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Public Works (1899.) Department.

CONCERNS BOTH BRITISH INDIA
AND INDIAN STATES.

RAILWAY BRANCH.

G.O., No. 534- 35 Ry

DATED 5 May/99.

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[Despatch Abstract.]

Travancore branch of the South Indian Ry.

Ordering that the South Indian Railway Company's Estimate for the ——
be forwarded for sanction of the Govt of India.

Forwarding for sanction, copy of Pros: embodying the South Indian Railway Company's estimate for the ——

Indexed.

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. } 1899.
Regd.

Enclosures

Spare copies

G.O., No. 534 Ry., 5th May 1899.

MAY.

Travancore Branch of the South Indian Railway

Ordering that the South Indian Railway Company's estimate for the — be forwarded for sanction of the Government of India.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Railway.

Read again the following paper :—

G.O., No. 263 Ry., dated 4th March 1899.

Read also the following papers :—

From—The Agent, South Indian Railway.
To—The Consulting Engineer for Railways, Madras.
Dated—Trichinopoly, 28th February 1899, No. 188.

In compliance with the request contained in your letter, No. 234, dated 21st January 1899, I have the honour to forward estimates for (1) the final survey and staking out of the ghât section of the Tinnevelly-Quilon Railway, and (2) for staking out and making minor alterations in the alignment of the first and third divisions of the line from mile 0 to 48 and from mile 72 to 103. The cost of the work in these two divisions has been shown separately and the whole survey expenditure for the line incorporated in one abstract. I also forward, for your information, a copy of letter No. T.Q. 1435/8 from the Engineer-in-Chief.

Enclosures.

From—The Engineer-in-Chief, Madura-Pamban and Tinnevelly-Quilon Railways.
To—The Agent, South Indian Railway.
Dated—24th February 1899, No. T.Q. 1435/8.

[Your No. R. 343/6/232 of 24th January 1899, and No. 343/6/536 of 21st February 1899.]

Tinnevelly-Quilon Railway Survey Estimates.

As requested in your above, I have the honour to submit, herewith, separate estimates for the three divisions of the Tinnevelly-Quilon Railway.

The estimates for the first and third divisions are for staking out and minor alterations of alignment, if found necessary, prior to commencement of construction, and it is assumed that the survey will commence on each division on the 1st March. Owing to the more difficult nature of the ground in the eastern part of the third division, I have estimated the work will take four months to complete.

It will, in my opinion, be necessary to spend two seasons on the final survey and alignment of the 24 miles in the ghât division, and I have estimated accordingly. It will be preferable to devote the first season to surveying and determining the position for the best line over about half the length, then to plot and prepare drawings, estimates, &c., during the recess, so that in the following season construction can start on the length fixed and survey work on the remaining distance to be aligned. Having a knowledge of the locality and of the very difficult nature of the ground, I strongly recommend that my proposal be adopted.

I wish specially to point out that unless orders are received so that we can start the survey of the ghât section in June (at the latest), we shall lose a part of the coming season in field work.

I have charged the proportionate amounts for direction of the ghât division for the two years' survey work on the assumption that construction work will start early in the coming financial year.

TRAVANCORE RAILWAY—Abstract Survey Estimate for the three divisions.

Division number.	Particulars.	Cost per mile.	Amount.
		RS.	RS.
1	Estimate for staking out and making minor alterations in the alignment of the 1st division from mile 0 to 48 = 48 miles	304	14,597
2	Estimate for staking out and making minor alterations in the alignment of the 2nd or ghât division from mile 48 to 72 = 24 miles	5,500	1,32,046
3	Estimate for staking out and making minor alterations in the alignment of the 3rd division from mile 72 to 103 = 31 miles	694	21,505
		Total ..	1,68,148

NOTE.—*Average cost per mile, for 103 miles, Rs. 1,632 per mile.*

DETAILED Estimate for staking out and making minor alterations in the alignment of the 1st Division from mile 0 to mile 48.

	RS.	RS.	RS.
Survey Expenses—			
(a) Centre line pegs, centre line stones and lockspitting at Rs. 60 × 48 miles.	2,880	..	2,880
Plant—			
(a) Tents—			
One Swiss cottage tent	500		
One do.	430		
One Bechoba tent	140		
Twelve servants' pals	730		
Two necessary tents	70		
Carriage	100		
		1,970	
(b) Instruments—			
Two theodolites at Rs. 600 ..	1,200		
Two levels at Rs. 400	800		
Four levelling staves at Rs. 50 ..	200		
Thirty-six ranging rods at Rs. 3 ..	108		
Four measuring chains at Rs. 10 ..	40		
Other items of plant	1,000		
	3,348		
Deduct—75 per cent. on value of stores returned.	2,511		
		837	2,807
Carried over ..	..	..	5,687

	RS.	RS.	RS.
Brought forward ..	..	..	5,687
Establishment—			
March to May 1899—			
Engineer-in-Chief	5,430		
Personal Assistant	2,400		
Six clerks	630		
Two draftsmen	240		
Two tracers	113		
Eleven menials	245		
Travelling allowances	359		
Office expenses	150		
	9,567		
Half cost to Madura-Pamban ..	4,784		
	4,783		
Half cost to Tinnevelly-Quilon Railway for these three months, half of which debit to 1st division.	..	2,392	
Field Establishment—			
One Engineer at Rs. 500 × 3 months ..	1,500		
One Engineer at ,, 400 × 3 ,, ..	1,200		
Two Surveyors at ,, 150 × 3 ,, ..	900		
One clerk at ,, 40 × 3 ,, ..	120		
One draftsman at ,, 40 × 3 ,, ..	120		
One Apothecary at Rs. 50 × 3 months.	150		
Thirty-two lascars at Rs. 8 × 32 × 3 months.	768		
Travelling allowance at Rs. 320 × 3 months.	960		
Contingencies	800		
		6,518	8,910
Total, 1st Division ..	..	..	14,597

DETAILED Estimate for staking out and making minor alterations in the alignment of the 3rd Division from mile 72 to 103.

	RS.	RS.	RS.
Survey Expenses—			
(a) Centre line pegs, clearing jungle, pillars, lockspitting, at Rs. 100 × 48 miles.	4,800	..	4,800
Plant—			
(a) Tents—			
One Swiss cottage tent	500		
One do.	430		
One Bechoba tent	140		
Thirteen servants' pals	740		
Two necessary tents	70		
Carriage	200		
		2,080	
(b) Instruments—			
Two theodolites at Rs. 600 ..	1,200		
Two levels at Rs. 400	800		
Four levelling staves at Rs. 50 ..	200		
Thirty-six ranging rods at Rs. 3 ..	108		
Four measuring chains at 10 ..	40		
Other items of plant	1,000		
	3,348		
Deduct—75 per cent. on value of stores returned.	2,511	837	2,917
Carried over ..	..	..	7,717

	RS.	RS.	RS.
Brought forward ..	..	..	7,717
Establishment—			
Estimated for four months—			
Engineer-in-Chief (three months) ..	5,430		
Personal Assistant	2,400		
Six clerks	630		
Two draftsmen	240		
Two tracers	113		
Eleven menials	245		
Travelling allowances	359		
Office expenses	150		
Half debited to Madura-Pamban Railway .. .. .. RS. 4,784	9,567		
Amount debited to 1st division. 2,392			
	7,176		
Cost for three months	2,391		
Proportionate for four months ..	..	3,188	
Field Establishment—			
One Engineer at Rs. 700 × 4 months ..	2,800		
One Engineer at Rs. 500 × 4 do. ..	2,000		
Two Surveyors at Rs. 150 × 4 months ..	1,200		
One clerk at Rs. 40 × 4 months ..	160		
One draftsman at Rs. 45 × 4 months ..	180		
One Apothecary at Rs. 50 × 4 months ..	200		
Forty lascars at Rs. 8 × 40 × 4 months.	1,280		
Travelling allowances, Rs. 320 × 4 months.	1,280		
Contingencies	1,500		
		10,600	13,788
Total, 3rd Division ..	..	..	21,505

Detailed Estimate for re-aligning and staking out the 2nd or Ghât Division, miles 48 to 72.

