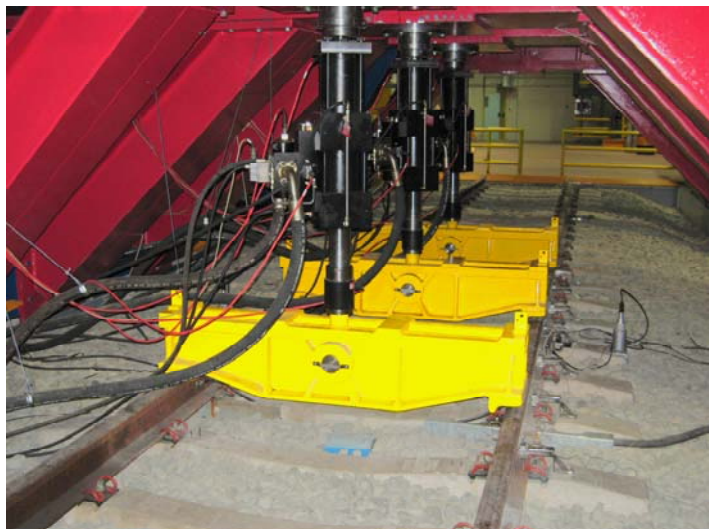




## 1. General Description

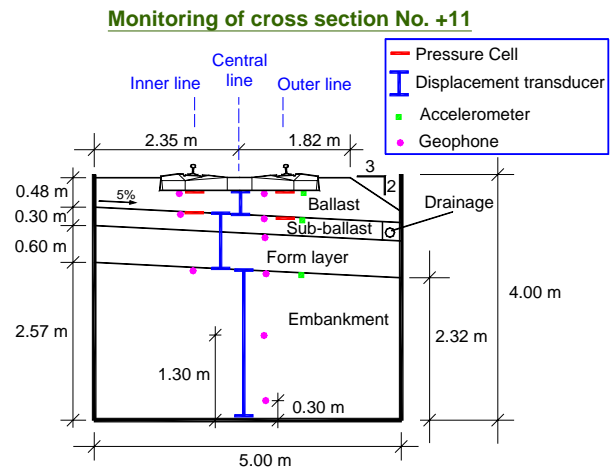
The Geotechnical Laboratory of CEDEX has developed an experimental installation for testing railway structures. The installation includes a 21 m long x 5 m wide x 4 m deep track box, with the corresponding reaction frames and stiffeners, and four independent dynamic actuators that can reproduce the effect of both simple axles and bogies on the rails, simulating their approach to, passing and moving away from the testing section considered.

In the general case of a track on an embankment it is possible to monitor both the superstructure and the infrastructure of the track in different sections of the cell with up to 128 sensors, which can be distributed in depth and on the surface to analyse the behaviour of the different components of the track.



## 2. Applications

- Study in the short and long run of conventional and high speed railway lines.
- Simulation of real loads produced by the railway traffic to allow the study of the fatigue of the different elements of the track.
- Tests with polyvalent sleepers.
- Experimental analysis of the reinforcement of bed layers by means of bituminous sub-ballast or with geosynthetics.
- Research on new solutions to optimise the variations of track stiffness in detours and transition zones.



## 3. Technical Characteristics

- The track box is a hyperstatic structure of 21m x 5m x 4m.
- Four dynamic actuators of 250 kN of nominal load and 150 mm of maximum displacement with three step servovalves.
- Power generating station composed of three interconnected pressure pumps, each of a flow of 600 l/min at a pressure of 210 bars.
- Auxiliary cooling system by water including two refrigerating towers
- Control and data acquisition system for up to eight dynamic actuators and 128 data acquisition channels.
- Rain simulation on the track, with both intensity and duration control.
- Autonomous equipment for the tamping of ballast.

FACILITY FINITE ELEMENT MODEL

