

(1) Number of pages _____
(2) Date of repair _____
(3) Initials of the Referencer _____

MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No.	1027-28 (R)	Press
B.P. No.		Mis.
Dated	24-4	1876

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
24th April 1876.*

No. 337. Read the following letter from Lieutenant-Colonel J. H. M. SHAW-STEWART, R.E., Consulting Engineer for Railways, to Major-General G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Madras, 4th April 1876, No. 171:—

ADVERTING to the Proceedings of Government, under date the 6th November 1875, No. 3,171, I have the honor to lay before Government two letters from the Agent of the Madras Railway Company, with the first of which is forwarded a second memorandum, drawn up by the Chairman of the Company, upon the comparative advantages, as to first cost and permanent maintenance, of creosoted wood and cast iron pot-sleeper roads in a financial point of view.

2. In accordance with the orders of Government, Mr. Elwin submits an indent for furnishing the line between Palghaut and Beypore with sleepers of creosoted pine; and along with it, in accordance with instructions received from his Board, he also submits an alternative indent for furnishing the same section of line with cast iron pot-sleepers. These indents amount respectively to Rupees 6,48,420 and Rupees 9,10,142. Explanation regarding the manner in which these sums have been arrived at is given in the second letter from the Agent.

3. The arguments urged by the Board in support of the second of the indents are given in full in Mr. Elwin's letter, and need not be repeated here. The Directors appear to rely too much upon the suitable nature of the ballast procurable throughout the section between Palghaut and Beypore. A reference to the papers printed with the Proceedings of Government, under date the 5th October 1870, No. 2,400, and the 21st March 1872, No. 808, will show that the ballast is not generally of a kind suitable to pot-sleepers.

4. In paragraphs 5 of their letter, dated the 25th October 1875, the Government of India remark upon the data employed by the Chief Engineer of the Madras Railway in calculating the cost of the iron sub-way. In reply, it will probably be sufficient to draw attention to the Proceedings of Government noted in the margin.

No. 712, 24th Mar. 1873.
„ 1,581, 17th June „
„ 362, 14th Feb. 1874.
„ 1,053, 24th April „

It will be seen that the Government of India, after ascertaining that the price of iron had risen considerably after the preparation of the original estimate in January

1872, called upon the Madras Railway Company to state at what prices they could procure and lay iron sleepers upon their lines. In reply, the Chief Engineer stated that, taking the latest quotations available in February 1874, the cost of a road laid with pot-sleepers was Rupees 17,440 per mile; and these figures were used in the subsequent calculations.

From R. B. ELWIN, Esq., Agent and Manager of the Madras Railway Company, to Lieutenant-Colonel J. H. M. SHAW-STEWART, R.E., Consulting Engineer for Railways, dated Madras, 9th March 1876, No. 243.

ADVERTING to your letter of the 19th of November 1875, No. 1,230, and to the Proceedings of Government forwarded therewith on the subject of the employment of iron or creosoted pine sleepers on the section of line from Beypore to Palghaut, I have the honor, by desire of the

Statements and calculations now forwarded

*Proceedings of the Madras Government, Public Works Department,
24th April 1876.*

Board of Directors, to forward herewith, for the consideration of Government, a second

* Six copies enclosed.

indicated by the Government of India; and in submitting, in accordance with the orders of

† No. 234.

‡ No. 235.

number of miles of iron bowl sleepers, and to express the respectful solicitation of the Board that unless, in opposition to the statements and calculations now forwarded, there be satisfactory evidence that the iron sleepers are decidedly more costly than those of wood, the Government of India will not object to pass the indent for the former, which are now required for the restoration of the line.

2. I am to point out that about nine-tenths of the Company's lines have now been re-established, under the sanction of the Government of India, by the use of the iron sleepers, with the most satisfactory results, and that, were there no other reason for it, there would be strong grounds for completing the remainder in the same manner, to avoid destroying the unity of the system. The Directors point out that this reason would exist whether or not the locality were decidedly favorable to the use of one or other, and that it is strengthened by the fact that the section is plentifully supplied, as the Board are informed, with proper ballast for the iron sleepers, and is most unsuited, from its alternations of heat and excessive moisture, for the use of wooden ones.

