

RAILWAY BRANCH.

G.O., No. 979 R

DATED 27th June.

[Despatch Abstract.]

Silpini Railway

The inspection report of the — by A. S. R.
Lipcott, Consulting Engineer for Railways,
recorded, and the attention of the
Engineer-in-Chief drawn to paras 3 & 5.

[illegible]

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

CHAINAGE FROM COONOR.		Amount done.	Remarks.
From	To		
0	40	7 8	Cuttings filled by spoil from road above.
40	50		
50	60		
60	70		
70	80		
80	90		
90	100		Cutting full of springs, has slipped badly.
100	116	1	
116	118	$\frac{1}{4}$	
118	130	1	
130	136	0	
136	148	1	
148	150	$\frac{1}{2}$	Runnymede station.
150	165	$\frac{1}{2}$	
165	168	$\frac{1}{2}$	Bad ground, full of springs.
168	172	$\frac{1}{2}$	
172	182	$\frac{1}{2}$	
182	187	$\frac{1}{2}$	
187	191	1	
191	193	$\frac{1}{2}$	Dangerous over-hanging rock here; should be removed.
193	198	$\frac{1}{2}$	
198	201	$\frac{1}{2}$	
201	202	0	
202	210	$\frac{1}{2}$	Very good quarry here.
210	218	$\frac{1}{2}$	
218	224	0	
224	228	$\frac{1}{2}$	
228	246	0	Benhope cliff cutting not begun.
246	256	$\frac{2}{3}$	
256	272	0	

CHAINAGE FROM COONOR.		Amount done.	Remarks.
From	To		
272	277		
277	281		
281	284		
284	290	0	
290	297		
297	303		
303	310		
310	323		
323	348		
348	399	0	Hill Grove station. Hill Grove estate paths are kept open by Collector at cost of about Rs. 50 per mensem.
399	406		
406	408	0	
408	412		Burliar.
412	425	0	
425	430		
430	433	0	
433	436		
436	445		
445	450	0	Two nasty gorges here 120 ft. and 180 ft. wide.
450	456		
456	465		
465	467	0	
467	469		
469	472	0	
472	474		
474	487	0	
487	490		
490	498		Adderly station.
498	503	0	
503	505		
505	515		
515	527		
527	538		
538	542	0	
542	550		
550	567		
567	578	0	
578	585		
585	596		
596	607		
607	610	0	
610	618		
618	621	0	
621	624		
624	627	0	
627	640		
640	650		Kullar station.
650	925	1	Mettapollium station.

3. *Revetment walls*.—The second-class wall at chain 31 has bulged and will require watching. Those built of sized headers and stretchers are standing well.

Wall at 47½ chains, complete.

Do. „ 168 „ being built with 10' culvert through it.

Do. „ 198 „ not yet put in by road engineers.

Do. „ 219 „ being built.

4. *Bridges (minor) and culverts*.—These are 19 complete and 25 in progress or about half done between Coonor 0 and Benhope 250. An additional 6' culvert at 61 will be required owing to the shifting of the centre line. The 6' arched culvert at 65 has

been wrecked by a flood getting at the side and will require lengthening and rebuilding. This was not due to faulty design or work.

The floor of the 10' culvert at 72 should be stepped in 6" steps instead of 12" as at present.

The Engineer-in-Chief is substituting 2' openings arranged singly or in series covered with a stone slab or open topped with broad gauge rails built to the grade in place of arched culverts and I approve of the alteration.

5. *Major bridges—Kurtari*.—4×60'—

North abutment complete.

No. 1 pier quarter done.

„ 2 „ foundations being taken out.

„ 3 „ complete.

South abutment not begun.

Hulikal.—1×40'—

North abutment not begun.

South abutment complete.

Runnymead.—1×100'—

In consequence of the alteration of the main stream, it is proposed to build one pier 60' from the completed north abutment and the south abutment 100' from the pier, giving 1×60' and 1×100' thereby securing good foundations for the remaining pier and abutment. The bridge is skew to the stream.

Coonor.—1×60'—

North abutment half done.

South „ complete.

Benhope 2×60' } Are not yet begun.

Barliar 5×60' }

Kullar.—3×60'.—Foundations begun. A very good site has been selected with live rock for the highest pier foundation.

