

## **Life cycle performances of log wood applied for soil bioengineering constructions**

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Nowadays there is a high demand on engineering solutions considering not only technical aspects but also ecological and aesthetic values. Soil bioengineering is a construction technique that uses biological components for hydraulic and civil engineering solutions. Soil bioengineering solutions are based on the application of living plants and other auxiliary materials including among others log wood. This kind of construction material supports the soil bioengineering system as long as the plants as living construction material overtake the stability function. Therefore it is important to know about the durability and the degradation process of the wooden logs to retain the integral performance of a soil bio engineering system. These aspects will be considered within the framework of the interdisciplinary research project „ELWIRA Plants, wood, steel and concrete – life cycle performances as construction materials”.

Therefore field investigations on soil bioengineering construction material, specifically European Larch wood logs, of different soil bioengineering structures at the river Wien have been conducted. The drilling resistance as a parameter for particular material characteristics of selected logs was measured and analysed. The drilling resistance was measured with a Rinntech Resistograph instrument at different positions of the wooden logs, all surrounded with three different backfills: Fully surrounded with air, with earth contact on one side and near the water surface in wet-dry conditions. The age of the used logs ranges from one year old up to 20 year old.

Results show progress of the drilling resistance throughout the whole cross section as an indicator to assess soil bioengineering construction material. Logs surrounded by air showed a higher drilling resistance than logs with earth contact and the ones exposed to wet-dry conditions. Hence the functional capability of wooden logs were analysed and discussed in terms of different levels of degradation. The results contribute to a sustainable and resource conserving handling with building materials in frame of construction and maintenance works of soil bioengineering structures.