3. I am also to bring to the notice of Government the fact that the iron sleepers cannot be found fault with as constituting an inefficient line, for there can be no question that where they have been used, with due regard to ballast, they form a road equal in its admirable qualities to any of the very best in India.

4. Adding to these special reasons the facts derived from late experience and the simple calculations contained in the memorandum herewith sent, that the iron sleepers are, for this special occasion, far more economical than wooden ones, and will probably turn out to be much more so than can at present be conclusively proved, the Directors trust that His Grace the Governor in Council will be persuaded to support the earnest representation they desire me to submit on their behalf of their wish to be allowed to complete the improvement they have already carried so far, instead of reverting to a form of construction and expenditure which they consider, under the circumstances of the case, open to serious objection.

5. In conclusion, I have only to add with reference to the 5th paragraph of the letter from the Government of India, embodied in G.O., No. 3,171, dated 6th November 1875, that the figures referred to were adopted by the late Mr. Goings in 1872—a time when the price of iron was exceptionally high—in deference to the wishes of the Government of India, and that these figures were retained in subsequent calculations. The average price of pig iron for the ten years previous to June 1871 was about £3 a ton, in August 1872 it reached £7 a ton, and since then it has again fallen to about £3 a ton. The last purchase of pig iron made by this Company was at the rate of £3-2-0.

MADRAS RAILWAY COMPANY.

Second Memorandum by the Chairman, on the comparative advantages, as to first cost and permanent maintenance of creosoted wood and cast iron pot-sleeper roads, in a financial point of view.

THE comparison made in my memorandum of the 4th August 1875, between the financial advantages of wood and iron sleepers was a general one, as is stated in the leading paragraph at the top of the second page. This was done because the problem determining which is, essentially, the more economical system was thought of much greater importance than the supposed saving in the first history of the particular section from which the question arose.

*Proceedings of the Madras Government, Public Works Department,
24th April 1876.*

Twelve years is but a small space in the history of a railway, and any small advantage during the first twelve years was not thought deserving of consideration in the light of the permanent economy of the future.

Colonel Shaw-Stewart, in his letter of the 31st August 1875, No. 489, remarks that the memorandum is in error when, at its close, the results obtained from the general comparison are applied to the particular section under consideration, where the question is affected by special conditions.

This remark is not altogether uncalled for, and I regret that I did not allude to the subject; but the fact is that the special conditions ought not, properly, to affect the calculation at all; for the wooden road could not be fairly credited with more than the actual *bonâ fide* value of the full stock of chairs, &c., now in hand, and that actual *bonâ fide* value might be realised from any other Company, who almost all require and use chairs in vast numbers. Moreover, whatever might be credited to the wooden road, on the one hand, must be opposed by a debit on the other of the price which would be realised for the chairs and trenails as old iron.

In my memorandum, the full prime cost of each kind of road is entered, and the value of old iron in each case credited. It was thought not to be a correct comparison to establish the iron road with chairs and trenails, which have already been in use fourteen years of their whole supposed life, and continue the calculation on the supposition that they would last as long as new ones.

Having made this explanation, I trust, as the subject is indeed one of considerable importance, that I may be permitted to offer a few remarks, in order to show that the method of calculation which I have ventured to suggest is not only critically correct and more convenient, but also is not liable to the objection of practically deviating from the truth.