	Rs.	Rs.	Rs.
Survey Expenses—			
Clearing jungle at Rs. 300 × 24 miles ..	7,200		
Centre line pegs, centre line stones, bench marks, lookspitting, &c., Rs. 200 × 24 miles.	4,800		
			12,000
Plant—			
Tents—			
One 14′ sq. Swiss cottage tent at Rs. 500.	500		
Two 12′ sq. do. at Rs. 430.	860		
One 12′ sq. Hill tent at Rs. 320 ..	320		
Sixteen servants' pals..	935		
Three necessary tents at Rs. 40 ..	120		
		2,735	
Instruments—			
Two theodolites at Rs. 600	1,200		
Three levels at Rs 400	1,200		
Six levelling staves at Rs. 50	300		
Sixty ranging rods at Rs. 3	180		
Four measuring chains at Rs. 10 ..	40		
Other items of plant	2,000		
	4,920		
Less—60 per cent. on value of stores returned.	2,952	1,968	
			4,703
Establishment—			
Direction—			
One Engineer-in-Chief at 1,350 × ½ ..	675		
One Personal Assistant at 800 × ½ ..	400		
One Chief clerk at 200 × ½	100		
Twelve clerks at 430 full	430		
Two clerks at 60 × ½	30		
One attender at 15 × ½	7½		
One moochee at 10 × ½	5		
Seventeen menials at 128 × ½ ..	64		
One draftsman at 100 × ½ ..	50		
Two draftsmen at 50 × 2 ..	100		
Four tracers at 70 full ..	70		
Office expenses at 100 full ..	100		
Travelling allowances at 100 full ..	100		
Exchange compensation allowance at 100 × ½	50		
Pension and leave contribution at 364 × ½	182		
Total for one month ..	2,363½		
For 12 months = 2,363½ × 12 ..	28,362		
Carried over ..	28,362	..	16,703

	Rs.	Rs.	Rs.
Brought forward ..	28,362	..	16,703
Establishment—cont.			
Lump sum estimates—			
Instruments	700		
Office accommodation	8,750		
Government Audit and Control ..	8,240		
Total for one year ..	46,052		
Proportionate charge for 24 miles—			
Ghât survey for 1st year $\frac{24}{103}$ × 46,100 =	10,742		
,, ,, 2nd year $\frac{12}{103}$ × 46,100 =	5,371		
		..	16,113
Note.—In the second year only 12 miles will be under survey; the remaining portion will be under construction and debit for direction of that portion will be to Construction estimate.			
Audit and Accounts—			
Four clerks under Rs. 100 at Rs. 90 for two years.	2,160	..	2,160
Field Establishment—			
1 Executive Engineer { 18 months at 1,000 ..	18,000		
6 ,, at 800 ..	4,800		
2 Assistant Engineers { 18 ,, at 625 × 2.	22,500		
6 ,, at 500 × 2.	6,000		
1 Surveyor .. 18 ,, at 250 ..	4,500		
1 Do. .. 18 ,, at 200 ..	3,600		
1 Apothecary. 18 ,, at 75 ..	1,350		
1 clerk { 18 ,, at 75 ..	1,350		
6 ,, at 50 ..	300		
1 draftsman. { 18 ,, at 75 ..	1,350		
6 ,, at 60 ..	360		
60 lascars .. 18 ,, at 10 ..	10,800		
20 Do. .. 6 ,, at 8 ..	960		
Travelling allowance, Rs. 900 × 18 months.	16,200		
Contingencies	5,000	..	97,0
Total, 2nd Division ..			1,32,046

Note on the Tinnevelly-Quilon Survey Estimate, by Mr. A. Bewley, Deputy Consulting Engineer for Railways, Madras, dated 14th March 1899.

From the abstract of this estimate it is seen that the average rate of cost per mile in the three divisions under estimate is as follows:—

Division No. 1, average cost per mile	Rs. 304
,, 2, ,, ,, ...	,, 5,500
,, 3, ,, ,, ...	,, 694

and that the average mileage cost of the whole is Rs. 1,632.

No. I Division.—As regards the cost per mile Rs. 304, it may be passed by without remark, as it calls for none.

No. II Division.—On the other hand, this figure Rs. 5,500 requires explanation. It appears that the two chief causes of this very high average cost are to be found in—

(*a*) The unusual length of time that the survey and location of the 24 miles of ghât will require. This is fixed in the estimate at two years, or a mile per month.

(*b*) The salaries that it has been decided to offer — are somewhat high for this class of work under ordinary circumstances in India and wisely so if it will ensure the utmost that can be done to obtain the best line.

To turn to details—

A. Survey expenses—amount to Rs. 12,000. Under this head the item "Clearing jungle" is naturally a large one on ghât work: and Rs. 300 per mile is probably not an exaggerated estimate.

B. Field establishment—amounts to Rs. 97,070, *i.e.*, 73 per cent. of the whole ghât estimate. This is mainly made up of the salaries of one Executive Engineer at Rs. 1,000 and of two Assistant Engineers at Rs. 625 and Rs. 500 for the first 18 months. Apparently, with a view to a saving, the above salaries are to be reduced to Rs. 800 and Rs. 500, respectively. This arrangement seems ill-judged and impracticable.

C. Establishment—amounts to Rs. 16,113. The chief charges swelling the cost of this item are the salaries of the Engineer-in-Chief and his Personal Assistant at Rs. 1,350 and Rs. 800, respectively. These salaries are divided in mileage proportions between the survey work and the construction for the last year's work on the quite arbitrary assumption that "in the second year only 12 miles will be under survey; the remaining will be under construction." It may be so; but it is equally possible that it may not. The other items call for no remark.

No. III division.—amounts to Rs. 694 per mile. This figure, though high, is not under the circumstances sufficiently so to call for detailed explanation, beyond the statement that here again the item "field establishment" is large, being 50 per cent. of the whole survey cost of the division. The length of time provided for is four months.

In general, the estimate has been quite carefully framed, and all reasonable credits made.

The actual cost of Mr. Shadbolt's survey and location, as ascertained from the Examiner, Public Works Accounts, was 701·2 rupees per mile. In the present estimate Mr. Michell estimates the cost of finally locating a line suitable for the commencement of construction work at Rs. 1,632 per mile.

Mr. Shadbolt's line was laid down in 1895. It is therefore almost a matter of certainty that little of the work then done now remains; and that the location will have to be done afresh. On this assumption it will be seen that the provision for re-locating the line in the present estimate made for the I and III divisions, viz., Rs. 304 and Rs. 694, respectively, does not call for further remark.

As regards the II or ghât division, it must be remembered that the survey of Mr. Shadbolt was limited in its object to finding a possible and financially practicable route across the ghât. It consisted merely of a string of straight lines marked on the ground by pegs at every 100 feet, daghbeled, and with but three pillars per mile. Benchmarks, also, were but three per mile, which would not be liberal for even a line in the plains. Mr. Shadbolt's estimate for this part of the location was Rs. 115 per mile; and since the total of his estimate and his total outlay only differed by a few rupees (Rs. 75), his estimate-figures and his actuals may, in this instance, be assumed to be identical.

From Mr. Shadbolt's description of his method of locating, it would appear that he did not lay down any curves on the ground; and that consequently the least possible quantity of jungle clearing was done.

Mr. Michell's estimate now under notice provides for very much more than this, in fact for a line "fit for the commencement of construction."

He anticipates that more or less important alterations of Mr. Shadbolt's line will be necessary involving the running of trial lines; and speaks of the first season being devoted to "determining the position of the best line," which is then to be laid down completely on the ground, and extensive clearing of jungle made. Mr. Michell's provision under this head is equivalent to the cost of a force of 800 coolies (at 6 annas each) for a day per mile over the whole line; and the cost of putting his line down on the ground would in the ghât division be naturally greater than the average for the whole line which is Rs. 200 per mile.

It will thus be seen that the two surveys under notice differ widely in character. Mr. Shadbolt's estimate (and actual outlay) represents the minimum cost requisite to ascertain the bare possibility of a financially practicable line, while that of Mr. Micheil, now submitted for sanction, provides for the expense of getting the best possible line either by minor alterations of that of Mr. Shadbolt, or if necessary in places by breaking entirely new ground.

Order—No. 534 Ry., dated 5th May 1899.

The Government of India will be addressed.

[Here enter No. 535 Ry., dated 5th May 1899.]

(True Extract.)

Francis J. E. Spring,
Joint Secretary.

To the Agent, South Indian Railway.
„ the Consulting Engineer for Railways.

Exd. Shaik Karim.

PUBLIC WORKS DEPARTMENT.

