Abstract
The quality control of newly constructed asphalt layers and their long-term performance are becoming two important issues in today’s paving industry. Rutting is among the main distress types, considered as significant indicator of poor long-term performance. Shear properties of asphalt mixes are known to be among the most important factors in resisting rutting. In this regard, the InSiSST facility was developed at Carleton University to measure the in–situ shear properties. This thesis introduces the main steps leading to the present test facility. It also describes the new proposed enhancements and their effect on the overall capabilities of the machine. Laboratory and field investigations have been carried out to examine and validate the improved testing facility. It is concluded that the new enhancements have significantly improved the abilities of the upgraded facility in measuring the torque and angular displacement more accurately, controlling the test temperature and increasing the testing speed.