

MEASURED PAVEMENT RESPONSES UNDER FALLING/HEAVY WEIGHT DEFLECTOMETER AND HEAVY AIRCRAFT GEAR LOADINGS

Jeffrey S Gagnon, P.E. & Mr. Albert Larkin

FAA Airport Technology R&D Branch, William J. Hughes Technical Center,
Atlantic City Int'l Airport, NJ USA 08405

ABSTRACT

A Falling/Heavy Weight Deflectometer (F/HWD) applies a load impulse to the pavement surface which is supposed to simulate the dynamic short term loading of a moving wheel load. The deflection basin measured is then used to calculate in-situ pavement strengths. In reality, how well does the F/HWD simulate the moving load of an aircraft? The FAA Airport Technology R&D Branch held a F/HWD round-up in May 2010 inside the National Airport Pavement Test Facility (NAPTF) located at the William J Hughes Technical Center in Atlantic City International Airport, NJ. Inside the NAPTF, specially constructed rigid and flexible pavement test sections of typical airfield cross sections were instrumented and tested. The flexible pavement structure was a 127-mm asphalt surface, 127-mm asphalt base, 305-mm crushed stone subbase on a silty-clay subgrade with a 7 to 8 CBR. Soil pressure cells were placed at the interfaces of the surface, base, subbase and subgrade materials. Strain gages were also installed within the pavement structure. The instruments were monitored to measure the pavement responses caused by various loadings of the F/HWDs at 40-kN, 55-kN, 73-kN, 110-kN and 160-kN. Pavement responses were also measured under full scale loading tests performed by the National Airport Testing Vehicle single wheel module at the same load levels as the F/HWDs. This paper will summarize the comparison of the measured pavement response values between different F/HWDs loads and the heavy aircraft loading of the single wheel module.