Railway.

Letter—from

Francis J. E. Spring, Esq., c.i.e.,
Joint Secretary to the Government of Madras,
Public Works Department,
Railway Branch,

To

The SECRETARY to the GOVERNMENT of INDIA,
Public Works Department.

Sir,

With reference to correspondence ending with your letter, No. 0102 A.R., dated the 16th February 1899, I am directed to forward a copy of this Government's Proceedings, No. 534 Ry., dated the 5th May 1899, containing, on page 2, a letter No. 188, dated the 28th February 1899, from the Agent, South Indian Railway, giving cover to an estimate, amounting to Rs. 1,68,148, for finally staking out the Travancore Branch, fit for the commencement of construction. The estimate which is an unusually high one, but which it does not seem possible to materially reduce, has been reviewed in a note prepared in the office of the Consulting Engineer for Railways, Madras, which will be found in the accompanying Proceedings.

2. As sanction has now been received for the commencement of work upon the branch the outlay will be met from the construction grant and the cost of much of the staff will doubtless be transferred to construction, — for example the Engineer supervising the summit tunnel will be able to direct his assistant on the survey, — and so the survey estimate will be reduced. Meanwhile, the estimate being necessary for audit purposes, I am instructed to recommend that it be sanctioned as it stands.

I have the honour to be,
Sir,
Your most obedient servant,
Francis J. E. Spring,
Joint Secretary.

Ootacamund,
5th May 1899.

Documents accompanying.
Proceedings referred to.

Exd. Shaik Karim.

RAILWAY.

Government {1899} of Madras.

PUBLIC WORKS.

Recd. } 1899. Enclosures
Regd. } Spare copies

Letter, No. 535 Ry., 5th May 1899.

MAY.

Travancore Branch of the South Indian Railway

Forwarding, for sanction, copy of Proceedings embodying the South Indian Railway Company's estimate for the —.

South Indian Railway.

Print

Copy of a letter, No. T.Q 2/435/8, dated 24th February 1899
from The Engineer-in-chief, Madura-Paumban & Tinnevelly-Quilon Rys
to the Agent, South Indian Railway.

Your no. R 343/6/232 of 24th January 1899 & 343/6/536 of 21st February 99.
Tinnevelly-Quilon Railway Survey Estimates.

As requested in your above I have the honor to submit herewith separate estimates for the 3 Divisions of the Tinnevelly Quilon Railway.

The estimates for the 1st and 3rd Divisions are for staking out and minor alterations of alignment, if found necessary, prior to commencement of Construction and it is assumed that the Survey will commence on each Division on the 1st March. Owing to the more difficult nature of the ground in the eastern part of the 3rd Division I have estimated the work will take 4 months to complete.

It will in my opinion be necessary to spend 2 Seasons on the final Survey and alignment of the 24 miles in the Ghat Division and I have estimated accordingly. It will be preferable to devote the first season to surveying and determining the position for the best line over about half the length, then to plot and prepare Drawings, estimates &c during the recess so that in the following season construction can start on the length fixed and Survey work on the remaining distance to be aligned. Having a knowledge of the

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AGENT'S OFFICE,
TRICHINOPOLY,
28th February 1899.

True copy.
W. Le Mesurier
for Agent.

Accompaniment to the Agent's letter
No. 188 of 28th Feby 1899.

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locality and of the very difficult nature of the ground I strongly recommend that my proposal be adopted.

I wish specially to point out that unless orders are received so that we can start the Survey of the Ghat section in June (at the latest) we shall lose a part of the coming season in field work.

I have charged the proportionate amounts for direction of the Ghat Division for the 2 years Survey work on the assumption that construction work will start early in the coming financial year.

Here print the Abstract.

AGENT'S OFFICE,
TRICHINOPOLY,
28th February 1899.

True copy.
W. Le Mesurier
for Agent.

Accompaniment to the Agent's letter
No. 188 of 28th Feby 1899.

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~~South Indian Railway Co., Ld.~~

Tinnevelly-Quilon Railway.

Abstract of Estimate for staking out etc., in the three Divisions

Travancore Railway, Abstract Survey Estimate for the three Divisions.

Division No.	Particulars	Cost per mile	Amount. Rs.
1	Estimate for staking out and making minor alterations in the alignment of the 1st Division from mile 0 to 48. = 48 miles	304	14,597
2	Estimate for -do- of the 2nd or Ghat Division from mile 48-72 = 24 miles	5500	1,32,046
3	-Do- Do- of the 3rd Division from mile 72 to 103 = 31 miles	694	21,505
	Total Rs.		1,68,148

Note. Average cost per mile, for 103 miles, Rs. 1632 per mile.

Engineer-in-chief's Office,
Trichinopoly,
28th February 1899.

Theo. Mitchell
Engineer-in-chief.

M Le Mesurier
for Agent
28.2.99

South Indian Railway Co (Limited,

Tinnevelly - Quilon Railway.

Detailed Estimate for staking out and making minor alterations in the alignment of the 1st Division from mile 0 to mile 48.

Print

Survey Expenses:			
(a) Centre line pegs, centre line stones & lockspitting @ Rs 60/- × 48 miles	2880		2880
Plant.			
(a) Tents:-			
1 Swiss cottage tent	500		
1 do	430		
1 Bechoba tent	140		
12 Servants Pals	720		
2 Necessary tents	70		
Carriage	100		
		1970	
(b) Instruments:			
2 Theodolites @ Rs 600/-	1200		
2 Levels @ Rs 400/-	800		
4 Levelling staves @ Rs 50/-	200		
36 Ranging rods @ 3/-	108		
4 Measuring chains @ 10/-	40		
Other items of plant	1000		
	3348		
Deduct 75 % on value of stores returned	2511		3
		837	2807
C.C.	3	3	5687

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B. F			5687
Establishment			
March to May 1899.			
Engineer-in-Chief	5430		
Personal Assistant	2400		
6 Clerks	620	3	
2 Draftsmen	240		
2 Tracers	113		
11 Menials	245		
Travelling allowances	359		
Office expenses	150		
	9567		
Half. Cost to Madura-Paumban	4784		
Half. Cost to Tinnevelly-Quilon Ry for these 3 months half of which debit to 1st Division	4783	2392	
Field Establishment.			
1 Engineer @ Rs 500/- × 3 months	1500		
1 Engineer @ Rs 400/- × 3 months	1200		
2 Surveyors @ Rs 150/- × 3 "	900		
1 Clerk @ Rs 40/- × 3 "	120		
1 Draftsman @ Rs 40/- × 3 "	120		
1 Apothecary @ Rs 50/- × 3 "	150		
32 Lascars @ Rs 8/- × 32 × 3 "	768		
Travelling allowance @ Rs 320/- × 3 "	960		
Contingencies	800		
		6518	8910
Total 1st Divn			14,597

52 lines

65
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Engineer-in-Chief

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South Indian Railway Co (Limited)

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Tinnevelly-Quilon Railway

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Detail Estimate for staking out and making minor alterations in alignment of 3rd Division from mile 72 to 103.

Survey Expenses.			
(a) Centre line pegs, clearing jungle, pillars, lockspitting, @ Rs 100/- × 48 miles	4800		4800
Plant			
(a) Tents.			
1 Swiss Cottage Tent	500		
1 do	430		
1 Bechoba tent	140		
13 Servants Pals	740		
2 necessary tents	70		
Carriage	200		
		2080	
(b) Instruments.			
2 Theodolites @ Rs 600/-	1200		
2 Levels @ Rs 400/-	800		
4 Levelling staves @ Rs 50/-	200		
36 Ranging rods @ Rs 3/-	108		
4 measuring chains @ 10/-	40		
Other items of plant	1000		
	3348		
Deduct 75 o/o on value of stores returned	2511	837	2917
C.O.			7717

9 pm

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B. F.			7717
ablishment			
Estimated for 4 months			
Engineer-in-Chief (3 months)	5430		
Personal assistant	2400		
6 clerks	630		
2 Draftsmen	240		
2 Tracers	113		
11 menials	245		
Travelling allowances	359		
Office expenses	150		
	9567		
Half debited to N. P. Ry 4784	4784		
Amount debited to 1st Division 2392	2392		
	- 7176		
Cost for 3 months	= 2391		
Proportionate for 4 months		3188	
Field Establishment			
1 Engineer @ Rs 700/- × 4 months	2800		
1 do @ Rs 500/- × 4 "	2000		
2 Surveyors @ Rs 150/- × 4 "	1200		
1 Clerk @ Rs 40 × 4 "	160		
1 Draftsman @ Rs 45 × 4 "	180		
1 Apothecary @ Rs 50 × 4 "	200		
40 Lascars @ Rs 8 × 40 × 4 "	1280		
Travelling allowances Rs 320 × 4 "	1280		
Contingencies	1500		
		10600	13,788
Total 3rd Division			21,505

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Theo. [illegible]

Engineer-in-Chief

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1123/99

~~28/9/99~~

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South Indian Railway C^o. (Limited).

