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Permeability in soils

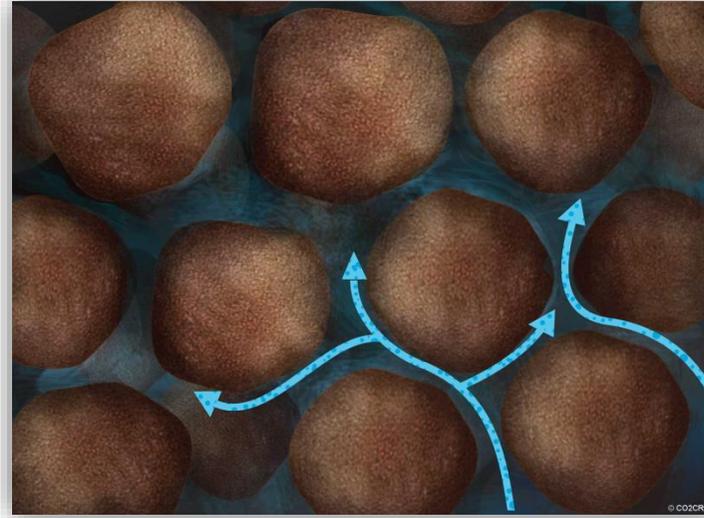
How fast does water travel through soils?

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Permeability in Soils - Definition



Permeability is the measurement of the soil's ability to allow water to flow through its pores or voids

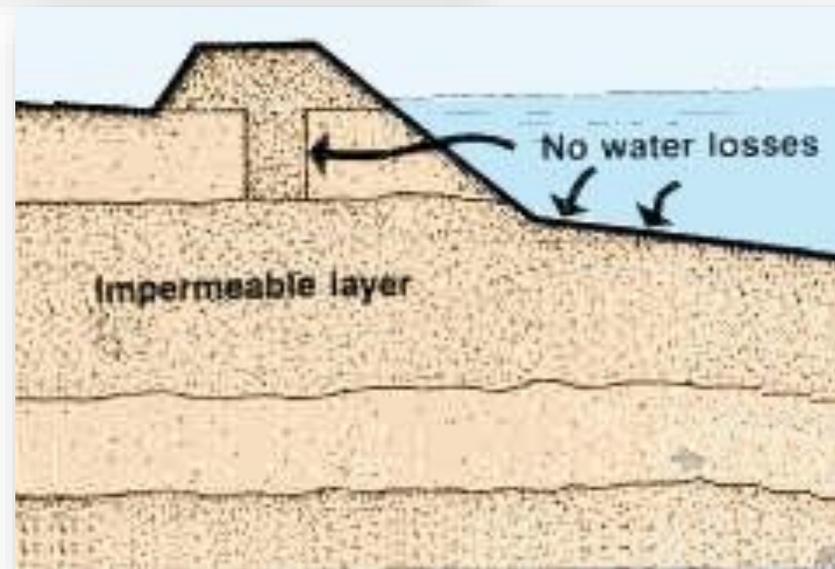
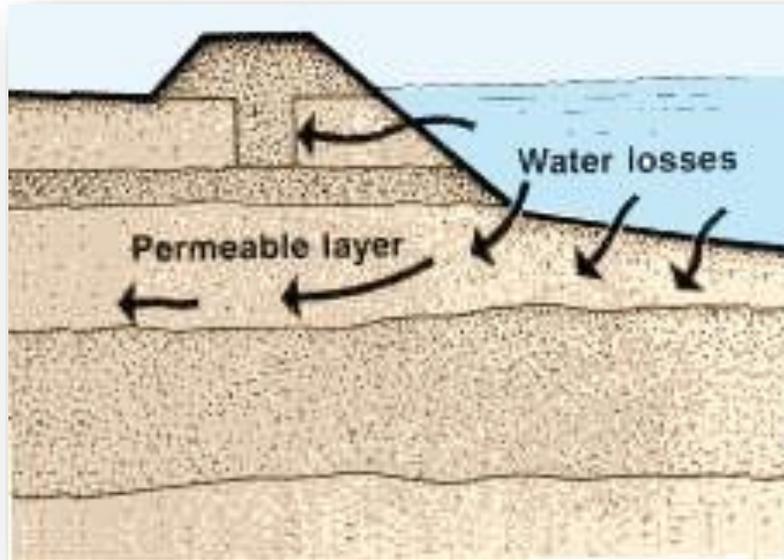
Importance of permeability

