REMODELING AND ENVIRONMENTAL ADAPTATION OF CONCRETE BATCHING FACTORY

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PRIZE DISTINCTIONS COAM 2011

Abstract: *Inside the city of Madrid, near the main trade fair enclosures, existed a traditional factory of manufacture of concrete whose process of gather of arid in surface and handcrafted dosing by means of contribution with tractor mounted scoops, generated serious environmental problems: Noises, Powder, unforeseen Movement of heavy vehicles. In conclusion, not only environmental pollution but also aesthetic. An inappropriate place for the city. The Challenge: To make compatible an industrial use with the life of the urban ecosystem.*
The Solution:- To transform the system of surface collections to silos in height.
-To design the whole system of transport of the different flows of materials making easier "the mixtures"
-To wrap all this under a skin that promotes the urban image and identifies the activity.
Project dates: Basic project: December 2006, Project of Execution: September 2009, Completion date: abril 2010;
Data of the site: C/Tomás Redondo 7,Madrid, España

Keywords: URBAN SUSTAINABILITY, INDUSTRIAL DESIGN PROJECT, CONCRETE BATCHING PLANT, RAW MATERIALS, NOBLE MODERN MATERIALS, ENERGY EFFICIENCY, REDUCTION OF IMPACTS, PASSIVE SYSTEMS

1. Introduction

1.1. The Order:

The studio received the proposal to act in an old cement factory that was fully operative and which generated negative impacts on the surroundings (visual, noise, dust, etc.). The idea was to mitigate these impacts and optimize production, as well as environmental and landscape parameters, with the final aim of integrating the factory into the city. We accepted the task as an urban and architectural challenge; the challenge of integrating a "cement factory" in a consolidated urban network.

Fig. 1 *Place*
Representative and very visible place

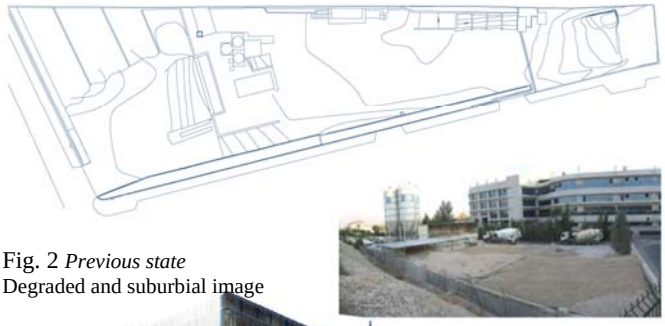

Fig. 2 *Previous state*
Degraded and suburbial image

Nowadays, there does not yet exist a **typology** of this type of intervention, neither in Spain nor in Europe, as it has always been associated to an impressive holding, hardly compatible with urban areas. From an architectural and urban point of view we believe that **with adequate treatment, any industrial activity can be adapted to the city**. This entails carrying out an extensive study of the problems that can arise and providing them with a solution, thus aiming for the **sustainable** exploitation and coexistence of industry and city.

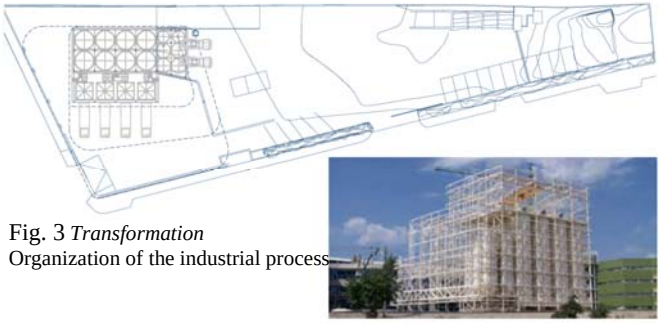

Fig. 3 *Transformation*
Organization of the industrial process

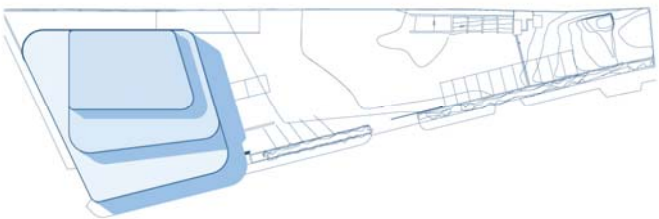

Fig. 4 *Architectural treatment*
Architectural response to an industrial urban element

The project arises from the search for an industrial prototype of urban batching plant of concrete, which supposes a great advance both in the minimization of the consumption of resources and in the efficiency and quality of the production.

