

THE HEART OF INNOVATION



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**Italcementi Group**



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**Italcementi Group**

A company that looks to the future is a company that encourages and supports economic and industrial development focusing on the preservation of natural and cultural resources.

This is the vision that led to the creation of i.lab, Italcementi's own Research and Innovation Centre.

i.lab is an engine of growth and competitiveness, a place dedicated to research and the transfer of technology in the building materials sector, where cement is the element that generates sustainable architecture and smart buildings. Not simply a commodity, but a versatile material that accompanies mankind throughout the history of construction.



Carlo Pesenti  
Italcementi Ceo



Carlo Pesenti  
Italcementi Ceo

INSIDE **i.lab**

**INNOVATION  
A GROUP  
STRATEGY**

A company that looks to the future is a company that encourages innovation, focusing on the preservation of natural and cultural resources. This is the vision that led to the creation of i.lab, Italcementi's new Research and Innovation Centre. i.lab is an engine of growth and competitiveness, a place dedicated to the building materials sector, where cement is the element that is not simply a commodity, but a versatile material that acco

#### ITALCEMENTI GROUP'S RESEARCH AND INNOVATION ACTIVITIES

Innovation applied to the continued search for sustainable architectural solutions is Italcementi's strategic lever to create its own competitive advantage, whilst contributing to improving the quality of life and the environment. The construction market is increasingly oriented towards advanced solutions which are sustainable and of highest levels of quality. In this context, Italcementi aims to become a cutting-edge cement manufacturing group capable of transforming a commodity into a technologically advanced product at the service of the building community.

Innovation in processes and products, but above all in ideas: this is what allows Italcementi to face new markets with new proposals, new services and new eco-sustainable solutions for the construction industry.

i.lab, Italcementi's new Research and Innovation Centre designed by the American architect Richard Meier, is tangible evidence of this strategic vision. 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.

- About 170 people, including chemists, geologists and engineers, engaged in Research and Innovation activities in Italy and France
- An annual budget of approximately 13 million euro destined to Research & Development activities
- About 0.5% of the Group's turnover invested in Innovation (0.3% in R&D)
- 92 patents filed since 1992
- A corporate organisation strongly oriented not only towards research but also towards the market



A fundamental element to success is the network of scientific cooperation in Italy and abroad that includes research centres, universities, architects, engineers, designers and businesses from the building community. Such a shared effort is focused on reducing time-to-market in terms of industrialisation and marketing of new products, services and processes. This approach integrates perfectly with the positioning of i.lab at the Kilometro Rosso Scientific Park where multidisciplinary methodology provides key support to research and development activities.

The core of Italcementi's innovation strategy is Sustainable Development.

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.
- 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.
- Technical solutions aimed at reducing the CO<sub>2</sub> 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 new materials, the environment and the people.



Carlo Pesenti  
Italcementi Ceo

i.lab

# INNOVATION A GROUP STRATEGY



**i.nova** is the concept box and laboratory of knowledge, information and opportunities that reinforces and enhances the wealth of skills and expertise gained by the Group over the years.

