The influence of mixture composition, adhesion promotor and compaction degree on the groove stability of grooved Marshall asphalt

Cedric Vuye[1], Karolien Couscheir[1], Leen Lauriks[1], Wim Van den bergh[1] and Philippe Van Bouwel[2]

[1]Faculty of Applied Engineering, EMIB research group, University of Antwerp, 171 Groenenborgerlaan, Antwerp, 2020, Belgium
[2]Infrastructure & Real Estate, Brussels Airport Company, 1C Luchthaven Brussel Nationaal, Zaventem, 1930, Belgium

E-mail: cedric.vuye@uantwerpen.be

Abstract. After the first rehabilitation of runway 07R/25L in 2015, runway 01/19 was reconstructed in the summer of 2016, as part of a cycle where all runway pavements at Brussels airport are completely renovated each thirty years. The top layer is a Marshall asphalt with a polymer modified bitumen. To optimize the water drainage the central part of the runway (47 m wide) is grooved instead of applying an anti-skid layer. In this paper the focus is on the durability of the grooved top layer. Two different Marshall asphalt mixtures with a different maximum granulate size (10 mm or 14 mm) are compared, both in the laboratory and in a full-scale trial. In the laboratory the resistance against rutting and raveling are investigated for both mixtures with and without adhesion promotor, which did not show a positive effect. In the full-scale trial the compactability and impact of both a longer curing period and a variation in the degree of compaction on the groove stability is investigated for both mixtures using a heavy truck. No visual differences could be found except in areas which were undercompacted and showed more damage to the grooves.