitated a restriction of speed. On this inspection I was informed that 60 miles of these rails still remained on the section and were daily run over by the fast mail trains from Madras to Bangalore and Mettupalaiyam and *vice versâ* and that latterly no complaints had been received from passengers. Before noting the impressions received by me on this inspection it is well to briefly summarize the results obtained on last year's inspection which were, that in either a four-wheeled or six-wheeled carriage the oscillation at speeds exceeding 45 miles an hour was excessive and at a speed of 54 miles an hour, the greatest speed attained on that occasion, the oscillation was such as to make it extremely difficult to keep one's seat in the carriage and very likely to make a timid passenger extremely nervous, to say nothing of the discomfort. On the present occasion the train in places attained a speed of 59 miles an hour and the oscillation was almost unnoticeable; in one or two places, it is true, a sudden oscillation was set up, reminding me very forcibly of last year's experience, but the carriage almost immediately regained its previous steadiness and continued steady for the remainder of the run. The theory was then advanced that the train ran steady on the present occasion, because we were running against the grades, whereas on the previous inspection we had been running with the grades and in support of this theory it was pointed out that all the complaints which had been made had been received from passengers travelling from Bangalore or Mettupalaiyam to Madras, that is, with the grades. We had an opportunity of testing the truth or otherwise of this theory on our return at the end of the inspection. We were to run over the section laid with the new rails at night and the driver was instructed to run fast over a portion of the new rails. My personal impression was that the oscillation was inconsiderable on all parts of the line, but complaints were made the next morning by other members of the inspection party about the excessive oscillation on the section between Jalarpet and Vaniyambadi. A glance at the section in the possession of the Chief Engineer, giving the different types of rails laid, showed us that the section complained of had recently been laid with 30-foot steel rails of a pattern very closely approximating to the old Madras Railway pattern and not with rails of the State Railway pattern. Personally I am now fairly well satisfied that the Madras Railway vehicles will run smoothly over a rail of the State Railway section and that the substitution of a rail of different length for the old rail on a pot sleeper road will always cause the running of fast trains over it to be exceedingly bad until the road is thoroughly well set and the columns of earth which always form beneath the sleeper are thoroughly consolidated. The running over the old 65 lb. rails was, as usual, a bit rough, owing to the hammering at the joints caused by the sag due to the weakness of the fish plates.

6. *Ballast.*—The following table shows the progress made in covering the sand ballast with broken stone:—

	Covered to date. MILES.	Not yet covered. MILES.
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Podanur to Calicut, including Palghat Branch (This includes about 41 miles of laterite ballast)	50·28	63·34
Jalarpet to Bangalore	53·36	34·06
Arkonam to Raichur	224·20	84·08

7. *Stations—Central Station.*—Quarters for the stationmaster have been built and are now practically ready for occupation. The traverser at the end of the platforms is not giving satisfaction, it is said to be constantly jamming, it is probable that the whole road requires relaying. A cross-over road is said to be required between the two gas-works sidings, it appeared to me that this would diminish the already restricted standing room and it seemed possible to curve the outside line into the inner one so as to form a loop. *Salt Cotaurs.*—The wagon turntables of the goods shed have all been condemned and new ones indented for. The present shunting neck is only of sufficient length to hold half a train and the result is that shunting is carried on on the