Tinnevelly-Quilon Railway.

Estimate for re-alignment and staking out the 2^nd or Ghat Division Miles 48-72.

		Rs.	Rs.	Rs.
Survey expenses:				
Clearing jungle @ Rs 300 × 24 miles		7200		
Centreline pegs, centre line stones, benchmarks, lockspitting, &c	Rs 200 × 24 miles	4800		12,000
Plant.				
Tents:				
1. 14' SV: Swiss Cottage tent	@ Rs 500	500		
2. 12' SV: do	@ Rs 430	860		
1. 12' SV: Hill tents	@ Rs 320	320		
16 Servants pals		935		
3 Necessary tents	@ Rs 40	120	2735	
Instruments				
2 Theodolites	@ Rs 600	1200		
3 Levels	@ Rs 400	1200		
6 Levelling staves	@ Rs 50	300		
60 Ranging rods	@ Rs 3	180		
4 Measuring chains	@ Rs 10	40		
other items of plant		2000		
		4,920		
Less 60 per cent on value of stores returned		2952.	1968	4,703
Establishment.				
Direction:				
1. Engineer-in-Chief	@ 1350 × ½ = 675			
1. Personal Assistant.	@ 800 × ½ = 400			
1. Chief Clerk	@ 200 × ½ = 100			
12 Clerks	@ 430 full = 430			
2 Clerks	@ 60 × ½ = 30			
1 Attender	@ 15 × ½ = 7½			
1 Moochee	@ 10 × ½ = 5			1670

11 Br

Print

B. F. 16703

Establishment (Continued)

17 menials @ 128 × $\frac{1}{2}$ = 64
1 Draftsman @ 100 × $\frac{1}{2}$ = 50
2 Draftsmen @ 50 × 2 = 100
4 Tracers @ 70 full = 70
Office expenses @ 100 full = 100
Travelling allowances @ 100 full = 100
Exchange Compensation allowance @ 100 × $\frac{1}{2}$ = 50
Pension & leave contribution @ 364 × $\frac{1}{2}$ = 182

Total for 1 month = 2,363$\frac{1}{2}$
For 12 months = 2363$\frac{1}{2}$ × 12 = 28,362

Lump Sum estimates
Instruments = 700
Office Accommodation = 8750
Government Audit & Control = 8240

Total for 1 year = 46,052

Proportionate charge for 24 miles:
Ghat survey for 1st year $\frac{24}{103}$ × 46100 = 10,742
" " 2nd year $\frac{12}{103}$ × 46100 = 5371 — 16,113 — 16,113

NOTE:— In the 2nd year only 12 miles will be under survey; the remaining portion will be under construction & debit for direction of that portion will be to Construction estimate:

Audit and Accounts

4 Clerks under Rs 100 @ Rs 90 for 2 years — 2160 — 2160

C. O. 34,97

20-11

3 3 4

1½ Bn

Print

Field Establishment	B.F.			34,976
1 Executive Engineer	18 months @ 1000	18,000		
	6 months @ 800	4,800		
2 Assistant Engineers	18 " @ 625 × 2	22,500		
	6 " @ 500 × 2	6000		
1 Surveyor	18 " @ 250	4500		
1 Do	18 " @ 200	3600		
1 Apothecary	18 " @ 75	1350		
1 Clerk	18 " @ 75	1350		
	6 " @ 50	300		
1 Draftsman	18 " @ 75	1350		
	6 " @ 60	360		
60 Lascars	18 " @ 10	10800		
20 "	6 " @ 8	960		
Travelling Allowance Rs 900 × 18 months		16200		
Contingencies		5000	97,070	97,070
			Grand Total Rs	1,32,046

Engineer-in-chief's Office,
Trichinopoly,
28th February 1899.

Theo. [illegible]
Engineer-in-Chief.

about 7½ [illegible]

Enc. 4 1123/99
188 28-2-99
From A

No. 188

2P. Print

South Indian Railway Co., Ld.,
AGENT'S OFFICE,
TRICHINOPOLY, 28th February 1899.

CONSULTING ENGINEER FOR RAILWAYS
RECEIVED
1 MAR 1899
MADRAS.

1123

From

The AGENT,
SOUTH INDIAN RAILWAY,

To

The CONSULTING ENGINEER FOR RAILWAYS,
MADRAS.

Sir,

In compliance with the request contained in your letter No. 234 dated 21st January 1899, I have the honor to forward estimates for (1) the final survey and staking out of the ghat section of the Tinnevelly - Quilon Railway and (2) for staking out and making minor alterations in the alignment of the first and third divisions of the line from mile 0 to 48 and from mile 72 to 103. The cost of the work in these two divisions has been shown separately and the whole survey expenditure for the line incorporated in one abstract. I also forward for your information a copy of letter No. T.Q. 1435/8 from the Engineer - in - Chief.

I have the honor to be
Sir
Your most obedient Servant
A.C.G. Shelley
Captain, R.E.
Agent

5 Enclosures herewith

From
The Agent,
South Indian Railway,
Trichinopoly.

To
The Consulting Engineer for
Railways,
Madras.

Dated }
Received } 18

No.

Enclosure.

RAILWAY.

Government {1899} of Madras.

PUBLIC WORKS.

Recd. } 1899.
Regd. }

Enclosures

Spare copies

G.O., No. 263 Ry., 4th March 1899.

MARCH.

Travancore Line

Directing the Agent, South Indian Railway, to submit early an estimate of the cost of the re-survey and re-grading of the —.

No. 263 Ry., 4th March 1899.

From—The Secretary to the Government of India, Public Works Department.
To—The Joint Secretary to the Government of Madras, P.W. Dept., Ry. Branch.
Dated—Calcutta, 16th February 1899, No. 0102-A./R.

In continuation of Public Works Department letter No. 036 R.C., dated 14th February 1899, I am directed to convey the sanction of the Government of India to a grant of Rs. 15,000 under the head "41. Miscellaneous Railway Expenditure" to meet outlay during the current official year on the Tinnevelly-Quilon Railway survey.

Order—No. 230 Ry., dated 23rd February 1899.

Communicated to the Agent, South Indian Railway, for information.

Order—No. 263 Ry., dated 4th March 1899.

The Agent, South Indian Railway, will submit an early estimate of the cost of the re-survey and re-grading of the Travancore line now ordered. Meanwhile he will utilize the allotted grant, Rs. 15,000 for the current year, to the best advantage on the survey of those parts of the alignment which he may be able to undertake, and which may be approved by the Consulting Engineer for Railways.

2. A copy of the Government of India's letter, No. 036 R.C., and of its enclosure, will be furnished to the Agent for information and guidance.

(True Extract.)

Francis J. E. Spring,
Joint Secretary.

To the Agent, South Indian Railway.
„ Consulting Engineer for Railways.
„ Examiner, Guaranteed Railway Accounts, Madras.
„ Political Department.

W. D'Mois.

Form No. 14.

PUBLIC WORKS DEPARTMENT,
RAILWAY BRANCH.

138

C. No.

Print

NOTE FOR E. R.

On the Tinnevelly – Quilon Survey Est.

[illegible]

Dr.

This is a very incomplete note. It tells me nothing about what Mr Shadbolt actually spent on the T. Q. Ry. Survey. The information is obtainable in C.R.'s office. Also compare with Mr Shadbolt's Estimate below for Preliminary Expenses — and tell me whether the latter represents actuals or whether it contemplated further expenditure on realignment, or progress of the figures.

FKS
9/3/99

From the Abstract of this Estimate it is seen that the average rate of cost per mile in the 3 Divisions under estimate is as follows:—

	Rs.
Division No 1 – av. cost per mil.	304.
" 2 " "	5500
" 3 " "	694;

and that the average mileage cost of the whole is Rs 1632.