2. The concrete

CITIUS, ALTIUS, FORTIUS

Three Olympian words to define a noble material, which for more than two millenniums competes in the career of the materials to offer useful and beautiful solutions in the construction of the human habitat.
Its manufacture is the result of man's cleverness, the concrete is fusion, mixture of different materials. Each of them yields its characteristics to the set to fuse into a new one, original materials that share and transform themselves into a new one, a "networked", modern, digital material.
It is a challenge to place its manufacture nearby the places where it is going to be used so as to make it really useful. It has to coexist with the City, to be adapted to it.

3. Principles of sustainability

3.1. Situation of the plant (Fig. 5)

An indispensable element of **necessary consumption** as a concrete factory can be joins the city, integrating itself into the environment by means of the suitable architectural treatments.

This proximity **reduces** the tours of trucks, and therefore, the **pollution** produced and the consumed resources are also reduced.

Fig. 5 *Situation of the factory*

3.2. Storage of arid (Fig. 6, Fig. 7)

The original plant had a system of traditional arid storage, which is set in surface.
The trucks came and went constantly from the gravel pits to leave the material needed for the concrete.
We introduce a collecting system of in silos, which allows to have major quantity of arid in the plant.

Fig. 6 *Storage in the surface*

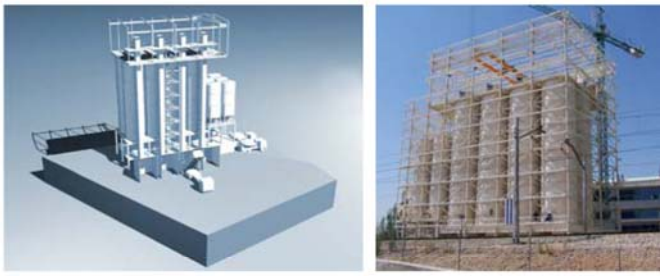

Fig. 7 *Storage in silos*

Therefore, improvements take place:

-environmental: emissions to the atmosphere are avoided because it is a completely closed system.

-energy efficiency: the machinery is more efficient, and as we are able to gather more arid the traffic of trucks is reduced.

In this way, an idustrial prototype of urban concrete plant is achieved, which supposes a great advance both in the minimization of the consumption of resources and in the efficiency and quality of the production.

3.3. Reduction of impacts (Fig. 8)

-visual impact: the "skin" provides to the Concrete Factory a more urban façade integrating it in an environment of office blocks
.
-emission of dust and noise: the framework that shelters the exploitation serves as a filter, controlling the emission of dust and noise.

Fig. 8 *Architectural skin*

-tour of trucks: the possibility of storing more arid allows fewer trucks tours and off-peak hours.

3.4. Passive systems (Fig. 9)

-ventilation: a zone of ventilation is left in the whole roof perimeter where the hot air escapes

-treatment of the skin: we provide a façade of uglass with diverse finishings, that vibrate adapting to the solar control according to the orientation; and different degrees of transparency that sift the sights of the interior.