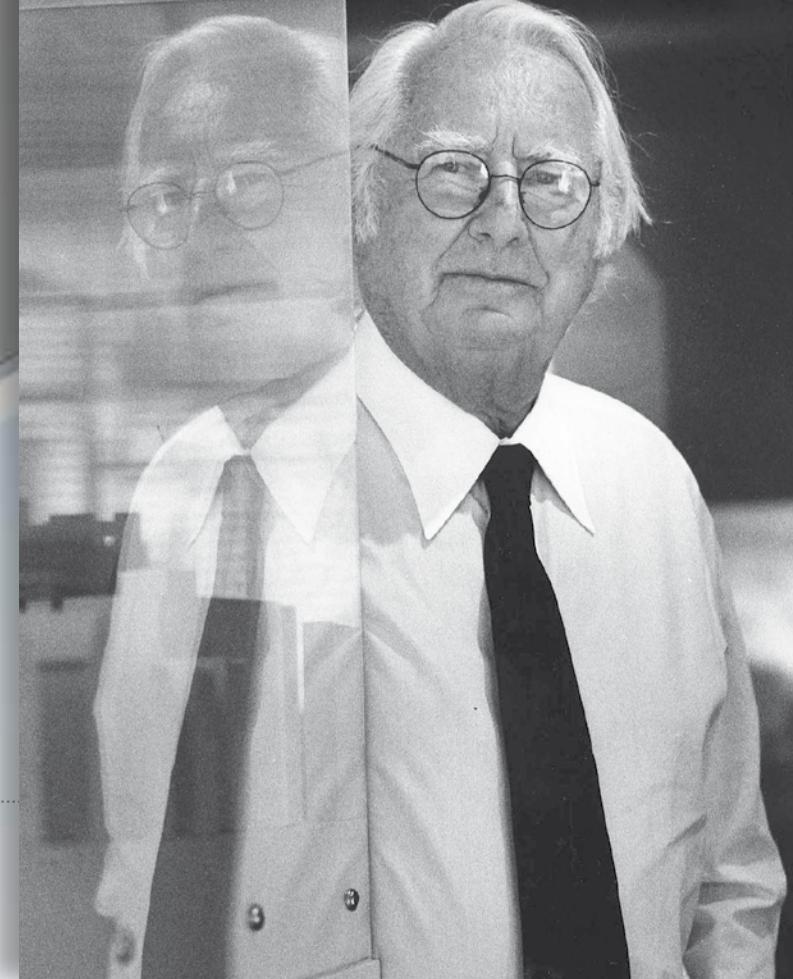
**i.nova** is the corporate flag for innovation and research committed to the building community and focusing on new sustainable materials.

Under **i.nova**, the multidisciplinary skills of Italcementi's innovation community team up to meet the challenging needs of both architecture and the construction industry in terms of versatility, design, aesthetics, safety and energy efficiency.

With **i.nova**, the Group aims to anticipate market trends and needs through a new cultural approach to building construction, where cement can be rediscovered as the raw material of beauty and sustainability.

INSIDE EXCELLENCE

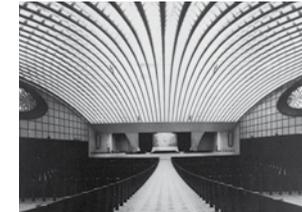
Our innovation combines the ethics of sustainability with the value of beauty and aesthetic quality typical of Italian style. Italcementi Group views architecture as a tool for sustainable transformation of the territory and a workshop encouraging dialogue among all players in the building community.



Italcementi Group has always operated alongside architecture in the development of innovative and high technological content projects, from the experiments with **Gio Ponti** and **Pier Luigi Nervi** for the Pirelli Tower and the Paul VI Audience Hall to the cooperation with some of today's greatest designers such as **Richard Meier**.



Pier Luigi Nervi



Paul VI Audience Hall



Pirelli Tower



Gio Ponti

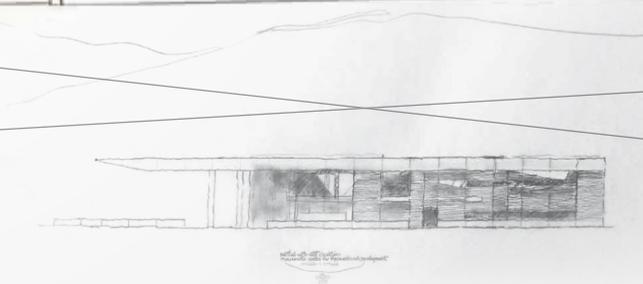


Richard Meier and Giampiero Pesenti, Italcementi Chairman

**Richard Meier** is one of the masters of contemporary architecture. Some of his most renowned works include the **High Museum** in Atlanta, the **Contemporary Art Museum** in Barcelona, the Getty Center in Los Angeles and the **Dives in Misericordia Church** in Rome, where Italcementi served as technical partner.

