# Italcementi opens its Research Centre: i.lab, the heart of innovation and sustainability

**The Italian Minister for the Environment, Corrado Clini, unveiled today the Group's new laboratory, a place where over a hundred people are engaged in research and technological transfer activities in the building materials sector. The innovative solutions accomplished across 23,000 sq.m. of i.lab are clear evidence of how cement can be an element that generates sustainable architecture and smart buildings.**

**Bergamo, April 16, 2012 – i.lab**, Italcementi's new Research and Innovation Centre designed by the US Architect Richard Meier, was inaugurated today in the presence of the Italian Minister for the Environment Corrado Clini. The Minister cut the ribbon in front of a large audience including Giampiero Pesenti, Italcementi Chairman, Carlo Pesenti, the company's CEO, and the Group top management. Also attending were representatives and journalists from 18 countries where Italcementi Group operates.

Located in the Kilometro Rosso Science Park, the building has an overall surface area of 23,000 $m^2$ and hosts engineers, technicians and researchers from the Research & Development and Laboratories Departments of CTG, the Group Technical Centre, and from Italcementi's Innovation Direction, all engaged in investigating and developing innovative technological, functional and aesthetic solutions for new construction materials.

Built in line with the Group's concept of innovation, sustainability and architectural excellence, **i.lab** is the synthesis of this trail blazing technology in terms of quality of materials and green construction technologies, a place of knowledge and scientific know-how.

«*Not only in Italy but also abroad, companies are changing their course of action shifting towards sustainability: this is green economy, which is in fact "economy" because those manufactures that fail to include environmental or innovation considerations are destined to exit the market. This is the reason why - added* ***Corrado Clini****, Italy's Minister for the Environment - our Government is keen to encourage initiatives like those undertaken by Italcementi, which confirm how the entrepreneurial world is proactively committed to research and innovation*».

«*Innovation is Italcementi's strategic lever to create its own competitive advantage - stated* ***Carlo Pesenti****, Italcementi CEO- The Group focuses on the continuous search for sustainable production processes and innovative architectural solutions to meet the growing market demand for applications and products that can enhance the quality of life and of the environment. About 170 people including chemists, geologists and engineers are engaged in Italcementi Group's Research & Innovation activities in Italy, with i.lab, and in France, at the Technodes campus based in Guerville, near Paris. An annual budget of approximately 13*

*million euro is destined to Research & Development activities, which represents - compared to the total turnover - one of the highest values in the construction sector.*
*We have filed 60 patents over the last decade. The Group's current innovation rate – continues Mr. Pesenti – that is the ratio of revenues generated by innovation projects to total sales, is equal to 4 while it was 3.9 in 2010, so gradually increasing as planned. The target is to reach an innovation rate equal to 5 and maintain it in the medium to long term*» **.**

*«i.lab - concluded **Mr Pesenti** - conveys two fundamental messages to its community. First, innovation can respect the environment and industry can be the driving force behind a change that is advantageous for everyone, the economy, the environment and the society. The second message is that the future of business belongs to those who have been able to cleverly combine industrial and economic development with a careful use of natural resources and a deep respect for human rights, work and life».*

**i.lab's** activity is geared around five main strategic axes:

- **New clinker, cements or binders** alternative to Ordinary Portland Cement. In particular, research will focus on the use of renewable and reusable raw materials and the development of specialty admixtures and special additions for concrete. This project study will also be promoted through investigations and experiments based on nano- and biotechnologies applied to the construction materials sector;

- **Unconventional products**, such as TX Active, i.light and others, able to provide added technological and functional value to traditional products.

- **Special concretes, repair and structural strengthening mortars** for both new and existing construction delivering added value innovative performance;

- **Technical solutions** aimed at reducing the $CO_2$ impact within the construction materials industry.

- **Networking with international architects and project designers** aimed at defining and disseminating a culture of construction that is mindful of the environment and the people.