main line and across a level-crossing, this is most objectionable and will be further dealt with under the head level-crossings. *Washermanpet.*—Pending settlement of the situation for a joint engine shed near this station, it would be well if building on land likely to be required could be prevented. The land on which the present plague camp is situated will probably be required. *Royapuram.*—A carriage dock for the East Coast Railway has been built. A platform for the beach extension has been completed. Coal now comes in considerable quantities down the East Coast Railway, at present this has to be shunted into the stores sidings to be weighed and consequently these sidings are often blocked. If it is intended to continue dealing with this coal at Royapuram, coal sidings might be laid west of the Mill road over-bridge, where land is available and a weigh bridge erected. A stand pipe is stated to be necessary for filling the East Coast Railway carriage tanks. The building of the new audit rooms over the printing office is in progress, the second floor rooms are complete and only the third floor remains under construction. *Avadi.*—There is a large passenger traffic at this station, 11,000 passengers were booked during June, mostly to Madras, the line being a double one, an overbridge would be a convenience even if it is not an absolute necessity. *Tinnanur.*—Waste land abuts right against the platform on the north-west side. The station compound might be squared off by taking up some of this land. *Mosur.*—A station-house and stationmaster's quarters are to be built here. *Ponpadi.*—The station-house is being built in a catch water drain, there is sufficient land to divert this drain through, though a better job of it could be made by acquiring a narrow extra strip. *Taduku.*—A trial station situated in cutting on a curve, it is not a nice place for a station, but it is on the only bit of level available. *Renigunta.*—Engines continue to stable here, partly owing to the lack of staff quarters at Nandalur and partly owing to the difficulty of arranging a suitable time-table. As soon as these difficulties are removed, a portion of the engine shed will be demolished and the materials taken to Nandalur to enlarge the shed there. *Nandalur.*—The platform line which has previously been reported as low has not yet been raised. Signaller's bungalow and signaller's office in station are required. Another entrance to the engine shed would be a great convenience, the engine shed is situated near the north of the station and the entrance leaves the through siding at the south end. *Cuddapah.*—Now that this has ceased to be an engine-changing station the turntable, siding and engine shed lines can all be taken up. *Yerrayudipad.*—This is a new station similar to several other stations not long opened, trains cannot cross, but there is a laybye for wagons, the points lever and the signals (two arms on one post) are both locked by a Whitney's point bolt lock. Only one key is used. This key cannot be removed from the signal lock unless the signals are at danger nor can it be removed from the point lock except when the points are locked to main line. This arrangement is now preferred to and being substituted for the ordinary Annetts' lock. *Wallajah Road*, late Arcot station. There is a cross over road from the main line to the new Arcot branch, the points of which are efficiently interlocked with the signals. An overbridge for passengers appears necessary between the up and down main line platforms, the down platform being an island platform which also serves the branch. There is a siding between the two platform lines which is used for stabling wagons on and thus often blocks the rail level-crossing. *Arcot.*—This station is now complete with the exception of the goods loading bank which requires widening, ramping at the Arcot end and a fence to prevent carts from going down the slopes. *Jalarpet.*—It is proposed to gradually enclose by a wall the portion of the new land on the south side which is close to the public road running through the station compound. A length of 100 feet will be budgeted for per annum. A number of huts have been built close up to the station boundary, indeed, this seems likely to become a village of some importance. Great complaints are made by the railway people concerning the sanitary condition of these huts and the road which runs through them.—*Lokur.*—As no good water-supply can be obtained here, the scheme for stabling the ghât engines at this station instead of Mallapuram must, I am afraid, be given up. As it is a crossing station for passenger trains, a latrine is stated to be required. *Annangur.*—The receipts justify the building of a platform here. *Totiyapalaiyam.*—A platform has been sanctioned, and present receipts point to the necessity for a station-house and latrine. Land on the

north side will be required. *Ingur.*—The receipts of this station justify the building of a platform, but as the present site is on a high bank, it is proposed to shift the station to begin at mile 255/10, where the grade is 1 in 659, and the station will be in slight cutting. *Mettupalaiyam.*—The Nilgiri Railway begins to curve away before it reaches the end of the straight platform, and it has been suggested that the portion of the platform from the point where the line begins to curve should be fenced off. I do not consider this either necessary or advisable. A road is stated to be required to the transhipping platform; this can easily be made at the back of the buffer stops. Quarters are required for the Locomotive Department, and land for these should be acquired on the west of the line. The available land to the east will all be required for the traffic staff. *Olavakkot.*—Complaints have been received from passengers about the want of shelter on the portion of the platform which serves the Palghat branch. One hundred feet length of shed on single rail-posts, similar to the Connur shed, might be erected. *Tirur.*—The goods shed here is to be raised. Some extra land might be acquired on the south side of the platform; it is lying waste. *Kallaye.*—The timber traffic appears to be increasing, and more siding and shed accommodation is required. *Bangalore City.*—The extra land to the north of the station has been handed over and is to be enclosed by a wall. An overbridge for the public road will have to be built. The approach road to the west side of the station has been widened. It is proposed to take up a portion of the so-called garden at the back of the police station, clear away the trees and metal it. *Bowringpet.*—An estimate will be submitted for draining this station yard—apparently a very necessary work. *Nine Reefs.*—On the new alignment of the Kolar Gold Fields branch just opposite mile 5 of the present line will be placed a new station to be called "Nine Reefs." A plan of the proposed station has been prepared, and the ground was marked off for the inspection. The arrangements will, I think, require considerable modification. The station site is on sidelong ground with a nullah to be bridged at the west end and a deep cutting at the east. A road exists crossing the centre line almost at right angles near the east boundary. The proposed plan showed the passenger platform on the south or up-stream side of the line and the sidings on the north or down-stream side, but the Agent suggested, and I think rightly, reversing these positions. It will be much easier to extend sidings on the up-stream side. It will also probably be found convenient to carry the existing road over the railway on an overbridge as the cutting will be deep where the road now runs.

8. *Signals.*—Some time ago a train over-ran Timmancherla station, and I gathered from the evidence given at the joint enquiry that mixed trains do not always stop at certain stations; the driver may get instructions that he is to stop at a certain station or that he is to run through it, or he may not. In the latter case, as both distant and home signals are lowered whether he is to stop or not, he has nothing to guide him until he sights the starter. If this is at danger, it must often be too late for him to stop his train at the platform, especially if he has made up his mind that he is to run through. I do not say that this was the cause of the driver overrunning Timmancherla the other day, in fact, I believe it was not, but as considerable discussion has lately been going on about the best system of signalling, I think it is well to note any defects which may be brought to light in a joint inquiry or otherwise. At *Guntakal*, the home signals which used to be located on the roof of the station building have been removed. The two so-called auxiliary home signals are to have double arms put on, one for the main and one for the loop. The signal controlling the exit from the tranship yard remains as previously reported. I do not think there will be any danger of a driver mistaking it for the home signal when the latter is furnished with two arms. *At Bowringpet*, I noticed three starting signals to control trains leaving to the south, one electric starter for main line trains, one ordinary starter for Kolar Gold Fields trains, and one which was apparently the starter for the main line trains before the electric signal was erected,—the last should be removed. I also noticed that the engine of a train waiting for its signal to proceed on the Kolar Gold Fields line was some way in front of its starter. I very much doubt if this starter is ever used, if such a signal is thought necessary it should be placed farther away. I do not see that it matters a bit whether it fouls the cross-over road or not.

