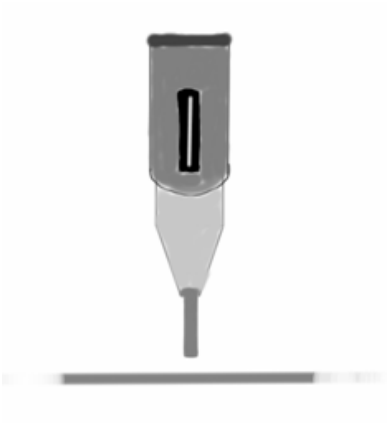
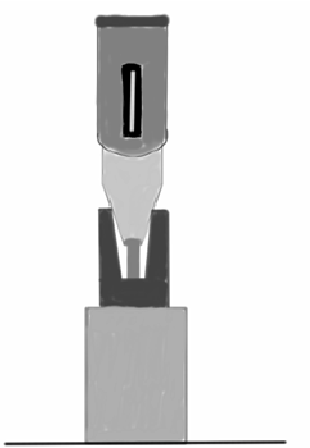
Operating verification and Calibration





A1
Activate the instrument at least 3 times, pressing it against a rigid wall.

A2
Insert the instrument in a calibration anvil, which must be provided with the instrument, and perform at least 10 strikes.

A3
Record the index values and verify that rebound index mean calculated from the 10 strikes. The value must be within the tolerance indicated by the reference standard.

If the mean strike value is not within the tolerance indicated by the anvil manufacturer, calibrate the rebound hammer.

Hammer Investigation: New Building

SAMPLE IDENTIFICATION

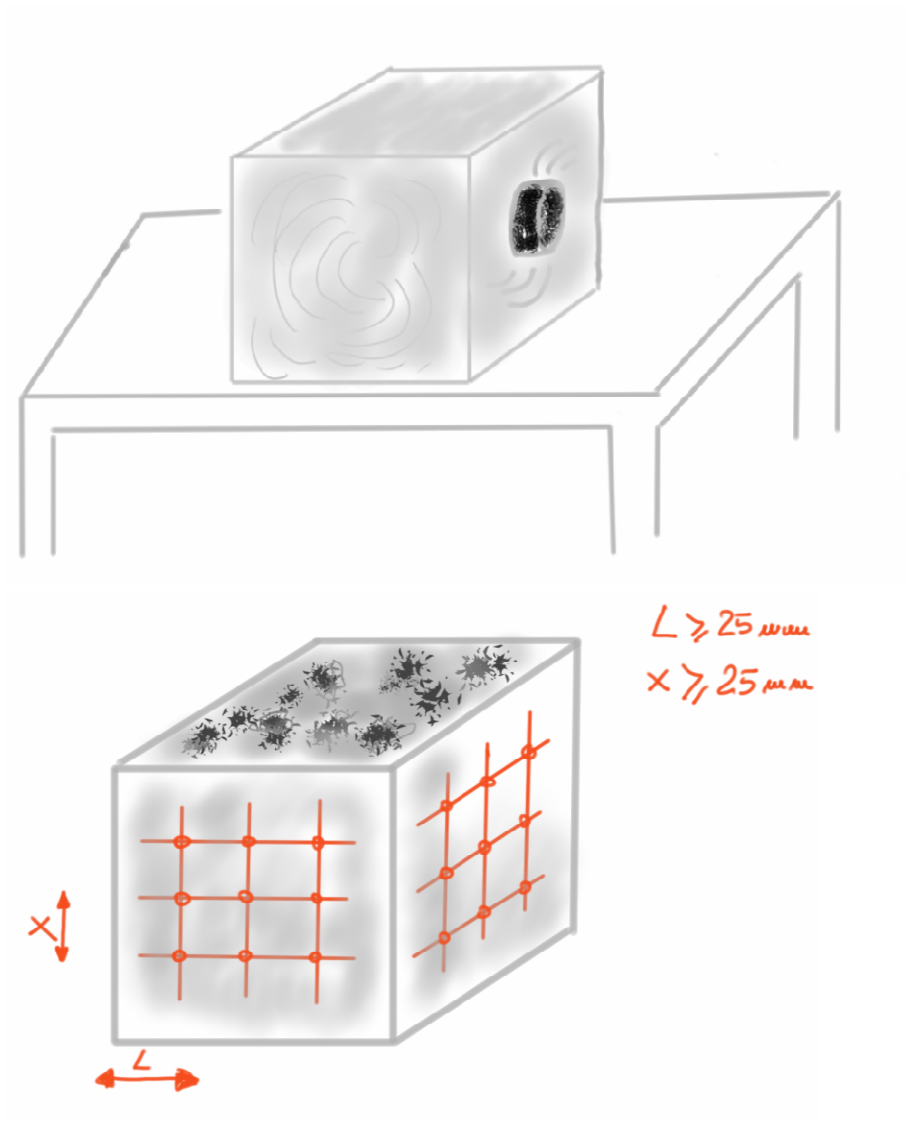
The DL Site Engineer or the authorised technician must be present when samples are taken (Extraction Phase).