Bhavani.—2×100' with 2×60' (one at each end).—Masonry complete, except the central pier. This has been a source of much trouble and expense. In the early part of the year open foundations were taken out by a coffer dam, but the March floods swept them away and subsequently two iron well curbs 10' diameter were sunk with a 3' interval and 2' stone steining to depth of 7½ feet. At this depth some rails, which were used in the coffer dam, were found under the well curbs and great delay took place in endeavouring to cut or draw these out. At the time of inspection all of these rails had been drawn out by screw jacks, and it is hoped that nothing will prevent the wells being soon sunk on to the rock bed and the pier completed.

The stone work of these bridges is good, but greater attention should be given to getting clean sand for mortar. The lime is good and the proportions used are 2 sand to 1 lime.

Besides these large bridges there are some 15 ravines which it is proposed to cross by 30' spans carried on wrought iron braced standards. These are estimated to cost for an average height of 45 feet 150 rupees per foot run, and they are cheaper and more easily erected than longer girders with masonry piers, and, moreover, accommodate the sharp curves on which they have to be built better than longer spans. These are not yet ordered from England as the settled policy of the Agent is to finish the formation as far as possible before ordering more English stores.

Girders.—The following are delivered:—

2 spans 100'.

12 „ 60'.

4 „ 40'.

6 „ 20'.

Of these, two spans of 60' are at the Bhavani bridge site, one span rivetted up and two spans of 100' are being sorted before erection; also at the bridge site.

6. *Tunnels*.—There are several of these, aggregating 800' long, but none are yet commenced. In many cases open cuttings will, I think, be more economical than tunnels.

7. *Ballast*.—The last $2\frac{1}{2}$ miles are ballasted to a section of 8 cubic feet per foot run.

8. *Permanent-way*—is complete from Bhavani bridge to Mettupalaiyam. Several joints, where rails had been cut for curves, are not bolted. These are delivered at Mettupalaiyam—

18 miles 50 lb rails and fastenings. 12 miles Abt. rack are under delivery.
5,000 wooden sleepers.
30 sets points and crossings.

9. *Stations and buildings*.—*Stations and offices*.—Small offices are being built at Runnymede, Hillgrove, Adderly and Kullar, and at Mettupalaiyam a transshipping platform $240' \times 22'$ is complete and a shed 100' long over both lines of way on each side is begun.

10. *Station machinery*.—Six iron tanks $8' \times 8' \times 4'$ and five sets signals are delivered at Mettupalaiyam.

11. *Plant*.—There is sufficient plant already purchased to carry on the work to completion.

12. *Rolling stock*.—Ten low sided wagons on double bogies, weighing $5\frac{1}{2}$ tons, to carry 22 tons, have been delivered. They are of pressed steel frames, but appear to me to be not well rivetted up.

13. *General remarks*.—The detailed estimate has been submitted. A separate report will be sent up with it when thoroughly gone into. It may here be remarked that this estimate is for 32,75,207 as against Mr. Gilchrist's estimate of 25,16,134, being an excess of $7\frac{1}{2}$ lakhs of rupees.

The figures given me by the Engineer-in-Chief for earthwork quantities done to date are 168 lakhs of cubic feet, and I estimate that about half the work is done, which agrees with Mr. Weightman's figures based on quantities paid for. Mr. Gilchrist's total earthwork quantities were for a 1 in 15 line 530 lakhs which he reduced to 156 lakhs for a 1 in $12\frac{1}{2}$ line which proves that the original estimate was quite insufficient in this particular item.

Major Constable's remark in the last inspection report that "in his opinion this line can be built and equipped for 25 lakhs" is based on insufficient data. Any opinion to be worth anything can only be arrived at after first taking out the quantities and then estimating the rates. The Engineer-in-Chief's return is appended.

OOTACAMUND,
9th June 1893.

(Signed) F. R. UPCOTT,
Consulting Engineer for Railways.

NILGIRI RAILWAY.

MEMORANDUM of work done up to 30th April 1893.

Supplied by the Engineer-in-Chief.

Earthwork (approximately)—

4,500,000	cubic feet soft earth.
6,300,000	" hard "
3,100,000	" soft rock.
2,900,000	" hard "
16,800,000	

Retaining walls—

225,000 cubic feet dry stone masonry.

Minor bridges—

19 complete.
25 in progress.

