

the majority, as I say, almost without exception, and are eliminating the safety walks from future designs.

There is a third fact that disturbs me quite a bit. We saw in the picture unprotected exposed ends of the curbs and I really could not justify in my own mind leaving this curb exposed.

To a vehicle, that certainly results in a disabling accident if it should run onto this curb. The car would have no chance to recover at all; and this could be improved at very small expense, to provide an adequate transition, or a much better transition. Apparently we are still making the same mistakes.

The last remark is that apparently there was inadequate coordination between the bridge designers and the roadway designers to produce the safest highway that can be produced from our present knowledge.

Mr. CONSTANDY. Do you know, Mr. Wilkes, for how long the AASHO standard for the bridge railing was in effect, up until it was changed recently?

Mr. WILKES. No.

Mr. CONSTANDY. It was for some years, was it not?

Mr. WILKES. Yes. I would say there was no change in the railing specification for a period of more than 15 years, until 1964 when the heavier loading was reviewed and approved by the committee.

Mr. CONSTANDY. Up until 1964, would a bridge railing built pursuant to the AASHO standard contain a vehicle on a bridge?

Mr. WILKES. I would say in a majority of cases they did.

Mr. CONSTANDY. If it is built only to standard?

Mr. WILKES. Built to design; yes. Most of the rails that performed badly would not even meet the then-existing design standards.

Mr. CONSTANDY. Of AASHO?

Mr. WILKES. Of AASHO.

Mr. CONSTANDY. If the bridge railing were built to the pre-1964 AASHO standard, it would contain an automobile if struck?

Mr. WILKES. Let me say in most cases the rail performed in an acceptable manner.

Now, certainly there are many instances where the vehicle did go through the railing, so I will not claim 100 percent performance, but most of the time it did.

Mr. CONSTANDY. You know, of course, we have no professional competence on this staff in the engineering field; we do not purport to have.

However, I have had many conversations with bridge engineers—dozens of them—relative to design strength of the AASHO standard bridge railing prior to 1964.

It was my impression, as a result of these conversations, that if they had answered the question, the answer would be no, it would not contain an automobile.

Mr. WILKES. Let me say that, as a result of this Highway Research Board Special Report 81, certain angles of attack and speed of the vehicle were prescribed for a bridge rail or parapet test.

I would agree that the pre-1964 bridge specifications for rail design, according to those specifications, would not contain a vehicle at the speed and direction recommended for testing in this bulletin.