Extract material (12390-1: 2009)

Select the identifying samples of structural elements for verification.

Identify samples uniquely, recording the date, number, name and signature.

Hammer Investigation: New Building



PREPARING SAMPLES

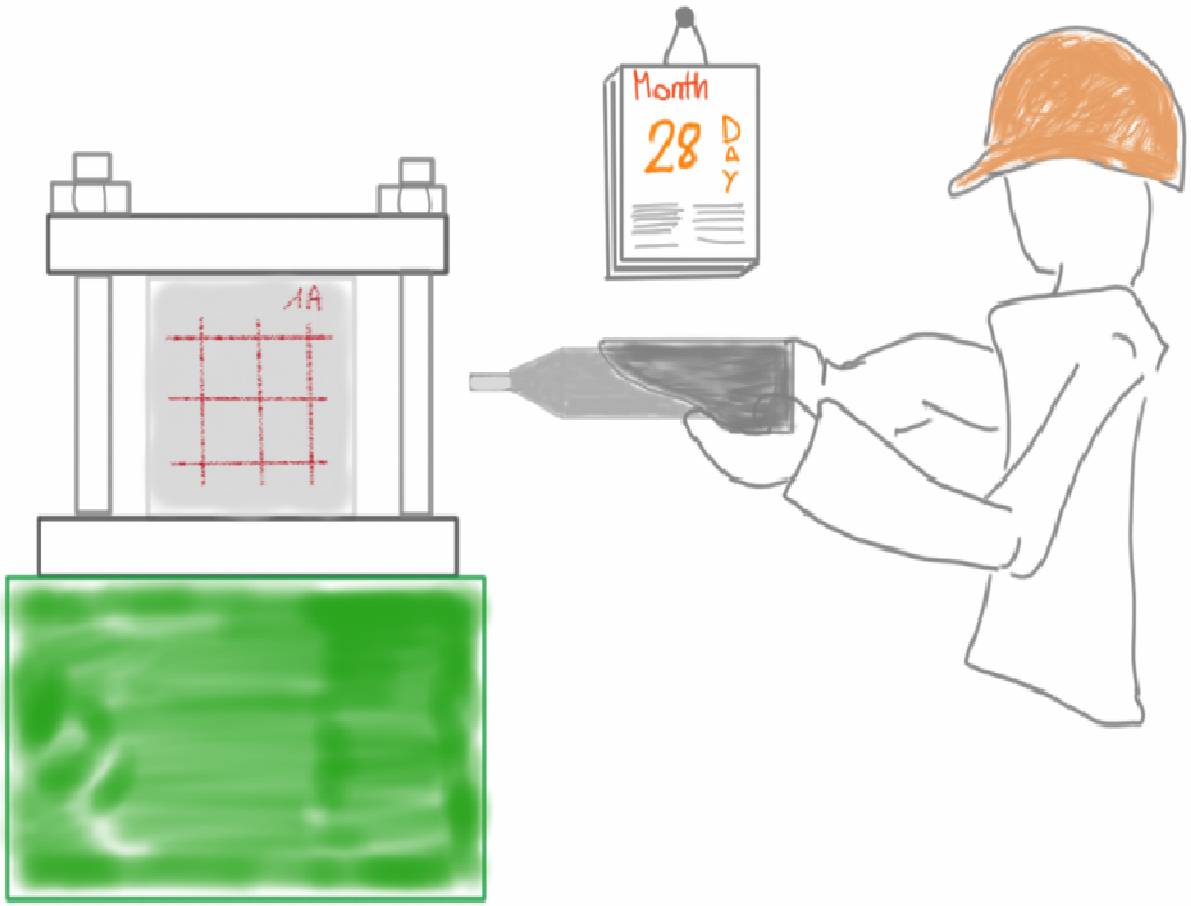
After having selected the samples, keep them in a suitable place for proper maturation (EN 12390-2:2009).

Once the maturation phase has been completed, verify that there are no areas with high porosity, presence of gravel, surface moisture, or flaking.

Grind samples using an abrasive disk.

Draw a measurement grid on the 4 sides of the sample, discarding those free of concrete and its opposite side.
The grid must be drawn in accordance with the dimensions indicated in the standard and in compliance with distances (EN 12504-2: 2012)