Major bridges—

8 in progress.

Permanent-way, &c.—

18 miles rails and fastenings at Mettupalaiyam.	
5,000 wooden sleepers	" "
30 sets points and fixings	" "
6 iron tanks	" "
5 sets signals	" "

Rolling stock.—

10 low-sided wagons (22 tons), "

Under order.—

12 miles Abt. rack complete
(half to be delivered in October 1893 and half in June 1894).

Girders.—

2 spans 100 feet at Mettupalaiyam.	
12 " 60 " "	" "
4 " 40 " "	" "
6 " 20 " "	" "

No. 228 C.

Endorsement by the Consulting Engineer for Railways, dated 22nd June 1893.
Submitted for the information of Government.

ORDER—dated 27th June 1893, No. 979 R., Public Works.

Recorded.

2. The attention of the Engineer-in-Chief should be drawn to paras. 3 and 5.

(True Extract.)

(Signed) F. R. UPCOTT,
Joint Secy. to Govt., P.W.D.,
Railway Branch.

To the Consulting Engineer for Railways.

Exd. A. D. Xavier.
Spare Copies

RAILWAY.
Govt. of {1893} Madras.
PUBLIC WORKS.

Dated June, 27th.

Recd.

Encl.

G.O., 27th June 1893, No. 979 R.

JUNE.

Nilgiri Railway

The inspection report of the — by
Mr. F. R. Upcott, Consulting Engineer for
railways, recorded, and the attention of the
Engineer-in-Chief drawn to paras. 3 and 5.

See query in page 2.

20 June 1893

Compared.

Kms

20/6

REPORT OF INSPECTION OF THE NILGIRI RAILWAY.

I inspected this Railway on the 29th, 30th and 31st May in company with the Engineer-in-Chief and his Assistants.

Land.—The whole land has now been made over to the Company including the Coonoor station site, which is situated in a field near the Madras Carrying Company's offices and alongside of the main road. A diversion of this Government road is being made for a few chains on the Coonoor side of the station where the railway will run on the road. Some slight improvements suggested by Mr. Wolfe-Murray, the Collector, will be carried out. It will not be necessary, as stated in Major Constable's report of 28th September 1892, to acquire temporary land below the Benhope cliffs, as this question has now been definitely settled by Government Order.

Earthwork.—The following tabulated statement shows the estimated quantity of earthwork done to date, and the returns supplied by the Engineer-in-Chief are also given. Many serious slips have taken place along the whole line; this was to be expected, and I believe the Engineer-in-Chief has made provision for these in his revised estimate:—

CHAINAGE FROM COONOOOR.		Amount done.	Remarks.
From	To		
0	40	1 2 3 4 5 6	Cuttings filled by spoil from road above.
40	50		
50	60		
60	70		Serious wash-out here.
70	80		
80	90		
90	100		Cutting full of springs, has slipped badly.
100	116	1	
116	118	1	
118	130	1	
130	136	0	
136	148	1	
148	150	1	Runnymede station.
150	165	1	
165	168	1	Bad ground, full of springs.
168	172	1	
172	182	1	
182	187	1	
187	191	1	
191	193	1	
193	198	1	Dangerous over-hanging rock here; should be removed.
198	201	1	
201	202	0	
202	210	1	
210	218	1	Very good quarry here.
218	224	0	
224	228	0	
228	246	0	Benhope cliff cutting not begun.
246	256	0	
256	272	0	

as most of
the slopes are
1/4 to 1

flattening

slopes

CHAINAGE FROM COONOR.		Amount done.	Remarks.
From	To		
272	277	3	
277	281	4	
281	284	3	
284	290	6	
290	297	7	
297	303	6	
303	310	7	Hill Grove station.
310	323	13	Hill Grove estate paths are kept open by Collector at cost of about Rs. 50 per mensem.
323	348	25	
348	399	51	
399	406	7	
406	408	2	Burliar.
408	412	4	
412	425	13	
425	430	5	
430	433	3	
433	436	3	
436	445	9	Two nasty gorges here 120 ft. and 180 ft. wide.
445	450	5	
450	456	6	
456	465	9	
465	467	2	
467	469	2	
469	472	3	
472	474	2	
474	487	13	
487	490	3	Adderly station.
490	498	8	
498	503	5	
503	505	2	
505	515	10	
515	527	12	
527	538	11	
538	542	4	
542	550	8	
550	567	17	
567	578	11	
578	585	7	
585	596	11	
596	607	11	
607	610	3	
610	618	8	
618	621	3	
621	624	3	
624	627	3	
627	640	13	
(640)	650	10	Kullar station.
650	925	1	Mettapollium station.

