

The laboratory and its references

The laboratory



5 m³ tank for the water of the CET, JET and HET erosion tests



Driving of the test beds
Samples preparation

A worldwilde acknowleged expertise attested by
tens of scientific papers





Contact

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Erosion tests

The **Erosion Tests Laboratory** offers state-of-the-art erosion tests which enable to quantify the resistance to erosion of soils. The provided results are commonly used as inputs for « *Diagnostics* » or French « *Étude de dangers* ».

	JET	HET	CET																				
Application	Overflowing, soil erodability estimate	Concentrated leak erosion	Contact Erosion (between 2 different layers of soil)																				
Samples characteristics	<i>In-situ</i>	Possible (provided there are no particles of	Impossible																				
	Intact	✓ Min dim: Ø ~ 8 cm, h ~ 30 cm ✓ Absence of particles > 5 mm	✓ Min dim: Ø ~ 8 cm, h ~ 30 cm ✓ Absence of particles > 5 mm	Impossible																			
	Re-worked	Min weight of dry soil to provide with : 2.5 kg 	Min weight of soil to provide : 2.5 kg 	✓ Min weight of thin soil to provide : 10 kg ✓ Max weight																			
	<table><tr><th>Graviers</th><th>Sable grossier</th><th>Sable fin</th><th>Limons sableux</th><th>Limon argileux</th><th>Argile</th><th>Sols traités</th></tr><tr><td colspan="3">LIET</td><td colspan="3">HET</td><td></td></tr><tr><td colspan="2">CET : sol grossier</td><td colspan="2">JET</td><td colspan="2">CET : sol fin</td><td>LIET</td></tr></table>			Graviers	Sable grossier	Sable fin	Limons sableux	Limon argileux	Argile	Sols traités	LIET			HET				CET : sol grossier		JET		CET : sol fin	
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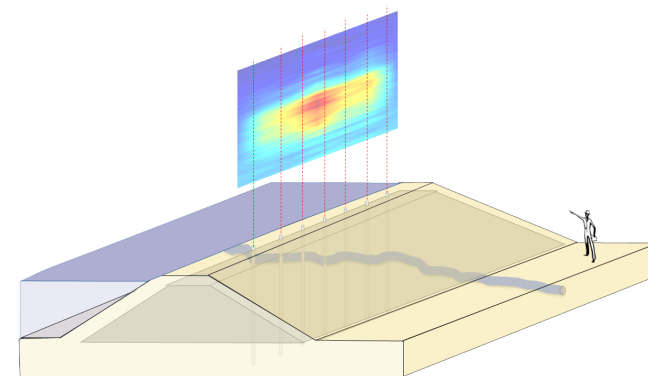
Suffusion Tests (ST) and Crumb Tests (CT) : please contact us.



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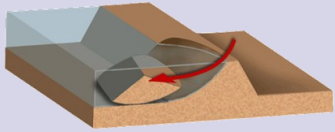
« **State-of-the-art technologies
for the safety and the
monitoring of infrastructures** »



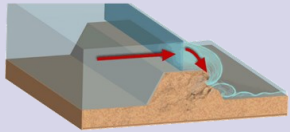
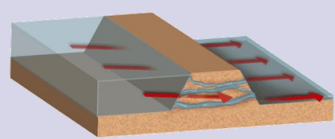
« **Diagnosis** »

Stability studies and erosion risk assessments

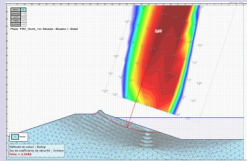
A **hydraulic embankment structure** (dikes, dams, etc.) is likely to be degraded, or even led to failure, in particular by **mechanical or hydromechanical instabilities**, as well as



by **erosion**, either on its surface (scouring, overflow...) or directly in the embankment itself (leaks in the structure or in the foundation, etc.). To take this risk into account, it is necessary to **quantify the action of flows as well as the resistance to erosion of the materials** which are present in the structure.



geophyConsult's experts offer to carry out diagnosis of structures including numerical hydraulic modelling (to characterise flows), mechanical modelling (to characterise stability) as well as the evaluation of the safety margins of each of the erosion mechanisms.



As an active member of the French ICOLD Erosion Working Group, geophyConsult has made a significant contribution to the national recommendations for the control of the erosion risk. It also offers to bring support to its clients in the implementation of these recommendations.

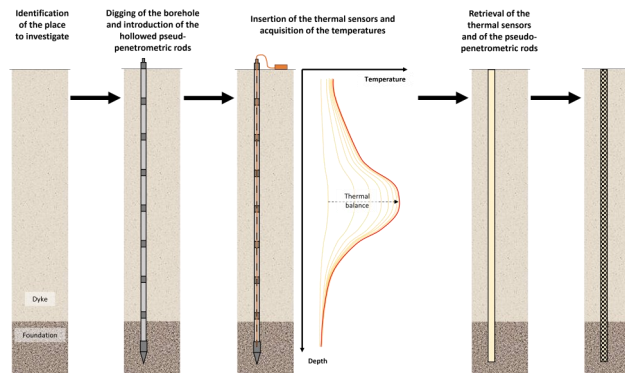
Thermal reconnaissance/monitoring around imbalances



In the event of the occurrence of a worrisome imbalance (e.g. following the sudden appearance of a hole in a structure), a thermal mapping of the abnormal zone makes it possible to delimit the extent of the area affected by the imbalance and, thus, to effectively size the remediation to be considered.

To do this, a simple and economical solution consists in bringing one or more small driving drilling machines to the abnormal area (see photo), and using them to successively insert, throughout the affected area, hollowed penetrometric rods down to the foundation. Then, each time a borehole is installed, a thermistor chain is inserted into the rod to deliver, once the thermal equilibrium is reached, a vertical thermal profile of the dike along the borehole.

This method can be applied to slowly-evolving imbalances which need to be followed-up so as to ensure that it does not evolve further or, if it does, that the structure owner is automatically and immediately notified.



The same type of measure can be considered when a slowly-evolving imbalance needs to be followed-up so as to ensure that it does not evolve further or, if it does, that the structure owner is automatically and immediately notified.

geophyConsult showed in 2022 that it masters this technique and is capable, in the field, of carrying out up to 50 ml of vertical thermal profiles per day (for a total of 515 ml). It also showed that it is capable of deploying these measures throughout the national territory in an extremely short period of time, as low as a few days.



To guarantee these yields and the reach of the required depths, geophyConsult systematically subcontracts the jacking part to local and specialized companies. In a similar way to penetrometric tests, the sinking strength is recorded and its mapping is cross-mapped with that of the temperature during the interpretation of the results.

Naturally, when follow-up is required, the instrumentation is left in place and protected from vandalism. A remote data transmission system can be added to it, with automatic alarm transmission.

When the borehole that is intersecting the leak can be left downhole during a few days or weeks, the method can deliver the fluid velocity within the leak, which is a key parameter to determine whether the leak is likely to be associated with internal erosion or not – and, consequently, must be cured or can be left with little surveillance.