Applications in Civil Engineering

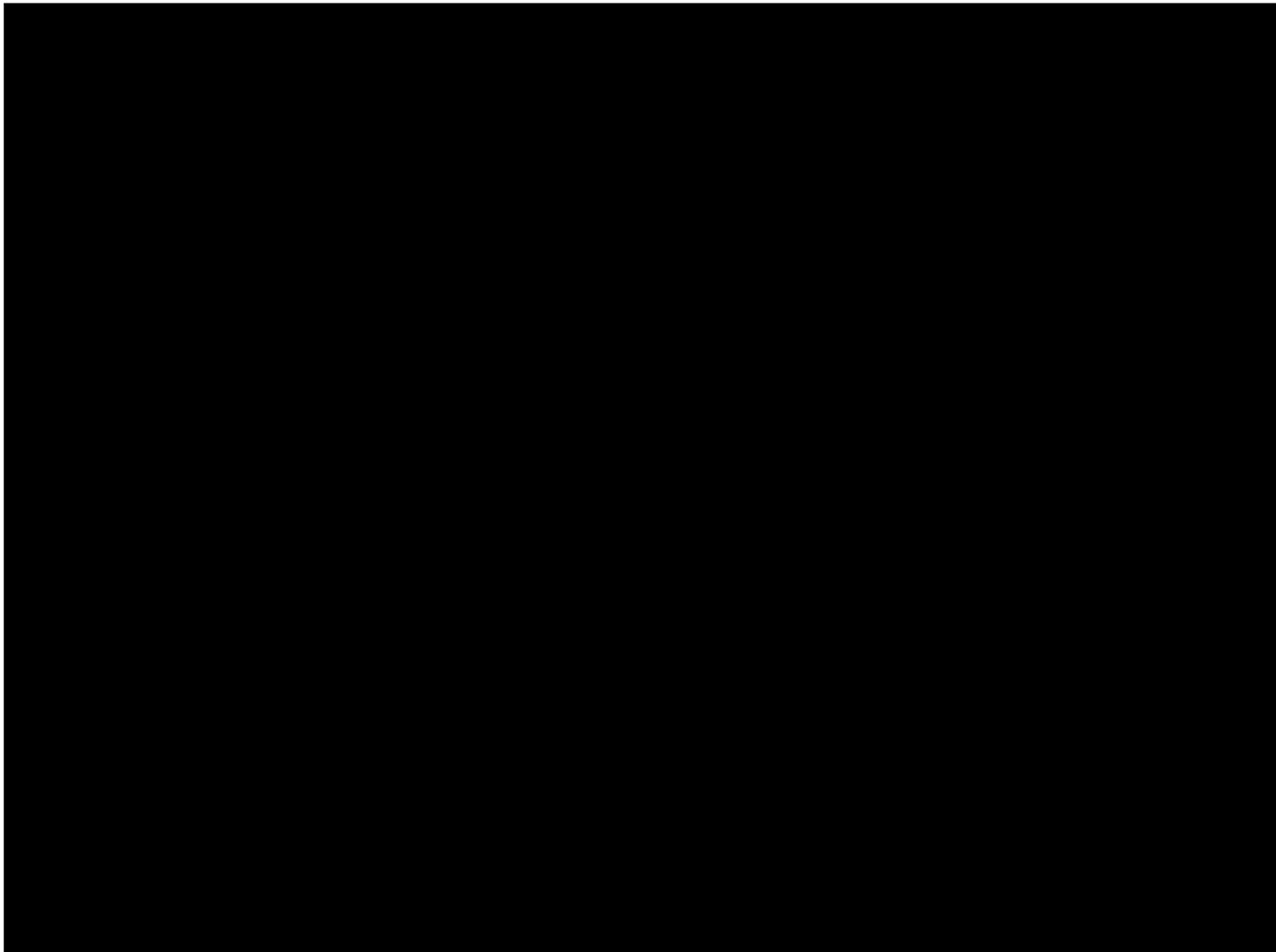
- Design of earth Dams ▶▶
- The slope stability (mountains stability) ▶▶
- Retaining walls
- Filters
- Underground seepage and aquifers ▶▶



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<http://www.youtube.com/watch?v=8uRtKOrJqx0>