3. *Revetment walls.*—The second-class wall at chain 31 has bulged and will require watching. Those built of sized headers and stretchers are standing well.

Wall at 47½ chains, complete.
 Do. " 168 " being built with 10' culvert through it.
 Do. " 198 " not yet put in by road engineers.
 Do. " 219 " being built.

4. *Bridges (minor) and culverts.*—These are 19 complete and 25 in progress or about half done between Coonor 0 and Benhope 250. An additional 6' culvert at 61 will be required owing to the shifting of the centre line. The 6' arched culvert at 65 has

been wrecked by a flood getting at the side and will require lengthening and rebuilding. This was not due to faulty design or work.

The floor of the 10' culvert at 72 should be stepped in 6" steps instead of 12" as at present.

The Engineer-in-Chief is substituting 2' openings arranged singly or in series covered with a stone slab or open topped with broad gauge rails built to the grade in place of arched culverts and I approve of the alteration.

5. *Major bridges—Kurtari.*—4×60'—

North abutment complete.

No. 1 pier quarter done.

" 2 " foundations being taken out.

" 3 " complete.

South abutment not begun.

Hulikal.—1×40'—

North abutment not begun.

South abutment complete.

Runnymede.—1×100'—

In consequence of the alteration of the main stream, it is proposed to build one pier 60' from the completed north abutment and the south abutment 100' from the pier, giving 1×60' and 1×100' thereby securing good foundations for the remaining pier and abutment. The bridge is skew to the stream.

Coonor.—1×60'—

North abutment half done.

South " complete.

Benhope 2×60' } Are not yet begun.

Barliar 5×60' }

Kullar.—3×60'.—Foundations begun. A very good site has been selected with live rock for the highest pier foundation.

Bhavani.—2×100' with 2×60' (one at each end).—Masonry complete, except the central pier. This has been a source of much trouble and expense. In the early part of the year open foundations were taken out by a coffer dam, but the March floods swept them away and subsequently two iron well curbs 10' diameter were sunk with a 3' interval and 2' stone steining to depth of 7½ feet. At this depth some rails, which were used in the coffer dam, were found under the well curbs and great delay took place in endeavouring to cut or draw these out. At the time of inspection all of these rails had been drawn out by screw jacks, and it is hoped that nothing will prevent the wells being soon sunk on to the rock bed and the pier completed.

The stone work of these bridges is good, but greater attention should be given to getting clean sand for mortar. The lime is good and the proportions used are 2 sand to 1 lime.

Besides these large bridges there are some 15 ravines which it is proposed to cross by 30' spans carried on wrought iron braced standards. These are estimated to cost for an average height of 45 feet 150 rupees per foot run, and they are cheaper and more easily erected than longer girders with masonry piers, and, moreover, accommodate the sharp curves on which they have to be built better than longer spans. These are not yet ordered from England as the settled policy of the Agent is to finish the formation as far as possible before ordering more English stores.

Girders.—The following are delivered:—

2 spans 100'.
 12 " 60'.
 4 " 40'.
 6 " 20'.

Of these, two spans of 60' are at the Bhavani bridge site, one span rivetted up and two spans of 100' are being sorted before erection; also at the bridge site.

6. *Tunnels.*—There are several of these, aggregating 800' long, but none are yet commenced. In many cases open cuttings will, I think, be more economical than tunnels.

7. *Ballast.*—The last 2½ miles are ballasted to a section of 8 cubic feet per foot run.

8. *Permanent-way*—is complete from Bhavani bridge to Mettupalaiyam. Several joints, where rails had been cut for curves, are not bolted. There are delivered at Mettupalaiyam—

18 miles 50 rails and fastenings and 12 miles Abt. rack are under delivery.
5,000 wooden sleepers.
30 sets points and crossings.

9. *Stations and buildings—Stations and offices.*—Small offices are being built at Runnymede, Hillgrove, Adderly and Kullar, and at Mettupalaiyam a transshipping side is begun.

