

This is a section of a guardrail intended to protect the motorist from the shoulder here on the right. The guardrail is 25 feet long and supported by three steel posts.

You will notice that the approaching end of the guardrail is aimed directly at the car. There are a number of fatalities each year when the driver is pierced by such an approaching end.

The other end of the guardrail ends here at the pier and a car impacting the guardrail would in all probability bend the guardrail back. This particular installation has no blocked-out feature to prevent the wheel of the automobile from catching at the post. It does not contain any washers to prevent the heads of the bolts that attach it to the post from pulling through the guardrail.

This was a typical installation in the State in which we found it which happened to be Indiana. We found in all nine States that either the design or the installation of the guardrail left something to be desired.

Would anyone care to comment about this photograph?

Mr. E. M. JOHNSON. Mr. Constandy, may I ask you a question?

Mr. CONSTANDY. Please do.

Mr. E. M. JOHNSON. In your studies, have you any comparison of the safety value of an adequately flared guardrail as compared to the buried-in-line guardrail? Your point, of course, that you make there is well taken. I am going a little further.

Mr. CONSTANDY. If you are asking for my personal judgment or opinion, I have none. However, I am somewhat familiar with the Special Report 81 of the Highway Research Board, which represented at the time of publication in 1964, the composite knowledge of those people who conducted sufficient research into the matter to justify having an opinion on this.

I think you will find that in Special Report 81, in reference to the point you raised, they recommend that in all cases the guardrail be anchored on the approach ends. They give two illustrations, one of which shows the buried end parallel with the traveled roadway while the other shows an offset or flare from the travel way.

My recollection of it is that they recommend 4 to 10 feet flare and they then recommend that before it comes back on a tangent that the distance be some 10 to 15 times the amount of the offset. This latter installation of being both anchored and flared was the recommended design by the Highway Research Board Special Report 81.

They have recently come out with an additional publication which perhaps puts in more perspective the problems involved in guardrail installation.

In the course of our speaking to the people who have conducted research, we found that there was much that could be said as to the advisability of a washer and advisability of blocking out the guardrail.

Mr. Beaton tested the guardrail in attempting to find out how short a section would be effective. In the course of his study at one point the test was approximately 90 feet, and the car tore it away. He concluded a section could not be less than 100 feet and be effective, particularly if it was not anchored. When Mr. Stonex testified, I believe he said they use a length 500 feet in advance of a bridge. This is 25 feet, one section.