



PREEMPTIVE
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LANAMME MINI TOUR

Civil Infrastructure Lab – Construction Area

The laboratories of the construction area have modern equipment to perform multiple tests. They also have certifications from the ACI (American Concrete Institute) for concrete tests in the field. These laboratories are focused on tests for materials and structural models concerning civil works such as buildings, slopes, houses, foundations, and bridges, among others.

The LANAMME-UCR structures laboratory performs tests on elements, components and structural systems on a natural scale. In this lab, natural scale tests are carried out on structures such as mezzanines, walls, beams, and large concrete pipes. Connections of different systems are also tested, such as reinforced concrete, masonry, steel and wood, and even three-dimensional structures, thanks to its reaction wall and reaction floor systems, and two servo-controlled hydraulic actuators with a load capacity of 490 kN (in tension and compression) and a displacement capacity of ± 250 mm. These jacks are handled with high-tech software to program loading protocols and with capacity for automatic data acquisition (LVDT's, strain gauges, load cells, among others). Also, there

are two steel reaction frames with an axial load capacity of 1000 and 2000 kN. Other equipment that the laboratory possesses are: manual hydraulic jacks, metal accessories for mounting tests and placement of independent measuring devices, digital finger gauges, among others. Given the complexity of the tests carried out in this laboratory, it only has 13 routine tests of which two are accredited with the Standard INTE-ISO / IEC-17025: 2005.

The Structures Laboratory also has a Reduced-Scale Laboratory that allows testing of prototypes on a smaller scale. It is equipped with four rigid aluminum tables of $1800 \times 1100 \times 900$ mm, which simulate the strong floor. On the tables, there are aluminum reaction frames simulating the frames and the strong wall of the laboratory on a natural scale. Tests are carried out on reinforced concrete and masonry elements on a reduced scale. For the masonry specimens, there are molds for the blocks and a corrugator for steel wire. The measuring equipment consists of mechanical or hydraulic jacks and has load cells of 2 kN capacity. In this lab, there is also four Quanser shake tables that can test small scale models.

For more information, you can visit the following web-sites:



Construction area



Structures

Force Laboratory

The LanammeUCR Force Laboratory was designated by the Costa Rican Metrology Laboratory (LACOMET) as the National Reference Laboratory in Metrology. Among the services provided are the calibration of machines and force instruments as well as training courses in force metrology.

For calibration of force or test machines, there are patterns with capacity from 10 N to 3 MN. Calibration procedures based on international standards are used, for example, the "Procedure for calibration of uniaxial force machines" (IT-LF-01), is substantially equivalent to ISO 7500-1. To calibrate force instruments, they have standards with capacity from 50 N to 3 MN and the IT-LF-02 method called "Procedure for calibration of force instruments" is used, which is substantially equivalent to the ISO 376 standard.

For more information, you can visit the following web-site:



Force Laboratory

Heavy Vehicle Simulator Laboratory – Transportation Area

Laboratories in the area of transportation and pavements provide services for the characterization and design of component materials of pavement structures, as well as the functional and structural assessment of existing pavements.

The Materials and Pavements Unit conducts research in various areas such as: performance and characterization of asphalt mixtures, analysis of granular materials and soils, materials science (asphalt binders, different types of additives, adhesives), maintenance techniques, performance of rigid pavements and modeling of pavement structure response. Currently, they are conducting new research projects with the Accelerated Pavement Program (with the Heavy Vehicle Simulator, *HVS Mark VI*), which can monitor the capacity of pavement structures at a natural scale. This simulator is mobile, so it allows the evaluation of pavement structures in different locations.

Some other services that the laboratory has are conventional tests for the characterization of asphalts, emulsions, road demarcation paints, asphalt mixtures, bases, sub-bases and sub-grades; additionally, we have state-of-the-art equipment for the mechanical characterization and performance of materials, and the evaluation and auscultation of pavements.

For more information, you can visit the following web-sites:



Transportation



Materials

