Superintendent of Works that Messrs. Sullivan & Co should be required to make a reduction of at least one half in the price of the rope last supplied for the B tramway to compensate for the inferiority in the quality of its predecessor.

I have &c

D W

26.9

Wire rope for B.
Reference to P. Provis

I am to add that I am able to confirm from personal knowledge the accuracy of Mr Davis's statements, and that I share the views expressed by him that the difference was a decided difference in practical value of the two ropes.

Rec. 2443-4 W. & 2d Oct 91

DESPATCHED
4 OCT. 91

2/10

W/ on Service

Cuj

PUBLIC WORKS DEPARTMENT.

No. 2443W. dt 2nd October 1894.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

READ the following

From the Supt: of Works No I Periyar Dn (No. 126 C.E. of 21 Septr: 1894)

The Director General of Stores will be addressed.

The Supt: of Works P. P.

DESPATCHED 4 OCT. 94

(No. 2446W of 2nd Octr 94)

To

The Director General of Stores
India Office
London.

Sir,

With reference to your letter No. S 2771 dated 3rd August 1894, I am directed to forward copy of one from the Superintendent of Works Periyar Project No. 126 C.E dated 21st Septr: 1894, affording further information relative to the failure of the wire rope supplied in January 1893 for the B rope way, and to submit for consideration the suggestion of the Superintendent

(40—1,000—13-9-94.)

W. CURRENT No. 7173

From

The Superintendent of Works
No. 1 Periyar Division

To

The Chief Engineer
Public Works Dept.
Madras

No. 126 C.E.

Dated 21st September 94
Recd: 24-9-94

Wire Ropes:— Submitting further details of failure of — with reference to G.O. No. 2133W dt 28-8-94.

single wires at random and bending
them found that they broke at A be
they were bent double ∧ while a Spec
-men from the original rope bent mor
than double ∧ without breaking, clear
showing that, in the specimens at all
events, the flexibility was appreciat
greater in the latter one than in the
former two. I would recommend tha
Messrs Bullivant & Co should be
asked to make a reduction of at lea
one half in the price of their last B.R
to compensate for the inferiority in th
quality of its predecessor.

Fig. 2.

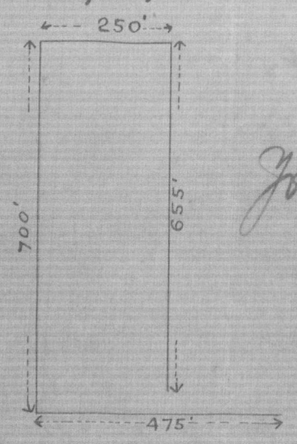
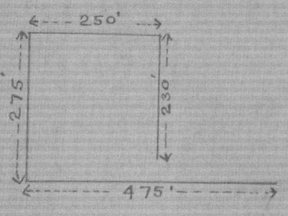


Fig. 1.



I have the honor to be
Sir
Your most obedient servant
S. D. Evans.
Superintendent of Works
No 1 Division Perim

being excessively or improperly used.

6. Messrs Bullivant & Co's tests do not by any means disprove the inferiority of the rope. The tension of these ropes is not the force which tries them most severely; it is not their tensile strength which suffers, and I do not for a moment contend that it was from tensile weakness that this rope failed. It is the bending round the pulleys which is the severest test, and in a lesser degree the torsion which is set up in them; by reason of their conformation, by the friction between the rope and the pulleys. With regard to their torsional strength Messrs Bullivant & Co's figures confess the large reduction that had taken place in this rope as compared with a new rope. With regard to the bending round the pulleys it may be worth mentioning that I took two

Single

No 1267 E.E.

Office of the Superintendent of Works
No 1. Division Periyar

Periyar 2/ct September/94

From

S. D. Pears Esqre.
Superintendent of Works.
No 1. Divn Periyar.

To

The Chief Engineer,
P. W. D.
Madras.