9. *Level-crossings.*—The question of the crossing of several roads within the limits of Madras City must soon be taken up. At *Elephant Gate crossing*, a footbridge for passengers has been erected. The new extension of the Madras Tramway Company now runs along this road: at the time of my inspection the tram lines were laid up to the railway on each side and the completion was only waiting the laying of the timber trestles by the Railway Company. I have not heard any complaints about the stoppage of road traffic at this station, although this traffic appears considerable. *Basin Road level-crossing.*—Constant complaints have been made about the delay caused to road traffic by the shunting of trains over this crossing which is close to Salt Cotaurs goods station. There is a shunting neck which is not of sufficient length to hold a full train, and trains therefore shunt on the main line and are constantly blocking the road. As, however, the shunting neck cannot be lengthened without crossing the road, its lengthening would not help matters. I am of opinion that the only way out of the difficulty is to build a main road overbridge and this should, I think, be designed to cross four lines of rails. It is certainly wrong to have a level-crossing fouling the shunting neck of the busiest goods station on the railway. *Crossing opposite Massey & Co.'s works.*—The crossing here is only about 9 feet wide, and the confusion which reigns when the gates are opened with a block of traffic at each side may be imagined. The Railway authorities have agreed to put in double gates and double the width of the crossing. This should be done at once. *Mill Road.*—This road, which is just outside Ráyapuram station, is carried over the railway on an overbridge, and this will block railway developments at Ráyapuram in connection with the Beach and East Coast Railway traffic. The Agent suggests removing this bridge and in its place constructing a bridge for the Monegar Choultry Road which is stated to be the busier thoroughfare of the two. I am, however, afraid that if this was agreed to, it might happen that this road would be in the way of shunting goods trains and we might find ourselves in the same difficulty as we now are at the Salt Cotaurs. The matter requires being gone carefully into. *Level-crossings on Arcot branch.*—Just outside Arcot station the line curves away through deep cutting and there is an overbridge at mile 3/10 in the middle of the cutting, in addition to this there is a level crossing at mile 3/7 just at the end of the cutting. Inquiries might be made as to the possibility of closing this level-crossing and diverting the traffic over the bridge. In the event of this being impossible, I think it would be well to interlock the level-crossing gates with the starting signal or to arrange that the stationmaster cannot start a train without having some indication that the gates are closed across the road.

10. *Engine fuel.*—Successful experiments have been made with engines burning liquid fuel, from Borneo, instead of coal If this fuel is properly used it gives no sparks or smoke, an advantage which would, I am sure, be greatly appreciated by the travelling public, I would not, however, recommend the introduction of this fuel until not only is it proved to be economical at its present market price, but also satisfactory guarantees can be obtained that its price is likely to remain stationary or at any rate not to arise above certain maximum.

11. *Watering arrangements.*—Although the rainfall of the districts through which the railway passes was very much below the average there were not so many complaints as usual about scarcity of water for locomotive purposes. At *mile* $\frac{82}{5}$, where in previous years a great scarcity of water has been experienced, a permanent supply has now been found in the bed of the stream; on the date of the inspection this water was being baled out by picottahs and led into the old well from which it has to be pumped. A more satisfactory scheme, whereby the water can be pumped direct to the tank, should now be got out. At *Kamalapuram* the tank house has been raised. At *Kondapuram* there is some difficulty about water, but no proposals have been made for improving the supply; it would be an expensive matter to lead water from the river. At *Gooty*, the station well water is at present augmented by pumping from an auxiliary well close to a nullah at the north of the station. The water of this auxiliary well is exceedingly bad and cannot be used except when mixed with the station water. A scheme has been matured for pumping water from the river distant one mile to the north of the station. At *Adoni* the loco well was very low, proposals will, I understand, be submitted for tapping the bed of a nullah which runs close by. At *Kosgi* there was very little water in the well, but there is a good supply at Tungabhadra and the run from *Adoni* to the latter station is not excessive. At *Olavakkot* I was informed that water sometimes failed and that a scheme would be prepared for pumping from the river; there were 22 feet of water in the well on the date of inspection.

