

“Grand Paris” - Ile de France Nord Agency

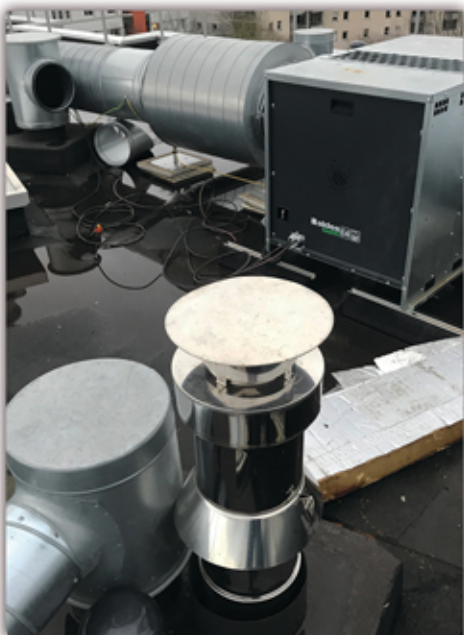
> Rincent Ile de France Nord has moved into new premises in Tremblay in France near Roissy. The doubling of the operating surface was made necessary by the increase in the activity volume of the agency. Already equipped with an HWD / FWD, the agency will be equipped with a second Dynaplate to meet the demand.

The works on “Grand Paris” induce control activities, for example that of soil consolidation injections as part of the project to create an underground passage on the Saint-Denis station site - 93.

The 10 m wide and 70 m long structure will be slid under the rail tracks to create new pedestrian access.



Air permeability 3CEP networks



> Rincent Normandie, Agency of Bretagne, in addition to the usual tests carried out by agencies, it specializes in testing individual and collective housing, for example air permeability tests. The operator is certified 8711 - 8721 and Thermography.

In situ tests aimed at characterizing the level of air permeability of 3CEP networks are part of the services provided.

In collective housing, the association of individual condensing boilers and a Collective Conduit for a Waterproof Pressure Boiler (3CEP) allows residents to benefit from the advantages of the condensing boiler thanks to a solution of evacuating the combustion products.

The tests were carried out on the network before connecting the boilers to the conduits according to the procedures described in Standards NF EN 1859 and NF EN 1856. It was a first check on the network of a residence with 23 collective housing.

Guardrails tests



> To justify the mechanical performance of the guardrails, the manufacturers carry out calculations which must be validated by dynamic tests.

Rincent Champagne Ardenne agency performs this type of test using a 50kg impact bag in accordance with NFP 01-013 standard, and NFP 01-012 related to sizing and safety rules.

NF DTU 39 part 5 particularly deals with glazed structures.

The sphericoconical impact bag of 50 kg has precise dimensions and special manufacturing characteristics.

For example, this bag consists of 8 tarpaulins assembled and sewn, the bottom is reinforced by a leather cap. The whole is filled with 3 mm diameter hardened glass marbles.

Maxidyn® dynaplate

> A new Maxidyn® dynaplate has arrived in the Nord Pas de Calais agency. This equipment manufactured by Rincent ND Technologies provides important differentiating elements:

The load is centered on the vehicle which improves driving comfort

The hydraulic arm easily adapts to conventional 4x4 chassis

This facilitates the export of equipment on international sites

The hydraulic arm and the measuring device are thus transferred without worrying about the carrier vehicle.



The rehabilitation of old buildings diagnostics

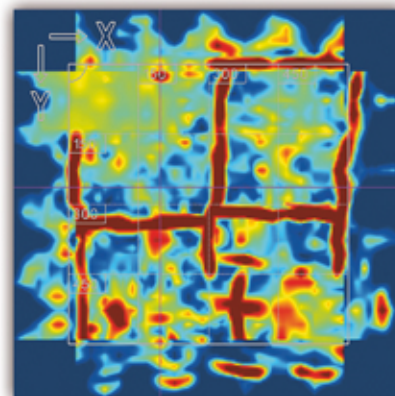
> The rehabilitation of old buildings represents around 50% of the total amount of building work. This activity continues to increase regularly at 1.5% to 2% each year.

Now is the time for heavy rehabilitations of certain complexes, particularly in the Ile de France region.

In addition to the floor loading tests to validate the new loads, the Ile de France Sud agency is carrying out investigations on the concrete structures of the buildings to be rehabilitated.

These tests are :

- locating the reinforcements in concrete, their dimensions
- carrying out excavations to validate these results
- The sampling of concrete cores
- For laboratory analysis, for example mechanical resistance, chemistry...
- The measurements of free potentials which allow to understand corrosion problems.



Quantity of particles in the air

> Rincent AIR is the specialist in environmental diagnostics related to air quality. The agency is particularly present on the works of "Grand Paris", for example on the site of the Créteil l'Echât metro station located near the Henri Mondor hospital.

Rincent Air measures particles and calcium concentrations as a tracer for quicklime used during the works.



Located on the plot limit, a continuous dust concentration analyzer has been installed (photo attached).

In addition to these measurements, a dust filter sampling device is used to quantify the presence of calcium.

A second measurement point determines the background concentrations, that is to say not related to the site in dust and calcium, in order to determine the impact of the site. This surveillance is spread over a period of three months.