Fig. 9 *Batching factory*

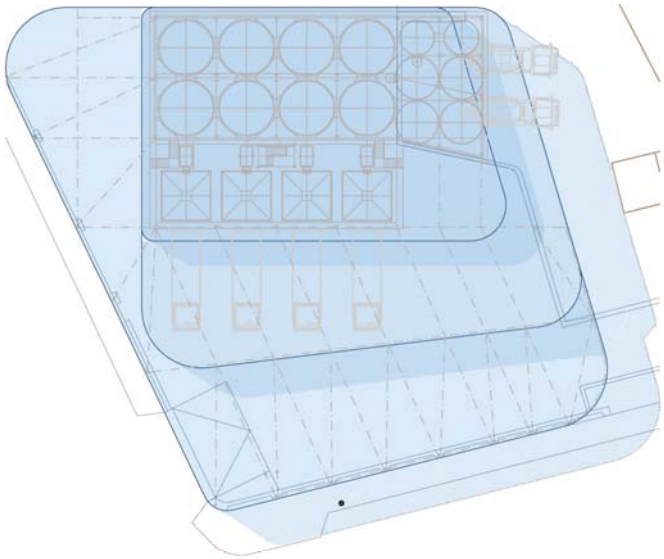

Fig. 10 *Ground floor*

4. In conclusion

The processes of transformation of raw materials have formed the city historically, today the city has to recover the industrial activities and adapt them to the urban ecology. Any activity tied to the development of humanity has to be able to be done in the urban field. The human being has to design the necessary processes to make the activities that accompany him compatible throughout history.

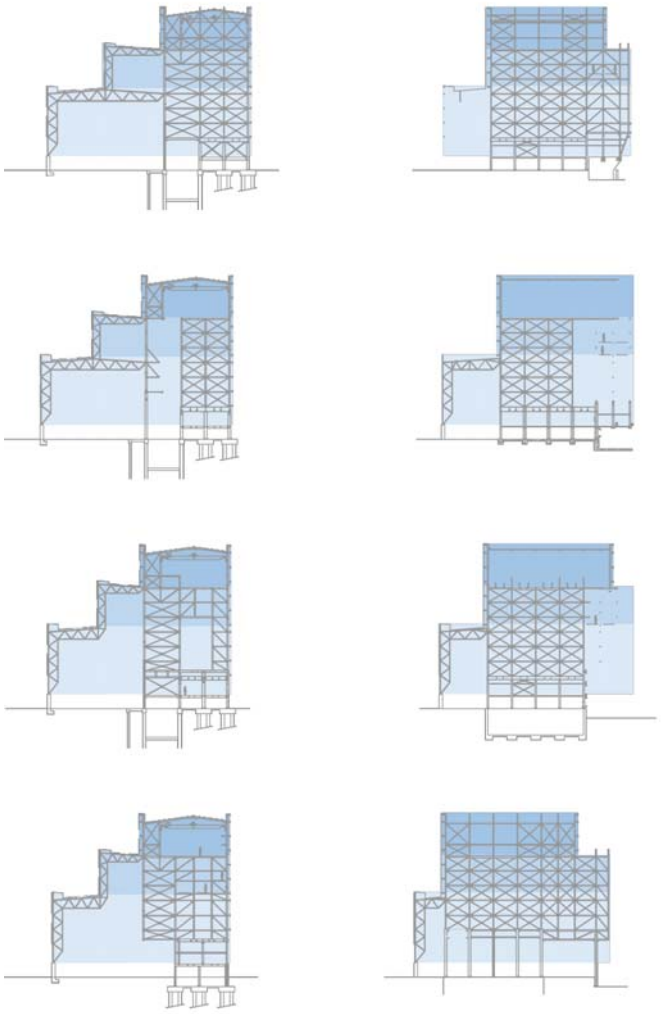

Fig. 11 *Sections*

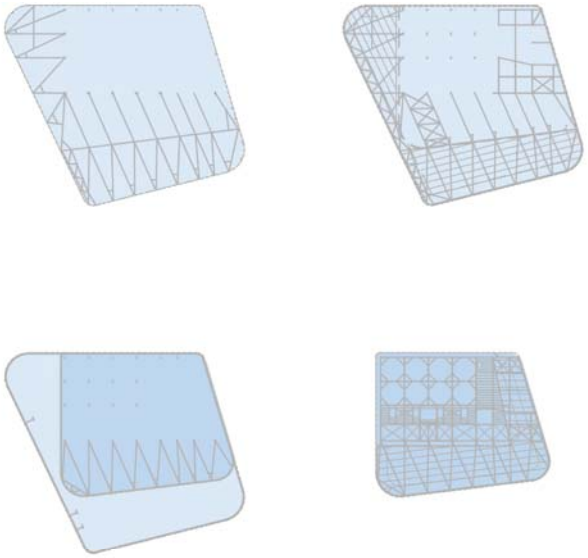

Fig. 12 *Layers*

The concrete is an invention of the human being, an inseparable partner, that has helped him to build his cover for centuries. It has helped to write in the city a modern and beautiful language. The city does not have to relegate it, it has to integrate the concrete as a fundamental piece in its construction.