Sir,

With reference to the correspond-
-ence communicated to me with G.O. No. 2183
W. of 28-8-94, I have the honor to report
that, as far as the A rope is concerned,
no claim at all can, I think, be esta-
-blished against Messrs Bullivant & Co
for the compensation which they offer
to make. The rope had a bad journey
in 1888, it lay in store at Thekady for
over 3 years, and when put up it was
worked at a greater tension than that
specified

single wires at random and bendu
them found that they broke at A
they were bent double ∧ while a sp
-men from the original rope bent m
than double ∧ without breaking, cle
showing that, in the specimens at a
events, the flexibility was apprec
greater in the latter one than in the
former two. I would recommend
Messrs Bullivant & Co should be
asked to make a reduction of at le
one half in the price of their last E
to compensate for the inferiority in
quality of its predecessor.

Fig. 1.

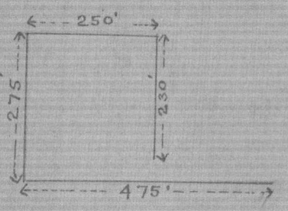
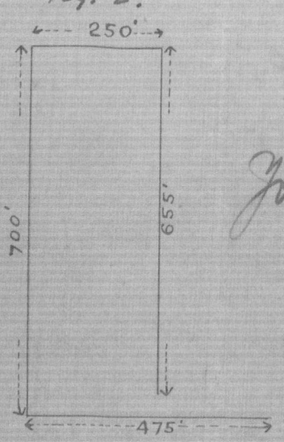


Fig. 2.



I have the honor to b
Sir
Your most obedient serv

S. D. Pears.
Superintendent of Wo
No 1 Division Pe

Specified. I still think that it should have done more work than it did, before breaking down, but this is an opinion only and nothing more, and it would be quite impossible to prove that its premature failure was entirely or even chiefly due to the quality of the rope more than to the aforementioned circumstances which have all along been admitted.

2. With regard to the B. rope however the case is quite different. In the first place it stands condemned by comparison with the first rope, its predecessor, on the B ropeway. The first rope was Supplied in 1888, had a bad road journey to Periyar which occupied several months and exposed it to rain and to much other unfair treatment: on arrival at Periyar it lay in store, not very carefully stowed, for nearly 3 years. One half of it was brought into use 1st October 1891 and worked till the end of March 1892; the other half worked from 4th October 1892 till 4th March 1893, and had still some wear in it when discarded. The second rope on the other hand, after a very much quicker journey, escaping the worst of the monsoon rains on the road, arrived at Periyar in seemingly perfect order and one half was at once set to work. It may therefore be safely stated that its subsequent failure was due quite inappreciably if at all to any bad treatment prior to its being actually set to work.

3. The reason for its being cut in half was merely that the most convenient position of the angles at that period was as shown in figure 1 and the subsequent position (fig 2) was as yet

yet unsuitable. The intention was to use one half of the rope on the first position, and when the second position became necessary to splice the half onto it and work the whole rope; this intention was baulked by the breakdown of the first half. It had to be discarded and replaced by the second half, and for the new position of the rope-way the new rope supplied this year by Messrs Bullivant & Co had to be procured.

4. With regard to the work done by the rope complained of, my former statement that it had a life of 3 months and 20 days included Sundays and off-days: it actually worked on 89 days. The specification demands that it should carry 40 tons per hour, viz 20 tons per hour from each terminal. The rope

Complained

complained of on no day carried more than 175 tons in 8 hours from the two terminals, of which about $\frac{5}{8}$ was carried from the one and about $\frac{3}{8}$ from the other terminal. Its average from the two terminals for the 189 actual working days was 107 tons in 8 hours. Its speed on 88 days was $2\frac{1}{4}$ miles per hour, and on 1 day was $2\frac{1}{2}$ miles per hour. Its tension was less than that with which its predecessor had been worked. Finally if it might with some truth be said that the original ropes were worked by men who had not had much experience with wire ropes, it must with equal truth be said that this was not the case with the rope complained of.

5. In the face of the above figures and facts it is impossible to maintain that the failure of the rope was due to its being

being excessively or improperly used.

6. Messrs Bullivant & co's tests do not by any means disprove the inferiority of the rope. The tension of these ropes is not the force which tries them most severely; it is not their tensile strength which suffers, and I do not for a moment contend that it was from tensile weakness that this rope failed. It is the bending round the pulleys which is the severest test; and in a lesser degree the torsion which is set up in them; by reason of their conformation, by the friction between the rope and the pulleys. With regard to their torsional strength Messrs Bullivant & co's figures confess the large reduction that had taken place in this rope as compared with a new rope. With regard to the bending round the pulleys it may be worth mentioning that I took two single

GENERAL.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated August, 28th.