10. *Station machinery.*—Six iron tanks 8' × 8' × 4' and five sets signals are delivered at Mettupalaiyam.

11. *Plant.*—There is sufficient plant already purchased to carry on the work to completion.

12. *Rolling stock.*—Ten low sided wagons on double bogies, weighing 5½ tons, to carry 22 tons, have been delivered. They are of pressed steel frames, but appear to me to be not well rivetted up.

it 13. *General remarks.*—The detailed estimates have been submitted. A separate report will be sent up with them when they have been thoroughly gone into. It may here be remarked that this estimate is for 32,75,207 as against Mr. Gilchrist's estimate of 25,16,134, being an excess of 7½ lakhs of rupees.

The figures given me by the Engineer-in-Chief for earthwork quantities done to date are 168 lakhs of cubic feet, and I estimate that about half the work is done, which agrees with Mr. Weightman's figures based on quantities paid for. Mr. Gilchrist's total earthwork quantities were for a 1 in 15 line 530 lakhs which he reduced to 156 lakhs for a 1 in 12½ line which proves that the original estimate was quite insufficient in this particular item.

Major Constable's remark in the last inspection report that "in his opinion this line can be built and equipped for 25 lakhs" is based on insufficient data. Any opinion to be worth anything can only be arrived at after first taking out the quantities and then estimating the rates. The Engineer-in-Chief's return is appended.

OOTACAMUND,
9th June 1893.

(Signed) F. R. UPCOTT,
Consulting Engineer for Railways.

NILGIRI RAILWAY.

MEMORANDUM of work done up to 30th April 1893.

Supplied by the Engineer-in-Chief.

Earthwork (approximately)—

4,500,000	cubic feet soft earth.
6,300,000	" hard "
3,100,000	" soft rock.
2,900,000	" hard "
16,800,000	

Retaining walls—

225,000 cubic feet dry stone masonry.

Minor bridges.—

19 complete.
25 in progress.

Major bridges—

8 in progress.

Permanent-way, &c.—

18 miles rails and fastenings at Mettupalaiyam.	
5,000 wooden sleepers	" "
30 sets points and fixings	" "
6 iron tanks	" "
5 sets signals	" "

Rolling stock.—

10 low-sided wagons (22 tons), "

Under order.—

12 miles Abt. rack complete
(half to be delivered in October 1893 and half in June 1894).

Girders.—

2 spans 100 feet at Mettupalaiyam.	
12 " 60 " "	
4 " 40 " "	
6 " 20 " "	

no 228c dt 22 June 93.
Submitted for the information of Government.

Repts: 1.7.53

Report of Inspection
of the
Ulpiri Railway

I inspected this Railway on the 29, 30, and 31 May in company with the Engineer in Chief and his Assistant - Land The whole land has now been made over to the Company including the Coorong Station which is situated in a field near the mallee carrying Coorong - and alongside of the main Road - a diversion of this foot Road ^{is being made} In a few days on the Coorong side of the station where the rails will run on the road - some slight improvements suggested by Mr. Wolfe Murray the collector will be carried out - it will not be necessary as stated in Major Constable's report of 28th Sept. 92 to acquire temporary land before the Barroo cliffs as this question has now been

definitely settled by G.O.

Earthwork The following tabulated statement shows the estimated quantity of earthwork done to date and the returns supplied by the Eng. in Chief are also given

Many serious slips have taken place along the whole line, this was due expected and I believe the Eng. in Chief has made provision for them in his revised estimate

Chainage from	Amount due	Remarks
0	40	Cutting filled by spoil from road sloping
40	50	
50	60	washed out & serious slips here
60	70	
70	80	
80	90	
90	100	Cutting full of springs has slipped badly
100	116	
116	118	
118	120	
120	136	
136	148	
	150	Rumyemad Station
	165	
	168	Red pond full of springs
	172	
	182	
	187	

