

provide both the grated inlet and slot that will be self-cleaning. And we have attempted to distribute some of these details to the States. We hope that they will be adopted.

Other details we saw were the result, I am sure, or a designer attempting to produce a maximum economy. For example, the end wall that spilled down into the ditch could be eliminated completely by a longer bridge. So this designer, in developing what he thought was the most economical design, encroached into this ditch area with his embankment and, as a result, it produced a second area hazard.

I guess that is the point I am trying to make, that if we are willing to spend more money, many of these details could be corrected.

Mr. CONSTANDY. Yes. We again are looking at situations where perhaps there were considerations of first cost and perhaps they were not really concerned with economics.

Mr. RICKER?

Mr. RICKER. Two points: One, it is certainly objectionable to run a large culvert out beyond the ditch line where it makes a hazard in itself. On the other hand, if it is cut back flush with the side slope, it is still a hazard, because there is a large hole there that vehicles could drop into. I don't know that we can get away from that hazard and maybe we need to evaluate which is worse, to have a round pipe or a hole.

The other point, I am not sure I entirely agree as to the hazard involved in a moderate amount of water in a ditch. Certainly if the water is deep enough to cover a vehicle, it would be a hazard, but—

Mr. CONSTANDY. I am sorry—deep enough to what?

Mr. RICKER. To contain a vehicle. If it went under the water it would be a hazard. But it could be that a relatively shallow body of water there would be a very effective deceleration device in itself. And there are many, many parts of the country where there will be water standing in the ditches a large part of the year.

Mr. CONSTANDY. Would it be true, too, that the relationship between the depth of the water and the ratio of slope and height of it should be considered? A car going over a steep slope is apt to turn over; if it turns over in the ditch, it would not have to be deep to kill the driver. We all on the committee are acutely aware of an example of that very same thing.

Mr. RICKER. I have never seen crash tests in the movie, vehicles running into a shallow body of water like this. I am just guessing that it might be well as a deceleration factor.

Mr. CONSTANDY. Thank you.

Mr. HARSHA. May I ask a question? Would an additional guardrail in the vicinity of these extended drainage pipes, these large corrugated pipes, possibly alleviate any of the hazard?

Mr. RICKER. I believe, Mr. Congressman, as we have been discussing for the past several days, guardrail itself is a hazard and we need to evaluate whether it would be less of a hazard than the exposed end of the pipe or more. In each case, perhaps, it has to be thought of individually, depending upon the curvature of the road.

Mr. HARSHA. Thank you.

Mr. CONSTANDY. Some of the examples we saw, incidentally, did have a guardrail protection for the hazard. I would suggest in each