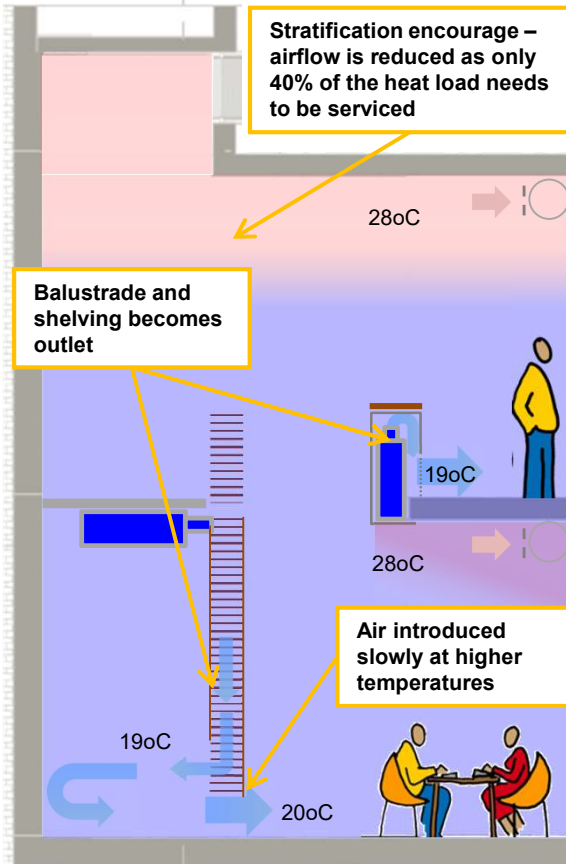


DISPLACEMENT VENTILATION – EXPERIMENTAL TEST RIG

Integration of the displacement ventilation diffuser into the building/interior design can result in both a cost reduction as well as a well integrated system. In building design, the system can be integrated via various means, for example in a railing for a mezzanine, or through book shelving in a library.



Sketch concept in elevation



Library bookshelves blowback option test setup.



Library bookshelves test setup front view.
Transparent ventilation diffuser.



1. Airflow from bookshelf diffuser. Cooler air flowing low to the ground.



2. Person (heat source) steps into the air flow.



3. Supplied air is heated at the heat source and displaces.

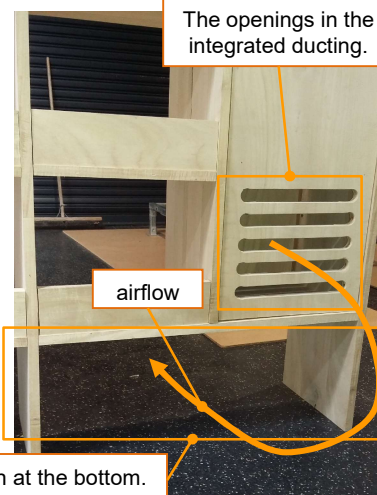
SHELVING DEMONSTRATION – UMP LIBRARY

On-site real life demonstration

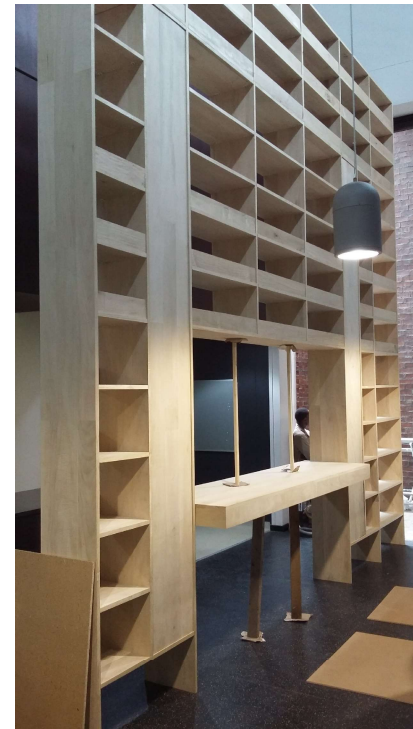
The custom designed book shelving with integrated Displacement Ventilation diffusers for the University of Mpumalanga's L003 Library has been tested using a shelving mock-up in the University of Mpumalanga's auditorium. Images on the right give an impression of the design and the test.



Smoke for demonstration rising at “heat sources”.



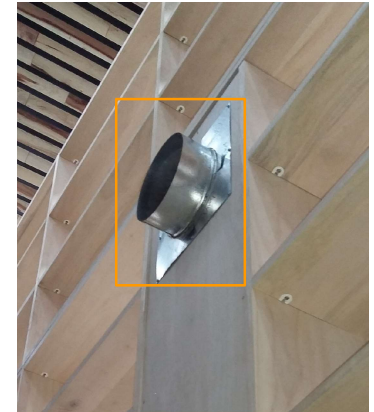
Detail of the displacement ventilation diffuser



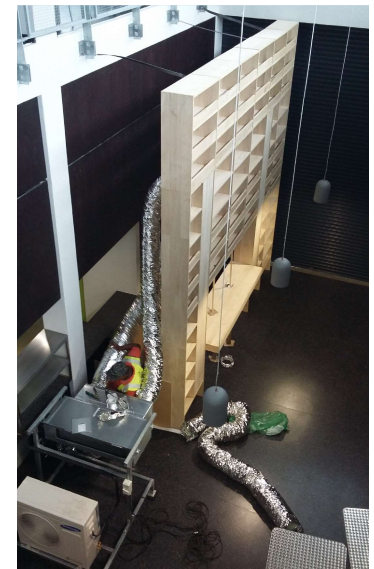
Design of the book shelving.



Smoke indicating the airflow. Fresh air being diffuse by the integrated diffusers.



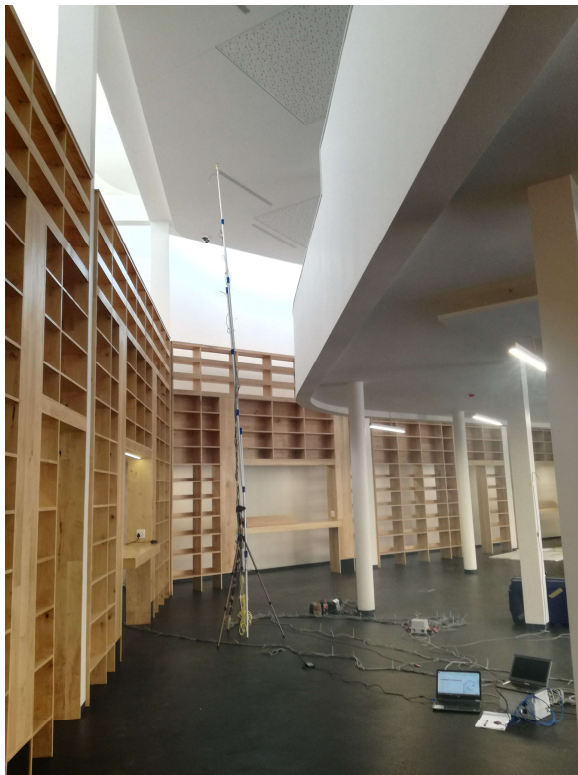
Detail of connection air supply ducting to the shelving design.



Overview of the test setup.

UMP LIBRARY - FINAL INSTALLATION AND TESTING

The building was completed in the first quarter of 2017 but had not been occupied as yet. The adjacent images are of testing undertaken during June 2017 to trouble shoot the tricky control situation of low load in a sub-tropical winter.



Measurement of stratification



Bookracks - solid sections are the air ducts bring air to low level



Smoke testing – to visualise air movement