Hammer Investigation: New Building



REBOUND HAMMER TESTING

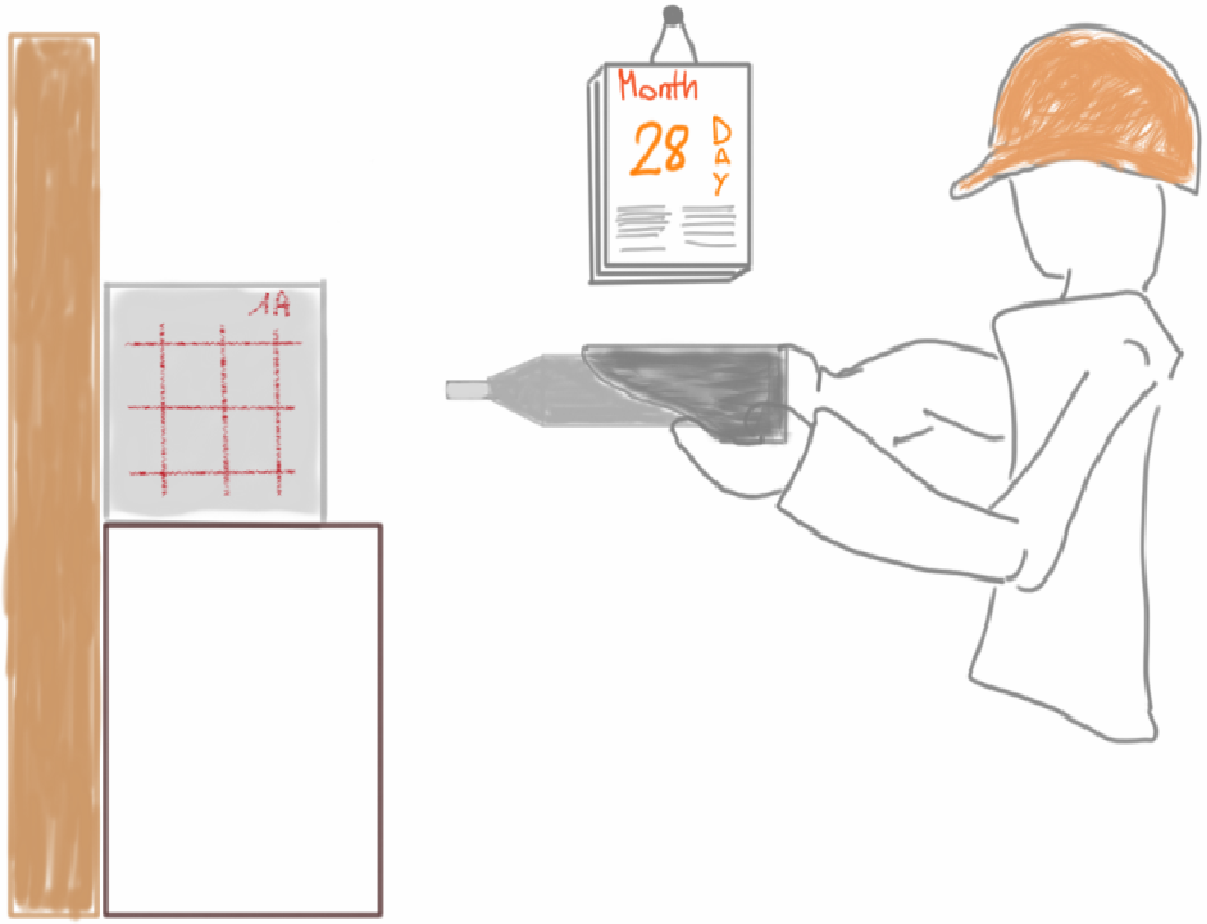
Wait for sample maturation in accordance with EN 12390-2:2009.

Position the sample between the press plates, applying load of about 1N/mm^2.

Perform strikes with the rebound hammer, keeping a horizontal position.
Perform a minimum of 9 strikes on each side.

Record the values of each single strike with the rebound hammer. Associate the values to the identifying code of the concrete sample.

Hammer Investigation: New Building



REBOUND HAMMER TESTING

If it is not possible to use a press to secure the sample, position it so that no movement is possible due to hammer impact.

For rebound values to be valid, the concrete sample must be rigidly secured.

Hammer Investigation: New Building

BREAKING TEST

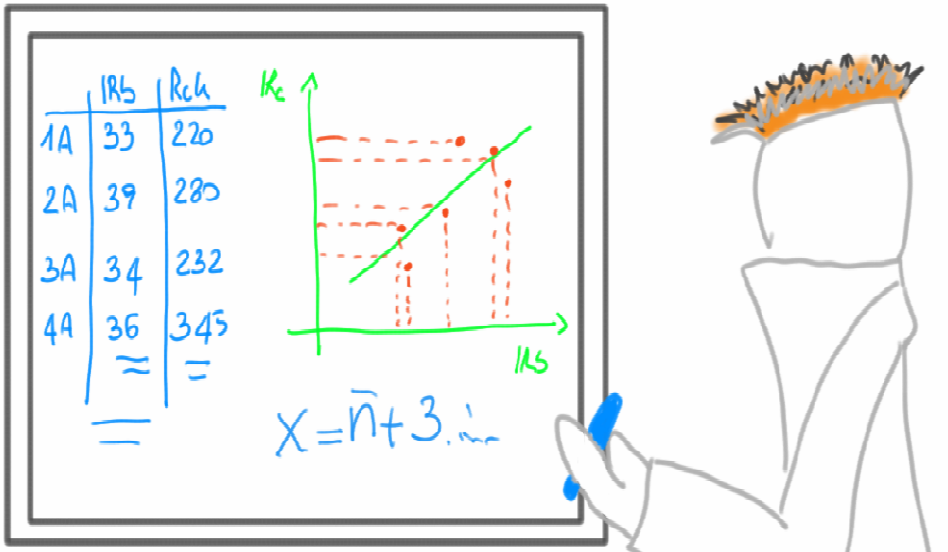
Perform destructive testing of the sample in accordance with EN 12390-3: 2009.

