

Case Study

Application	Abutments for a 16 m Span Bridge	Wall designer	Betoconcept
Location	Le Mans, France	Contractor	Jean Lefèvre
Product	TenCate GeoDetect®		
Owner	French Ministry of Infrastructure		

TenCate develops and produces materials that function to increase performance, reduce costs and deliver measurable results by working with our customers to provide advanced solutions.

THE CHALLENGE

The new bypass along the RN 38 at Saint Saturnin near Le Mans in France had to cross a small river. A 9.9 m high geosynthetic reinforced- earth structure with a facing of prefabricated concrete blocks was constructed to form the bridge abutments. The retaining walls were designated as a reference project for the concrete block system “Leromur” by the manufacturer, Betoconcept. Therefore a monitoring system was required, allowing the measurement of the deformations of the wall both during construction and after completion, at reasonable costs.

THE PRODUCT

Betoconcept decided to use TenCate GeoDetect®, because of the benefits of the system compared to conventional instrumentation systems:

- ease of installation
- accuracy
- longevity
- cost effectiveness.

TenCate GeoDetect® allows a punctual measurement of the deformations during construction and in the future.

THE CONSTRUCTION

Strips of TenCate GeoDetect® were installed at various heights within the embankment. Each strip is equipped with 7 measurement gauges, adapted to the Leromur concrete-block design into which the strips were anchored. During compaction of the fill material, continuous measurement was carried out. Typical results are illustrated in Figure 4. A maximum strain of 0.5% was observed in the compaction phase, reducing to a stable level of max. 0.28% after compaction. Further measurements were made intermittently during the construction of the embankment. The results, illustrated in Fig. 5, show that the majority of the deformation is mobilized during installation and compaction of the embankment fill. Subsequently, deformation increases only slightly, reaching a final maximum strain of 0.73 % at a wall height of 6.5 m. During construction of the bridge, which will take place 8 months later, measurements of deformation will continue.



Figure 3: The elements of the TenCate GeoDetect® equipped wall system: (1) Leromur blocks (2) reinforcing geosynthetics (3) GeoDetect® strip (4) outdoor cable (5) hand-held measuring device.

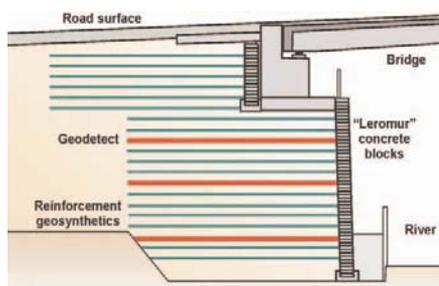


Figure 2: Schematic cross section of the bridge abutments.



Figure 1: View of finished wall bridge abutment walls with “Leromur” concrete block facing.

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THE PERFORMANCE

This project clearly demonstrates the benefits of the TenCate GeoDetect® monitoring system compared to conventional costly instrumentation: Ease of installation, reliability, and the possibility of future measurements at any time with a minimum of cost.

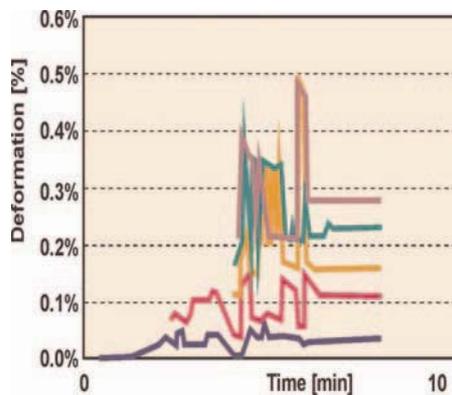


Figure 4: Typical deformations measured during the compaction of a fill layer.



Figure 7: Overview of construction works.

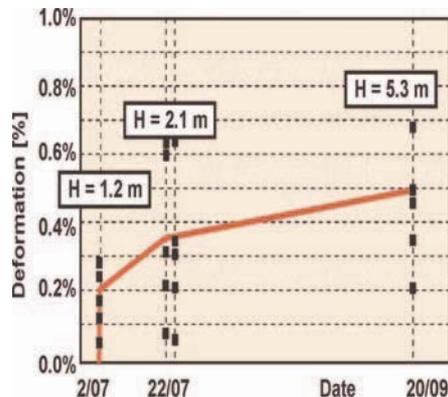


Figure 5: Deformations measured during the rise of the embankment.



Figure 6: Embedding the TenCate GeoDetect® strips and instrumentation cables into the fill material.

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