12. *Intercommunication between Passengers and Drivers of Trains.*—At present communication is affected between the guards and drivers of trains by means of Winter's patent system. By this arrangement electrical communication is effected by means of the side chains of the vehicles and 1st and 2nd class carriages are allowed access to this line of communication. In each of these carriages a button is placed which on being pressed makes contact and causes a ring on a bell placed on the engine. The buttons are protected by brass circular boxes with glass faces. A passenger in order to communicate with the driver is obliged to break the glass face and then press the button, this makes contact and causes the engine bell to give a single stroke. It is not generally known that the bell only gives a single stroke, no matter what length of time the button is kept pressed. The chief objections to this system are—

(1) That the oscillation of the engine sometimes causes the bell to ring. With a single stroke bell it is impossible for the driver to distinguish between such rings and *bonâ fide* calls by passengers who, being unacquainted with the code of signals used by the staff, usually call up the driver by giving a prolonged press to the button, thus causing a single beat on the bell. It is worthy of note also that this signal, when used by the guard simply means "attention" to be followed by some other signal, not necessarily the signal to stop, which is three regular beats. Under such conditions a driver can hardly be blamed if he ignores a signal or answers it only by asking the guard if all is right.

(2) The difficulty of breaking the protecting glass before pressing the button. This as I can answer for from experience is a serious difficulty, and in the absence of a stick or other weapon the operation is likely to seriously injure a passenger's hand.

(3) The absence of an indication to inform the guard of the particular carriage from which the signal has been given. At present there is nothing but the broken glass to indicate the button which has been pressed.

These are the principal defects which have been experienced and now as to the proper remedies. The whole question of communication between passengers and the train officials is now engaging considerable attention both in England and in India and it seems probable that a universal system will be evolved and that all railways in India will be required to introduce this system with perhaps slight modifications to suit existing apparatus. Under these circumstances a railway is naturally averse to going to considerable expense to improve their communication when a short time may see them obliged to replace their present system with something entirely fresh.

The Madras Railway Telegraph Engineer proposes for the present to improve Winter's system as follows:—

(*a*) By replacing the single stroke bells on the engines by trembling bells, which will continue ringing so long as contact continues.

(*b*) By replacing the present glass protected buttons in the first and second class carriages by plungers actuated by handles which when pulled down to make contact will be locked in that position and will thus cause the bell to ring continuously until the guard replaces the plunger by means of a special key. The plunger will also when pulled down disclose a red disc, and a glance into the carriages will be sufficient to detect the particular handle which has been pulled.

I have seen a specimen plunger designed by Mr. Pigott which acted perfectly and was simple and inexpensive.

These improvements can, I am informed be introduced at a small cost and in my opinion they will suffice for present requirements.

Of course brakevans and inspection carriages will continue to be fitted with the present buttons, so that officials will be enabled to signal to drivers by means of the Code. A continued ring on the bell will, of course, mean "stop".

J. C. LYLE,
Government Inspector of Railways.

No. 1164 Ry., 16th October 1899.

Remarks/-

work of 3/.

Note by the Senior Government Inspector of Railways, Madras.

The general condition of affairs, as disclosed in the report, is good. I can see nothing now to prevent the strengthening of the bridge from going ahead satisfactorily. There is reason to hope that a consensus of opinion in regard to an universal system of signalling may soon be arrived at, and with such a system the Madras Railway Company will doubtless fall into line. The question of an over-bridge for Salt Cottaurs level-crossing has reached an acute stage and will require early settlement. The Telegraph Engineer's proposals for improving Winter's intercommunication system seem sound.

The Agent's attention is invited to the several minor matters brought to notice in the report as demanding attention.

OOTACAMUND,
2nd October 1899.

FRANCIS J. E. SPRING,
Senior Government Inspector of Railways.

A.E.H. 12.10.99

ORDER—No. 1164 Ry., dated 16th October 1899.

Communicated to the Agent and Manager, Madras Railway, for information and necessary action.

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

[Here enter No. 1165 Ry., dated 16th October 1899.]

(True Extract.)

FRANCIS J. E. SPRING,
Secretary.

To the Agent and Manager, Madras Railway.
" Consulting Engineer for Railways.

ENDORSEMENT—No. 1165 Ry., dated 16th October 1899.

Forwarded.

(By order.)

Despatched on 24-10-99

F.V.S. (initials)

Secretary.

11/10/99

Exd. C. M. Thumbusawmy.

Proof copy placed in Sanction form 18/2/99

Madras Railway

A.R. Please fill this / Ascertain the length of the Ancot branch only has to be added to bg & give last report

Standard, 5' 6", gauge. 853·22 miles.

Total mileage open to traffic

Inspection Report for the half year ending 30th June 1899

1. The inspection was made between the 7th & 12th August and 22nd August to 2nd September. The Agent & Chief Engineer accompanied the party throughout, the Traffic Manager during a portion of the time and the Locomotive Superintendent during part of the inspection & his Deputy for the remainder.

Formation

2. Banks & Cuttings are well maintained throughout, the failure of the June rains, of course, prevented account for the absence of any weak places in the formation. For instance the Tungabadra bank over which the running is not usually up to the usual standard of excellence was on this occasion in very good running order.

Pitching of the slopes of banks on the Ancot branch was in progress.

3. Bridges & Culverts. Tungabadra Bridge

The new girders have arrived for this bridge. Some doubts were expressed as to the advisability of starting work before the question of the allocation of the expenditure has been settled. I do not see why this question should be allowed to delay the

commencement of operations. I informed the Agent that in my opinion sufficient sanction had already been accorded to authorize him in putting the work in hand at once.

Bridges on Nilgiri Branch The work of strengthening the bridges on this branch by putting in intermediate piers has been completed.