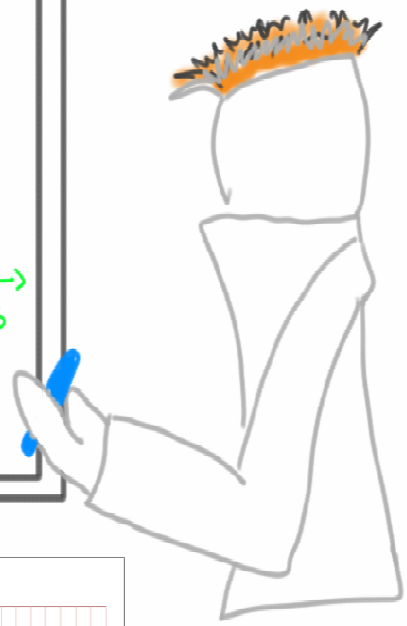
Verify that sample breaking occurs correctly.

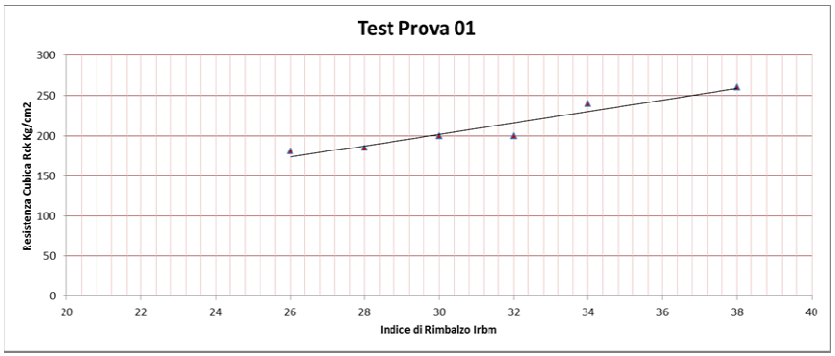
Sample compression testing can only be carried out by an Official Laboratory or a laboratory authorised in accordance with law 1086/71.

Record the obtained cubic resistance value.

Hammer Investigation: New Building







ANALYSING RESULTS

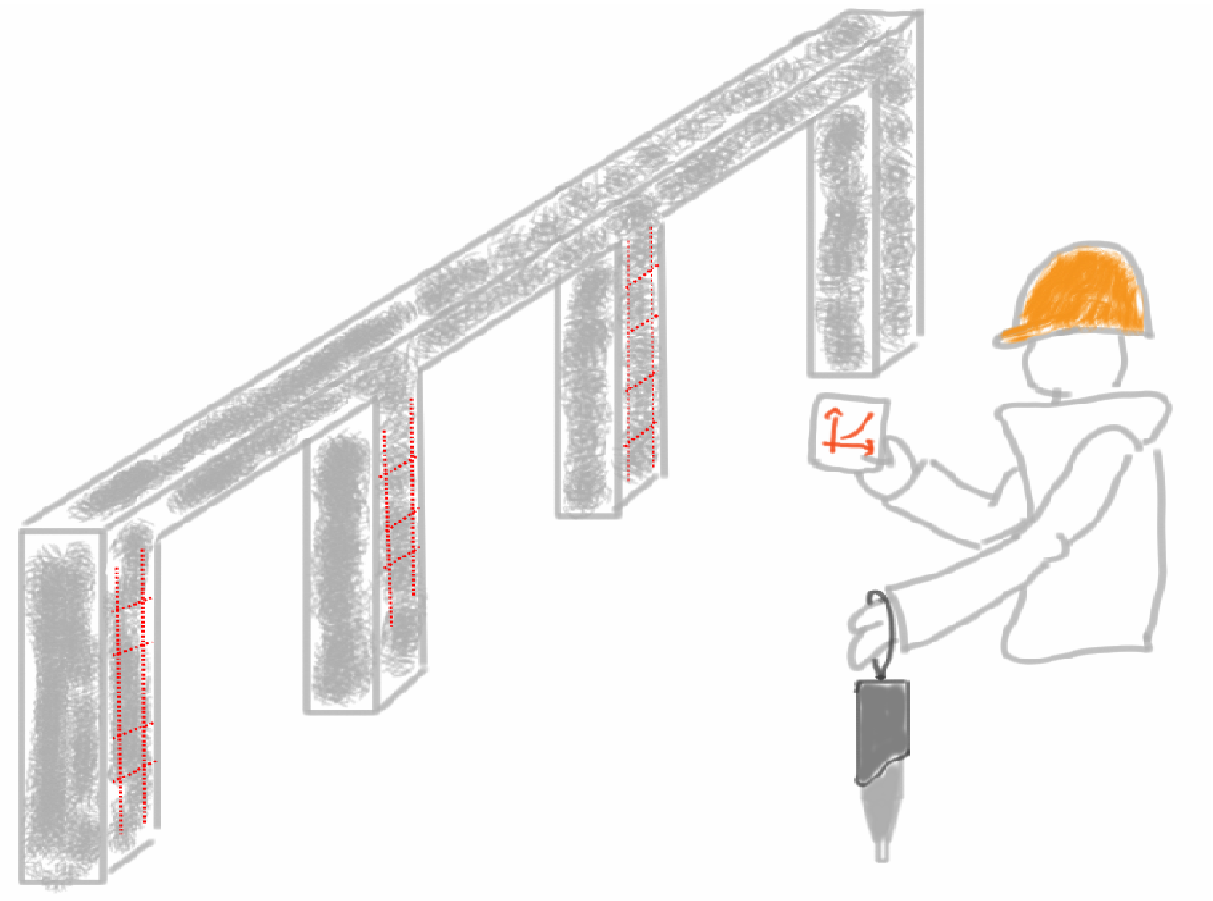
Record the values obtained on a table, associating the results obtained by testing with the rebound hammer with those obtained from destructive testing.