..... EXCELLENCE

INSIDE THE CONCEPT





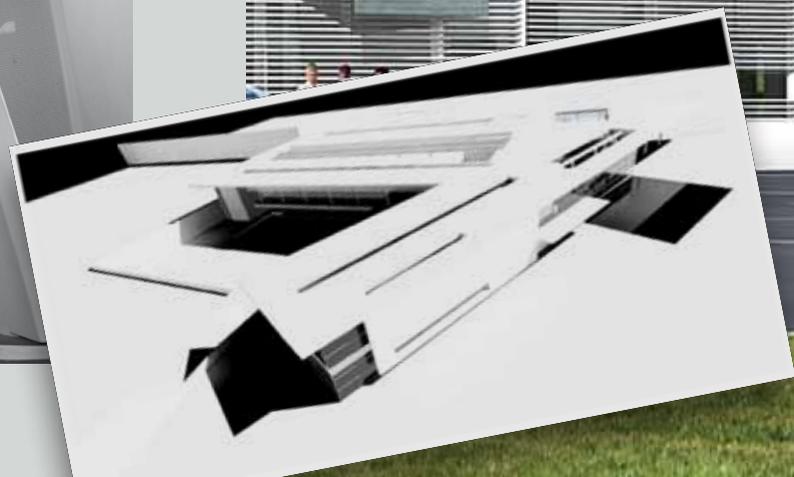
A work of art in typical Meier style, i.lab is an element of extraordinary architecture, extraordinary style and construction techniques, the result of exceptional technical and scientific skills combined with sophisticated engineering.

“The new Italcementi Research Center 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”.

**Richard Meier**



Richard Meier e Carlo Pesenti, Ceo Italcementi



# i.lab, WHERE INNOVATION ENCOUNTERS ARCHITECTURE

.....• CONCEPT

“The building has a striking visual presence, not only from within but from all sides. If you move around it, it has a sculptural quality”.

**Richard Meier**

INSIDE THE PROJECT



"The building has a striking visual presence, not only from within but from all sides. If you move around it, it has a sculptural quality".

Richard Meier



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. Let us start from the generous covered "plaza" created by the extensive projection of the white concrete roof - the most distinctive feature of the entire building - that projects into the landscape and along the axis towards the historic part of the city, with an impressive twenty-metre cantilever overhang.

Protection, reception and the demonstration of extraordinary technological performance, the large cantilever roof canopy leads

to the vast **access hall**: the attention of visitors is immediately captured by the long **walkway** that, with an interrupted line, leads to the upper floor and to the public wing hosting the large conference room, in turn surmounted by a smaller area for more confidential meetings. However, reaching these areas is not simply a matter of moving from one place to another.

The construction elements, the columns, the large wall built with "transparent cement", the tall windows forming the original "curtain wall", mark the passage across the area, flooded in natural light, which pervades the entire public wing and even extends into the work areas in the basement levels. This creates ever-changing perspectives, dominated by the ultra-white light reflected by the TX Active concrete.



ABSTRACTION  
AND VITALITY  
OF SPACE

PROJECT



INSIDE BEAUTY

i.lab is basically a factory of knowledge, a large-scale laboratory where every construction element, every functional area, every space solution is in itself evidence of the constructive and expressive potential of the most cutting-edge cement solutions.

This striking "luminous machine" boasts a multitude of **technical and industrial innovative elements**. Some can be valued as real inventions because of their capacity to mediate between technique and aesthetics, between the materiality and immateriality of the building. The most impressive element is the **glass façade** system. The glazed surfaces seem to be solely supported by the concrete mullions, thus creating a contrast effect between the solidity of cement and the transparent lightness of glass and making mullions turn into actual "objects" as in the best tradition of industrial design.

A similar quality can be found in the **sun louvre** system on the opposite side of the building. Here again, Meier focused on the need for natural lighting to create an element that is both a definite formal statement and a tool to provide shade to the interior by intercepting sunlight. The shielding system is formed by an array of

concrete blades resembling a geometrical sculpture of its own intrinsic beauty.

Meier's intuitive solutions reconcile **design and structural engineering** with scrupulous attention to the **aesthetic quality** of the building.

i.lab is the working proof that solutions incorporating the natural inclination to standard criteria of industrial design and the spatial emotion of architecture are eventually possible.



..... • BEAUTY

THE BEAUTY  
OF MATTER



INSIDE LIFE



Considering the major significance that the building would have, Meier's design work required a great **imaginative effort** in order to sense the possible future of the industry: from conceiving new prefabricated elements to configuring spaces, bearing in mind the possible **lives of the people** who would be using the building. People move, meet each other, isolate themselves to study, reunite again to compare desired and achieved results: all these considerations become as important as the static solutions bearing the construction. Living architecture becomes a continuous spatial navigation under natural light, with the possibility of viewing the outside world. In line with the idea of a luminous machine pervading the entire building, the glass

walls that in some areas extend below the road plan, together with the system of roof skylights conveying natural daylight to the offices, corridors and laboratories, are a perfect example of the care and attention that the designers dedicated to creating the best possible environmental conditions allowing even the basement floors to enjoy good natural light during the day. All life stages of the building, from the construction site through to its daily operations, reflect the same criterion of **sustainability** that inspired the entire project. Issues like indoor air quality, presence of CO<sub>2</sub>, volatility of the materials used, natural and artificial lighting, temperature and humidity, energy and water consumption are all rigorously planned and controlled, often automatically.



