Building Thermal Loads: A case study for David Hellen Petta public secondary school

T Kumirai
Built Environment, Council for Scientific and Industrial Research
PO Box 395, Pretoria, 0001
South Africa
tkumirai@csir.co.za

Abstract

Statistics published by the Department of Basic Education in November 2010 reveal the following: a) There are 11 834 516 learners that attend public schools, b) there are 387 837 educators for public schools and c) there are 24 699 public schools in South Africa (DOE, 2010).These statistics show that almost 25% of the South African population spends the majority of its time in public school buildings. Often, however, indoor environmental conditions in the classroom is not conducive to learning. Gibbert *et al*, 2012, carried out measurements for air temperature in an occupied classroom at David Hellen Peta public secondary school. The measurements were done in an over occupied classroom (45 learners) during winter and summer. The results of the measurements reviewed classroom temperatures above 30˚C during summer and winter temperatures below 18˚C. Both measured winter and summer temperatures are outside the thermal comfort band (20.5°C - 26.5°C, calculated as shown in paragraph 2.3.1.2) for the site (ASHRAE, 2004). Extreme thermal conditions have been found to increase irritability and reduce students' attention spans and mental efficiency. This results in an increased rate of student errors, increased teacher fatigue and deterioration in work patterns (Department of Basic Education, 2008).