187	191	$\frac{1}{2}$	
	193	1	Dangerous shattering rock line will be removed.
	198	$\frac{1}{2}$	
	201	$\frac{1}{2}$	
	202	0	
	210	$\frac{1}{2}$	Very good quarry here
	218	$\frac{1}{3}$	
	224	0	
	228	$\frac{1}{2}$	
	246	0	Benboke Cliff not begun
	256	$\frac{2}{3}$	
	275	0	
272	277	$\frac{2}{3}$	
	281	$\frac{1}{4}$	
	284	$\frac{1}{5}$	
	290	0	
	297	$\frac{1}{4}$	
	303	$\frac{2}{3}$	
	310	$\frac{1}{4}$	
	323	$\frac{1}{2}$	Still prove station still prove cuttings are kept open by collecting at cost of about 50 of per m.
	328	$\frac{1}{2}$	
	368	0	
	399	0	
	406	$\frac{1}{2}$	
	408	0	Burliar
	414	$\frac{1}{2}$	
	425	0	
	430	$\frac{1}{2}$	
	433	0	
	436	$\frac{1}{4}$	

436 445 $\frac{1}{4}$ 2 half forces here 120' & 140' wide

450 0
 456 $\frac{1}{4}$
 465 $\frac{1}{4}$
 467 0
 469 $\frac{1}{3}$
 472 0
 474 $\frac{1}{2}$
 487 0
 490 $\frac{1}{2}$
 498 $\frac{1}{3}$
 503 0
 505 $\frac{1}{4}$
 515 $\frac{1}{2}$
 527 $\frac{1}{3}$
 538 $\frac{1}{2}$
 542 0
 545 $\frac{2}{3}$
 550 $\frac{1}{2}$
 567 $\frac{1}{2}$
 578 0
 585 $\frac{1}{4}$
 596 $\frac{1}{2}$
 607 $\frac{1}{2}$
 610 0
 618 $\frac{1}{2}$
 621 0
 624 $\frac{2}{3}$
 627 0
 640 $\frac{2}{3}$
 650 $\frac{2}{3}$
 925 1

Caddis Station

Kullar Station

2

Retement. Walls

30

the 2nd Class Wall at Chain 31 two bulged & will require watching. These built of rigid masonry & stretchers called 1st Class are standing well. Wall at 47 $\frac{1}{2}$ chains complete. " " 168 " being built with 10' culvert thro' it. " " 198 " not yet put in by road engineers. " " 219 " being built

Bridges minor & culverts

There are ^{19 complete & 25 in progress} about $\frac{1}{2}$ done between Coonoon & and Renkohe 250. The 6' arched culvert @ 65 has been wrecked by a flood getting at the side and will require lengthening & rebuilding. The floor of the 10' culvert at 72 should be stepped $\frac{1}{2}$ in 12" steps instead of 24" as at present. The hgt. in chief is substituting 2' openings arranged in series covered with a stone slab or open topped with broad gauge rails built in to the grade in place of arched culverts & I think agree with him.

Major bridges

Kurtari 4 x 60' North abut complete No 1 pier $\frac{1}{4}$ done " 2 " foundations being taken out " 3 " complete South abut not begun

An additional 6' culvert @ 61 will be required owing to the shifting of the centre line.

Kulikal 1 x 40'

South about not begun
North " complete

Runnymede 1 x 100'

In consequence of the
alteration of the main
stream - it is proposed
to build one pier 60'
from the completed
North abut & the South
abut 100' from the
pier - giving 1 x 60' and
1 x 100' thereby securing
good foundations for
the remaining piers &
abut. The bridge is
skew to the stream

Coonoor 1 x 60'

North abut $\frac{1}{2}$ done
South " complete

Benthoor 2 x 60'

Benthoor 5 x 60'

are not yet begun

Benthoor 2 x 60'

Benthoor 5 x 60'

Benthoor 5 x 60'

Benthoor 5 x 60'

Benthoor 5 x 60'

Benthoor 5 x 60'

Benthoor 5 x 60'

Benthoor 5 x 60'

Benthoor 5 x 60'

Benthoor 5 x 60'

Benthoor 5 x 60'

Benthoor 5 x 60'

Benthoor 5 x 60'

Besides these large
bridges there are some
15 railways which
it is proposed to
cross by 30' spans
carried on wrought
iron braced standards

150' height of 45 feet
24.5¢ per foot run
and they are cheaper &
more easily erected
than longer piers
with masonry piers

and moreover accommodate the
sharp curves on which they have
the built better than longer
spans - There are not yet a-
head from England as the
settled policy of the Agent is to
finish the formation as far as
possible before ordering more Eu-
ropean stores -

