

InnoCons Barcelona,

A professional network innovating in construction.

The InnoCons Barcelona network is made up of more than 150 architects, engineers and construction firms that have joined forces to promote global, radical changes in construction practices.

1. What is InnoCons Barcelona?

The InnoCons Barcelona programme for Innovation in Construction is an initiative born in Barcelona with an international focus. It is a network made up of over 150 professionals from the fields of architecture and engineering, comprising various perspectives of the sector: developers (public and private), technicians, product manufacturers and suppliers and construction firms, both specialist and generalist.

Its goal is to allow members to share, consolidate and spread their experience and knowledge, to resolve technical problems via innovative solutions and thus to promote radical, global changes in the way we build. The aim is to create a Construction sector with high added value and qualified personnel, applying technological developments and guaranteeing maximum safety for workers and users of the completed building.

2. Principles governing InnoCons Barcelona

Three basic concepts govern the management of InnoCons Barcelona together with 10 ideas or principles that have inspired the debates (Appendix no. 1), helping to unite the network.

The network is governed by three guiding principles: to share knowledge and experience with loyalty, thanks to the connections provided by CIT

The first main concept involves **sharing** knowledge and experience. The knowledge and experience built up over these years in Catalonia (within Spain) affords us confidence in dealing with any challenge. Through collaborative work methods and creativity techniques, we have achieved innovative solutions that can be applied instantly to the problems and demands put forward by end users of buildings to be built, renovated or maintained in the future.

Members of the InnoCons Barcelona programme act on the assumption that they all stand to benefit from their willingness to share their knowledge and experience, and for this reason, they do so **loyally**.

Communication and Information Technologies (CIT) provide an essential tool for ensuring permanent **connections** among the group. For this reason, the Official Chamber of Contractors of Catalonia (CCOC) has set up a project extranet, accessible to all participants.

3. Development of the InnoCons Barcelona programme

The CCOC gathered over 120 professionals, who organised themselves into five task forces.

After 58 meetings and 174 hours of work, in addition to a constant flow of opinions and documents exchanged over the project's extranet...

...the final conclusions were approved in Sitges on 28 September 2009...

...and made public in Barcelona on 3 December 2009.

The CCOC, made up of 160 construction firms, invited professionals from all areas of the Construction industry, in the public and private sectors, to collaborate in the programme.

The 150-plus professionals who responded favourably to the summons of the CCOC were sorted into five creative groups: 1) Structures (the skeleton of the Building), 2) Façades, roofs and interiors (the skin), 3) Installations (the blood vessels), 4) Energy efficiency (behaviour) and 5) Environment (sustainability).

From 15 January to 15 July, the five groups thus formed organised 58 face-to-face meetings, with a total of 174 hours of conversations as well as a constant, effective exchange of documents and opinions via the collaborative work extranet. On 15 July, each group submitted a document with its conclusions (see www.innocons.cat) and on 28 September 2009, they met in Sitges to draw up and approve the final conclusions. On 3 December 2009, these conclusions were made public at a meeting attended by more than 300 people.

4. InnoCons Barcelona lays the foundations for global, radical changes in the construction industry.

InnoCons Barcelona defines a new way to build Buildings, enabling industrialised construction that is respectful with the environment, energy efficient and safer for workers and end users of the completed building.

The networking efforts of the 150-plus professionals in InnoCons Barcelona have set the foundations for a “**new way to build Buildings**”. This means building according to industrial techniques that are respectful with the environment and energy efficient with maximum safety for construction workers and end users (Appendix 2).

The dissemination of the conclusions of the work performed to date, its impact on the specialist and generalist media and its implementation in future projects should bring about a true paradigm shift in the sector, boosting interest in collaborating among companies, institutions and professionals who are not yet involved.

5. Future proposals of InnoCons Barcelona.

InnoCons Barcelona is a self-managed body, which presents the opportunity of developing its principles and solutions in concrete projects, which can be instantly implemented (demo projects).

The structure created, together with the prestige of its members, architects, engineers and construction firms in Barcelona, constitutes a powerful focus for promotion and activities related with construction, which can be used to give a collaborative boost to major projects with international relevance.

It offers training in the method, support in its development, execution of demo projects and facilitates contacts with members of the InnoCons Barcelona network.

InnoCons Barcelona gives interested parties the opportunity to develop its principles and solutions and apply them to construction.

It offers training in the developed method, support in the definition of concrete projects and the execution of so-called "demo projects", in addition to facilitating contact with draftsmen, product manufacturers and suppliers and specialist and generalist construction firms.

The application of these principles and solutions will create a benchmark for the future of Construction.

The development of the principles and solutions defined by InnoCons Barcelona constitutes a benchmark that will bring about a shift in the model used for construction of Buildings (housing, hospitals, schools, shopping centres and public and administrative buildings), with greater energy efficiency, respecting the environment and guaranteeing maximum safety for workers and users, applying industrial methods that substantially improve economic performance and productivity for operators, reducing costs while increasing quality and the predictability of delivery dates.

The current financial crisis and climate of economic uncertainty make the model change suggested by InnoCons Barcelona unavoidable.

Adequately meeting the needs of the users of Buildings to be built or renovated, who are the true customers of the construction industry, this program presents an unbeatable opportunity in these times of financial crisis and economic uncertainty.