Permeability Tests

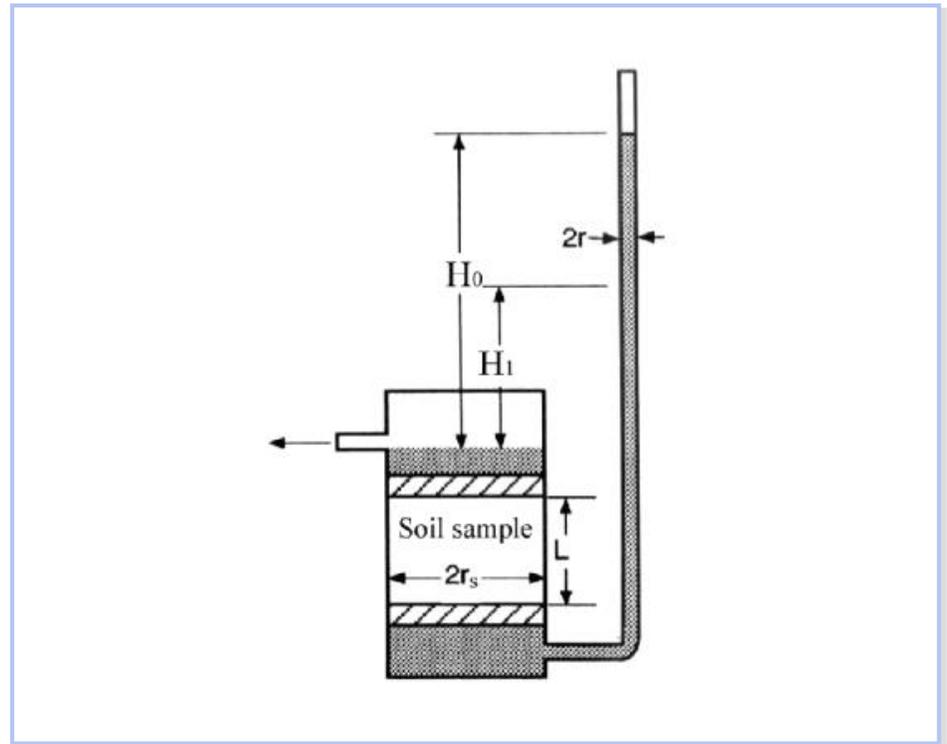
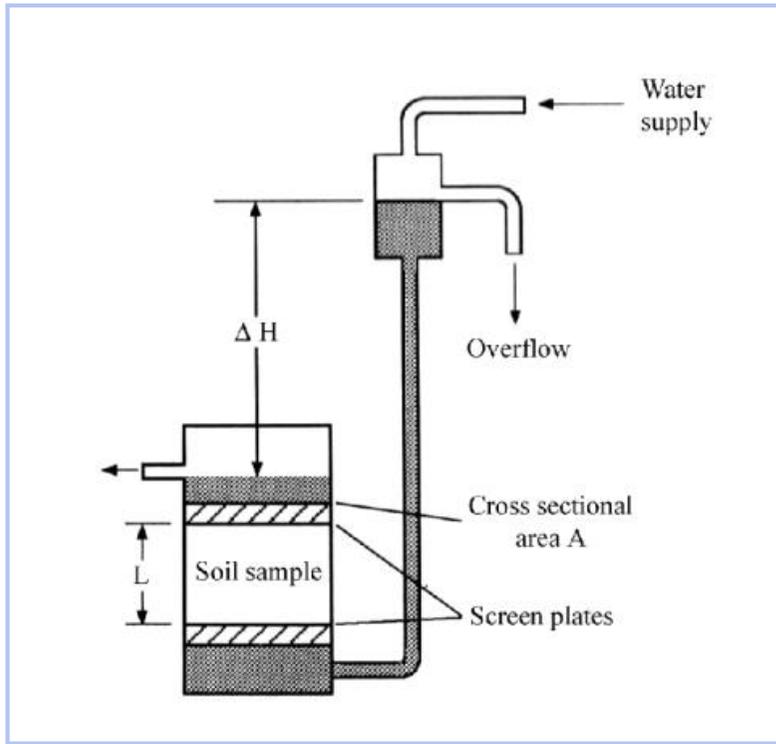
Constant Head vs. Falling (drop) Head



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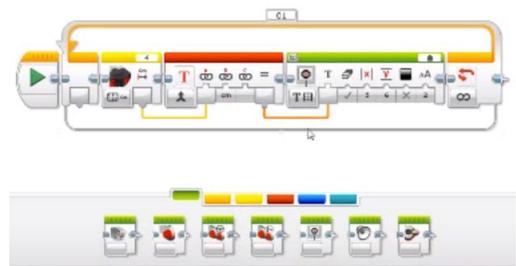
The constant head test is used primarily for coarse-grained soils

The falling head test is used both for coarse-grained soils as well as fine-grained soils



Mechatronics on Permeability

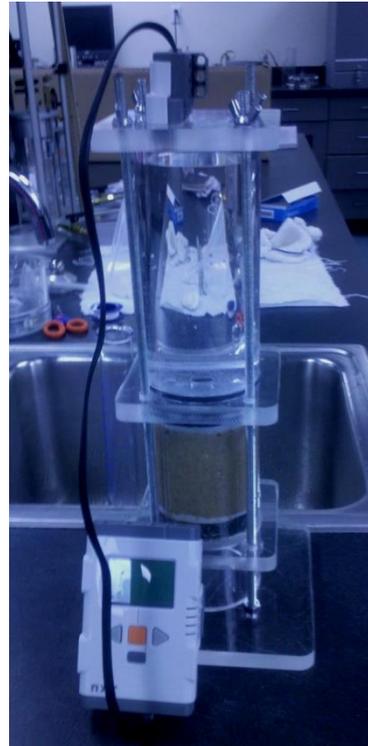
A Ultrasonic Sensor is used to find out where objects are! Using this sensor it is possible to detect an object and measure how far it is.



Advantages of mechatronics in permeability test



<http://earthlearningidea.blogspot.com/2008/04/great-soil-race.html>



Permeameter with ultrasonic sensor and EV3 to measure water volume and time

My expectations

- The ability to define and understand permeability in soils.
- The capacity to identify differences in size between gravel, sand, and clay
- The ability to identify advantages and disadvantages of having a highly permeable soil
- The ability to understand porosity in soils
- The ability to understand the function of sensors, and mechatronics importance



THANK YOU !



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