Graph the results, entering rebound index values on the X-axis and the strength values on the Y-axis.

You will obtain a linear regression curve.

The experimental curve obtained is representative of the material used in situ.

Hammer Investigation: New Building

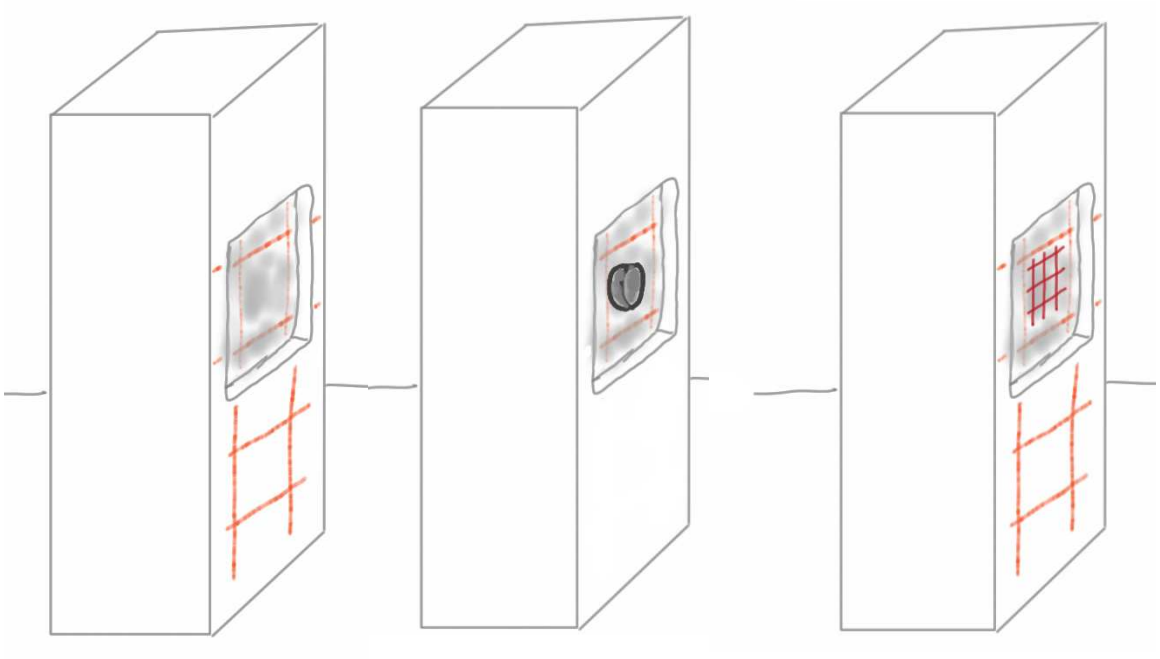


VERIFYING BUILDING ELEMENTS

Perform verifications on building element samples. Compare rebound index values with the experimental curve obtained from the breaking of cubic samples.

Verify that values comply with project requirements.

