

McGill University
Environmental Geomechanics Laboratory

Project Title: Vacuum Saturation of Cobourg Limestone

Date: 15/06/2015

Time: 14:00

Ref: Sample No. VE 11

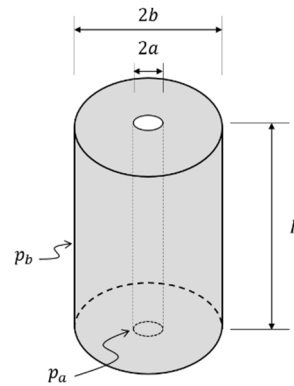
Location of Sample: St Mary's Quarry, Bowmanville, ON

Room Temperature: 23 °C

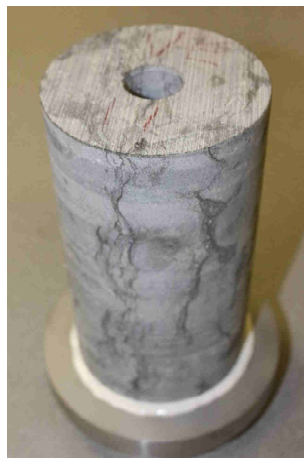
Central Cavity: $2a = 25.4$ mm

Sample Diameter: $2b = 101.6$ mm

Sample Height: $H = 190$ mm

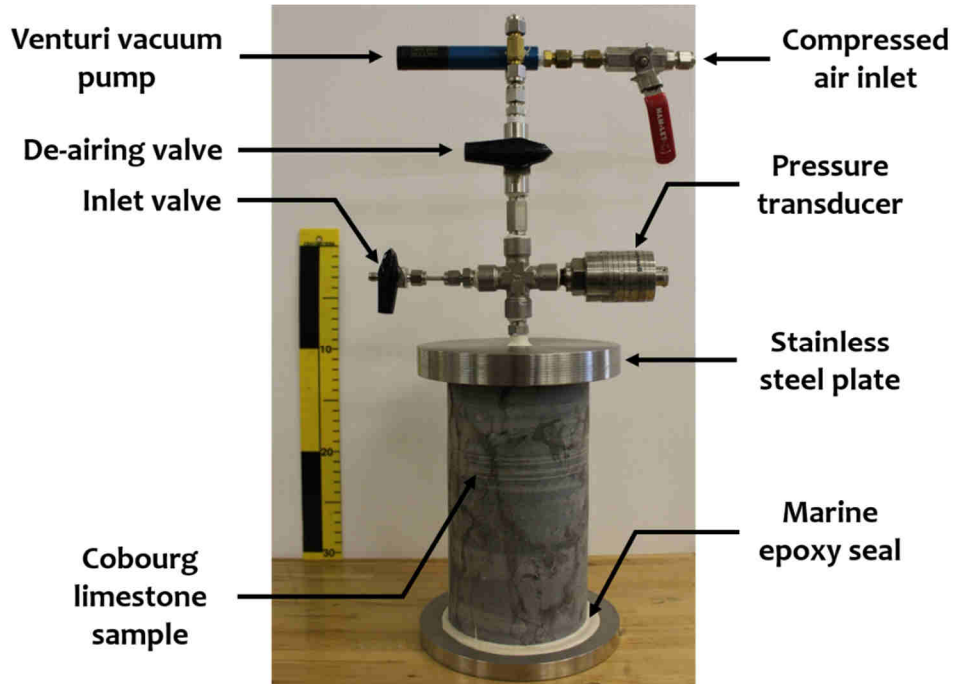


Orientation of Apparent Bedding Planes: Nominally Vertical



Photographs of Sample

Sample Assembly



The objective of Venturi vacuum pump is to completely remove residual air bubbles within sample cavity through saturation suction. Vacuum is produced by forcing compressed air through a nozzle. The limiting case for vacuum condition is around -101 kPa.

Experimental Procedures

- (1) The Cobourg Limestone cylindrical sample was submerged in water without any axial or confining pressure.
- (2) In order to eliminate any entrapped air bubbles from rock matrix, central cavity and fittings, vacuum suction was applied to the de-airing pipe before conducting transient pulse tests on Cobourg Limestone sample. The cavity pressure was maintained at -86 kPa by Venturi pump.
- (3) During the vacuum suction process, the inlet valve to the sample cavity should be closed while the outlet valve that is connected to Venturi pump should stay open.
- (4) The pump was turned off after 7-day de-airing and the outlet valve was immediately closed. A further 24-hour should be allowed for complete dissipation of residual negative pressure within rock matrix.