the rail and absorb some of the energy of the car, but yet it is weak enough in the longitudinal direction to be pushed down by the vehicle without violent deceleration.

In order to optimize our posts, to find a post that would do this for us, we ran quite a series of full-scale impact tests on posts alone in a variety of soils. We wanted to get, as I said, this sufficient lateral resistance, we wanted to get a minimum longitudinal resistance and we wanted a post that would react the same in all kinds of soils, whether they be loose, frozen, dense, or what have you. We were able to accomplish this with a 3-inch I-beam post, weighing 5.7 pounds per foot. We were able to equalize the reactions regardless of the type of soil by welding a plate under the bottom of the post, a 6- by 24-inch plate. So when this is driven, regardless of the type of soil, whether it is frozen, freshly thawed or normal, we get a predictable and uniform resistance.

Once the post problem was settled, the barrier design evolved around a rail which is of sufficient strength to limit the decelerations to what you would like to have, and this led to the development of our box beam system. For use in areas where deflection must be minimized we were able, with the heavier box, to limit the deflections to approximately 2 feet, under an impact of 60 miles an hour and 25°.

For situations where a greater deflection could be tolerated, we have developed a W-beam system, again on the same lightweight posts and we have a cable system for side rails also on lightweight posts.

We have two median barriers, one with the box beam and we have another one using W-beams placed on each side of the lightweight posts.

So in all, we have five guiderail and median barrier systems and we have also developed a bridge rail system which at the present time is not used. The lightweight post is.

We had to restrict the deflection even more on the bridge, so there is a heavier weight post but using the box beam railings.

I believe that is all the introduction unless there are some questions.

Mr. W. May. Will you run the film now.

(The filmscript, "New Highway Barriers, Practical Application of Theoretical Design," follows:)

FILMSCRIPT, NEW HIGHWAY BARRIERS, PRACTICAL APPLICATION OF THEORETICAL DESIGN, PREPARED BY H & H PRODUCTIONS FOR THE BUREAU OF PHYSICAL RESEARCH, NEW YORK STATE DEPARTMENT OF PUBLIC WORKS

In the United States, each year, fifty thousand people die in automobile accidents. Nearly one fourth of the automobile fatalities are caused by collisions with fixed objects, including barriers. This fatality rate approaches the population of a town the size of Bennington, Vermont. Some accidents cannot be prevented, but many can be minimized by providing safer driving conditions.

Properly designed highway barriers delineate roadway limits and denote hazardous conditions. They must also redirect a colliding vehicle to limit lethal decelerations and to minimize danger to other vehicles. Our film shows highlights of a research program that has resulted in a complete revision of New York State guiderail, median, and bridge barriers. From this project, we have developed analytical procedures for predicting vehicle reaction during a collision, and, for determining optimum characteristics of barriers for use in different applications.

At the beginning of this program, three goals were set: to evaluate existing barriers; to develop analytical procedures; and to design new barriers. A barrier