Recd. *Encl.*

G.O., 28th Aug. 1894, No. 2133 W.

AUGUST.

Periyar Project

Letter from the Director-General of Stores forwarding copies of correspondence in connection with the failure of the wire rope supplied to the —, communicated to the Superintendent of Works.

being excessively or improperly used.

6. Messrs Bullivant & co's tests do not by any means disprove the inferiority of the rope. The tension of these ropes is not the force which tries them most severely; it is not their tensile strength which suffers, and I do not for a moment contend that it was from tensile weakness that this rope failed. It is the bending round the pulleys which is the severest test, and in a lesser degree the torsion which is set up in them; by reason of their conformation, by the friction between the rope and the pulleys. With regard to their torsional strength Messrs Bullivant & co's figures confess the large reduction that had taken place in this rope as compared with a new rope. With regard to the bending round the pulleys it may be worth mentioning that I took two single

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

General.
Account.

READ—the following paper:—

From the Director-General of Stores, India Office, to the Secretary to the Government of Madras, Public Works Department, dated Whitehall, S.W., 3rd August 1894, No. S. 2771.

With reference to your letter No. 262 W., dated 30th January 1894, transmitting papers regarding the unsatisfactory quality of the wire rope supplied in January 1893 for the main dam ropeway, Periyár project, I have the honour to inform you that the samples sent home have been tested, and I now forward copies of the documents noted in the margin for your information.

Letters from Bullivant and Co., dated 12th and 13th March, 19th June and 2nd July 1894.
Report by the Consulting Engineer, dated 27th July 1894.

I may observe that Messrs. Bullivant and Co. were under a misapprehension in supposing that the Consulting Engineer had already forwarded to you a copy of their letter of 12th March 1894.

ENCLOSURES.

72, MARK LANE, LONDON, E.C.,
12th March 1894.

[Indian Public Works, Periyár Project.]

Dear Sir,

We have the honour to acknowledge and thank you for your esteemed communication of the first instant containing an extract from a report from S. D. Pears, Esq., Superintendent of Works of No. I Periyár Division, to the Chief Engineer of Public Works Department, dated Periyár, 20th November 1893, No. 193 C.E., and in conjunction with this we respectfully beg to refer you to a similar report, dated 4th October 1893, No. 153 C.E.

Mr. Pears is doubtless aware that these two wire tramways (A) and (B) were designed and supplied by us and that they were designed to do a certain quantity of work.

With respect to the life of the ropes on each line, we would respectfully submit that the proper way to consider this would not be as to the actual time the ropes have lasted, but should be considered as to the quantity carried by them.

We think, with reference to report No. 153 C.E., that Mr. Pears will agree with us that it is hardly fair to consider the work done by the ropes as being what they might truly have been expected to have done if the ropes had been put to work when they first arrived. He most candidly says in the report under consideration that although the rope was supplied as long ago as 1888, it was not put to work till 1892. He does not say in what month, but at the time of his report, October, it must have been at work over 10 months, and we can quite understand that nearly any rope which had been constantly at work on a running rope system of tramway and doing the amount of work that was calculated that that tramway would do would show very considerable signs of wear and tear after being at work for 10 months.

With respect to report No. 193, we must ask a preliminary question. Mr. Pears says that when he received this rope of 5,400 feet in length that he cut it into two equal parts. We do not understand why he should do so, because it requires 5,400 feet of rope to work this tramway and that he has not materially shortened the length of the tramway is shown by the fact that the rope has to pass over 10 pulleys each 8 feet in diameter in each circuit, and this is as designed in the original tramway which took 5,400 feet of rope.

We have not yet received the specimens of rope that he refers to in his report and we shall be very glad to do so. In fact without these it is nearly impossible for us to offer any remarks on the working of the rope. We can only go back to our original point and say that the work the rope has done must be considered not by length of time it has run but by quantity it has carried.