# THE TRUE LIFE OF ARCHITECTURE

.....• LIFE





INSIDE THE LANDSCAPE



The true last key to interpret Meier's "beautiful and stylish" architecture is the building's position in relation to its **surroundings**, both close and distant. The large **arrow-like cantilever roof** overhanging the plaza makes the Italcementi complex a true landmark, a recognisable sign on the territory. At the other end opposite the i.lab, from under a large hanging wall in white TX Active, it is still possible to catch a glimpse of the final volume of the Kilometro Rosso by Nouvel,

which Meier uses in a refined modern manner to create a fleeting, almost invisible colour contrast. The mastership of Meier lies also in his vaguely ironic ability to create buildings whilst "faking" total expressive freedom, fully aware that, even the very best architects cannot escape from the constraints imposed by the world, the economy, the technique and the local territory. The only way out is to start a dialogue and find meaningful solutions, maybe even only for a specific moment in time and space.

## DIALOGUE WITH THE TERRITORIAL CONTEXT

## .....• LANDSCAPE



“Italcementi is dedicated to sustainability. The Group is willing to spend more on a building to make it sustainable. In the longer run, it is the right thing to do and Italcementi recognized that and insisted on that”.

**Richard Meier**

INSIDE SUSTAINABILITY



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.

i.lab is designed and built to conform to **LEED** - Leadership in Energy and Environmental Design standards, the most authoritative and widely used rating system for assessing the environmental sustainability of 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.

i.lab makes a large contribution to innovation on the territory, being supportive both to environmentally friendly development and to the identity of local communities.

i.lab conveys two fundamental messages to its community: innovation can respect the environment and industry can be the driving force behind a change that is advantageous for all concerned, the economy, the environment and society. Achieving sustainability goals requires a joint effort by all the players involved to identify real solutions to the multitude of environmental and social problems that characterise today's world. A virtuous relationship between an important infrastructure, the territory and the community. Not simply for the aspects concerning architecture and sustainable ornamental choices, but also for the widespread value that both the design & construction activities and the Research and Innovation Centre operations can offer to an extended social community.



2009, i.lab was honored with the **Green Good Design Award** by the Chicago Athenaeum and the European Centre for Architecture Art Design and Urban Studies.



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.



i.lab has achieved the **Platinum** certification from **LEED**, the most authoritative and rigorous rating system for assessing the environmental sustainability and energy efficiency of buildings.

.....• SUSTAINABILITY

INNOVATION  
A TOOL FOR  
SUSTAINABILITY



INSIDE TECHNOLOGY



### THE GEOTHERMAL ENERGY SYSTEM

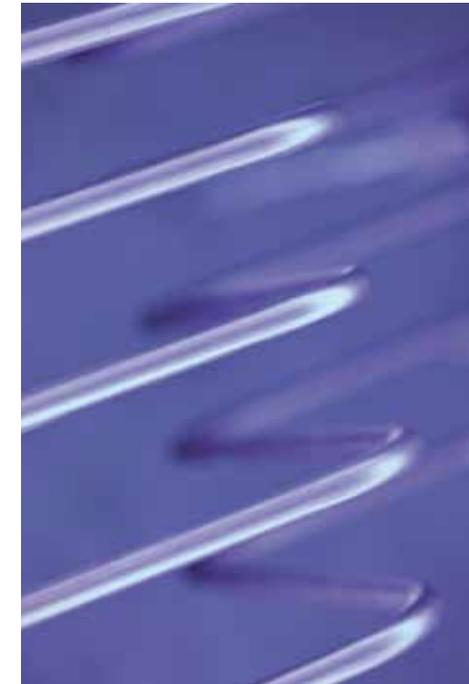
Fifty-one wells serving the building were dug as far down as 100 m from road level. The geothermal system contributes to winter heating and summer cooling, with energy savings of up to 50% and 25% respectively, thus reducing overall CO<sub>2</sub> emissions into the atmosphere.