No 1. Division — as regards this cost per mile (304), it may be passed by without remark, as it calls for none.

No II Division — On the other hand the fig. — 5500 — requires explanation. It appears that the Ex Chief cause of this very high average cost are found in

(a) The extra-ordinary length of the that the survey and location of the tiles of ghat will require. This is
pow

Form No. 14.

Print

C. No.

158

NOTE FOR

Eng. in Chief and his Pers. Assistant @ 1350/ and 800/- respectively. These salaries are divided in mileage proportions between the survey work and the construction for the first year's work on the quite arbitrary assumption that "in the 2nd year only 12 miles will be " under survey; the remaining will be " under construction." It may be so; but it is equally possible that it may not. The other items call for no remark.

No III Division amounts to Rs 694

This figure, though high, is not under the circumstances sufficient so to call for detailed explanation beyond the statement that here again the item "Field Establishment" is large being 50% of the whole survey cost of i

D°.

The length of line provided for is 42

In general, this estimate has b quite carefully framed, and a

[illegible]

Form No. 14.

C. No.

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daghbeled

rocks pitted

PUBLIC WORKS DEPARTMENT,
RAILWAY BRANCH

Point

NOTE FOR

financially practicable route across the ghat. It consisted merely of a string of straight lines marked on the ground by pegs at every 100 ft, daghbeled, and with but 3 pillars per m. Benchmarks also were but 3 per m, which would not be liberal for even a line in the plains. Mr. Shadbolts' estimate for this part of the location was 115 Rs per mile; and since the total of his estimate and his total outlay only differed by a few rupees (75 Rs) his estimate-figures and his actuals may in this instance be assumed to be identical.

2 From Mr Shadbolts' description of his method of locating it would appear that he did not lay down any curves on the ground; and that consequently the least possible quantity of jungle clearing was done.

The estimate now under notice of Mr Michell provides for very much more than this – in fact, for a line "fit for the commencement of construction". He antici [illegible]

Form No. 14.

PUBLIC WORKS DEPARTMENT,
RAILWAY BRANCH.

Print

C. No.

188

NOTE FOR

will be necessary involving the running of trial lines; and speaks – flag it – of the first season being devoted to "determining the position of the best line," which is then to be laid down completely on the ground, and extensive clearing of jungle made. Mr Michell's provision under this head is equivalent to the cost of a force of 800 coolies (@6%) for a day per mile over the whole line: and the cost of putting his line down on the ground would in the Ghat Dn be naturally greater than the average for the whole line which is 200 Rs per mile

It will thus be seen that the 2 surveys under notice differ widely in character. Mr Shadbolt's estimate (and actual cost outlay) represents the minimum ~~possible~~ requisite to ascertain the bare possibility of a financially practicable line – while that of Mr. Michell, now submitted for , provides for the expense of getting the possible line either by minor alterations o

in place

G.O. No. 263 Ry. d/ 16.3.99.
S. I. Ry. letter No. 188 dated 28th Feb. 99. with its enclosures.

Memo for press. Please try to arrange the detailed estimates in a workmanlike manner. This is strictly press work. This office ought not to have to attend to the details of it. No use in wasting quantities of space and making things unintelligible because compositors are I suppose paid by the page.

Next print the Office Note.

Then the Order. The Govt. of India will be addressed.

Then the letter to India on separate sheet.

FWS
15/3/99

15/3/99

5 pm

the Agent S. I. Ry. giving cover to an estimate amounting

for finally staking out the Travancore Railway fit for the commencement

of construction. The estimate which is an unusually high one, but which

it does not seem possible to materially reduce, has been reviewed in a

Note prepared in the office of the Con. Engr. for Ry. Madras which will

be found in the accompanying Proceedings. ~~above referred to~~.

2. – Should early sanction be received for the commencement of work upon ~~[illegible]~~

Railway the cost of much of the staff will doubtless be transferred to

construction, — for example the Engineer surveying the summit tunnel

will be able to direct his assistants on the survey, — and so the

Survey estimate will be [illegible] as the estimate is necessary

~~[illegible]~~ it for Audit purposes, I am instructed to recommend

G.O. No 386 R, 7/4/99

No. $\frac{10}{\text{B. O.}}$ A.—R.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

ACCOUNT.

Railway.

Calcutta, the 21st March 1899.

BEZWADA-MADRAS RAILWAY—MADRAS-ENNORE SECTION.
SURVEYS UNDER THE GOVERNMENT OF MADRAS.
(XXVI and 38.—State Railways—Gross Traffic Receipts and Working Expenses—Imperial.)
(41.—Miscellaneous Railway Expenditure—Imperial.)
(48.—State Railways—Construction.)

Revised Estimates for 1898-99, with Budget Estimates for 1899-1900.
Read again—

Public Works Department Resolution No. $\frac{1}{\text{B. O.}}$ A.—R., dated 22nd March 1898.

Read also—

Letter .	No. 1542 Ry.,	dated	15th	December	1898,	from	the Govt. of	Madras.
„	„ 1544 Ry.,	„	15th	„	„	„	„	„
„	„ 1556 Ry.,	„	17th	„	„	„	„	„
„	„ 1577 Ry.,	„	28th	„	„	„	„	„
P.W.D. letter	„ 028A.—R.,	„	14th	January	1899,	to	„	„
Letter	„ 139 Ry.,	„	4th	February	„	from	„	„
„	„ 206 Ry.,	„	21st	„	„	„	„	„
Telegram	„ 20 B.,	„	27th	„	„	„	„	„
P.W.D. letter	„ 0142 A.—R.,	„	14th	March	„	to	„	„
„	„ 0145 A.—R.,	„	14th	„	„	„	„	„

RESOLUTION.—The Budget Estimates and grants for these sources of revenue and services for 1898-99 and the amounts for which the Revised Estimates for 1898-99 and the Budget Estimates for 1899-1900 have been submitted to and accepted by the Government of India are stated in the following table :—

SERVICE.	Head of account.	Budget Estimate, 1898-99.	REVISED ESTIMATE, 1898-99.		BUDGET ESTIMATE, 1899-1900.	
			As submitted.	As accepted.	As submitted.	As accepted.
Imperial.		Rs.	Rs.	Rs.	Rs.	Rs.
BEZWADA-MADRAS RAILWAY.						
Madras-Ennore Section—						
Gross receipts . . .	XXVI	60,000	44,000	44,000	50,150	60,000
Expenditure . . .	38	37,000	28,600	29,000	33,050	38,000
Net receipts .		23,000	15,400	15,000	17,100	22,000
Madura-Paumben Survey . .	41	...	31,000	31,000	11,000	11,000
Shoranur-Cochin Survey . .	41	15,000	30,600	31,000	...	..
Tinnevelly-Quilon Survey . .	41	...	...	15,000	...	...
BEZWADA-MADRAS RAILWAY.						
Madras-Ennore Section . .	48					
Construction Works—						
Cash		...	2,000	2,000	...	...

2. The final issue of these estimates should be prepared and submitted so as to reach the Government of India not later than the 1st May 1899.

ORDER.—Ordered, that a copy of the above be forwarded to the Government of Madras, Public Works Department, Railway Branch, for information and guidance, with the request that 50* printed copies of the final issue of the estimates, as now passed, may be submitted in the usual course.

*15 copies to Simla and remainder to Calcutta.

A. R. BECHER,
Depy Secy. to the Govt. of India.

G. I. C. P. O.—No. 192 A. G. P. W. D.—22-3-99.—290—J. T. C.

URGENT.

No. 336

South Indian Railway Co., Ld.
AGENT'S OFFICE,
Trichinopoly, 12th April 1899.

RECEIVED 13 APR. 1899

1895
13.4.99

From
THE Ag AGENT,
SOUTH INDIAN RAILWAY,

To
THE CONSULTING ENGINEER
FOR RAILWAYS,
MADRAS.

Please see also S No 50091 in [illegible] case

Sir,

I have the honor to point out that in Government of India letter No $\frac{10^{M}}{R.C.}$ A.R dated 21st March 1899, received on the cover of the Madras Government Order No 386^{M}, Ry, of 7th April 1899, no provision is made for the Tinnevelly Quilon Railways Survey for 1899-1900, though in my letter No 202 of the 3rd March 1899 you were informed that no expenditure would be incurred during 1898-99 against the allotment of Rs 15,000 made. Will you please inform me at the earliest possible date if the allotment of Rs 15,000 made in the last Official year can be carried forward to the current Official year. The Engineer-in-Chief of the Madura-Pamban and Tinnevelly Quilon Railways has now sent out the first Survey Party to work in the field.