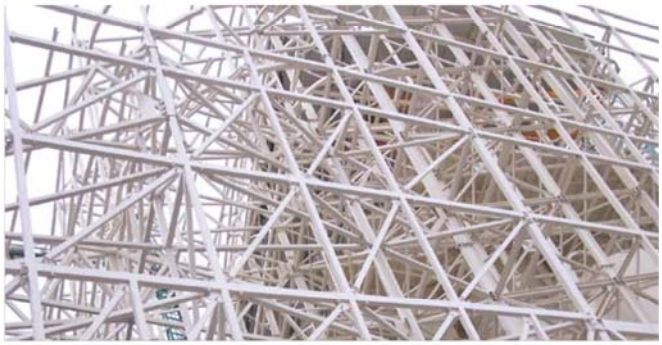

Fig. 13 *Photographs of the constructive process*

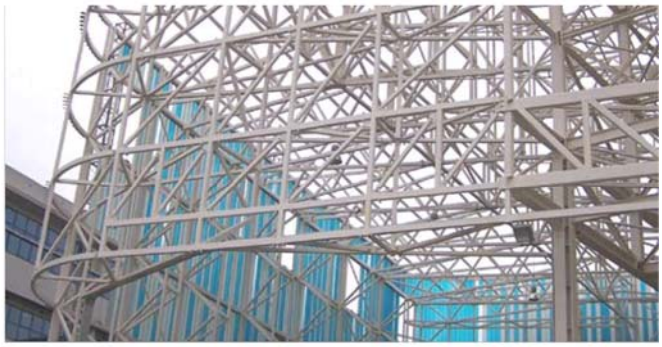

Fig. 14 *Photographs of the constructive process*

Fig. 15 *Silos (3500 m³ of arid)*

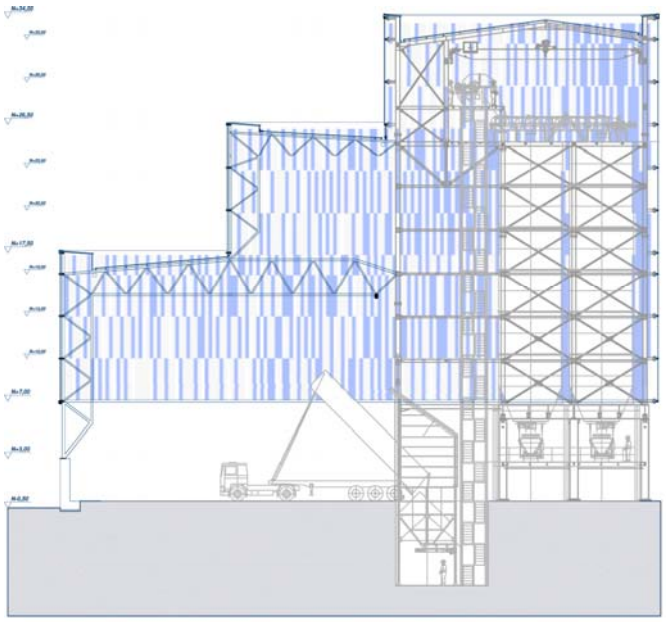

Fig. 16 *Section*

4. In conclusion

The industrial architecture has formed cities and has taken part of its economy and its identity. The industrial buildings are real cathedrals for the deepest religion: Human work.