And, first, with reference to the opinion expressed that the sleepers would *all* remain serviceable during the twelve or twenty-four years respectively, I beg to explain that this is the hypothesis which is proposed by me, and objected to as being less practically true than the hypothesis which assumes the sleepers to last twelve years, and calculates that one-twelfth of them perish annually. In both cases the stated periods used for calculation represent the various irregular times at which the decay actually occurs, just as the centre of gravity in mechanics represents all the particles of an irregular mass; and, in support of my assumption, I would remark that, although it is undoubtedly true that, when the sleepers last only twelve years on the average, there will, on the long run, be renewals at the rate of one-twelfth every year; yet, nevertheless, it leads to a wrong result to calculate, in respect of any particular lot laid down at a given time, that one-twelfth will perish annually within a few years. In order truly to carry out the average it is necessary that for every sleeper which fails after one year, that is eleven years short of the average, there should be another which lasts twenty-three years, or eleven years beyond the average. If one-twelfth part of a Company die every year, the average life of that Company is not twelve, but six-and-a-half years. For an average of twelve an equal number must die within and beyond it; and if all these be truly represented and calculated, the result will be precisely the same as that arrived at by using the mean period itself. Moreover, to suppose sleepers to last varying periods of from one to twenty-three years, is to suppose an irregularity of endurance which I believe is not met with in practice.

To compare these hypotheses with ascertained facts, I would refer to the 3rd paragraph of Sir John Hawkshaw's letter to the Secretary of the Eastern Bengal Railway, forwarded with Major Luard's letter of the 21st May 1874, No. 1,109 R., wherein allusion is made to the "surprise expressed that so many sleepers required renewal at about the same time," and also to the statement by the late Mr. Goings, Deputy Chief Engineer, Madras Railway, in his letter to the Agent and Manager, 4th July 1874, No. 436, forwarded to the Government of India, No. 2,580, 10th September 1874, that, according to the experience of twelve-and-a-half years, the renewals of iron sleepers had amounted, on the average, to only the one thousand six hundred and thirtieth part per annum, or less than one per cent. during the whole twelve-and-a-half years. In view of these facts, I trust that it will be allowed that an hypothesis which concentrates all the irregular and exceptional failures, both within and beyond the average, into one average period

Statements and calculations now forwarded

Boan

indi

nur

unl

Ind

of

lib

mo

gt.

de-

১৯

0123456789

1

h&

and

ca

33

G

61

to be now conceded, it would reduce the final result by Rupees 6,925.62. But then it would be necessary to reduce the value of the materials on hand by at the least $\frac{14}{24}$ ths to account for the depreciation after fourteen years' wear, adding to the apparent prime cost Rupees 2,178.75, which would increase the final result by Rupees 7,026.

Prime cost of the road	Rs. 10,836
Deduct value of the present chairs and trenails,	
&c., to be sold as old iron	1,050

To be renewed	...	...	...	...	Rs. 10,836
Less old iron	...	...	...	...	4,200

$$\frac{\text{Rs. } 6,636}{24} = 276.5 \text{ cost of renewal.}$$

First cost	...	...	...	...	...	$9,786 \times 3.2251^* = 31,560.8286$
Renewals	...	...	...	...	...	$276.5 \times 44.502\dagger = 12,304.8030$
						<u>Rs. 43,865.6316</u>

Sir,

Ma

the

the

the

In

—

100

statements and calculations now forward,

Proceedings of the Madras Government, Public Works Department,
24th April 1876.

RENEWALS.				RS.
Wood...	...	...	...	Rs. 7,055 × 1.256510
Iron chairs	...	...	...	3,735
Less old iron	...	...	...	1,050
				2,685 × 0.449418

Total first cost and renewals ... 17,607.35

IRON ROAD—24 YEARS.				RS.
First cost	...	...	...	10,836

RENEWALS.				RS.
Iron work	...	...	...	Rs. 10,836
Less old iron	...	...	...	4,200
				6,636 × 0.449418

Total first cost and renewals ... 14,818.33

If in both cases the iron work be supposed to last fifty years, the calculations are as follow:—

WOODEN ROAD—50 YEARS.				RS.
First cost	...	...	...	7,536

RENEWALS.				RS.
Wood	...	...	...	7,055 × 1.256510 =
Iron chairs, less old iron	...	...	...	2,685 × 0.095534 =
				16,657.17

Total first cost and renewals ... 10,836

IRON ROAD—50 YEARS.				RS.
First cost	...	...	...	10,836
RENEWALS.				RS.
Iron work, less old iron	...	...	...	6,636 × 0.095534
				634
				11,470

Thus it appears that by both methods of calculation the wooden road, even making allowance for the advantage of there being a full complement of chairs, &c., on hand, is decidedly more costly than the iron one, assuming the latter to last only twenty-four years; the advantage of the iron being of course greater the longer it endures. Supposing fifty years, the wooden sleeper road would be dearer by 45 per cent.