**BUILDING SUSTAINABLY**

**i.lab** will be a benchmark for sustainable design in Europe. It is a concrete application of Italcementi's strategy on the issues of innovation and sustainability.
Designed and built to conform to **LEED** - Leadership in Energy and Environmental Design standards, **i.lab** has been rated Platinum, the highest LEED rating for energy-efficient and environmentally sustainable buildings.
**i.lab** complies with very strict energy efficiency requirements, which allow it to save up to 60% more energy than a traditional building of the same size and end-use destination. This has been possible thanks to the special construction methods adopted, the materials used and the recourse to renewable energies, i.e. the installation of photovoltaic/solar thermal panels and the geothermal energy system.

In 2010**, i.lab** was prized by the European Commission with the European Green Building Award as the best Italian building for energy efficiency in the "Best New Building" category. 2009, **i.lab** had been honored with the **Green Good Design Award** by the Chicago Athenaeum and the European Centre for Architecture Art Design and Urban Studies.

**i.lab** is set to be a benchmark in sustainable architecture in Europe and clear evidence of the company's proactive commitment to a better quality of construction and of the environment.

«*i.lab will not only be an iconic building expressing the Group's reputation for technical expertise; it will be a benchmark for sustainable design in Europe. The building is particularly dear to me, not only for its achievements in terms of material performance and sustainability but also because it is a combination of an extraordinary collaboration with Italcementi, a collaboration started a long time ago for the Jubilee Church in Rome and has continued through the years. I hope this building will prove to be the best working environment for every day work and research »*, said Richard Meier.

## TWO WHITE WINGS FOR KILOMETRO ROSSO

**i.lab** is a powerful engine of industrial research. Meier's project is characterised by the utmost attention to quality, which is also apparent from the details of each and every component, but first and foremost from the quality of space. **Large airy spaces** that allow people and functions to interrelate along the paths suggested by the Architect.
**Richard Meier** has designed i.lab as a structure including two above-grade and three basement levels**. i.lab** follows and reinforces the V-shape of the site: the two wings facing a central courtyard seem to accentuate the building's opening towards **i.land,** the ornamental agricultural park that has been specially realized outdoors.
The impressive arrow-like canopy that lies above the main entrance creates a two-storey generous covered public plaza leading to a sky-lit atrium from which the two wings of the building depart. The first wing runs parallel to the highway and contains labs and offices; the second wing houses a large conference room with up to 260 seats on the ground floor and formal corporate offices on the upper floor.

**i.lab** boasts a multitude of **technical and industrial innovative elements:** the **glass façade system,** which creates a contrast effect between the solidity of cement and the transparent lightness of glass; the **curtain wall**, developed in response to the need for natural lighting, which stands on the side of the building facing the highway and the town of Bergamo. Formed by an array of concrete blades resembling a geometrical sculpture, it is capable of creating an element that is both a definite formal statement and a tool to provide shade to the interior by intercepting sunlight. Moreover, the **arrow-like end of the cantilever roof,** which makes **i.lab** a true landmark and a recognizable sign on the territory. Finally, at the other end opposite the i.lab, from under an impressive hanging white wall, it is still possible to catch a glimpse of the final volume of the Kilometro Rosso by Nouvel.

## HEAT FROM THE EARTH

### The geothermal energy system

Fifty-one wells serving the building were dug as far down as 100 m from road level. The geothermal system contributes to winter heating and summer cooling, with energy savings of up to 50% and 25% respectively, thus reducing overall $CO_2$ emissions into the atmosphere.

### The photovoltaic system and solar panels

The building's roof is fitted with 420 photovoltaic panels for an installed peak power of 90 kW. Total electricity generation per year is estimated at roughly 96,000 kW, corresponding to 52 tons of $CO_2$ saved each year. 50 $m^2$ of solar thermal panels meeting 65% of the building's yearly hot water requirement.
Solar thermal and photovoltaic panels reduce consumption from conventional energy sources, thus curbing $CO_2$ emission and contributing to protecting the environment.