Mr. Pears is also good enough to tell us in his report that he has considerably increased the tension, *i.e.*, reduced the sag on the ropes. This will make the wear and tear on them much more severe than if he had allowed the sag we had originally provided for.

In making these remarks we beg Mr. Pears to consider that what we are trying to arrive at is the perfecting of all parts of his gear, and any information that he may be good enough to give us will not only be of considerable interest to us but will be esteemed a great favour.

We have understood from letters we have received with respect to supplying motive power and also with respect to extension of the line that the tramways have given very considerable satisfaction, and if there is any part of the gear that we can improve, we shall only be too pleased to do so.

The amount of work done by both (A) and (B) must have been considerable, as we find in 1893 we supplied an additional number of Carrington's saddles, and in March 1893 we supplied additional numbers of carriers, wrought iron hangers and buckets. The whole of the last three items being for tramway (A), the first item being for tramway (B). It is fair to infer that as the 100 additional buckets were supplied in all probability extra work was put on the second rope.

In conclusion, we may say that the record of tests we have of materials used in the ropes referred to are all that can be desired.

To Sir A. M. Rendel, K.C.I.E.,
8, Great George Street, Westminster.

We have, &c.,

(Signed) BULLIVANT and CO.

72, Mark Lane, London, E.C.,
13th March 1894.

No. S. 2771, 12th March.

Sir,

We have the honour to acknowledge and thank you for your esteemed communication as above. With reference to our tender of the 2nd March, we wrote to Sir A. M. Rendel, K.C.I.E., yesterday on this subject replying to Mr. Pears' memorandum as far as we could from the data furnished us.

We have no hesitation whatever in giving the assurance you ask for, viz., that if it can be shown there is anything wrong with the ropes, either as to quality or make, that we supplied under contract No. 17/2751, we will make compensation.

We pointed out in our letter to Sir Alexander yesterday that the services of a rope must not be considered by its actual life but by the quantity of work that it does.

We should therefore not be prepared to rely simply on the samples that are sent home, but should ask, before any compensation be arrived at as to the alleged failure of the rope, that we should wait the reply to our letter addressed to Sir A. M. Rendel yesterday.

We have, &c.,

(Signed) BULLIVANT and CO.

To the Director-General of Stores,
India Office, Whitehall, S. W.

72, Mark Lane, London, E.C.,
19th June 1894.

[Indian Public Works, Periyár Project.]

Dear Sir,

In reply to your letter of yesterday and referring to your letter of the 18th April, we have to apologise that this has not been replied to before.

We need hardly assure you, however, that this is due to no discourtesy on our part, but simply to the fact that we wanted as far as possible to ascertain the actual conditions under which the rope on Tramway B has been worked.

Since the date of your letter we have had the pleasure of meeting on two or three occasions Mr. Roscoe Allan who was engaged at Periyár and who explains to us the point raised in our letter of 12th March as to why Mr. Pears should have cut the 5,400 feet of rope into two equal parts. It appears that Tramway B was divided into two parts of about equal length, and from what he tells us it seems that the work of each part was very considerably increased.

We have most carefully tested the samples of rope you were good enough to send us. These show considerable signs of wear, and to our mind the rope has been overstrained.

Attached to this letter we beg to send you a copy of the original tests of the rope under discussion before it was sent out. We also attach a copy of the results of the tests of the pieces returned.

Considering the work that the rope has had to do, we must say that we consider the tests satisfactory.

We therefore are disposed to think that the cause of failure, if any, has been due to the manner in which the rope has been worked and not to any inherent defect in the rope itself.

Mr. Pears will doubtless be replying to our letter of the 12th March, and we shall esteem it a favour if we may be honored with a copy of his reply.

We have, &c.,

(Signed) BULLIVANT and CO.

To Sir A. M. Rendel, K.C.I.E.,
8, Great George Street, Westminster.

Tests of wire made by Mr. Goldsack on 13th January 1893.