My own opinion, if I may be excused for expressing it, is, that the average life of the iron sleepers will be found to be nearer 100 than 24 years; and even if that method of construction were more expensive, instead of being, as it is, cheaper than that of wooden sleepers, it would be worth a material sacrifice to avoid the necessity of dismantling every part of our lines once in every twelve years.

28th January 1876.

J. T. SMITH.

From R. B. ELWIN, Esq., Agent and Manager of the Madras Railway Company, to Lieutenant-Colonel J. H. M. SHAW-STEWART, R.E., Consulting Engineer for Railways, dated Madras, 28th March 1876, No. 299.

With reference to your letter of the 17th instant, No. 278, I have the honor to forward herewith two statements giving the information called for, in the prescribed form, regarding the estimated cost entered in the indents for iron pot sleepers and creosoted pine sleepers, required to relay the road between Palghaut and Beypore.

Proceedings of the Madras Government, Public Works Department,
24th April 1876.

Laying Line between Palghaut and Beypore with Iron Pot Sleepers.

65 lbs. Rails.				RS.	A.	P.	RS.	A.	P.
Cast iron pot sleepers	...	No.	3,696	Each.	2	6	8,932	0	0
Wrought iron tie bars	...	"	1,848	"	0	14	1,617	0	0
Cotters	...	"	3,696	"	0	0	96	4	0
Gibs	...	"	3,696	"	0	0	38	8	0
Cost per mile				...	...	...	10,683	12	0

75 lbs. Rails.				RS.	A.	P.	RS.	A.	P.
Cast iron pot sleepers	...	No.	3,168	Each.	2	6	7,656	0	0
Wrought iron tie bars	...	"	1,584	"	0	14	1,386	0	0
Cotters	...	"	3,168	"	0	0	82	8	0
Gibs	...	"	3,168	"	0	0	33	0	0
Cost per mile				...	...	...	9,157	8	0

65 lbs. rails per mile as above, Rupees	10,683-12-0	× 77 miles	...	...	8,22,648	0	0
75 lbs. do. do. do. do.	9,157-8-0	× 2 do.	...	...	18,315	0	0

Add.—10 per cent. of the cost of all material except tie bars ... 9,12,330 0 0

Deduct.—Cost of 60,000 cotters available from stock at 0-0-5 ... 1,563
Cost of 60,000 gibbs available from stock at 0-0-2 ... 625

Total ... 9,10,142 0 0

Laying Line between Palghaut and Beypore with Wooden Sleepers.

65 lbs. Rails.				RS.	A.	P.	RS.	A.	P.
Creosoted pine sleepers	...	No.	1,848	Each.	4	5	8,017	10	0
Iron trenails	...	"	7,392	"	0	1	462	0	0
Cost per mile				...	...	...	8,479	10	0

75 lbs. Rails.				RS.	A.	P.	RS.	A.	P.
Creosoted pine sleepers	...	No.	1,584	Each.	4	5	6,872	4	0
Iron trenails	...	"	6,336	"	0	1	396	0	0
Cost per mile				...	...	...	7,268	4	0

65 lbs. rails per mile as above, Rupees	8,479-10-0	× 77 miles	...	...	6,52,931	0	0
75 lbs. do. do. do. do.	7,268-4-0	× 2 do.	...	...	14,536	0	0

Add.—1 per cent. ... 6,74,142 0 0

Deduct.—70 per cent. of the cost of iron trenails which will be available from those taken out of the present road ... 25,713 0 0

Total ... 6,48,429 0 0

Cast iron chairs are not included in the above statement, as the numbers required are available from the present road and from stock.