I have the honor to be,
Sir,
Your most obedient Servant,

W. A. Spalding
Ag: Agent

From
The Agent,
South Indian Railway,
Trichinopoly.

To
The Consulting Engineer for Railways,
Madras.

Dated
Received
No.
189

Enclosure.

Form No. 33.

Office of the Consulting Engineer for Railways,
Madras, 13th April 1899.

L 14/99
Regr. No. 206
1/4 APR 1899
Enclosures
RAILWAY ACCOUNTS, MADRAS

No. 1176.

OFFICE NOTE.

Letter from the Agent, South Indian Railway, No. 336, dated 12th April 1899, forwarded to the Examiner of Railway Accounts. for remarks.

for E. R.

EXAMINER'S REPLY.

The Govt. of India were not advised of the Company's inability to spend any portion of the grant (Rs 15,000) allotted for 1898-99, as intimation was received too late from the Company for such advice to be o any practical use. That allotmen lapsed on 31st March last, an cannot be utilised during the current year; but an application may be made to the Govt. of Indi for a grant for this year.

The Agent might be asked t state what amount is requi

F

In the financial Statement for 1899-1900, Rs 700,000 is provided for construction of the Tinnevelly-Quilon Railway, but no Budget order has been received in connection therewith.

JGH 15/4/99

C.R.
15.4.99

9/8/9

TELEPHONE.

From ER
To A
Dated 15th April/99 Time

Your No. 336 of 12th April/99 & Please state what amount is required for the Survey expenses during the current year.

A.J.
for ER.

Despd: 15/4/99
3-45 P.M.
15/4-99

REPLY.

From
To
Dated Time

9/8/9

TELEPHONE.

From ER
To A
Dated, 18° April/99 Time

Please reply early my telephone of 15th inst enquiring the amount required for T.A survey. The allotment of Rs 15000 provided for the last year ~~cannot be~~ lapsed on 31st March last and cannot be utilized during the current year

a/B.
for ER

Recd: 19/4/99
11 AM.

REPLY.

From
To
Dated Time

URGENT.

CONSULTING ENGINEER FOR RAILWAYS
20 APR 1899
MADRAS.

No. 371 **South Indian Railway Co., Ld.**
AGENT'S OFFICE,
Trichinopoly, 19th April 1899.

2068
20.4.99

From
THE Ag. AGENT,
SOUTH INDIAN RAILWAY,

To
THE CONSULTING ENGINEER
FOR RAILWAYS,
MADRAS.

Sir,

In reply to your telegrams of the 15th instant and today I have the honor to inform you that it is Estimated an amount of Rs: 96,000 can be spent during the Current Official year 1899-1900 against the Estimate forwarded with my letter No 188 of 28th February 1899 for the Tinnevelly Quilon Railway Survey.

As a Survey Party has already been placed in the field on the first division I shall be glad if a provisional allotment can be made to meet immediate expenses.

I have the honor to be,
Sir,
Your most Obedient Servant
W H Spalding
Ag: Agent.

Copy 25-4-99

Form No.

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

From D. E.R. To E R

India wires message
(1) lequus applaud 650 RC
(2) ansated Secy of State wires
(3) antartic lequus (4) appulsive
(2) ansated (5) Madena (6) Turnulus you
may commence work at once
ends Grants of 10 lacs (5) Madena
and 7 lacs (6) Turnulus are granted

(1) Your letter numbered and dated as follows
(2) 14th with
(3) 21st with
(4) Your telegram of
(5) Madura Ramnad Ry
(6) Tinnevelly Quilon Ry

Very well communicate to A & advise C.R now. Also gazette notification of land reqd at Pambam do this at once then ask C.R if any further action is necessary on our Office Note 1287. The original can then go to Ooty, all this should be done today

J.H. 25-4-99

---

to the Govt. of India, it may be mentioned that the outlay will be met from the construction grant.

2. already returned.

J.G.H. 25/4/99

C.R. 25-4-99

D, (1) Press copy of the G.O. forwarding the estimate is herewith put up for reference

---

P. W. D., RAILWAY BRANCH.

CONSULTING ENGINEER'S OFFICE.

Madras, 25th April 1899.

R No 243
25.4.99
CR's office

OFFICE NOTE.

No 1327

From E. R.

To C R

Will you please let me know if now that an allotment has been made for the P. R.: any further
(1) action is necessary ~~on your~~
~~reply~~ on this office note
No: 1287 herewith.

2. Please return the land papers connected with the M.P. Ry: sent to you with this office ~~lr~~ endt No: 1314 of 24th April 1899.

This has been indicated in the G.O. (No. Ry ck

J.W.
for E R
25.4.99.

6 proof Recd 8.4.99.

RAILWAY.

Government {1899} of Madras.
PUBLIC WORKS.

For H.E.'s approval

G.O. and letter to Govt of India

F.H.G.

Recd. } 1899. Enclosures

Regd. Spare copies

G.O., No. 534 **Ry.,** 5 ~~**April**~~ May **1899.**

APRIL.

Issue stamp

F.B.S.

20/4/99

Ry

Travancore line branch of the S. I. Ry

Ordering that the South India Railway Co's Estimate for the —— be forwarded for sanction of the Govt of India

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Railway.

Read again the following paper:—

G.O., No. 263 Ry., dated 4th March 1899.

Read also the following papers:—

From—The Agent, South Indian Railway.
To—The Consulting Engineer for Railways, Madras.
Dated—Trichinopoly, 28th February 1899, No. 188.

In compliance with the request contained in your letter, No. 234, dated 21st January 1899, I have the honour to forward estimates for (1) the final survey and staking out of the ghât section of the Tinnevelly-Quilon Railway, and (2) for staking out and making minor alterations in the alignment of the first and third divisions of the line from mile 0 to 48 and from mile 72 to 103. The cost of the work in these two divisions has been shown separately and the whole survey expenditure for the line incorporated in one abstract. I also forward, for your information, a copy of letter No. T.Q. 1435/8 from the Engineer-in-Chief.

ENCLOSURES.

From—The Engineer-in-Chief, Madura-Pamban and Tinnevelly-Quilon Railways.
To—The Agent, South Indian Railway.
Dated—24th February 1899, No. T.Q. 1435/8.

[Your No. R. 343/6/232 of 24th January 1899, and No. 343/6/536 of 21st February 1899.]

Tinnevelly-Quilon Railway Survey Estimates.

As requested in your above, I have the honour to submit, herewith, separate estimates for the three divisions of the Tinnevelly-Quilon Railway.

The estimates for the first and third divisions are for staking out and minor alterations of alignment, if found necessary, prior to commencement of construction, and it is assumed that the survey will commence on each division on the 1st March. Owing to the more difficult nature of the ground in the eastern part of the third division, I have estimated the work will take four months to complete.

It will, in my opinion, be necessary to spend two seasons on the final survey and alignment of the 24 miles in the ghât division, and I have estimated accordingly. It will be preferable to devote the first season to surveying and determining the position for the best line over about half the length, then to plot and prepare drawings, estimates, &c., during the recess, so that in the following season construction can start on the length fixed and survey work on the remaining distance to be aligned. Having a knowledge of the locality and of the very difficult nature of the ground, I strongly recommend that my proposal be adopted.

I wish specially to point out that unless orders are received so that we can start the survey of the ghât section in June (at the latest), we shall lose a part of the coming season in field work.

I have charged the proportionate amounts for direction of the ghât division for the two years' survey work on the assumption that construction work will start early in the coming financial year.

TRAVANCORE RAILWAY—Abstract Survey Estimate for the three divisions.

Division number.	Particulars.	Cost per mile.	Amount.
		RS.	RS.
1	Estimate for staking out and making minor alterations in the alignment of the 1st division from mile 0 to 48 = 48 miles	304	14,597
2	Estimate for staking out and making minor alterations in the alignment of the 2nd or ghât division from mile 48 to 72 = 24 miles	5,500	1,32,046
3	Estimate for staking out and making minor alterations in the alignment of the 3rd division from mile 72 to 103 = 31 miles	694	21,505
		Total ..	1,68,148

NOTE.—*Average cost per mile, for* 103 *miles, Rs.* 1,632 *per mile.*

DETAILED Estimate for staking out and making minor alterations in the alignment of the 1st Division from mile 0 to mile 48.