Hammer Investigation: Existing building



SELECTING TEST ELEMENTS

Once the structural elements for testing have been selected, prepare the test area:

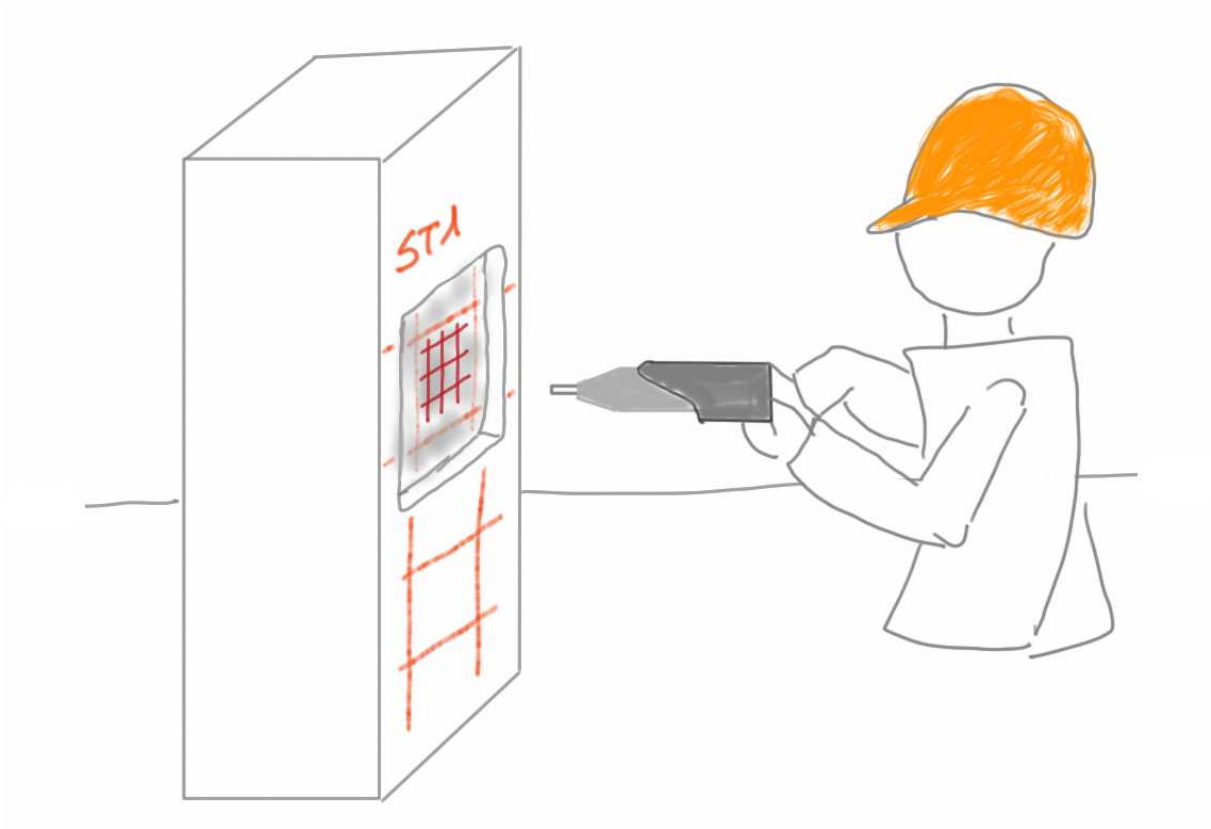
Remove plaster from the selected rebound hammer test area.

Grind the test surface, removing any surface stains.

Perform covermeter investigation to identify the reinforcing bars.

Draw a measurement grid in compliance with the dimensions and distances indicated in the rebound hammer reference standards (EN 12504: 2012)

