# CHAPTER 5 CONCLUSION

In this study, the behaviors of new and overlayed polymer modified asphalt pavements (PMA), which were reinforced with geosynthetics, were studied by performing a series of physical model test in the laboratory. From the test results and analyses performed in this study, the following conclusions can be derived:

1. The permanent settlement of the model footing decreased with PMA pavement reinforced with geosynthetics in both the new pavements and the overlayed pavements except for the overlayed pavement with reinforced geogrid together with geocomposite. The use of geosynthetic reinforcement for reinforcing the pavement was successful to widely distribute pressure underneath footing to other area. Thus, the rigidity of pavement was increased.
2. The surface settlement and settlement underneath pavement decreased with PMA pavements reinforced with geosynthetics in the new pavements and the overlayed pavements except for the overlayed pavement reinforced with geogrid together with geocomposite.
3. The maximum shear strain ( $\gamma_{max}$ ) distribution decreased with PMA pavements reinforced with geosynthetics in both the new pavements and the overlayed pavements except for the overlayed pavement reinforced with geogrid together with geocomposite. The geosynthetics reinforcement in pavement played an important role to distribute stress from footing to subbase layer.
4. The PMA pavement reinforced with geocomposite was the most effective among the new pavements. The PMA pavement reinforced with geogrid was the most effective among the overlyed pavements.
5. The overlayed PMA pavement reinforced with geogrid together with geocomposite was not effective for the improvement of the performance of pavement. This may be due to slippage of the two sheets of geosynthetics sandwiched.
6. When comparing PMA pavements and HMA pavements, the permanent settlement of the model footing decreased in PMA pavement both for unreinforced and reinforced cases and for new pavement and overlayed pavement conditions. Therefore, replacing asphalt cement (AC) with polymer modified asphalt cement (PM-AC) was successful to increase increased stiffness of pavement.
7. When comparing PMA pavements and HMA pavements, the surface settlement decreased in PMA pavement both for unreinforced and reinforced cases and for new pavement and overlayed pavement conditions. The new HMA pavements were seemed susceptible to bending moment in pavement, while not the case with the new PMA pavements. The cracking in HMA pavements may be probably occurred.
8. When comparing PMA pavements and HMA pavements, the maximum shear strain ( $\gamma_{max}$ ) distribution was decreased in PMA pavement both for unreinforced and reinforced cases and for new pavement and overlayed pavement conditions. The shear band was developed to a wider area in subbase for HMA pavements.

## Recommendations for Future Research

1. The physical model test for asphaltic concrete pavement and polymer modified asphalt pavement should be performed at high temperature conditions for studying the behavior of permanent deformation and strain distribution which are according to realistic application, in particular for pavement conditions in Thailand.
2. The various types of geosynthetics should be used for reinforcing the pavements.
3. The geosynthetics reinforcement should be reinforced in other part of pavement, such as subbase and subbgrade.
4. The geosynthetics should be installed in other locations of pavement, such as the middle of pavement and the upper one-third of the base layer. Thus, the effect of location of geosynthetic should be investigated.