Barcelona, January 2010

The 10 principles

guide to the debates of **InnoCons** Barcelona

1. The construction process does not need to change. We need to increase **productivity**
2. We need to meet the needs of the **end user of the building** as the true customer
3. We need a new, optimised approach to construction, based on **product development** and the use of **industrial components**.
4. We need to establish **collaborative dialogue** among the various players in the industry, overcoming the conventional, inefficient sequential process
5. We need to give top priority to the **Total Cost of the project**, including projection, construction and lifetime maintenance costs of the building
6. We need to **associate the project and the building**, promoting medium-term agreements in the **production and supply chain**.
7. We need to establish **competition** based on yielding the **expected results**, not price.
8. We need to include respect for the **Environment** in the design, execution and use of the building.
9. We need to consider the **Health and Safety** of workers in the sector and end users of the finished building as a **competitive factor**.
10. To ensure efficient project management and execution, we need to respect the **local nature** of the construction market.

InnoCons Barcelona'09

Suggestions for instant application¹

PRINCIPLE OR KEY IDEA OF THE PROGRAMME

The public sector needs to commit to changing the current growth model for the construction industry, turning it into a sector with high added value, qualified personnel, safe working conditions and the latest technology. For this reason, we believe that public sector projects need to act as "demo projects"; in other words, they must show the private sector that other approaches to construction are possible, using teamwork. This should convince those who are reluctant and sceptical to use the ideas listed below in the future projects they develop.

1. FORMING TEAMS FOR BETTER CONSTRUCTION

Buildings are the result of teamwork: developers, drafters, product manufacturers or suppliers, generalist construction firms and coordinators and specialist construction firms. When there is no team and all the parties involved in the construction of a building act in their own interest, even harming the others, the building, as the end result, suffers.

A good project is a necessary condition (although not enough on its own) for obtaining a good end result: a building that meets quality, deadline and price expectations, guaranteeing a "predictable and foreseeable" construction process, and that buildings become "predictable".

For buildings to be "predictable", the private or public developer must form a team during the project phase, so that all its members (the author or authors of the project together with the manufacturers or suppliers of products or materials to be used in the building, the generalist construction firm and the specialist construction firms which will build it later) can share their experience and knowledge.

The creation of the "project and construction team" (which is different from awarding a "project and construction" contract) is an entirely innovative process, which can be made easier thanks to new communication and information technology (CIT), such as extranets or sensors for efficient management of the project and execution phases.

¹ Derived from the conclusions approved by the members of InnoCons Barcelona in Sitges on 28 September 2009.

2. BUILDING FOR PEOPLE, NOT INDIVIDUALS

When designing and creating a building construction project, residential or otherwise, we need to recover the principle of the collective, applying it to:

- collective generation of heat and cold, doing away with gas as a fuel inside housing units (but not as a clean, efficient power source) and promoting energetic self-sufficiency
- contemplating and promoting rainwater collection and adequate treatment of grey water (bath and shower)
- facilitating the creation of new collective meeting areas.

3. RECOVERING AND UPDATING TRADITIONAL CULTURE

Applying traditional techniques for temperature and humidity control to create shade, and ventilation by convection (not forced) to cool the environment instead of refrigerating it. For example:

- Ensuring buildings have the right orientation and recovering the traditional functions of flat roofs, terrace roofs and interior courtyards.
- Using light colours, installing canopies, planting deciduous trees in collective areas to reduce sunlight during the summer, and other similar measures.
- Using insulating or thermally efficient materials

4. APPLYING NEW, MORE EFFICIENT MATERIALS ON A LARGE SCALE

Applying new materials, such as:

- High-strength, light, self-compacting, fibre-reinforced concretes.
- Post-tensioned slabs²

² Post-tensioned slabs are concrete slabs post-tensioned using high-strength steel cables, installed with pre-determined curves to create reactive forces within the structural element, anchored by wedges to the end anchor points. Once the slab has been concreted and forged, each cable is tensioned independently according to the project specifications. This system offers more and better creative opportunities for design, allowing greater spans, open-plan floors and more slender, lighter structures. It is also important to stress that this construction system does away with conventional static beams, achieving a greater usable height between levels.

5. INDUSTRIALISING, BUT NOT STANDARDISING

Industrialising the sector does not mean building aesthetically poor buildings. Industrialisation needs to be understood as the result of two interdependent phases, both of which are studied during the project phase: 1) production of project components in factories or workshops, 2) industrial assembly on-site by qualified personnel. For this purpose projects must include, and consequently apply to the buildings, industrialised components that are already available on the market, enabling and facilitating the industrialisation of the construction process by using more efficient, lighter materials that do not need water for their installation ("dry" construction).

6. STRIVING FOR FUNCTIONALITY TO ACHIEVE AESTHETIC APPEAL

- Avoiding superfluous elements that offer no added value for the end user, the true customer of the sector. Less is more.
- Concentrating the "wet" areas (kitchens and bathrooms) in the buildings.

7. INSTALLATIONS THAT EFFICIENTLY SERVE INTELLIGENT USERS

- Using the façade, interior courtyards and, inside the buildings, the accessible raceways (suspended ceilings, downpipes built into walls at pre-determined, standard heights and in doorframes and wall openings) to place the installations. This aims to ensure that the installations remain easily accessible for maintenance and/or repairs and improvements.
- Performing installation by modules and centralising power generation and management in the buildings to optimise consumption and improve efficiency, thanks to preventive maintenance of collective installations.
- Today it is possible to set up installations, for example in a house or office, using wireless technology. This technology is available on the market, which is one reason why construction firms should and must include it in their projects. Building projects in the public sector should include wireless connections and do away with manual switches.

8. TELECOMMUNICATIONS FOR EVERYONE

Telecommunications installations for buildings, residential and non-residential, should be made with connections using category 6 cables (S/FTP) and RJ-45 plugs for receiving telephone, TV and data signals, with PLC technology, which uses the power grid to transmit voice, audio, video and data.