

SUGGESTED RESEARCH

- 1 Comparison of the load distributing properties of the standard center joint and the longitudinal groove in both plain and reinforced slabs.

A RÉSUMÉ OF RESULTS FROM STUDIES MADE ON BRICK PAVEMENTS

J T PAULS

United States Bureau of Public Roads

One of the early studies made on brick surfaces was the accelerated wear test conducted during 1920 and 1921 at the Arlington Experiment Farm, Virginia. The purpose of this test was to compare the behavior of the various features of the pavement when subjected to heavy steel-tired traffic.

The following conclusions were given in the report on this work:

- 1 The edge protection offered by bituminous and cement-grout fillers is considerably greater for vertical fiber and wire-cut lug than for repressed brick.
- 2 The adhesion of bituminous fillers to wire-cut lug and vertical fiber brick tends to protect the surface and reduce the wear.
- 3 With cement-grout fillers the surface becomes a rigid slab and failure occurs because of the breaking of this slab under load and consequent loosening and shattering of the brick.
- 4 Sand cushions are subjected to more compression than sand-cement cushions, and the greater compression results in a more uneven surface.
- 5 Elastic fillers considerably reduce the effects of impact occasioned by steel-tired traffic and the destructive effects increase with increased rigidity of the fillers.

A study of the "rolled base" brick roads in Ohio was made during 1921. The so-called "rolled-base" type includes those in which the base consists of one or more courses of crushed stone, gravel, or slag rolled and thoroughly bonded with screenings.

The conclusions drawn from this study were:

- 1 A "rolled base" may be successfully used under ordinary road conditions, provided the thickness of the base is adjusted to meet the probable traffic requirements. An 8-inch to 10-inch

compacted base should suffice under all but the heaviest truck traffic.

- 2 A bituminous rather than a grout filler should be used in order to provide a flexible section throughout.
- 3 A very inferior material as measured by laboratory tests may be successfully used as base material for brick roads

Many miles of brick roads in Florida have been built by laying the brick directly upon the sand subgrade³. With this type of construction the brick are filled with sand, cement-grout or a bituminous material and are restrained at the sides of the road by cypress or concrete curbs, while sand, shell, clay, or limerock is used for shoulders

A study of these roads was made in 1924. The report on this investigation showed these roads to be very satisfactory both as to service and as to costs

A study of the behavior under impact, of brick surfaced slabs of different types was made at the Arlington Experiment Station during 1921,⁴ from which the following conclusions were drawn

1. The monolithic slabs in most cases showed less resistance than the 1:1½:3 concrete slabs of the same depth. The failure of the former resulted from the shearing of the brick top from the concrete base
2. Grout-filled brick tops with sand and screening cushions on concrete bases showed slightly greater resistance than would be expected from the bases alone
3. Grouted brick surfaces compared favorably with 1:1½:3 slabs of equal thickness
4. The beam strengths of the bases were not much increased by bituminous-filled tops

The Bureau of Public Roads made an investigation during 1926 of thin brick pavements⁵. The purpose of the study was to determine the practical brick thickness for different traffic conditions from the points of view of manufacture, service and cost.

This investigation consisted of a field study of the service behavior of brick pavements in which brick of less than 4-inch thickness had been used, and concurrently an accelerated traffic test at Arlington, Virginia, on sections of pavement built of brick of different thicknesses, with a series of laboratory tests on the brick used to determine their quality. Several plants manufacturing brick of less than 3-inch thickness were also visited to determine the attitude of the industry

toward the use of the thinner brick and to ascertain if their manufacture presented any particular difficulties.

The following conclusions were drawn from these investigations:

1. That 2 $\frac{1}{2}$ -inch brick of the quality used in the Arlington traffic tests, when properly supported, will prove satisfactory for pavements carrying the heavier types of traffic
2. That brick of 2-inch thickness, when properly supported and of a quality used in the tests, will be adequate for pavements on streets carrying the lighter types of traffic.
3. That a bedding course of plain sand is more effective in reducing breakage of brick than a cement-sand bedding course. The depth of sand bedding course should not greatly exceed three-fourths inch. Increasing the depth tends to produce roughness in the pavement.
4. That cobbling of the brick is greatly increased as the spacing between bricks is increased
5. That the use of excessive quantities of asphalt filler is a common and serious fault in construction, unnecessarily increasing the cost and resulting in a condition which impairs both the appearance and the serviceability of the pavement
6. That base construction of other than the rigid type may in many cases prove entirely satisfactory when the local conditions of traffic subgrade and climate are such that this type of construction maintains its stability throughout the year
7. That no difference in the base construction is necessary for the different thicknesses of brick

ADDITIONAL RESEARCH NEEDED

Further study should be made on base types to determine their respective utilities

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