## EXCELLENCE OF MATERIALS, FROM THE FOUNDATIONS TO THE ROOF

**Alternative, recycled and/or locally produced materials** have been used to build **i.lab**. Concrete containing recycled aggregates from construction and demolition or blastfurnace slag was used to build the floor screeds, the foundations and the outer walls. Other portions of the building were built using cement containing recycled slag in addition to other materials obtained entirely from industrial process waste.

As a continued effort to adhere to **LEED** standards, also FSC® Forest Stewardship Council-certified **forest products** have been used. FSC labeled products demonstrate that the material originates from correct and responsible forest management practices according to strict environmental, social and economic standards.

As to **iron**, products featuring the highest possible recycled material content have been used. With respect to **glass**, a huge design effort was made to identify and obtain a unique material vis-à-vis the type of mixes used, the refractive index and the k heat transfer coefficient. Moreover, all glass installed on **i.lab** is of the triple-glazing two-chamber type to guarantee excellent acoustic and thermal comfort.

### TX Active®, photocatalytic cement

The **i.lab** building is covered with cement containing **TX Active**®, the photocatalytic "smog-eating" active principle that has already been used by architect Richard Meier on the Dives in Misericordia church project in Rome. **i.lab**'s structural elements made of white concrete required development of a high-strength fibre-reinforced white concrete capable of meeting a complex array of static, durability and unalterability requirements.

### i.light®, transparent cement

Some walls in the **i.lab** building are made of i.light®, the "transparent" cement developed by Italcementi laboratories and used for the first time on the Italian Pavilion at Expo 2010 in Shanghai. Stemming from the combination of a polymer more transparent than glass and a brand new mortar formula, i.light® is a precast cement-based element that allows

light to filter through from the outside inside and vice versa while providing the same solidity as high performance concrete.

**i.idro DRAIN, draining cement**

i.idro DRAIN was used for paving the ramps leading to the basement floors and the garden, and also for the concrete beading around the plants.
Thanks to a specially formulated mix, this product combines the strength of concrete paving with the drainage properties of soils, respecting the water cycle and reducing water ponding, runoff and hydroplaning phenomena, with lower costs associated with discharging and treating stormwater.

**Effix Design®, creative material**

Some interior and exterior decoration elements are made with **Effix Design®**, a mortar with impressive mechanical and aesthetic properties, developed for creating non-structural cement elements (interior and outdoor furniture, street furniture, lamps and spotlights and many others). Successfully tried and tested by renowned architects and interior designers in France, **Effix Design®** is a sustainable product in that its photocatalytic version can guarantee a self-cleaning and depolluting action.

## I.LAND, THE AGRICULTURAL ORNAMENTAL PARK

**i.land** is the agricultural ornamental park of **i.lab**, designed by Studio GPT – Giardini Paesaggio Territorio. **i.land** derives from the desire to merge Richard Meier's architecture with local culture and geography, innovation with the authentic tradition of the Bergamo area, which in modern terms becomes sustainability, biodiversity and zero food miles.
It is from the very strength of the land and its environment that the project nourished and enhanced itself from inception to development.
Whereas **i.lab** makes a significant and innovative contribution to the territory, as it supports environmentally friendly development and the identity of local communities, **i.land** translates the commitment to sustainability into the awakening of the values of the past, especially those of the local agricultural tradition, so that they can go hand in hand with an industrial culture that is mindful both of nature and the landscape.

The project design phase has followed a compositional and stylistic approach based on criteria specifically focused on energy saving and LEED certification, to create a work that respects the environment and is under the banner of ecosustainability.
Gardening works were assigned to a social co-operative that is engaged in providing employment opportunities to people in difficulty.