MADRAS,
27th March 1876.

(Signed) W. R. ROBINSON,
Acting Chief Engineer.
B. B. ELWIN,
Agent and Manager.

Statements and calculations now forwarded

*Proceedings of the Madras Government, Public Works Department,
24th April 1876.*

Nos. 338 & 339. ORDER THEREON, 24th April 1876, No. 1,027.

RAILWAY, No. 37.

ORDERED that the indents for sleepers for the line between Palghaut and Beypore, together with the correspondence with which they are accompanied, be forwarded to the Government of India.

(Here enter No. 1,028, dated 24th April 1876.)

(True Extract.)

Colonel,

Offg. Under Secy. to Govt., P.W.P.

To the Consulting Engineer for Railways

PUBLIC WORKS DEPARTMENT,
FORT ST. GEORGE, 24th April 1876.

No. 340.

No. 1,028.

FROM

MAJOR-GENERAL G. W. WALKER, R.E.,
Secretary to the Government of Madras,
Public Works Department,

TO

THE SECRETARY TO THE GOVERNMENT OF INDIA,
Public Works Department.

RAILWAY, No. 38.

SIR,—Adverting to the correspondence ending with your letter, No. 2,668 R., dated 25th October 1875, on the subject

of the comparative advantages of iron and wooden sleepers for the rails between Palghaut and Beypore, I am now directed to forward an indent, amounting to Rupees 6,48,429, for 146,918 creosoted pine sleepers and wrought iron trenails which has been prepared by the authorities of the Madras Railway; and also an alternative indent, amounting to Rupees 9,10,142, for iron materials, together with a second memorandum by the Chairman of the Board of Directors. The Railway authorities strenuously adhere to their original opinions as to the advantages of the iron roadway.

2. His Grace the Governor in Council trusts that in dealing with the question now submitted for final decision due weight will be given to these representations.

I have the honor to be,

Sir,

Your most obedient servant,

Colonel,

Offg. Under Secy. to Govt., P.W.D.,
for Secretary to Government.

Exd. E. C. Shunker.
Spare Copies

Statements and calculations now forwarded

No. 243.

504
MADRAS RAILWAY.

AGENT AND MANAGER'S OFFICE.

Madras, 9th March 1876.

From

R. B. Clewin Esq
Agent and Manager. M. R. Co.

To

Mr. Col. J. Hall & Son & Stewart, R.E.
Consulting Engineer for Railways.

Sir,

Referring to your letter of the 19th of November 1875 at 1230 and to the Proceedings of Government forwarded therewith on the subject of the employment of woad or crested pine sheppers on the section of line from Beypore to Palghat, I have the honour by desire of the Board of Directors to forward herewith for the consideration of Government a second Memorandum by the Chairman, in which the question has been treated in the manner indicated by the Government of India; and in submitting, in accordance with the orders of Government, an Indent for crested Pine sheppers I am instructed to forward at the same time the accompanying Indent for the same number of miles of woad bowl sheppers, and to express the respectful solicitation of the Board that unless, in opposition to the statements and calculations now forwarded,

234

235

there be satisfactory evidence that the iron sleepers are decidedly more costly than those of wood, the Government of India will not object to pass the indent for the former, which are now required for the restoration of the line.

2. I am to point out that about 9/10^{ths} of the Camp and lines have now been re-established, under the sanction of the Government of India, by the use of the iron sleepers, with the most satisfactory results, and that, were there no other reason for it, there would be strong grounds for completing the remainder in the same manner, to avoid destroying the unity of the system. The Director points out that this reason would exist whether or not the locality were decidedly favourable to the use of one or other, and that it is strengthened by the fact that the section is plentifully supplied, as the Board are informed, with proper ballast for the iron sleepers, and is most unsuited, from its alternations of heat and excessive moisture, for the use of wooden ones.

3. I am also to bring to the notice of Government the fact that the iron sleepers cannot be found fault with as constituting an inefficient line, for there can be no question that, where they have

been used, with due regard to ballast, they form a road equal in its admirable qualities to any of the very best in India.