### THE PHOTOVOLTAIC SYSTEM AND SOLAR PANELS



420 photovoltaic panels for an installed peak power of 90 kW. Total electricity generation per year is estimated at roughly 96,000 kWh, corresponding to 52 tons of CO<sub>2</sub> saved each year. 50 m<sup>2</sup> 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<sub>2</sub> emission and contributing to protecting the environment.



.....● TECHNOLOGY



INSIDE THE MATERIALS



**Alternative, recycled and/or locally produced materials** have been used to build i.lab. By way of example, 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.

## .....● MATERIALS



INSIDE THE PRODUCTS

#### **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 - columns and roofing shells - 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.



#### **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.idro DRAIN, draining cement**

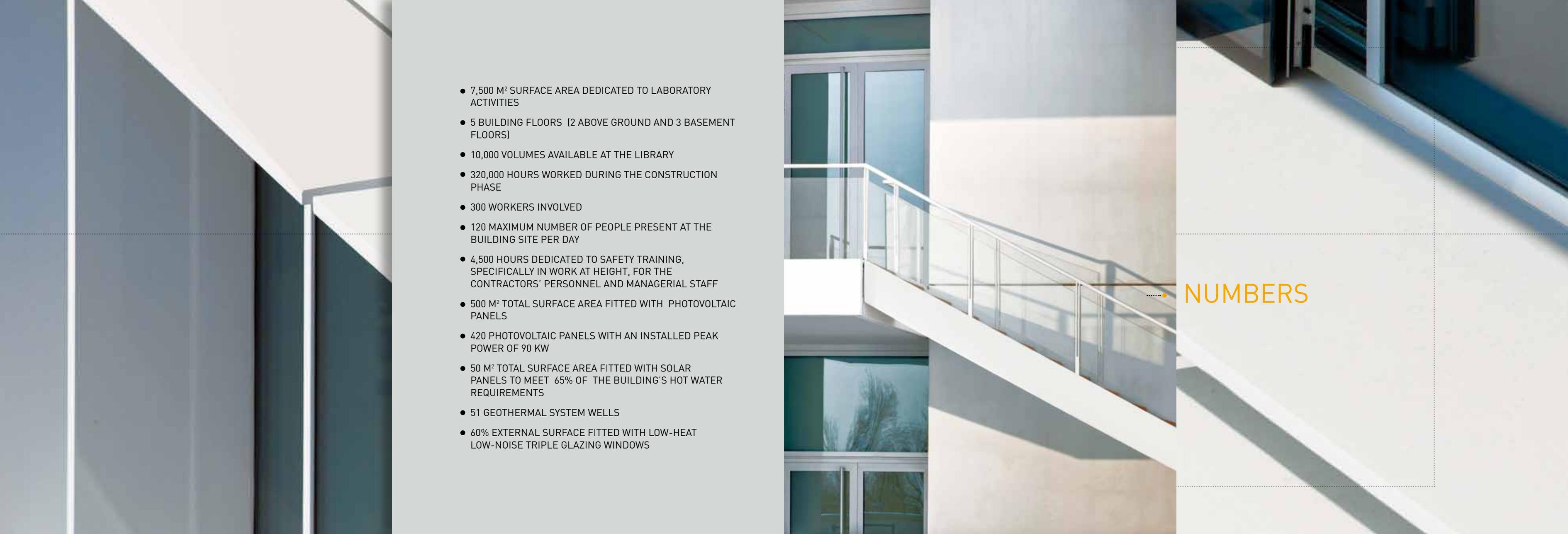
**i.idro DRAIN** was used for paving the ramps leading to the basement floors and the garden, and also for the concrete beading around the plants. Thanks to a specially formulated mix, this product combines the strength of concrete paving with the drainage properties of soils, respecting the water cycle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

## PRODUCTS



INSIDE THE **NUMBERS**

- 7,500 M<sup>2</sup> 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<sup>2</sup> TOTAL SURFACE AREA FITTED WITH PHOTOVOLTAIC PANELS
- 420 PHOTOVOLTAIC PANELS WITH AN INSTALLED PEAK POWER OF 90 KW
- 50 M<sup>2</sup> 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



## NUMBERS



INSIDE **i.land**

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**Italcementi Group**



enhanced itself from inception to development.

