

MEASUREMENT OF FLEXURAL DISPLACEMENT AND STRAIN IN BENDING TEST BASED ON DIGITAL IMAGE ANALYSIS

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ABSTRACT

Properties of pavement material are analyzed through the vertical load and displacement or strain in bending tests. The traditional displacement or strain results will be affected by the contact displacement between the beam and support, especially for asphalt mixture because of its viscous-elastic property. This paper presents a method for measuring the deflection and strain of the beam basing on digital image recognition technique. The measuring requirements are given including the image resolution, frames per second, accuracy of displacement etc. According to the requirements, a measurement system consisting of digital camera and image analysis software is developed. A standard procedure is established to capture the images of the beam with reference lines. Those images are analyzed to get the displacement of the key points. Then a method to calculate the flexural strain is developed. The measuring results are compared with traditional method carefully.