REPORT OF THE COMMITTEE ON TIES

Ottawa, November 28th, 1911.

The Secretary, Canadian Society of Civil Engineers,
Montreal, P.Q.

DEAR SIR,

Referring to your request of 25th inst., that the Report of Tie Committee for 1911 be submitted to the Council before December 9th, I attach for the Council's information copies of correspondence I have had in this connection, from which it will appear that only four out of the nine members have taken any part in the discussion, and that two of them are in favour of using ties not longer than 8′ 6″; one sticks to the 8 foot length without, however, advancing any reasons to support his views. Under these circumstances it seems impossible to present anything that could be called a Report of Tie Committee, hence I submit the correspondence for such action as the Council may deem advisable, and in doing so desire to say that this year's discussion, in my opinion, has not disclosed any definite or conclusive reasons to prove that ties shorter than 10 feet meet the requirements of the standard modern track, required to support the immensely increased loads of up-to-date rolling stock.

Perusal of the reports and discussions of the Committee on Ties of the American Railway Engineering Association for several years past will disclose the fact that many members of that association are of the opinion that longer ties are necessary, but that they hesitate to recommend the same definitely for fear of seeming to commit the roads they represent to large increases of expenditure. It would be equally logical to advocate using a 56 lb. rail for the same reason. The chief engineers of the London and Northwestern, and of the Midland Railway, of England, inform me that their standard tie is 9 feet long. These are two of the best maintained roads in the country, but their engines are probably not more than two-thirds the weight of the heavy engines used on this continent, and the axle loads are lighter in proportion.

Ties 9 feet long have been used in Texas over 30 years with mud ballast, which would indicate that the advantage of increased bearing must more than offset the disadvantages of drainage, even in bad ballast, and these disadvantages would not be so great in gravel ballast.

The chief engineer of the Louisville and Nashville Railway informs me that they have used 10 ft. ties with sand ballast and had no difficulty with drainage, or trouble with ties breaking under the rail. They now use blast furnace slag for ballast in place of the sand, and their standard tie is 9 feet long.

Some ten years ago I had personal experience with a piece of track, about one-half mile long, over Muskeg, on the Canadian Pacific Railway, which piece of track is was impossible to keep in surface or line with ties 8 ft. long. An experiment was tried with ties 12 ft. long, and that length of tie has been used there ever since with perfectly satisfactory results. The roadmaster recently informed me that he had no trouble with the long ties breaking, and that this summer he had treated another muskeg the same way, with the result that a-half mile of 7 mile section, which with 8′ ties had taken 50% of the time of the section gang to keep in order, had, since the placing of the 12′ ties, scarcely needed any attention, and remained in good surface and line.

These examples would indicate that there is not much danger of 10′ ties breaking, and that they do give the much needed additional support.

I am sending a copy of this letter to each member of the Committee, but do not propose to submit any further formal report.

Yours very truly,
D. MACPHERSON,
Chairman of the Committee on Ties.

CANADIAN PACIFIC RAILWAY COMPANY.

Winnipeg, June 5th, 1911.

D. MacPherson, Esq.,
Assistant Chief Engineer, N. T. R.,
Ottawa.

DEAR SIR,

I have the Secretary's circular letter of May 23rd, notifying members of the Railway Committee of their re-appointment, and asking that we reply to you accepting the same. I will be pleased to serve on this Committee, and do what my spare time will permit.

I also have copy of your letter, May 5th, to the Secretary, regarding an error in the Committee's report. I think, if you will give this matter a little further study, you will find that there was not only an error in figures, but there was also a very serious error in principles. Leaving aside all the features that make it unnecessary to tamp under the centre of the ties, and assuming that it would be good railroading to so tamp ties, (which, of course, I do not admit), the only place a tie is apt to break is under the rail or at the centre. Now, if you will figure up the strain, putting the moment at the centre of the tie equal to the moment underneath the rail, I think you will soon discover the error I allude to.

To make the case a little more clear. Imagine the tie turned upside down, the rails a support, and the tie carrying a uniform load. I think you will find that theoretically the length of tie for a safe load is considerably less than 9 ft.

Yours truly,
J. G. SULLIVAN.

TO THE MEMBERS OF THE COMMITTEE ON TIES, CANADIAN SOCIETY OF CIVIL ENGINEERS.

As the Committee on Ties has been continued from last year, with the understanding that only those who expressed a willingness to act need be considered as members, I would advise you that the men whose names appear on this letter have stated their readiness to act, which should assure a good live report for next Annual Meeting. Unless the majority of the members of the Committee wish otherwise, it might be well to confine our work this year entirely to determining what, in our opinion, are the best dimensions for ties for a standard trunk line railway, and not go into tie preservation or cost at all.

Of course the question of cost is very vital, but the first and most important things to determine are the proper dimensions to give the best results.

I enclose copy of some correspondence between one member of the Committee and myself, which may help to set the ball rolling, and I would ask each member to contribute something definite on the subject as early as possible, avoiding generalities and giving logical reasons for all theories advanced. As soon as all the members contribute something on the subject, I shall call a Committee meeting, when we can exchange views more fully and perhaps evolve matter for further inquiry or discussion.

In the meantime, I hope you will pitch into the two of us who have so far committed ourselves to paper and handle our theories without gloves, so long as you evolve something better or advance arguments which prove our points of view to be erroneous.

COMMITTEE.

E. P. Gutelius.
H. G. Kelley.
Wm. McNab.
J. G. Sullivan.
T. C. Burpee.
H. A. Woods.
M. H. MacLeod.
W. A. Bowden.
W. B. MacKenzie.

D. MACPHERSON,
Chairman.

July, 1911.

J. G. Sullivan, Esq.,
Assistant Chief Engineer, C. P. R.,
Winnipeg, Man.

July 20th, 1911.

DEAR SULLIVAN,

I am obliged for yours of the 5th ult., *re* ties, and, if all members of the Committee, in addition to the interest they take in this matter, would show that interest as practically as you are doing, we should soon thresh out some useful information. We must, however, each be careful to try to look at the matter, not only from our own,