

https://dspace.org/

Wind-tunnel study of cross vault structures.

Bradley, Ryan Anthony.

2011-10-11
http://hdl.handle.net/10539/10534

Downloaded from a DSpace repository. https://dspace.org/

ABSTRACT

The present study examines the effects of surface roughness, flow characteristics, wind orientation and small geometrical changes of the roof apex (rise) on pressures measured at centrally located areas of the cross vault structure. The parameters noted above are assessed to shed light on their influence on pressure distributions and, ultimately, the loading on these structures.

.

Three cross vault models with flat, convex and concave roof apex geometries have been tested in two generic boundary-layer profiles within the BLWT at the CSIR, Pretoria, South Africa.

The study revealed that relatively small changes in roof geometry can noticeably influence the distribution of surface pressures, at certain azimuths and areas of the roof. Generally, mean and negative peak pressures over the cross vaults increased with the addition of surface roughness. Furthermore, mean pressures showed marginal sensitivity to the change of boundary-layer conditions, whereas noticeable differences were evident for the fluctuating pressures.