Waterproofing installation on a bridge

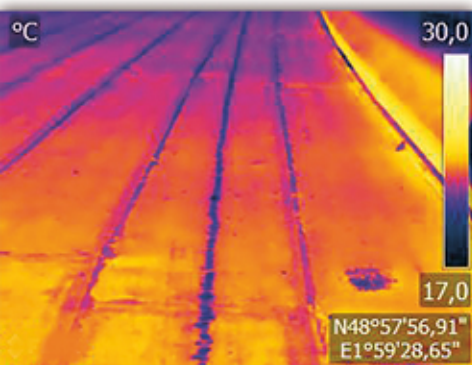


> Rincent Investigations has carried out tests by infrared thermography to check the waterproofing installation on a bridge.

The six main characteristics of the waterproofing material are:

- To be waterproof, resistant, durable,
- To have good mechanical stability over a wide range of temperatures
- To be resistant to cracking.

A thermal imaging camera is used to measure the surface temperature of a material. The presence of a lack of bonding of the waterproofing on the concrete support introduces an interface which induces a zone with a temperature different from the other zones. A sensitive thermal imaging camera identifies the areas with a lack of bonding which are then repaired.



The quality control of the installation of the waterproofing of the bridges is an essential element in the sustainability of the structures.

These easy-to-implement controls are an essential validation phase.



Ultrasonic Cross hole Tests

> The three attached photos are related to Ultrasonic Cross hole Test standard NF P 94 160-1:

- Control of the diaphragm wall of a Montauban car park, Rincent Midi-Pyrénées Agency
- Control of a bridge foundations in the department of Oise, Agence Rincent Picardie
- Control of of a bridge foundation in Sao Luis de Maranhão Rincent Recife Agency Brazil.

The common point of these sites is the use of equipment manufactured by Rincent ND Technologies which meets an essential point of the standard which is to store all the signals acquired and to be able to restore them if necessary, in case of an expertise for example.

A signal is made up of 600 points, each centimeter a signal is recorded, for a pile of 30 meters equipped with three tubes that represents 9000 signals.

Finally, the measurement chain and the probes are checked every six months as required by the standard.



Cuba - diagnostic the existing foundations



> Rincent Recherche Expertise was asked to diagnose the existing foundations of the Havana cruise terminal in Cuba. This evaluation of deep foundations is related among others to:

- The lengths of the piles
- Their diameters
- The quality of the concrete constituting these foundations. The final objective of the diagnosis is the reuse of these foundations in the project to be carried out, therefore their ability to support new loads or under what conditions this is possible. One of the tests implemented is the parallel seismic test which makes it possible to determine the length of a deep foundation under conditions defined by the standard NF P 94 160-3.

Before carrying out the test, it is necessary to install a waterproof tube parallel to the foundation, the length of which is 5 meters longer than the presumed length of the foundation to be examined. It is necessary to have access to the head of the pile to be tested or to the concrete block covering it. The equipment used for the tests consists of:

- a hydrophone
- an impact Hammer

The time elapsing between the generation of the shock and the reception of the signal by the sensor is recorded using a computer. The repetition of the test every 50 cm leads to draw curves which allow to calculate:

- The waves propagation speed in the concrete of the pile
- The waves propagation speed in the ground
- The length of the pile.

All this information then leads to models which define the conditions of future use of these foundations.

Haïti - dynamic pile tests

> Rincent ND Applications and Rincent Ports, a specialist in maritime infrastructure, were missioned to monitor the pile driving using the PDA method (Pile Dynamic Analysis).

This service was provided as part of the development of the Varreux Terminal in Port au Prince, in the Republic of Haiti. Prior to the monitoring, the operator equips the pile with two sets of sensors each composed of:

- an accelerometer,
- a deformation gauge.

This operation should not be trivialized because the installation of these sensors must be particularly careful.

The impact generated by the driving hammer is violent, and if the gauges are not fixed correctly, the fixings will be sheared.



After acquisition of the tests, they are analyzed using an iterative method which compares the calculations with what has been measured.

This calculation gives the values of lateral friction and point resistance which lead to defining the total static load.

Non-destructive tests on tie rods and connections

- > Rincent ND Applications, carried out the diagnosis of:
 - 94 tie rods of a sheet pile at the River Port of Arles (13).
 - Anchorages for fixing a signal gantry in the Annecy region.

The tests are carried out with the support of the local agency.

The principle of these tests is based on the analysis of the vibration response of the tested element. The vibration generated by a hammer equipped with a piezoelectric force sensor is recorded by a multidirectional geophone.

For the tie rods the analysis leads to:

- Calculate the total lengths of the tie rods, the free lengths
- The efforts in the tie rods®.

The results from two projects of tie rods in Brazil, one of 700 tie rods and another of 1600 tie rods provide information on the long-term behavior of these reinforcements since the structures are more than 30 years old.

For the anchors of signaling gantries, the dynamic stiffness defines the quality of the connection to the foundation.

In case of poor-quality connection, the calculated dynamic stiffness is generally a power of 10 less than the average of the other stiffnesses.



Brésil - Sao Paulo - trainings

> UNICID is the University of the city of São Paulo, the Civil Engineering department organizes an engineering week every year where companies make presentations which are similar to training on subjects defined with the teachers of this department.

The Rincent Sao Paulo agency carried out two days of training.

The usual non-destructive tests were presented after a theoretical course on vibrations:

- Mechanical impedance method
- Echo method
- Parallel seismic
- Ultrasonic cross hole tests



These trainings were well received by the students and made it possible to create links with the teachers.