

Thesis Title	Deflection Behaviors of Geosynthetic-Reinforced Polymer -Modified Asphalt
Thesis Credits	12
Candidate	Miss Thitapan Chantachot
Thesis Advisors	Asst. Prof. Dr. Warat Kongkitkul Asst. Prof. Dr. Sompote Youwai
Program	Master of Engineering
Field of Study	Civil Engineering (Geotechnical Engineering)
Department	Civil Engineering
Faculty	Engineering
B.E.	2554

### Abstract

Behaviors of polymer modified asphalt (PMA) pavement reinforced with geosynthetic reinforcement were studied by performing a series of scaled-down physical model tests in the laboratory. In these tests, both subbase and base layers were modeled by cleaned uniform sand while the PMA pavement was prepared to be 6 cm thick, either reinforced with geosynthetics or unreinforced. The modeled pavement was repeatedly compressed for 200 cycles by means of a 6 cm wide rigid rough footing placed at the center of the PMA pavement. The footing and surface settlements of PMA pavements were measured by laser displacement sensors. In addition, maximum strain distribution of the modeled subbase and base layers was determined by a photogrammetric analysis. Considering the permanent settlement of footing and surface settlements, the performance of PMA pavements improved when they were reinforced with geosynthetics for both new and overlaid pavements cases. This is due to increase of the rigidity of reinforced PMA pavement. The maximum shear strain distribution of the modeled subbase and base layers reinforced with geosynthetics also decreased; because of the geosynthetic reinforcement effectively distributed stress to a much wider area supporting layer underneath. Then, the test results were also compared with the ones performed with HMA pavement previously. The permanent settlement of footing and maximum shear strain distribution in PMA pavements were substantially smaller than the ones in HMA pavements, both unreinforced and reinforced cases. These results indicated that replacing asphalt cement (AC) with polymer modified asphalt cement (PM-AC) could increase the stiffness of the pavement.

Keywords: Flexible Pavement / Polymer Modified Asphalt / Geosynthetic Reinforcement / Permanent Deformation / Physical Model Test / Shear Band