Tirur Bridge This is one of the bridges, the strengthening of which it is intended will have to be taken in hand at an early date, but as the bridge is only just outside Tirur station at which all trains stop, I am of opinion that the strengthening may very well wait the settlement of the scheme for strengthening all bridges which are weak when calculated by the present rules.

Other bridges I inspected several other bridges some of which do not come up to the standard of strength now considered necessary, on these the speed of all trains is restricted.

4. Painting of girders I was able to gather very little information during my inspection on the efficacy of the various kinds of paints. The girders on the Madras Railway are after erection painted with a mixture of tar & Kerosine oil. This appears to require renewal after about 7 years. The proportions of the ingredients is not laid down, it appears to depend upon the consistency of the tar supplied. All these girders were painted in England before despatch with a coating of linseed oil and one of red lead. These coats appear never to be renewed in India.

5. Rails In my inspection report for the half year ending 30th June 1898 I gave the results of running at high speeds over the rails with a large radius table, similar to the State Railway section, which had been laid between Katpadi and Jalarpet. The general opinion at that time was that the excessively bad running oscillation which occurred in trains running at high speeds & which was constantly complained of by passengers was caused by the wheel tires not fitting the table of the rails. With this opinion I was not disposed to unreservedly agree, as it appeared to me that good results running could not be expected where a pot sleeper road, previously laid with 20 foot rails had just been relaid with 30 foot rails thus necessitating the respacing of the pots. I understood however that the Administration had completely condemned the rails for fast

running and that they had all been removed to
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I was informed that 60 miles of these
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summarize the results obtained on last
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in the carriage & very likely to make
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say nothing of the discomfort. On the
present occasion the train in places
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in one or two places it is true a sudden
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carriage almost immediately regained its
previous steadiness & continued steady for
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then advanced that the train ran steady
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previous inspection we had been running
with the grades and in support of this
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night & the Driver was instructed to
run fast over a portion of the new rails.
My personal impression was that the oscillation
~~I am afraid the oscillation was not sufficient~~
was inconsiderable on all parts of the line
~~to create any impression on my mind~~
as I slept through the whole of it, but
complaints were made the next morning
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about the excessive oscillation on the
section between Jalarpet & Vaniyambadi.
A glance at the section in the possession

of the Chief Engineer giving the different types of rails laid showed us that the section complained of had recently been laid with 30 foot steel rails of a pattern very closely approximating to the old Madras Railway pattern & not with rails of the State Railway pattern. Personally I am now fairly well satisfied that the Madras Railway vehicles will run smoothly over a rail of the State Railway section and that the substitution of a rail of different length for the old rail on a pot sleeper road will always cause the running of fast trains to owe it to be exceedingly bad until the road is thoroughly well set & the columns of earth which always form beneath the sleeper are thoroughly consolidated. The running over the old 65 lb rails was, as usual, a bit rough, owing to the hammering at the joints caused by the sag due to the weakness of the fish plates.

6. Ballast The following table shows the progress made in covering the sand ballast with broken stone

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6. Stations Central Station Quarters for the Station Master have been built & are now practically ready for occupation. The traverser at the end of the platforms is not giving satisfaction it is said to be constantly jamming, it is probable that the whole road requires relaying. A cross-over road is said to be required between the two gas-works sidings, it appeared to me that this would diminish the already restricted standing room, it seemed possible to curve the outside line into the inner one so as to form a loop.

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Washermanpet Pending settlement of the situation for a joint Engine shed near this station it would be well if building on land likely to be required could be prevented. The land on which the present plague camp is situated will probably be required.

Royapuram A carriage dock for the East Coast Railway has been built. A platform for the Beach extension has been completed

coal now comes in considerable quantities down the East Coast Railway, at present this has to be shunted into the stores sidings to be weighed & consequently these sidings are often blocked. If it is intended to continue dealing with this coal at Rayapuram, coal sidings might be laid West of the Mill Road overbridge, where land is available and a weigh bridge erected. A stand pipe is stated to be necessary for filling the E. C. R carriage tanks. The building of the new audit rooms over the printing office are in progress, the 2nd floor rooms are complete & only the 3rd floor remains under construction.

~~Pacumbu Road~~ Avadi There is a large passenger traffic at this station, 11,000 passengers were booked during June, mostly to Madras, the line being a double one, an overbridge would be a convenience even if it is not an absolute necessity.

Tiruvanur Waste land abuts right against the platform on the North West side. The station compound might be squared off by taking up some of this land.

Mosur. A station house & Station Masters Quarters are to be built here.