'102

lb.	Turns 6″.	lb.	Turns 6″.	lb.	Turns 6″.
1,410	22	1,390	23	1,435	25
1,374	24	1,395	26	1,405	23
1,407	24	1,412	24	1,384	22
1,424	22	1,407	24	1,424	25
1,405	21	1,380	24	1,384	30
1,382	21	1,422	24	1,410	23
lb.	Turns 8″.	lb.	Turns 8″.	lb.	Turns 8″.
1,396	31	1,395	28	1,437	29
1,402	30	1,404	31	1,384	31
1,404	30	1,422	31	1,384	33
1,408	32	1,381	31	1,423	38
1,392	26	1,385	30	1,482	33
1,424	31	1,387	33	1,404	29

Tests of samples sent down, 2 $\frac{7}{8}$″ rope.

Strand No. 1.

			Breaking S. lb.	Turns in 6″.	
'102	...	...	1,322	13	(badly abrazed).
101	...	...	1,410	10	(„ „)
100	...	...	890		(too much worn to test).

Strand No. 2.

			Breaking S. lb.	Turns in 6″.	
'102	...	...	1,330	13	All these wires are more or less abrazed.
'102	...	...	1,360	10	
'101	...	...	1,352	14	
'101	...	...	1,328	11	
'102	...	...	1,330	12	
'102	...	...	1,290	13	

Strand No. 3.

			Breaking S. lb.	Turns in 6″.	
'102	...	...	1,300	14	All abrazed badly.
'101	...	...	1,308	12	
'102	...	...	1,421	18	
'102	...	...	1,329	10	
'103	...	...	1,408		Too abrazed to test for torsion.
'103	...	...	1,349		

Strand No. 4.

			lb.	Turns in 6″.	
′102	...	...	1,400	14	Slightly abrazed.
′101	...	...	1,328	13	
′100	...	...	1,310	16	
′101	...	...	1,424	9	Badly abrazed.
′101	...	...	1,370	10	
′101	...	...	1,435	13	Slightly abrazed.

Strand No. 5.

			lb.	Turns in 6″.	
′101	...	...	1,332	7	Badly abrazed.
′102	...	...	1,382	15	Slightly abrazed.
′101	...	...	1,321	11	
′100	...	...	1,380	8	Badly abrazed.
′101	...	...	1,467	16	Slightly abrazed.
′104	...	...	1,450	14	

Strand No. 6.

			lb.	Turns in 6″.	
′101	...	...	1,322	13	Very badly abrazed.
′102	...	...	1,370	11	
′102	...	...	1,300	7	
′099	...	...	1,369	6	
′099	...	...	1,364		Too badly abrazed to test.
′101	...	...	1,350		

72, Mark Lane, London, E.C.,
2nd July 1894.

[Indian Public Works, Periyár Project.]

Dear Sir,

In reply to your letter of the 25th ultimo, as far as we know the conditions of working of the two ropes were not the same. We think in the first case the rope was worked as a whole; in the second case it was divided into two parts. This is a question you will remember on which we asked information from Mr. Pears.

With respect to the overstrain, this may be done—

Firstly.—By increasing the number of carriers.

Secondly.—By increasing the speed of the rope.

Thirdly.—By means of tightening gear.

This latter might cause overstrain by tightening the rope during the very hot weather and leaving it subject to the effect of the cold night.

It is very difficult to give a definite answer to your letter until we receive a reply to our letter, dated 12th March, which will doubtless soon be to hand, when we shall be very pleased to go into the matter fully with the aid of the further information that Mr. Pears may give us.

To Sir A. M. Rendel, K.C.I.E.,
8, Great George Street, Westminster.

We have, &c.,

(Signed) BULLIVANT and CO.

P. S.—We will return you by messenger to-morrow the samples you refer to in your letter of the 26th ultimo.

Copy report by Consulting Engineer, dated 27th July 1894.

I enclose a letter from Messrs. Bullivant, dated the 16th ultimo, giving the results of both tensional and torsional tests made on wires taken from the samples of rope sent home. Seeing that all the wires were more or less damaged by wear, I think that these results are satisfactory and that Mr. Pears' suggestion that the failure of the ropes has been due to bad material is not borne out.

I see that in his letter No. 226 C.E. to the Chief Engineer, Mr. Pears says, "The sag with which the ropeway has hitherto been worked is less than that specified by the makers . . . But as I think the premature failure of the present rope may not improbably be partly attributable to the excess over the specified tension," &c.