	RS.	RS.	RS.
Survey Expenses—			
(*a*) Centre line pegs, centre line stones and lockspitting at Rs. 60 × 48 miles.	2,880	..	2,880
Plant—			
(*a*) Tents—			
One Swiss cottage tent	500		
One do.	430		
One Bechoba tent	140		
Twelve servants' pals	730		
Two necessary tents	70		
Carriage	100	1,970	
(*b*) Instruments—			
Two theodolites at Rs. 600 ..	1,200		
Two levels at Rs. 400	800		
Four levelling staves at Rs. 50 ..	200		
Thirty-six ranging rods at Rs. 3 ..	108		
Four measuring chains at Rs. 10 ..	40		
Other items of plant	1,000		
	3,348		
Deduct—75 per cent. on value of stores returned.	2,511	837	2,807
Carried over .	..	..	5,687

	RS.	RS.	RS.
Brought forward ..	..	..	5,687
Establishment—			
March to May 1899—			
Engineer-in-Chief	5,430		
Personal Assistant	2,400		
Six clerks	630		
Two draftsmen	240		
Two tracers	113		
Eleven menials	245		
Travelling allowances	359		
Office expenses	150		
	9,567		
Half cost to Madura-Pamban ..	4,784		
	4,783		
Half cost to Tinnevelly-Quilon Railway for these three months, half of which debit to 1st division.	..	2,392	
Field Establishment—			
One Engineer at Rs. 500 × 3 months ..	1,500		
One Engineer at ,, 400 × 3 ,, ..	1,200		
Two Surveyors at ,, 150 × 3 ,, ..	900		
One clerk at ,, 40 × 3 ,, ..	120		
One draftsman at ,, 40 × 3 ,, ..	120		
One Apothecary at Rs. 50 × 3 months.	150		
Thirty-two lascars at Rs. 8 × 32 × 3 months.	768		
Travelling allowance at Rs. 320 × 3 months.	960		
Contingencies	800	6,518	8,910
Total, 1st Division ..	..	..	14,597

DETAILED Estimate for staking out and making minor alterations in the alignment of the 3rd Division from mile 72 to 103.

	RS.	RS.	RS.
Survey Expenses—			
(*a*) Centre line pegs, clearing jungle, pillars, lockspitting, at Rs. 100 × 48 miles.	4,800	..	4,800
Plant—			
(*a*) Tents—			
One Swiss cottage tent	500		
One do.	430		
One Bechoba tent	140		
Thirteen servants' pals	740		
Two necessary tents	70		
Carriage	200	2,080	
(*b*) Instruments—			
Two theodolites at Rs. 600 ..	1,200		
Two levels at Rs. 400	800		
Four levelling staves at Rs. 50 ..	200		
Thirty-six ranging rods at Rs. 3 ..	108		
Four measuring chains at 10 .	40		
Other items of plant	1,000		
	3,348		
Deduct—75 per cent. on value of stores returned.	2,511	837	2,917
Carried over ..	..	..	7,717

		RS.	RS.	RS.
Brought forward ..		..	..	7,717
Establishment—				
Estimated for four months—				
Engineer-in-Chief (three months) ..		5,430		
Personal Assistant		2,400		
Six clerks		630		
Two draftsmen		240		
Two tracers		113		
Eleven menials		245		
Travelling allowances		359		
Office expenses		150		
Half debited to Madura-Pamban	RS.	9,567		
Railway	4,784			
Amount debited to 1st division.	2,392	7,176		
Cost for three months		2,391		
Proportionate for four months ..		..	3,188	
Field Establishment—				
One Engineer at Rs. 700 × 4 months ..		2,800		
One Engineer at Rs. 500 × 4 do. ..		2,000		
Two Surveyors at Rs. 150 × 4 months ..		1,200		
One clerk at Rs. 40 × 4 months ..		160		
One draftsman at Rs. 45 × 4 months ..		180		
One Apothecary at Rs. 50 × 4 months ..		200		
Forty lascars at Rs. 8 × 40 × 4 months.		1,280		
Travelling allowances, Rs. 320×4 months.		1,280		
Contingencies		1,500	10,600	13,788
Total, 3rd Division ..		..	..	21,505

Detailed Estimate for re-aligning and staking out the 2nd or Ghât Division, miles 48 to 72.

	Rs.	Rs.	Rs.
Survey Expenses—			
Clearing jungle at Rs. 300 × 24 miles ..	7,200		
Centre line pegs, centre line stones, bench marks, lockspitting, &c., Rs. 200 × 24 miles.	4,800		
Plant —			
Tents—			12,000
One 14′ sq. Swiss cottage tent at Rs. 500.	500		
Two 12′ sq. do. at Rs. 430.	860		
One 12′ sq. Hill tent at Rs. 320 ..	320		
Sixteen servants' pals..	935		
Three necessary tents at Rs. 40 ..	120		
Instruments—		2,735	
Two theodolites at Rs. 600	1,200		
Three levels at Rs 400	1,200		
Six levelling staves at Rs. 50	300		
Sixty ranging rods at Rs. 3	180		
Four measuring chains at Rs. 10 ..	40		
Other items of plant	2,000		
	4,920		
Less—60 per cent. on value of stores returned.	2,952	1,968	
Establishment—			4,703
Direction—			
One Engineer-in-Chief at 1,350 × ½ ..	675		
One Personal Assistant at 800 × ½ ..	400		
One Chief clerk at 200 × ½ .. .	100		
Twelve clerks at 430 full	430		
Two clerks at 60 × ½	30		
One attender at 15 × ½	7½		
One moochee at 10 × ½	5		
Seventeen menials at 128 × ½ ..	64		
One draftsman at 100 × ½ ..	50		
Two draftsmen at 50 × 2 ..	100		
Four tracers at 70 full ..	70		
Office expenses at 100 full ..	100		
Travelling allowances at 100 full ..	100		
Exchange compensation allowance at 100 × ½	50		
Pension and leave contribution at 364 × ½	182		
Total for one month .	2,363½		
For 12 months = 2,363½ × 12 .	28,362		
Carried over ..	28,362	..	16,703
Brought forward ..	28,362	..	16,703
Establishment—cont.			
Lump sum estimates—			
Instruments	700		
Office accommodation	8,750		
Government Audit and Control ..	8,240		
Total for one year ..	46,052		
Proportionate charge for 24 miles—			
Ghât survey for 1st year $\frac{24}{103}$ × 46,100 =	10,742		
" " 2nd year $\frac{12}{103}$ × 46,100 =	5,371	..	16,113
Note.—In the second year only 12 miles will be under survey; the remaining portion will be under construction and debit for direction of that portion will be to Construction estimate.			
Audit and Accounts—			
Four clerks under Rs. 100 at Rs. 90 for two years.	2,160	..	2,160
Field Establishment—			
1 Executive Engineer { 18 months at 1,000 ..	18,000		
{ 6 " at 800 ..	4,800		
2 Assistant Engineers { 18 " at 625 × 2.	22,500		
{ 6 " at 500 × 2.	6,000		
1 Surveyor .. 18 " at 250 ..	4,500		
1 Do. .. 18 " at 200 ..	3,600		
1 Apothecary. 18 " at 75 ..	1,350		
1 clerk { 18 " at 75 ..	1,350		
{ 6 " at 50 ..	300		
1 draftsman. { 18 " at 75 ..	1,350		
{ 6 " at 60 ..	360		
60 lascars .. 18 " at 10 ..	10,800		
20 Do. .. 6 " at 8 ..	960		
Travelling allowance, Rs. 900 × 18 months.	16,200		
Contingencies	5,000	..	97,070
Total, 2nd Division ..			1,32,046

Note on the Tinnevelly-Quilon Survey Estimate, by Mr. A. Bewley, Deputy Consulting Engineer for Railways, Madras, dated 14th March 1899.

From the abstract of this estimate it is seen that the average rate of cost per mile in the three divisions under estimate is as follows:—

Division No. 1, average cost per mile ... ... Rs. 304
" 2, " " ... ... " 5,500
" 3, " " ... ... " 694

and that the average mileage cost of the whole is Rs. 1,632.

No. I Division.—As regards the cost per mile Rs. 304, it may be passed by without remark, as it calls for none.