Hammer Investigation: Existing building



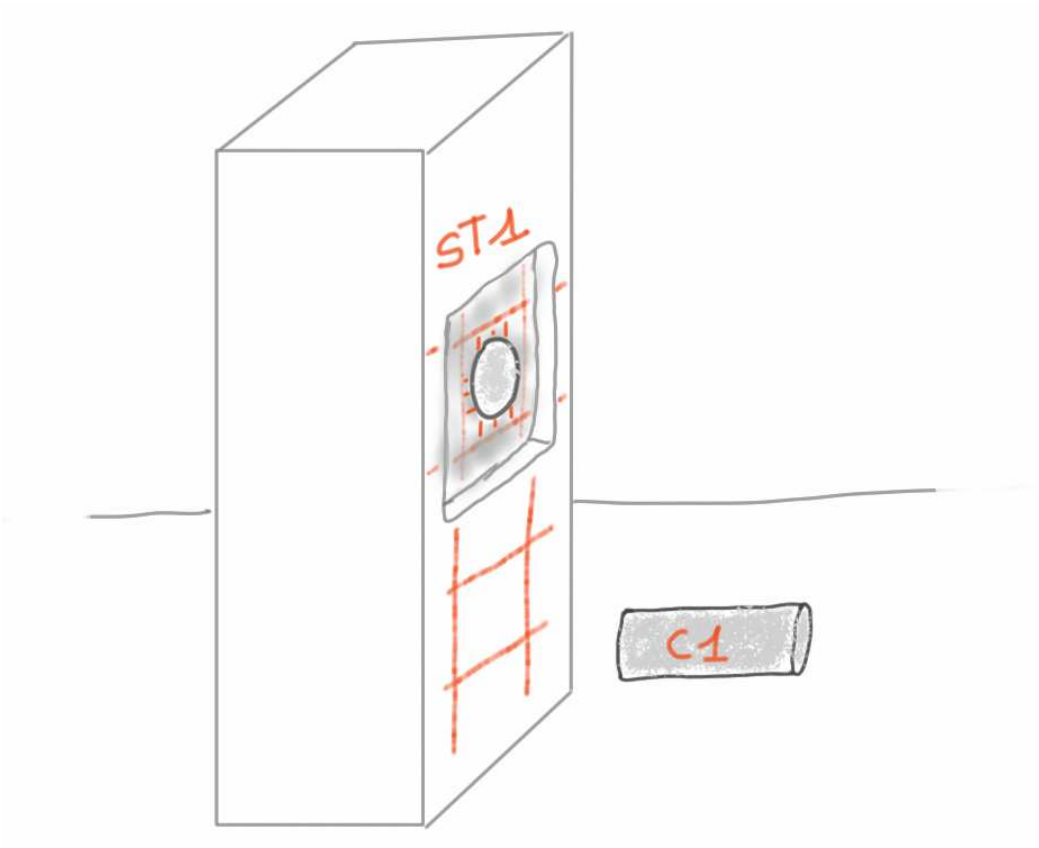
SELECTING TEST ELEMENTS

Position the rebound hammer with an angle of 0°, keeping an orthogonal position to the test surface.

Perform strikes with the rebound hammer in the identified area.

Record the rebound index values, associating them to the structural element, test station and position.

Hammer Investigation: Existing building



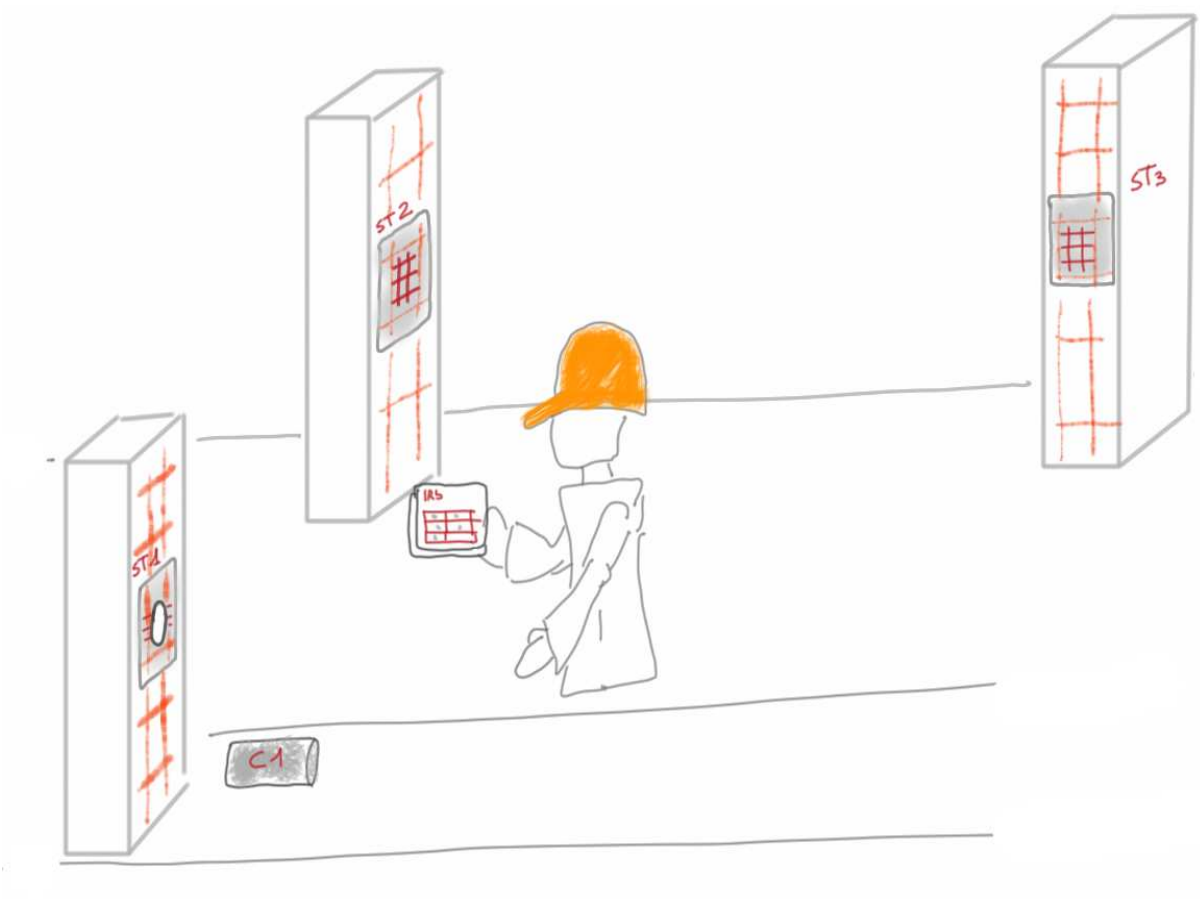
CORING

Extract a material sample from the test area, where strikes were performed with the rebound hammer.