Not only does i.land have an ornamental value, it also has a significance in terms of production and preservation of endangered varieties. It is an innovative example of landscape projects whereby the typical ornamental features of industrial areas can go hand-in-hand with a real agricultural activity that pays particular attention to tradition, territorial aspects, eco- and food sustainability, interpreted with a design that reflects the local agricultural landscape.

i.lab and i.land represent the two faces of Italcementi: a leading company in the advanced research on construction materials that has always been respectful of tradition, the values of the past and attentive to environmental and food sustainability.

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

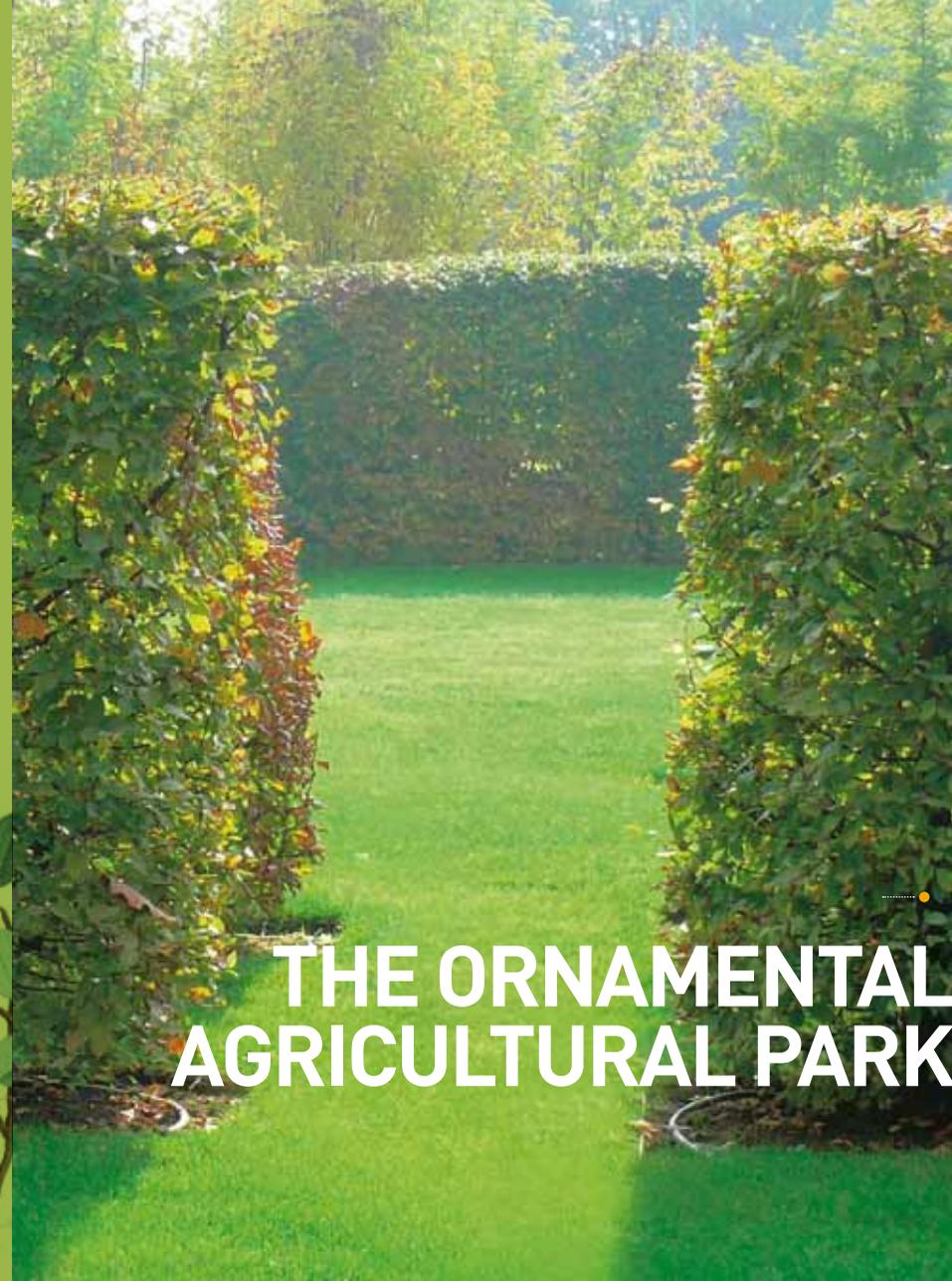
The project design phase has followed a compositional and stylistic approach based on criteria specifically focused on energy saving and LEED certification, to create a work that respects the environment and is under the banner of eco-sustainability.

