

# REPORT OF PROJECT COMMITTEE ON FILLERS AND CUSHION COURSES FOR BRICK AND BLOCK PAVEMENTS

JOHN S CRANDELL, *Chairman*

*Professor of Highway Engineering University of Illinois*

## SYNOPSIS

The report describes the recent use of a number of new fillers for brick pavements. Among them are Temperature Resisting Cement, a bituminous compound known as Zorbit, an asphalt-rubber compound and Trinidad asphalt. Means for removing filler from the top surface of the brick pavement are described. To facilitate the removal, the brick have been coated with various materials, among them being whitewash, calcium chloride, and several proprietary materials. All are used successfully with proper precautions and methods.

Several new materials have been advocated for fillers. During 1932 Temperature Resisting Cement was used on two jobs in Ohio, and from these it was learned that: (a) the sand used with the cement should have a greater percentage of fines than is ordinarily found in concrete sands, (b) because of water repellancy of the cement, caused by the bituminous film thereon, a longer time and a more thorough mixing is requisite, and (c) it is not good practice to dump the filler direct from the mortar box to the pavement as there is likely to be some separation of ingredients.

Experiments are being conducted with a bituminous compound known as Zorbit. This is a powdered asphalt which is mixed with a flux of such character that the resultant mixture is fluid for a reasonable length of time, sets with a minimum of shrinkage. It adheres well, and seems to be capable of holding grit or other skid-proofing substances.

Mention was made in the 1932 Proceedings of an asphalt-rubber compound which has been developed at the University of Illinois. This has been wholly satisfactory in a small experimental patch in a pavement at Urbana, Illinois. It did not run in summer, and it is not brittle in cold weather. Its one disadvantage is that it does not flow readily enough to enter the joints of a lugless brick pavement, although it does fill the joints of a lug brick job.

Trinidad asphalt filler was used experimentally on January 6, 1933 at New Castle, Pennsylvania on U S Route 422, between Chestnut and Walnut Streets. An area of 383 square yards was filled, using 26 pounds of asphalt per square yard. The brick were laid with wide joints, to correspond with the old pavement already in place, on a

sand cushion The asphalt was pushed into the joints with the customary squeegee, and a sand cover was applied at 10 lbs per square yard

#### REMOVAL OF FILLER FROM TOP OF PAVEMENT

Numerous attempts have been made to find a material that may be applied to the surface of the bricks so that the bituminous filler may be peeled off without removing it from the joints themselves White-wash, calcium chloride, and proprietary "separators" have been used successfully At first it was thought that whitewash should be applied so as to leave a heavy coat, and that this should be dry when the bitumen is applied however it has been found that if the filler is immediately peeled off damp whitewash is better than dry. If calcium chloride solution is used the filler may be applied as soon as the bricks are sprayed, and the excess should be quickly scraped or peeled off Going one step further, it is probable that in moderate weather it may be possible to do a good job by merely sprinkling the top of the pavement with water alone So long as there is a film of moisture present to prevent the asphalt from adhering, there will be little difficulty in removing the film. In hot weather water alone would evaporate too quickly and calcium chloride is indicated One very important item to watch is that of foaming If too much watery solution is present then the filler will foam to such an extent that the joints will not be filled And furthermore, since the material recovered is put back in the heating kettle, there must be a minimum of water present in it or there will be foaming in the kettle, which leads to a fire

The 1933 specifications for Ohio do not permit of the filler being squeegeed into the joints. It is to be poured over the surface or into the joints, and then the excess removed It has been found in practice that thin films of bitumen are difficult to scrape off, whereas thick films or layers are easy to remove in any weather

The Committee will investigate various types of cement grout filler during the coming year.

### DISCUSSION

ON

### FILLERS AND CUSHION COURSES FOR BRICK AND BLOCK PAVEMENTS

MR GEO F SCHLESINGER, *National Paving Brick Association* The part of the report which is very interesting to me is Professor Crandell's investigation of a new type of filler—some sort of rubber compound If we develop a filler that will not come up after it is in the joints there will be no danger of any subsequent effect which would serve to decrease the coefficient of friction. If Professor Crandell will discover

some filler of that kind he will make a valuable contribution. With a vertical fiber wire-cut lug brick we can use a much harder asphalt for filler than formerly, one that is not so susceptible to temperature changes. Professor Crandell in his report also discussed the surface removal method which has now been made standard practice in a number of states where brick pavements are used—Ohio, Illinois, Michigan, Indiana, and I think Pennsylvania. There have been enough jobs built to leave no question in my mind as to the merits of the surface removal method of filler application. All engineers that have used it say that is the preferred method of applying bituminous material to fill brick pavements.

MR. H. S. MATTIMORE, *Pennsylvania Highway Department*. We are rather interested in the methods used for removing the excess asphalt. Is there any danger of those liquid solutions going into the joints of the brick and defeating the purpose of the bond?

PROFESSOR CRANDELL. Yes. The workmen must be careful not to splash this material over the top. Use a spray or a mist. You need only the least bit of any of these materials to prevent adhesion provided you work quickly to remove the asphalt. If you wait an hour or two you will find that water or calcium chloride may not work so well. You will notice in the report in 1931 that a heavy coat of whitewash was recommended. This was advocated so that you could go back week after next and still be able to remove the asphalt, because there is a layer of whitewash on the brick which does not permit the asphalt to adhere. But this is not true if water or calcium chloride are used.

MR. SCHLESINGER. As far as foaming into the joints is concerned, there hasn't been any particular trouble. It should be sprayed on and the surface kept just moist. As between calcium chloride and whitewash, we recommend calcium chloride. With whitewash the filler can be scraped off and it doesn't stain the surface of the pavement. Nevertheless you get a good bright looking pavement with calcium chloride.

A. V. BRATT: How is the whitewash applied?

PROFESSOR CRANDELL. I prefer the spray equipped with a large nozzle. Mr. Mattimore brought up the question as to whether the calcium chloride would cause foaming in the kettle, and I have been fearful of that for some time. A small amount of water in the kettle is dangerous.