Material extraction, coring, must be carried out in compliance with reference standard EN 12504-1: 2009

Identify the core uniquely, indicating the position and measurement station.

Hammer Investigation: Existing building



REBOUND HAMMER TESTING IN SITU

Perform tests with the rebound hammer on all selected structural elements.

Acquire the largest number possible of rebound index values.

Extend non-destructive testing on all possible structural elements.

Hammer Investigation: Existing building

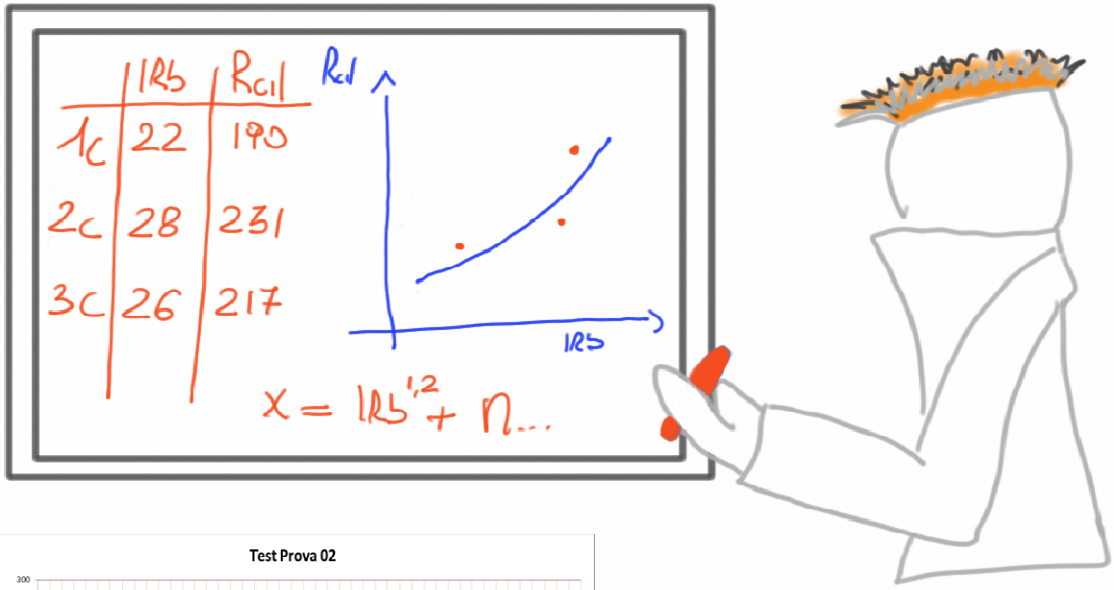
CORING BREAKING TEST

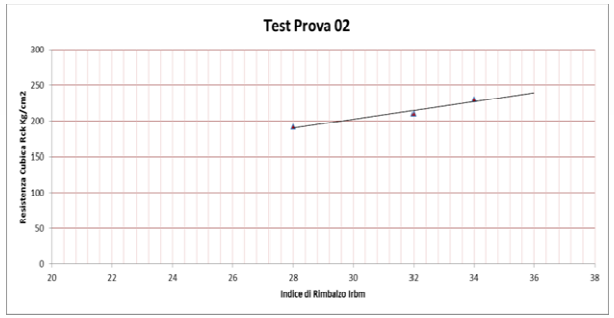
Perform coring breaking testing, positioning it under the press plates.

Perform testing in accordance with EN 12390-3:2009.

Record the cylindrical compression strength value and convert it with the corresponding cubic resistance value RcK.

Hammer Investigation: Existing building





Stazione	RcK (carota)	Irbm
ST1	210	32
ST2	230	34
ST3	239,5	36
ST4	214,5	32
ST5	239,5	36
ST6	189,5	28
ST7	214,5	32
ST8	202	30
ST9	191	28

Stazione	RcK (carota)	Irbm
ST1	210	32
ST2	230	34
ST3		36
ST4		32
ST5		36
ST6		28
ST7		32
ST8		30
ST9	191	28

ANALYSING RESULTS

Record the values obtained on a table, associating the results obtained by testing with the rebound hammer with those obtained from destructive testing.

Graph the results, entering rebound index values on the X-axis and the strength values on the Y-axis.

You will obtain a linear regression curve.

The experimental curve obtained is representative of the material used in situ.

It is possible to assess the mechanical strength values of the stations where cores were not performed through the trend line obtained by linear regression.