Kullar 3 x 60' Foundations
begun - a very good site has been
selected with live rock for the
pier highest pier foundation

Bhawani 2 x 100' with 2 x 60'
one at each end. masonry com-
plete except the central pier -

This has been a source of much
trouble & expense - In the early
part of the year open grounds
were taken out by a cofferdam
but the March floods swept it
away & subsequently 2 iron
well curbs 10' diam were sunk
with a 3' interval and 2' stone
steining to depth of 7 1/2 feet -

at this depth some rails which
were used in the cofferdam
were found under the well
curbs & a great delay took
place in endeavouring to cut
or draw them out at the
time of inspection 2 of these
rails had been drawn out by
screw jacks and it is hoped

to the north-south direction
 across that nothing will prevent
 the wells being ^{soon} sunk on the
 rock bed & the pier completed.

Tunnels There are several of these
~~varying from~~ ^{approx. 800'} long
 but none are yet commenced.
 In many cases open cuttings will
 I think ~~be~~ be more economical
 than tunnels.

Ballast The last 2 1/2 miles are
 ballasted to a section of 8 cft.
 per foot run.

Permanent way - Is complete
 from Bhaurani bridge to Metta.
 5000 ft. of rails have been cut. The rails are not laid
 yet. There is delivered at Metta 12 miles of rails
 10 miles of sleepers & 50 sets of points & crossings.
 5000 wood in sleepers are under delivery.

The work of these bridges is of wood but the greater attention should be given to getting the setting well. There is present a sufficient amount of sand - the line comes from the sand & the proportion of wood are 2 to 1.

By girders the following are

Delivered	2 spans	100'
	12 "	60'
	4 "	40'
	6 "	20'

of these
 2 spans of 60' are at the Bhaurani
 one span rivetted up
 Bridge site & 2 spans of 100' are
 being sorted before erection also
 at the bridge site.

Stations & Buildings

Stations & offices. Small offices are being
 built at Rumpulaid, Kell pass, Addey
 and Kullar and at Metta. A
 transshipping platform 240' x 22' is
 complete & a shed 100' long over both
 lines of way on each side is being.
 Stations machinery - 6 iron towers 8' x 8' x 4'
 and 5 sets of signals are delivered at Metta
 and Kullar.

Plant - The following plant is
~~in use~~ There is sufficient plant
 already purchased to carry on the work
 to completion.

Rolling stock 10 low speed wagons
 on double bogies ^{weighing 5 1/2 tons} to carry 22 tons
 have been delivered. They are of
 pressed steel frames but appear to be
 not well rivetted up.

General Remarks The detailed
 estimates have been submitted
 a separate report will be sent up
 with them when they have been
 thoroughly gone into. It
 may here be remarked that
 this estimate is for 32,75,207
 as against Mr. Filch's estimate
 of 25,16,134 being an excess of
 7 1/2 lacs of rupees.

The figures given me by the
 Eng. in chief for earthwork quantities
 done to date are 168 lacs of cft.
 and I estimate that about
 half the work is done which
 agrees with Mr. Weiffert's
 figures based on his ~~estimated~~
 quantities paid for. Mr. Filch's total
 earthwork quantities were
 for a 1 in 15 line 530 lacs
 which he reduced to 156 lacs
 for a 1 in 12 1/2 line. Which
 proves that the original estimate
 was quite insufficient in this
 particular item.

in the last inspection report
Major Cristobal remarks that
"in his opinion this line can
be built & equipped for 25
cattle" is based on insufficient
data - Any opinion of the worth
anything must be arrived at
after first, taking out the quantities
& then estimating the rates.
The engineer in charge return is appended.

Ootacamund

9 June 93

J. Russell

Consulting Engineer
for Railways

Submitted for the
information of Government.

979 R 327 June 1893.

PUBLIC WORKS DEPARTMENT,
RAILWAY BRANCH.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following

Endorsement from } H.E. No. 228C of 12 June 1893.
the Comptroller for Rys.

Recorded

2. The attention of
the Engineer in Chief
should be drawn to para.
3 and 6.

Sd/- J. R. U.

H
979 R 327 June 1893.

+ Please obtain
half of 228C to 1 P.
Sent. 10/10/93. 10/10/93.
required. 10/10/93.

By
the Comptroller for Rys.

A

No. 949 RZ 27 June 1893.