4. Adding to these special reasons the facts derived from late experience and the simple calculations contained in the memorandum herewith sent, that the iron sleepers are, for this special occasion, far more economical than wooden ones, and will probably turn out to be much more so than can at present be conclusively proved, the Directors trust that His Grace the Governor in Council will be persuaded to support the earnest representation they desire me to submit on their behalf, of their wish to be allowed to complete the improvement they have already carried so far, instead of reverting to a form of construction and expenditure which they consider under the circumstances of the case open to serious objection.

5. In conclusion I have only to add with reference to the 5th paragraph of the letter from the Government of India embodied in Government Order No. 3171 dated 6th November 1875, that the figures referred to were adopted by the late Mr. Goring in 1872 - a time when the price of iron was exceptionally high in deference to the

MADRAS RAILWAY.

From

The Agent and Manager.

To

The Consulting Engineer

for Railways.

Dated

187

Recd.

No.

wishes of the Government of India, and
 that these figures were returned in subse-
 quent calculations. The average price of
 Pig iron for the ten years previous to June
 1871 was about £3 a ton, in August 1872
 it reached £7 a ton, and since then it has
 again fallen to about £3 a ton. The last
 purchase of Pig iron made by this
 Company was at the rate of £3.2.0.

I have the honour to be,
 Sir,
 Your most obedient servant,
 W. H. Home
 Agent & Manager.

MADRAS RAILWAY.

From

The Agent and Manager.

To

The Consulting Engineer

for Railways.

Recd.

187

No.

17th Dec 1872

M. 2483/96.
2

Respecting the
Construction of Port.
a second Memorandum
by the Chairman in the
Company's advantage
as to fuel cost and
fuel consumption. Materials
of elevated wood.
and cost from Port Blair
side, in a permanent
form of cost.

Date 9th March 1876.
Recd. 10. M.
No. 243

From
The Agent and Manager.
To
The Consulting Engineer
for Railways.
MADRAS RAILWAY.

No. 299

MADRAS RAILWAY.
AGENT AND MANAGER'S OFFICE.
Madras, 28th March 1876.

From
Robert B. Clavin Esq.
Agent and Manager of the M.R.
To
Lieut Colonel J. H. M. Shaw Stewart M.B.
Consulting Engineer for Railways.

SIR,

With reference to your
letter of the 17th instant, No. 298,
I have the honour to forward herewith
two statements giving the information
called for, in the prescribed form,
regarding the estimated cost entered
in the indent for iron plate sleepers
and creosoted pine sleepers, required
to relay the road between Palghat
and Beypore.

I have the honour to be
Sir,
your most obedient
servant
R. B. Clavin
Agent and Manager.

Mr. 2420/76.

Notwithstanding the information
 called for as to the
 estimated cost of the
 line to be constructed for the
 Madras Railway, and
 the cost of the
 proposed section of the
 Madras Railway
 to be constructed
 for the
 Madras Railway.

Dated 29th March 1876.
 No. 299.

From
 The Agent and Manager.
 To
 The Consulting Engineer
 for Railways.

MADRAS RAILWAY.

Laying Line between Palghat and Beypoor with Iron Pot Sleepers.

65 lbs. Rails			
Cast Iron Pot Sleepers	3696	Each 2.6.8	8932
Wrought Iron Tie Bars	1848	" 14	1617
Cotters	3696	" 5	964
Gibs	3696	" 2	388
			10683 12

75 lbs. Rails			
Cast Iron Pot Sleepers	3168	Each 2.6.8	7656
Wrought Iron Tie Bars	1584	" 14	1386
Cotters	3168	" 5	828
Gibs	3168	" 2	33
			9157 8

65 lbs. Rails per mile as above	Rs. 10,683. 12. x 77 Miles.	822,648
75 lbs. do do do	Rs. 9,157. 8. x 2 "	18,315
		Rs. 840,963

<u>Add.</u> 10 per cent of the cost of all Material except Tie Bars	Rs. 71,364
	Rs. 912,330

<u>Deduct</u> Cost of 60,000 Cotters, available from Stock at $\frac{1}{15}$ -	Rs. 1563-...
Cost of 60,000 Gibs, available from Stock at $\frac{1}{12}$ -	Rs. 625-... Rs. 2188-

Total	Rs. 910,142
-------	-------------

Madras Railway,
 Chief Engineer's Office,
 29th March 1876.
 W. R. Robinson
 Agent & Manager
 Ag. Chief Engineer

Rs. 26.83/26.