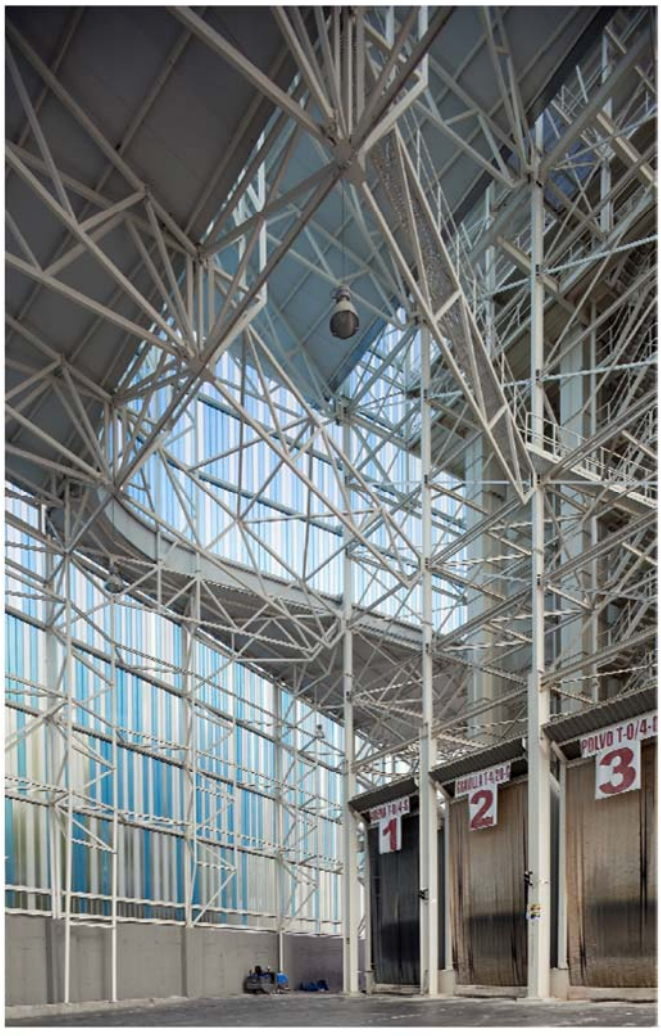

Fig. 17 *Silos*

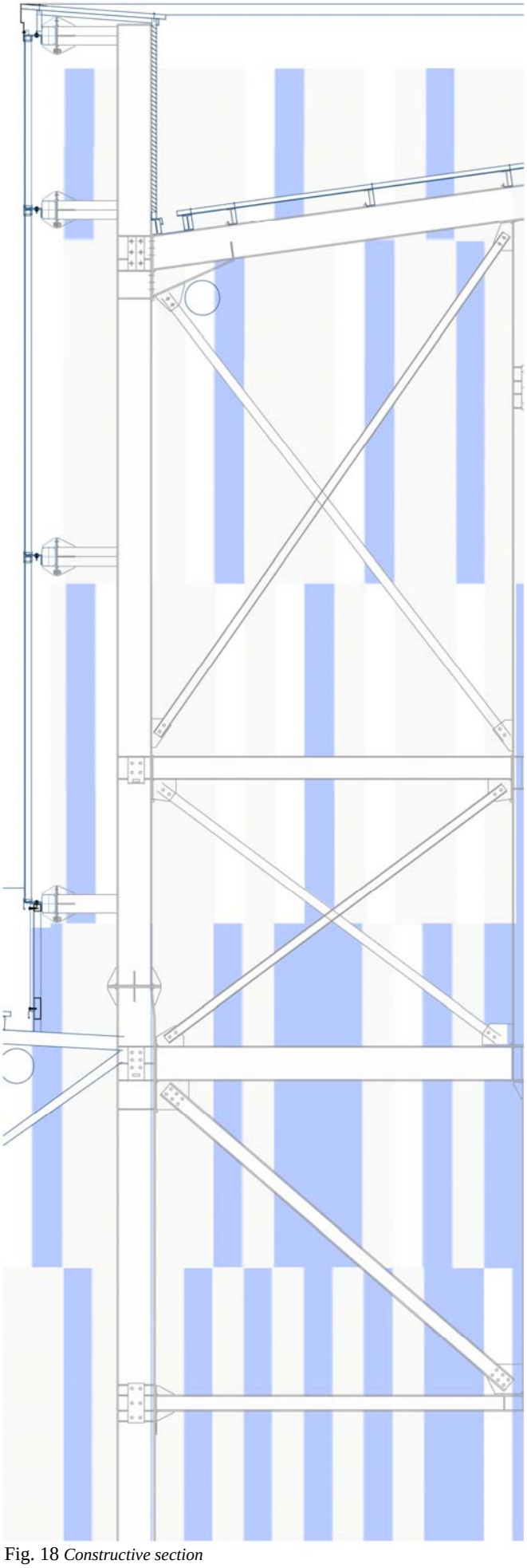

Fig. 18 *Constructive section*