Pompadi The station house is being built in a catch water drain, there is sufficient land to divert this drain through, though a better job of it could be made by acquiring a narrow extra strip

3

Tadukur A brick station situated in cutting on a curve, it is not a nice place for a station but it is on the only bit of level available. Renigunta Engines continue to be stable here, partly owing to the lack of staff quarters at Nandalur & partly owing to the difficulty of arranging a suitable timetable. As soon as these difficulties are removed, a portion of the Engine shed will be demolished and the materials taken to Nandalur to enlarge the shed there. Nandalur The platform line which has previously been reported as low has not yet been raised. Signallers bungalow & signallers office in station are required. Another entrance to the Engine shed would be a great convenience, the Engine shed is situated near the North of the station & the entrance is — leaves the through siding at the South end. Cuddapah Now that this has ceased to be an Engine changing station the turntable, siding & Engine shed lines can all be taken up. Jonnagudipad This is a new station similar to several other stations not long opened, traffic cannot cross, but there is a layby for wagons, the points, lever & the signals (two arms on one post) are both locked by a Whitney's point bolt lock. Only one key is used

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This key cannot be removed from the signal lock unless the signals are at danger nor can it be removed from the point lock except when the points are locked to main line. This arrangement is now proposed to be being substituted for the ordinary Annetts' lock

Godey The old well in the station yard is gradually falling in. Water is at present pumped from an auxiliary well close to a nullah to the North of the station. These arrangements are, however, only temporary as it is intended eventually to bring water from the river one mile to the North of the station.

Tirumandankudi The reason for the necessity of this is that the water of the auxiliary well has proved so bad that it has to be mixed with station well water before being used. Vallajah Road late Arcot station. There is a cross over road from the main line to the new Arcot branch, the points of which are efficiently interlocked with the signals. An overbridge for passengers appears necessary between the up & down main line platforms, the down platform being an island platform which also serves the branch. There is a siding between the two platform lines which is used for stabling wagons on & thus often blocks the rail level crossing. Arcot This station is now complete with the exception of the goods loading bank which requires

E

widening, ramping at the Arcot end and a fence to prevent to protect carts from going down the slopes. Jalarpet It is proposed to gradually enclose by a wall on the south side the portion of the new land which is close to the public road running through the station compound. A length of 100 feet will be budgetted for per annum. A number of huts have been built close up to the station boundary, indeed, this seems likely to become a village of some importance. Great complaints are made by the Railway people concerning the sanitary condition of these huts and the road which runs through them. Mallapuram. There was some talk of taking up the catch siding laid here, because, apparently a train had once gone over the end. This catch siding has, I believe, served its purpose & it would be a pity now to remove it, the bank should be widened at & near the end of the rails. The train that did go over the edge would not have done so, I believe, if the bank had been traffic of correct width. Dorkum As no good water supply can be obtained here the scheme for stabling the ghat Engines at this station instead of Mallapuram must, I am afraid, be given up. As it is a crossing station for passenger trains a latrine is stated to be required

Annangun The receipts justify the building of a platform here. Tolaypalaiyan A platform has been sanctioned & present receipts point to the necessity for a station house & latrine. Land on the South side will be required.

Ingur The receipts of this station justify the building of a platform but as the present site is on a high bank it is proposed to shift the station to begin at mile 255/10 where the grade is 1 in 659 & the station will be in slight cutting.

Metapalaiyam The Nilgiri Railway begins to curve away before it reaches the end of the straight platform & it has been suggested that the portion of the platform from the point where the line begins to curve should be fenced off. I do not consider this either necessary or advisable.
A road is stated to be required to the transhipping platform, this can easily be made at the back of the buffer stops.
Quarters are required for the Locomotive Department & land for these should be acquired on the West of the line.
The available land to the East will all be required for the Traffic Staff.

Olavakkot Complaints have been received from passengers about the want of shelter on the portion of the platform which serves the Palghat branch. 100 feet length of shed on single rail posts similar to the Coonoor shed may be erected.

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Tirur The goods shed here is to be raised. Some extra land might be acquired on the South side of the platform, if it is lying waste.

Kallaye The timber traffic appears to be increasing & more siding & shed accommodation is required. Bangalore City The extra land to the North of the station has been handed over & is to be enclosed by a wall. An overbridge for the public road will have to be built. The approach road to the West side of the station has been widened. It is proposed to take up a portion of the so called garden at the back of the police station, clear away the trees & metal it.

Bowringpet An estimate will be submitted for draining this station yard, apparently a very necessary work. Nine Reefs On the new alignment of the Kolar Gold Fields branch just opposite mile 5 of the present line will be placed a new station to be called "Nine Reefs". ~~The ground~~ A plan of the proposed station has been prepared & the ground was marked off for the inspection. The arrangements will, I think, require considerable modification. The station site is on sidelong ground with a nullah to be bridged at the West end & a deep cutting at the East. A road exists crossing the centre line almost

at right angles near the East boundary.
~~It will probably be found convenient to~~
place The proposed plan showed the passenger
platform on the South or up stream side of
the line & the sidings on the North or
down stream side but the Agent suggested,
& I think rightly, reversing these positions
It will be much easier to extend sidings
on the up stream side. It will also
probably be found convenient to carry the
existing road over the Railway road on an overbridge
as the cutting will be deep where the road
now runs.

Signals. Some time ago a train overran
Tenmanchala station and I gathered from
the evidence given at the joint enquiry
that ~~it~~ mixed trains do not always
stop at certain stations, the Driver may
get instructions that he is to stop at
a certain station or that he is to run through
it, or he may not. In the latter case,
as both distant & home signals are
lowered whether he is to stop or not,
he has nothing to guide him until
he sees lights the station. If this is at
dangr it must often be too late
for him to stop his train at the platform
especially if he has made up his mind
that he is to run through. I do not say
that this was the cause of the Driver
overrunning Tenmanchala the other day
in fact, I believe it was not, but as considerable
discussion has lately been going on about the
best system of signalling, I think it is well to
note any defects which may be brought to
light in a Joint Enquiry or otherwise.