The alteration of the amount of sag in the rope materially affects the initial tension upon it so that by reducing the sag Mr. Pears has put an unintended strain on the rope which may account for its failure.

I am satisfied that the frequent failure of wire ropes in India is to be attributed much more to mistaken usage than to bad workmanship.

Order—dated 28th August 1894, No. 2133 W., Public Works.

Communicated to the Superintendent of Works, Periyár Project, with reference to G.O., No. 261 W., dated 30th January 1894.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent of Works, Periyár Project.
" Chief Engineer for Irrigation.
" Superintending Engineer, V Circle.

Exd. C. A Munisawmy.
Spare Copies

GENERAL.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated August, 28th.

Recd. *Encl.*

G.O., 28th Aug. 1894, No. 2133 W.

AUGUST.

Periyar Project

Letter from the Director-General of Stores forwarding copies of correspondence in connection with the failure of the wire rope supplied to the —, communicated to the Superintendent of Works.

GENERAL.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated January, 30th.

Recd. *Encl.*

30th January 1894, No. 262 W.

JANUARY.

Indent

Forwarding for early compliance an — for 18,680 additional feet of steel wire rope required for the A. wire tramway and also for 5,400 feet of wire rope for the main dam ropeway in No. I Division, Periyár Project, and inviting special attention to the remarks regarding the unsatisfactory quality of the wire rope supplied for the main dam ropeway in 1893.

PUBLIC WORKS DEPARTMENT.

General.
Account.

Letter—from

Colonel J. PENNYCUICK, R.E.,
Secretary to the Government of Madras,
Public Works Department,

To

The DIRECTOR-GENERAL of STORES,
India Office,
London.

Sir,

In continuation of my letter No. 3113 W., dated 2nd December 1893, I am directed to forward an indent in duplicate for 18,680 additional feet of steel wire rope required for the A. wire tramway and also for 5,100 feet of wire rope for the main dam ropeway in No. I Division, Periyár Project.

2. I am at the same time to invite your special attention to the remarks in letter from the Superintendent of Works, No. I Periyár Division, No. 193 C.E., dated 20th November 1893, embodied in the Proceedings * herewith forwarded regarding the unsatisfactory quality of the wire rope supplied for the main dam ropeway in January 1893 and which failed after less than four months use. The specimens of the rope referred to by the Superintendent of Works will be transmitted to you in the next freight packet for inspection. It will be seen that in this case also it is suggested that the new rope indented for may be of the kind known as "Lang's patent lay."

* No. 261 W., dated 30th January 1894.

3. I am to request that the present indent may be treated as very urgent.

I have the honour to be,
Sir,
Your most obedient servant,

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

Fort St. George,
30th January 1894.

Exd. C. A. Manisawmy.

Spare Copies

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

General.
Account.

Read—the following papers:—

From S. D. PEARS, Esq., Superintendent of Works, No. I Periyár Division, to the Chief Engineer, Public Works Department, dated Periyár, 20th November 1893, No. 193 C.E.

I have the honour to bring to your notice that the steel wire rope supplied by the India office last January for the main dam ropeway under G.O., No. 3351 W., dated 7th December 1892, has proved so unsatisfactory that I request that the matter may be brought to the notice of the India office and of the makers. The rope in question should have lasted till the completion of the work; as it is, a new one will certainly be necessary, and if it is obtained, as it probably will be, from the same makers, they should, in my opinion, be asked to provide it at a very considerable reduction in price.

2. The rope complained of was shipped from England on the 31st January last, reached Ammayanáyakkanúr in April, and Periyár at the end of June. It was cut into two equal parts, of which one was brought into operation about the 20th July, since which time it has been working daily, except Sundays, holidays and about 7 other idle days, having to pass round ten 8' pulleys in each circuit. On the 9th November, after a life of only 3 months and 20 days, it had deteriorated to a condition so unsafe that it became necessary to dismantle it and replace it with the other unused half. The three specimens which accompany this letter will show you that it was not rejected too soon. The specimens are the worst flaws in the rope, but along its whole length single wires, and in a good many cases two or three wires at the same point, have parted, the fracture being generally clean and without trace of corrosion. I am inclined to attribute the failure of the rope to the inferior quality of the steel. It will be open to the makers to reply that the rope may have been subjected to corrosive influences in the course of its long journey to Periyár, but for the first part of the journey, by sea and rail, it could hardly have suffered had it been protected by tarred canvas as requested by the Madras Government in their telegram printed with the Government order above quoted, and for the last portion, although it was a long time on the road and was exposed to some bad weather, it nevertheless made a very much better journey than its predecessor, a rope of exactly the samedescription, furnished by, I believe, the same makers, Messrs. Bullivant and Co., which subsequently stood 11 months of actual work, under precisely the same conditions.