Laying Line between Palghat and Belpoor, with Wooden Sleepers.

65 lbs. Rails

Crossed Pine Sleepers	1848	Each	4. 5. 5	8017	10	-
Iron Spennails	7392	"	- 1 -	462	"	"

Cost per Mile. Rupees... 8479 10 -

75 lbs. Rails

Crossed Pine Sleepers	1584	Each	4. 5. 5	6872	4	-
Iron Spennails	6336	"	- 1 -	396	"	"

Cost per Mile. Rupees... 7268 4 -

65 lbs. Rails per Mile as above.	Rs. 8479. 10. -	x 77 Miles	652931	"	"
75 lbs. do do do do	Rs. 7268. 4. -	x 2 -	14536	"	"

Add one per cent.

	Rs. 667467	"	"
	6675	"	"
	Rs. 674142	"	"
Deduct 70 per cent of the cost of Iron Spennails which will be available from those taken out of the present road	25713	"	"
Total Rupees	648429	"	"

Cast Iron Chains, are not included in the above statement as the number required are available from the present stock and from stock.
 Madras Railway, Chief Engineer's Office, 27th March, 1876.
 W. R. Robinson, Agt. Chief Engineer.

Railway Department.

CONSULTING ENGINEER'S OFFICE.

No. 171 Madras, 4th April 1876.

From
LIEUT. COLONEL J. H. M. SHAW STEWART, R.E.,
Consulting Engineer for Railways,

To
COLONEL G. W. WALKER, R.E.,
Secretary to Government,
Public Works Department,
Fort Saint George.

SIR,

Adverting to the Pro-
ceedings of Government under date the
6th November 1875, N^o 3171, I have
N^o 240 - 9th March 1876 the honour to lay before Government
N^o 297 - 28th March 1876 two letters from the Agent of the Mad-
1876 with enco- - dres Railway Company, with the
- cures. - first of which is forwarded a second
memorandum drawn up by the Chair-
- man of the Company upon the
comparative advantages, as to first
cost and permanent maintenance, of
crested wood and cast iron pat
super roads, in a financial point
of

of view.

2. In accordance with the Orders of Government, Mr. Elwin submits an indent for furnishing the line between Palghat and Beypore with sleepers of crested pine; and along with it, in accordance with instructions received from his Board, he also submits an alternative indent for furnishing the same section of line with cast iron pot sleepers. These indents amount respectively to Rs. 6,48,142 and Rs. 9,10,142. Explanation regarding the manner in which these sums have been arrived at is given in the second letter from the Agent.

3. The arguments urged by the Board in support of the second of the indents are given in full

27
full in Mr. Elwin's letter, and need not be repeated here. The Directors appear to rely too much upon the suitable nature of the ballast procurable throughout the section between Palghat and Beypore. A reference to the papers printed with the Proceedings of Government under date the 5th October 1870, No. 2,400, and the 21st March 1872, No. 808, will show that the ballast is not generally of a kind suitable to put sleepers.

In paragraphs 5 of 4. their letter dated the 25th October 1871 the Government of India remark upon the data employed by the Chief Engineer of the Madras Railway in calculating the cost of the iron sub-structure. In reply it will probably be sufficient to say that the data are not correct.

-cient to draw attention to the Pro-
-ceedings of Government noted in

the margin. It will be seen

that the Government of India, after

ascertaining that the price of iron had

risen considerably after the prepara-

-tion of the original estimate in

January 1872, called upon the Ma-

-dros Railway Company to state

at what prices they could procure and

lay iron sleepers upon their lines.