At Guntakal the home signals which used to
be located on the roof of the station building
have been removed. The two so called auxiliary
home signals are to have double arms just
as then one for the main & one for the loop.
The signal controlling the exit from the transhipping
yard remains as previously reported. I do
not think there will be any danger of a
Driver mistaking it for the home signal as
the latter is furnished with two arms.

At Bowringpet I noticed three starting signals
to control trains leaving to the South, one electric
starter for the main line trains, one ordinary
starter for K.G. & trains & one which was
apparently the starter for the main line trains
before the electric signal was erected, the last
should be removed. I also noticed that the
Engine of a train waiting for its signal to
proceed on the K. G. & line was some way in
front of its starter. I very much doubt if
this starter is ever used, if such a signal
is thought necessary it should be placed
further away. I do not see that it matters
a bit whether it fouls the crossover road
or not.

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[S. P. W. Ry.]
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Level Crossings. The question of the crossing of several roads within the limits of Madras must soon be taken up. At Elephant Gate crossing a footbridge for passengers has been erected. The new extension of the Madras Tramway Company now runs along this road, at the time of my inspection the tram lines were laid up to the railway on each side & the completion was only waiting the laying of the timber trestles by the Railway Company. I have not heard any complaints about the stoppage of road traffic at this station although this traffic appears considerable. Basin Road Level Crossing. Constant complaints have been made about the delay caused to road traffic by the shunting of trains over this crossing. The crossing is close to the Salt Golaums goods station & although there is a shunting neck it is not of sufficient length to hold a full train; the result is that trains shunt on the main line & are constantly blocking the road. The shunting neck cannot be lengthened without crossing the road which would not help matters. I am of opinion that the only way out of the difficulty is to build an overbridge & this should

5/1

I think, be designed to cross four lines of rails. It is certainly wrong to have a level crossing fouling the shunting neck of the busiest goods station on the Railway.

Crossing opposite Massey & Co's Works. The crossing here is only about 9 feet wide & the confusion which reigns when the gates are opened with a block of traffic at each side may be imagined. The Railway authorities have agreed to put in double gates & double the width of the crossing. This should be done at once.

Mill Road This road which is just outside Royapuram Station is carried over the railway on an overbridge & this will block Railway developments at Royapuram in connection with Beach & E. C. Railway traffic. The Agent suggests removing this bridge & in its place constructing a bridge for the Ironegar Choultry Road which is stated to be the busier thoroughfare of the two. I am, however, afraid that if this was agreed to, it might happen that this road would be in the way of shunting goods trains & we might find ourselves in the same difficulty as we now are at the Salt Golaums.

Level Crossings on Arcot branch Just outside Arcot station the line curves away through

deep cutting & there is an overbridge at mile 3/10 in the middle of the cutting, in addition to this there is a level crossing at mile 3/7 just at the end of the cutting. Enquiries might be made as to the possibility of closing this level crossing & diverting the traffic over the bridge. In the event of this being impossible I think it would be well to interlock the level crossing gates with the starting signal so to arrange that the station master cannot start a train without having some indication that the gates are closed across the road.

Engine fuel Experiments have been made with engines burning crude petroleum instead of coal with fairly satisfactory results. If this fuel is properly used it gives no sparks or smoke, an advantage which would I am sure be greatly appreciated by the travelling public, I would not however recommend the introduction of this fuel until it is not only proved to be economical at its present market price, but also satisfactory guarantees can be obtained that its price is likely to remain stationary or at any rate not rise above a certain maximum.

Watering arrangements. Although Although the rainfall of the districts through which the Railway passes was very much below the average there were not so many complaints as usual about scarcity of water for locomotive purposes. At mile 82/5, where in previous years a great scarcity of water has been experienced, a permanent supply has now been found in the bed of the stream, but on the date of the inspection this water was being baled out by pacotahs & led into the old well from which it has to be pumped. A more satisfactory scheme whereby the water can be pumped direct to the tank should now be got out. At Ramalapuram the tank house has been raised. At Kondapuram there is some difficulty about water but no proposals have been made for improving the supply, it would be an expensive matter to lead water from the river. At Gooty The station well water is at present augmented by pumping from an auxiliary well close to a nullah at the north of the station. The water of this auxiliary well is exceedingly bad & cannot be used except when mixed with the station water. A scheme has been matured for pumping water from the river distant one mile to the north of the station. At Adoni the loco well was very low, proposals will, I understand, be submitted

10 P

for tapping the bed of a nullah which runs close by. At Hosgi there was very little water in the well, but there is a good supply at Tungabadra & the run from F. Adoni to the latter station is not excessive. At Olavakkot I was informed that water sometimes failed & that a scheme would be prepared for pumping from the river. There were 22 feet of water in the well on the date of inspection.