3. There is no reason to suppose that the second half of this rope, which is now being put up, will last any longer than the first half has done. It is moreover not long enough for the ultimate positions of the angles, which will have to be adopted at the beginning of next season. I therefore enclose an indent for a new rope of the same length, but of the kind known as Lang's patent lay (made by Messrs. Bullivant and Co.) for the reasons given in my No. 153 C.E., dated 4th October 1893. I beg that no time may be lost in ordering it, so that it may be sure of being at Periyár in time for the commencement of next season.

From the General Superintendent, Public Works Stores, dated 30th Nov. 1893, No. 72 S.

From S. D. PEARS, Esq., Superintendent of Works, No. I Periyár Division, to the Chief Engineer, Public Works Department, dated Periyár, 14th December 1893, No. 226 C.E.

In continuation of my No. 153 C.E., dated 4th October 1893, I have the honour to report that the last two months' working of the ghât wire ropeway has made it quite evident that the lower rope even when its worst pieces have been replaced by the best pieces of the upper rope (about to be rejected) will not last even one season more.

2. I am therefore compelled to submit an indent for a complete new rope for the lower section, and I beg that very early arrangements may be made for procuring it from England, so that it may be put up by the beginning of next season and the necessity avoided of having to stop transport and change ropes during the middle of the season.

3. I have again specified one of Messrs. Bullivant's ropes made on Lang's patent lay.

4. The length of the rope required for the whole ropeway, as calculated in a letter printed with G.O., No. 3004 W., dated 13th November 1890, is 35,930 feet. I indented in October for 17,250 feet and the present indent is for the balance of 18,680 feet. The sag with which the ropeway has hitherto been worked is less than that specified by the makers and would require a total length of rope of not more than 35,000 at most. But as I think the premature failure of the present rope may not improbably be partly attributable to the excess over specified tension, I have thought it better to provide for a deeper sag, giving a length of rope about 5 per cent. in excess of the direct length measured from post to post.

From the Examiner, Public Works Accounts, dated 21st December 1893, No. 2319 D.
" General Superintendent, Public Works Stores, dated 8th Jan. 1894, No. 81 S.
" Examiner, Public Works Accounts, dated 18th January 1894, No. 134 D.
" " " " 22nd " " " 200 D.

ORDER—dated 30th January 1894, No. 261 W., Public Works.

Indent No. 12 has already been forwarded* to the Home Government and indent No. 17 will therefore be modified so as to provide for the balance, 18,680 feet, of steel wire rope required for A. wire tramway. This indent, which will be forwarded for early compliance, also provides for the supply of 5,400 feet of wire rope for the main dam ropeway. Indent No. 15 will be cancelled.

* G.O., No. 3112 W., dated 2nd Dec. 1893.

2. The special attention of the Director-General of Stores will be invited to the remarks in the letter from the Superintendent of Works, No. 193 C.E., dated 20th November 1893, regarding the unsatisfactory quality of wire rope supplied from England in January 1893 for the main dam ropeway.

[Here enter No. 262 W., dated 30th January 1894.]

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent of Works, Periyár Project.
" Superintending Engineer, V Circle.
" Examiner, Public Works Accounts.

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Spare Copies

GENERAL.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated January, 30th.

Recd. *Encl.*

G.O., 30th Jan. 1894, No. 261 W.

JANUARY.

Indent

The — for 18,680 additional feet of steel wire rope required for the A. wire tramway and also for 5,400 feet of wire rope for the main dam ropeway in No. I Division, Periyár Project, ordered to be forwarded to the Home Government for early compliance.