PAPER TITLE: AIR TIGHTNESS IN NEW AND RETROFITTED U.S. ARMY BUILDINGS

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ABSTRACT

During the past several years ERDC CERL has been conducting investigations to develop design/construction strategies for improving the energy efficiency, preventing mold and improving indoor air quality in newly constructed buildings and buildings undergoing major renovations. An important part of these studies was building envelope leakage tests on some existing facilities to gain understanding of the general leakiness of Army buildings and the effect of increased air tightness on the building energy consumption. Based on the results of these studies, air tightness criteria and performance requirements to new construction and major renovation projects have been developed and included into the Army design/construction strategies.

Since 2009 the US Army Corps of Engineers (USACE) implemented a requirement for air tightness in all new construction and building enclosure renovation projects. This requirement set levels of air tightness for the building enclosure at the material, assembly, and system level. Additionally, it requires that a whole building air leakage test be completed at completion of construction to verify performance of the constructed air barrier system. The current version of the Air Leakage Test Protocol for Building Envelopes developed by USACE ERDC together with Air Barrier Association of America (ABAA) and industrial partners has been published in May 2012 and can be founded on http://www.wbdg.org/pdfs/usace_airleakagetestprotocol.pdf.

This paper presents results of air tightness tests before and after new requirements were set forward. Updated results for more than 350 newly constructed and renovated large buildings air leakage tests and perform analysis in regards to, design and construction process, air barrier materials, building use, and construction types are presented. Presented data may support future decisions regarding air tightness levels to be adopted for commercial buildings.