Intercommunication between passengers & Drivers of trains.

At present communication is effected between the guards & Drivers of trains by means of Winter's patent system. By this arrangement electrical communication is effected by means of the side chains of the Vehicles & 1st & 2nd class carriages are allowed access to this line of communication. In each of these carriages a button is placed which on being pressed makes contact & causes a ring on a bell placed on the Engine. The buttons are protected by brass circular boxes with glass faces. A passenger in order to communicate with the Driver is obliged to break the glass face & then on press the button, this makes contact & causes the Engine bell to give a single stroke.

It is not generally known that the bell only gives a single stroke no matter what length of time the button is kept pressed. The chief objections in this system method experienced are

+ (1) that the oscillation of the Engine sometimes causes the bell to ring & with a single stroke bell it is impossible for the Driver to distinguish between such rings & bona fide calls by passengers who, being unacquainted with the code of signals used by the staff, usually call up the driver by giving a prolonged continued press to the button thus causing a single beat on the bell. It is worthy of note also that this signal when used by the guard simply means "attention" to be followed by some other signal, not necessarily the signal to stop, which is 3 three regular beats. Under such conditions a Driver can hardly be blamed if he ignores a signal or answers it only by asking the guard if all is right.

(2) The difficulty of breaking the protecting glass before pressing the button, this I can answer for from experience is a serious difficulty & in the absence of a stick or other weapon the operation is likely to seriously injure a passenger's hand.

(3) The absence of an indication to inform the

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guard of the particular carriage from which signal has been given. At present there is nothing but the broken glass to indicate the button which has been pressed.

These are the principal defects which have been experienced & now as to the proper remedies.

The whole question of communication between passengers & the train officials is now engaging considerable attention both in England & in India & it seems probable that a universal system will be evolved & that all railways in India will be required to introduce this system with perhaps slight modifications to suit existing apparatus. Under these circumstances a railway is naturally averse to going to considerable expense to improve their communication when a short time may see them obliged to replace their present system with something entirely fresh.

The Madras Railway Telegraph Engineer proposes for the present to improve Winter's system as follows

(a) by replacing the single stroke bells on the Engines by trembling bells which will continue ringing so long as contact continues.

(b) by replacing the present glass protected buttons in the 1st & 2nd class carriages by plungers actuated by handles which when pulled down to make contact will be locked in that position & will thus cause the bell to ring continuously until the guard replaces the plunger by means of a special key, the plunger will also when pulled down down disclose a red disc & a glance into the carriages will be sufficient to detect the particular handle which has been pulled.

I have seen a specimen plunger designed by Mr. Pigott which acted perfectly & was simple & inexpensive.

These improvements can, I am informed be introduced at a small cost & in my opinion they will suffice for present requirements.

Of course brakevans & Inspection carriages will continue to be fitted with the present buttons so that officials will be enabled to signal to Drivers by means of the code. A continued ring on the bell will, of course, mean "stop".

J. C. Lyle
Govt Inspecting Engr

Madras Railway

Renewals of Permanent Way during the Half year Ending 30th June 1899.

During the half year ending 30th June 1899, 21.050 miles of Rails (of which 8.575 miles were worn out) were replaced by:-

		miles
1,766 -	Bull headed 30 ft Steel Rails	(= 5.017)
5,233½ -	New 42" Hand 20 ft & other Double headed Steel Rails	(= 9.855)
3,274½ -	2" Hand Double headed Iron Rails 20 ft & others	(= 6.178)
10,274		21.050

Covering Band ballast with Broken Stone.

Section	Covered to date	Not yet covered
	miles	miles
Madras to Mettupalayam.	327.33	Nil
Podanur to Calicut including Palghat Br: This includes about 41 miles with Laterite Ballast	59.28	63.34
Jalarpet to Bangalore	53.36	34.06
Arkonam to Raichur	224.20	84.08
Total	655.17	181.48

Madras Railway Co:
Chief Engineer's Office
Madras 7th September 1899

E. Stevens
Chief Engineer's

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ENC. No. 1 TO E. R's. C. No. 4702 OF 1899
LETTER No. G1034 D. 1.9.99
FROM Chief Engineer, M. & S. Ry.

Note of the Senior Govt. Inspector of Rly. Roads.

The general condition of affairs, as disclosed in the Report, is good. I can see nothing now to prevent the strengthening of the bridge from going ahead satisfactorily. There is room to hope that a conclusion of opinion in regard to an improved system of signalling may soon be arrived at, and with such system the Madras R.C. will doubtless fall into line. The question of an over-bridge for Salt Cotton had arrived at an acute stage and will require early settlement. The telegraph engineer's proposals for improving Wattis' intercommunicating system seem sound.

The Report attached is invited to the several remarks which the Inspector has noted in the report as deserving attention.

Ootacamund
2nd October 1899

Jlls.
Senr. I. G.
2/10/99

Approved G.O.

Order No. R. dated October 1899.
Communicated to the Agent & Manager, Madras Railway, for information and necessary action.
2. A copy of these Proceedings will be forwarded for the information of the Government of India.

To Agt. E.R.

No. R. dated October 1899.
Forwarded.

Secretary 3/10/99