The **roof garden** of the Auditorium, externally to the conference room, offers a panoramic view from inside and a relaxing place for both employees and guests.
The **entrance garden** has a purely aesthetic function, acting as a sign of welcome to the building. In order to leave space to architecture and highlight the striking cantilever roof at the entrance, it was decided not to include any three-dimensional elements: there is a simple grass lawn that does not distract from the imposing building in its entirety.
The **south-facing garden** is designed to act as a welcoming, relaxing area for both visitors and employees: a place outdoors to stage receptions, theatrical and musical events.

The south-facing garden also has wave-shaped hedges of hornbeam, typical of local traditions, that define an amphitheatre in front of the "**Mutated Panels**" sculpture by Richard Meier.
The garden also hosts a rectangular **pond** built using phytodepuration techniques with gravel and aquatic plants.
With respect to the **agricultural section**, typical varieties of the Bergamo and Northern Italian lands were selected. Called upon to assist in the realisation of the orchard, **Slow Food** has identified the most appropriate varieties and will be responsible for maintaining the area. The gathered fruit will be transformed into preserves and dried fruit sticks that will be distributed in schools. **Beehives** have been installed to guarantee pollination of the fruit growing plants and also to make honey, thanks to the **flowering meadow**.
**In the west-facing area**, there is a plantation zone with ancient endangered varieties of Bergamo maize. Crop preparation and planting will be performed and managed by the Council for Research and Experimentation in Agriculture CRA - MAC, headquartered right in front of the site. This cultivation complies with the **zero food miles** criteria.

## I.LAB IN FIGURES

- 7,500 $m^2$ surface area dedicated to laboratory activities
- 5 building floors (2 above ground and 3 basement floors)
- 10,000 volumes available at the library
- 320,000 hours worked during the construction phase
- 300 workers involved
- 120 maximum number of people present at the building site per day
- 4,500 hours dedicated to safety training, specifically in work at height, for the
- contractors' personnel and managerial staff
- 500 $m^2$ total surface area fitted with photovoltaic panels
- 420 photovoltaic panels with an installed peak power of 90 kW
- 50 $m^2$ total surface area fitted with solar panels to meet 65% of the building's hot water requirements
- 51 geothermal system wells
- 60% external surface fitted with low-heat low-noise triple glazing windows

## I.LAND IN FIGURES

18,200 $m^2$ total surface area including:

- 4,160 $m^2$ ornamental meadow
- 2,700 $m^2$ orchard
- 280 $m^2$ raspberry patch
- 2,800 $m^2$ planted maize crop
- 2,800 $m^2$ flowering meadow
- 720 $m^2$ grass paving grid
- 1,375 $m^2$ borders of shrubs and perennial grasses (including hedges)
- 140 $m^2$ pond
- 3,225 $m^2$ paved areas
- 620 m length of hornbeam hedging
- 340 $m^2$ surface area of the hanging garden

## THE SITE: KILOMETRO ROSSO

**i.lab** is located within the **Kilometro Rosso Science Park**, a managed environment just outside Bergamo that plays host to research centres, laboratories of high-tech manufacturing facilities and scientific institutions. The Park is a multi-disciplinary campus that fosters and supports innovation in research and technology.
Kilometro Rosso is a "node of an international network of relationships and connections", that boosts the share of skills, knowledge, information and know-how not only among its Partners, but also between them and the outside world.

The whole site overlooks and extends alongside the A4 Milan-Venice motorway: starting from these initial considerations, the master plan drawn up by French Architect Jean Nouvel presents a red lamellar meal wall that runs alongside the motorway for a kilometre, becoming the architectural scenario behind which the various research buildings are arranged in the park.

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**Italcementi Group** is the fifth largest cement producer in the world. The Group companies combine the expertise, know-how and cultures of 21 countries in 4 Continents, boasting an industrial network of 55 cement plants, 10 grinding centres, 8 terminals, 494 concrete batching units and with an overall staff of about 20.000 people. In 2011 Italcementi Group sales exceeded 4.7 billion Euro.