Gardening works were assigned to a social co-operative that is engaged in providing employment opportunities to people in difficulty.



## THE ORNAMENTAL AGRICULTURAL PARK

i.land



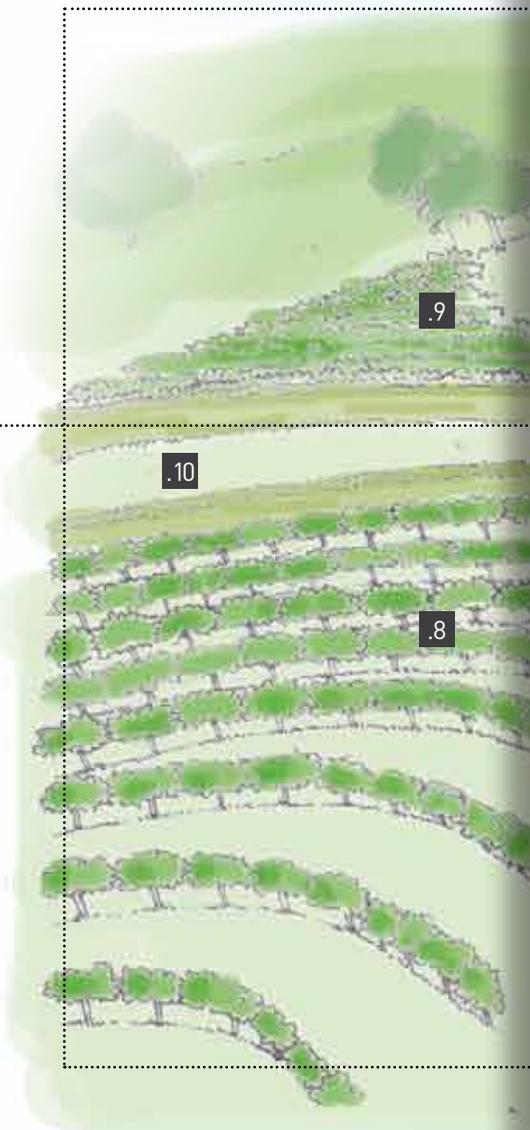
- .1 Entrance lawn garden
- .2 Green drops with ornamental grasses, perennial and bulb greenery
- .3 Wave-shaped hornbeam hedges
- .4 Auditorium roof garden
- .5 Inner courtyard with ash trees and undergrowth
- .6 Area to stage receptions, theatrical and musical events
- .7 Richard Meier's "Mutated Panels" resting on a reflecting water pond with aquatic plants



INSIDE *i.land*

- .8 Ancient pear and apple trees orchard, in cooperation with Slow Food
- .9 Traditional raspberry orchard, in cooperation with Slow Food
- .10 Flowering meadow with local spontaneous species
- .11 Ancient endangered varieties of Bergamo maize: *Rostrato Rosso di Rovetta*, *Spinato di Gandino* and *Nostrano dell'Isola*, managed by the Council for Research and Experimentation in Agriculture CRA-MAC

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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.

The hornbeam waves mark the south-facing **orchard**, where ancient apple and pear trees and traditional raspberries are planted in rows parallel to the hedges. 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.land IN FIGURES**

18,200 m<sup>2</sup> total surface area including:

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

i.land



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INSIDE THE CREDITS



We'd like to thank

Richard Meier

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Welcome Srl

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## ITALCEMENTI GROUP

With 2011 consolidated sales exceeding 4.7 billion Euro, Italcementi Group is the fifth largest cement producer in the world. The Group's companies combine the expertise, know-how and cultures of over 20 countries across four continents, boasting an industrial network of 55 cement plants, 10 grinding centres, more than 490 concrete batching units, and a staff of about 20,000. Italcementi Group is a member of WBCSD, the World Business Council for Sustainable Development, and has adhered to the UN Global Compact, a strategic initiative promoted by the United Nations to align companies' operations and plans with universally accepted principles in the areas of human rights, labour, environment and ethics.





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**Italcementi Group**

**A world class local business**

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