In reply the Chief Engineer stated

that, taking the latest quotations avail-

-able in February 1874, the cost of

a road laid with flat sleepers was

Rs. 17,440 per mile; and these

figures were used in the subsequent

calculations.

S

I have the honour to be,

Sir

Your most obedient servant

W. M. Stewart

Cons. Engineer for Railways

588-lands 70. 5. 722.
 5. dett - 2400 + 2400.
 23. dett - 2827
 21. dett - 2081 + 2081
 3. dett - 3422 + 3422
 21. dett - 912
 17. June 73 - 1587 + 1582
 16. Augt - 2026.
 6. Nov - 2714 + 2715
 16. Feb 74 - 362
 21. Apr - 1053 + 1054.

From the Agents in the
 with a second Office
 of our up by the
 Administration of the
 upon the comparative
 advantages as to
 cost of maintenance
 more of interest and
 and both are not
 parts between the
 and parts.

15. Apr 75 - 1069
 9. Sept - 2582 + 2583
 6. Nov - 3171.
 13. June 74 - 266 - 267
 22. July - 486 - 488
 10. Sept - 224 - 226
 227.

No 337

Cin - 19. 4. 76 - 29. 4. 76
 Despatch - 12. 4. 76.

8. 9. No. 171

The Secretary to Government,
 P. W. Department,
 Fort Saint George.

The Consulting Engineer,
 for Railways.

1876 2000.
 RAILWAY DEPARTMENT.
 No. 2483

No 1027

Public Works Department

Proceedings of the Madras Government

Under date 24th April 1896

Read the following

The Consulting Engineer for Railways

H. E. No. 171 of 4. April 1896.
 Order that the...
 between...
 together with the correspondence...
 which they are accom-
 -panied be forwarded to
 the Government of India.

The Consulting Engineer for Railways.
 Dated 9th

H. E. No. 1028 dated 7th Aug 96
 No 1028
 The Secretary to the
 Government of India

Sir
 According to the correspon-
 -dence ending with your letter

100.1

Letter No. 268 dated
25 October 1875 on the
subject of the comparative

advantages of cross-tied

wooden sleepers for the
rails between Palghat

and Beypore, I am now

directed to forward an

indent amounting to Rupees

64,842.9 for 146,918 cross-tied

Pine Sleepers and wrought

iron turnrails which has

been prepared by the authorities

of the Madras Railway, and also

An alternative indent

amounting to Rs 910,142

for iron materials together

with a second memorandum

by the Chairman of the Board

of Directors ~~have also been~~

submitted and are sent

forward as accompaniments

to this letter. It will be

seen that the Railway

Authorities

J. J. J. J.
D. J. J. J.

24
1875

33/5

authorities strenuously adhere
to their original opinions as
to the advantages of the

iron roadway, and earnestly

solicit that unless the iron
sleepers can be conclusively
shown to be more costly than

those of wood the alternative
indent may be sanctioned
for compliance. Particular

stress is laid on the cir-

I do not think there is
much in this point &
should therefore not
urge it in a government
letter

circumstance of the for larger

portion of the company's

system being already laid

with iron sleepers and of

the break of uniformity

which would occur by

renewing the portion of the

line under discussion with

materials of a different

character]

His Grace The

Governor in Council trusts

that

100

Set up with 4 Cues
9/5/76

2483



Govt. of India

PUBLIC WORKS.

The Comr. Eng. for P.W. Dept.

Dist.

Locality

Dist.

Locality

G. O. 240/1876, No. 1027/1028

327-328

Recd.

Comr. Eng. for P.W. Dept.
10-5-76

Forwarding Indent
for sleepers for the
line between Poul
shant & Begpur
together with the
correspondence with
which they are accom-
panied.

Sleepers - (On P.)

Indents for sleepers
for the line between
Poulshant & Begpur
together with certain
correspondence ordered
to be forwarded to the
Govt. of India.