

Belgian Building Research Institute

Laboratory of Geotechnics and Monitoring

Contact details

Limelette, Belgium

www.bbri.begust.van.lysebetten@bbri.be; noel.huybrechts@bbri.be**General description of the activities**

The laboratory of Geotechnics and Monitoring of the Belgian Building Research Institute (BBRI) is specialised in field testing and monitoring of geotechnical structures with advanced monitoring techniques (foundation pile static load testing, deformations of soil retaining walls, ground anchors, etc.). Energy geostructures are being studied and monitored as well (e.g. monitoring of thermo-active foundation slab, energy piles).

Overview of facilities**Laboratory testing facilities**

- Freeze-thaw cycle testing of grout samples

Field testing facilities

- TRT equipment (heating and cooling)
- Distributed TRT equipment with optical fibre distributed temperature measurements
- Enhanced TRT equipment
- Full-scale thermo-mechanical testing
- Monitoring and sensing:
 - o Local and distributed strain sensing (fibre optics with FBG and BOFDA technology, electrical strain gauges)
 - o Local and distributed temperature sensing (fibre optics with FBG, BOFDA and Raman technology)

Computational capacities

- Plaxis 2D (+ Thermal module) & 3D
- GIS mapping (QGIS, Python)

Key projects

- Smart Geotherm:
 - o 2011 – 2017
 - o Funded by Flanders Innovation and Entrepreneurship
 - o Project website (mainly in Dutch): www.smartgeotherm.be
 - o Geothermal screening tool (in Dutch): <http://tool.smartgeotherm.be>

Key references

- Huybrechts, N., De Vos, M., Van Lysebetten, G., 2016. Advances and innovations in measurement techniques and quality control tools. ISSMGE – ETC 3 Int. Symp. on Design of Piles in Europe. Leuven, Belgium, 28 and 29 April 2016.
- Huybrechts, N., Van Lysebetten, G., De Vos, M., 2017. Advanced monitoring solutions for a wide range of geotechnical applications. Proc. of the 19th ICSMGE, Seoul 2017 (to be published).
- Allani, M., Van Lysebetten, G., Huybrechts, N., 2017. Experimental and numerical study of the thermo-mechanical behaviour of energy piles for Belgian practice. Advances in Laboratory Testing and Modelling of Soils and Shales (ATMSS), Springer Series in Geomechanics and Geoengineering, p. 406 – 412.

Additional information, remarks

- TRT rig detailed information (power, heating/cooling, number of tests conducted, ...) – to be completed for BBRI

Ongoing PhD theses, research

- *BruGeo (2015-2020): detailed geothermal mapping for Brussels Capital Region*

Potential supervisors for thesis, PhD thesis, ...