No. II Division.—On the other hand, this figure Rs. 5,500 requires explanation. It appears that the two chief causes of this very high average cost are to be found in—

(*a*) The unusual length of time that the survey and location of the 24 miles of ghât will require. This is fixed in the estimate at two years, or a mile per month.

(*b*) The salaries that it has been decided to offer — are somewhat high for this class of work under ordinary circumstances in India and wisely so if it will ensure the utmost that can be done to obtain the best line.

To turn to details—

A. Survey expenses—amount to Rs. 12,000. Under this head the item "Clearing jungle" is naturally a large one on ghât work: and Rs. 300 per mile is probably not an exaggerated estimate.

B. Field establishment—amounts to Rs. 97,070, *i.e.*, 73 per cent. of the whole ghât estimate. This is mainly made up of the salaries of one Executive Engineer at Rs. 1,000 and of two Assistant Engineers at Rs. 625 and Rs. 500 for the first 18 months. Apparently, with a view to a saving, the above salaries are to be reduced to Rs. 800 and Rs. 500, respectively. This arrangement seems ill-judged and impracticable.

C. Establishment—amounts to Rs. 16,113. The chief charges swelling the cost of this item are the salaries of the Engineer-in-Chief and his Personal Assistant at Rs. 1,350 and Rs. 800, respectively. These salaries are divided in mileage proportions between the survey work and the construction for the last year's work on the quite arbitrary assumption that "in the second year only 12 miles will be under survey; the remaining will be under construction." It may be so; but it is equally possible that it may not. The other items call for no remark.

No. III division.—amounts to Rs. 694 per mile. This figure, though high, is not under the circumstances sufficiently so to call for detailed explanation, beyond the statement that here again the item "field establishment" is large, being 50 per cent. of the whole survey cost of the division. The length of time provided for is four months.

In general, the estimate has been quite carefully framed, and all reasonable credits made.

The actual cost of Mr. Shadbolt's survey and location, as ascertained from the Examiner, Public Works Accounts, was 701·2 rupees per mile. In the present estimate Mr. Michell estimates the cost of finally locating a line suitable for the commencement of construction work at Rs. 1,632 per mile.

Mr. Shadbolt's line was laid down in 1895. It is therefore almost a matter of certainty that little of the work then done now remains; and that the location will have to be done afresh. On this assumption it will be seen that the provision for re-locating the line in the present estimate made for the I and III divisions, viz., Rs. 304 and Rs. 694, respectively, does not call for further remark.

As regards the II or ghât division, it must be remembered that the survey of Mr. Shadbolt was limited in its object to finding a possible and financially practicable route across the ghât. It consisted merely of a string of straight lines marked on the ground by pegs at every 100 feet, daghbeled, and with but three pillars per mile. Benchmarks, also, were but three per mile, which would not be liberal for even a line in the plains. Mr. Shadbolt's estimate for this part of the location was Rs. 115 per mile; and since the total of his estimate and his total outlay only differed by a few rupees (Rs. 75), his estimate-figures and his actuals may, in this instance, be assumed to be identical.

From Mr. Shadbolt's description of his method of locating, it would appear that he did not lay down any curves on the ground; and that consequently the least possible quantity of jungle clearing was done.

Mr. Michell's estimate now under notice provides for very much more than this, in fact for a line "fit for the commencement of construction."

He anticipates that more or less important alterations of Mr. Shadbolt's line will be necessary involving the running of trial lines; and speaks of the first season being devoted to "determining the position of the best line," which is then to be laid down completely on the ground, and extensive clearing of jungle made. Mr. Michell's provision under this head is equivalent to the cost of a force of 800 coolies (at 6 annas each) for a day per mile over the whole line; and the cost of putting his line down on the ground would in the ghât division be naturally greater than the average for the whole line which is Rs. 200 per mile.

It will thus be seen that the two surveys under notice differ widely in character. Mr. Shadbolt's estimate (and actual outlay) represents the minimum cost requisite to ascertain the bare possibility of a financially practicable line, while that of Mr. Michell, now submitted for sanction, provides for the expense of getting the best possible line either by minor alterations of that of Mr. Shadbolt, or if necessary in places by breaking entirely new ground.

Order—No. Ry., dated April 1899.

The Government of India will be addressed.

[Here enter No. Ry., dated April 1899.]

F.S.H. 21.4.99

(True Extract.)

Francis J. E. Spring,
Joint Secretary.

To the Agent, South Indian Railway. ✓
" the Consulting Engineer for Railways. ✓

Despatched on 9/5/98.

Exd. Shaik Kariem.

No. 335 Ry., 5 May ~~April~~ 1899.

PUBLIC WORKS DEPARTMENT.

Railway.

Letter—from

Francis J. E. Spring, Esq., C.I.E.,
Joint Secretary to the Government of Madras,
Public Works Department,
Railway Branch,

To

The SECRETARY to the GOVERNMENT of INDIA,
Public Works Department.

Sir,

With reference to correspondence ending with your letter, No. 0102 A.R., dated the 16th February 1899, I am directed to forward a copy of this Government's Proceedings, No. , dated the 1899, containing on page 2 a letter No. 188, dated the 28th February 1899, from the Agent, South Indian Railway, giving cover to an estimate, amounting to Rs. 1,68,148 for finally staking out the Travancore Railway, fit for the commencement of construction. The estimate which is an unusually high one, but which it does not seem possible to materially reduce, has been reviewed in a note prepared in the office of the Consulting Engineer for Railways, Madras, which will be found in the accompanying Proceedings.

2. Should early sanction be received for the commencement of work upon the Railway the cost of much of the staff will doubtless be transferred to construction, — for example the Engineer supervising the summit tunnel will be able to direct his assistant on the survey, — and so the survey estimate will be reduced. Meanwhile, the estimate being necessary for audit purposes, I am instructed to recommend that it be sanctioned as it stands.

I have the honour to be,
Sir,
Your most obedient servant,
F.J.S.
Joint Secretary.

Ootacamund.
~~Fort St. George~~,
April 1899.

O.C. desp 9/5/98.

Exl. Shaik Karime.

Despatched on 5/5/99.

RAILWAY.

Government {1899} of Madras.

PUBLIC WORKS.

Recd.	1899.	*Enclosures*
Regd.		*Spare copies*

Letter, No. Ry., April 1899.

APRIL.

Modified subsequently

May

No. 534 Ry., 5 ~~April~~ 1899.

PUBLIC WORKS DEPARTMENT.

Railway.

Letter—from

Francis J. E. Spring, Esq., c.i.e.,
Joint Secretary to the Government of Madras,
Public Works Department,
Railway Branch,

To

The SECRETARY to the GOVERNMENT of INDIA,
Public Works Department.

Sir,

With reference to correspondence ending with your letter, No. 0102 A.R., dated the 16th February 1899, I am directed to forward a copy of this Government's Proceedings, No. 534, dated the 5 May 1899, containing, on page 2, a letter No. 188, dated the 28th February 1899, from the Agent, South Indian Railway, giving cover to an estimate, amounting to Rs. 1,68,148, for finally staking out the Travancore Branch, fit for the commencement of construction. The estimate which is an unusually high one, but which it does not seem possible to materially reduce, has been reviewed in a note prepared in the office of the Consulting Engineer for Railways, Madras, which will be found in the accompanying Proceedings.

2. ~~Should early~~ As sanction has now been received for the commencement of work upon the branch the outlay will be met from the construction grant and the cost of much of the staff will doubtless be transferred to construction, — for example the Engineer supervising the summit tunnel will be able to direct his assistant on the survey, — and so the survey estimate will be reduced. Meanwhile, the estimate being necessary for audit purposes, I am instructed to recommend that it be sanctioned as it stands.

I have the honour to be,
Sir,
Your most obedient servant,
FJES
Joint Secretary.

28/ Please see correspondence below

Ootacamund,
April 1899.

May

E. R
for approval
28/4/99

Issue 8 May
FJES
28/

Documents accompanying.
Proceedings referred to.

Exd. Shaik Karim.

RAILWAY.

Government {1899} of Madras.

PUBLIC WORKS.

Recd. } 1899.
Regd.

Enclosures

Spare copies

Letter, No. 535 Ry., 5 April 1899. May

APRIL. May

Travancore Branch of the South Indian Railway

Forwarding, for sanction, copy of Proceedings embodying the South Indian Railway Company's estimate for the —.