

# OVERVIEW OF PRECAST INDUSTRY IN BRAZIL

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**ABCIC's Experience**  
**Brazilian Precast Concrete Association**  
**Íria Lícia Oliva Doniak**

# EVOLUTION OF THE BRAZILIAN MARKET

- Some preliminary cases of precast - beginning of the 1960s/1970s;
- “Brazilian Miracle” – Brazil, the country of the future - investments in new technologies
- Beginning of the 80s:
  - execution of a great number of Industrial buildings;
  - Prefabrication is starting to be known in the construction market;
  - Consolidated use of folded plates roof elements .
  - Equipment importation to be used in the production of hollow core slabs;

# EVOLUTION OF THE BRAZILIAN MARKET



**Precast concept associated with industrial buildings and standardization due to architects creativity**

**Double T Walls- concept of façades**

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# EVOLUTION OF THE BRAZILIAN MARKET

- Due to the good performance of the system at the end of the 1980s, the use of precast slabs had started in housing (beam-block slabs, hollow core slabs, floor-plates and massive slabs);
- Early 1990s – Hollow core slabs used in buildings greater than three floors, trying to extend the span capability;
- Construction speed, organization, practicality , economy and architectonic identity standardization – large use in the supermarket sector;



# BRAZILIAN MARKET (NOWADAYS)



Consonance with architectonic liberty.  
Hollow core architectonic panels versatility.  
Vertical buildings (multi-storey buildings).  
Mixed structures.



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# BRAZILIAN MARKET (NOWADAYS)

- Last 8 -10 years precast façade = architectonic sophistication.
- Today, the Brazilian precast market is capable of offering a complete system, that goes from the structure to the façade.



# FACTS FROM THE BRAZILIAN MARKET

Generates about U\$ 2,7 billions per year (considered associated plants).

Grows annually with a rate of 15% a year.

Specific program to evaluate the participation of the precast concrete in the total market of concrete structures is being developed by ABCIC.

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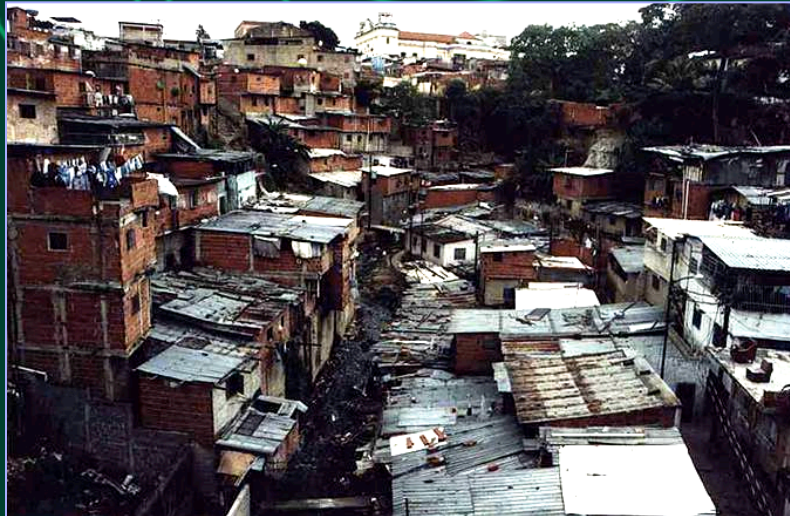
# REASONS FOR INCREASING COMPETITIVENESS

- Labor input and cost at manufacture and erection are likely to be lower. Labor costs are increasing
- Healthy and Safety requirements on building site are becoming more rigid, increasing the need for equipment that can be used in the erection process. Reduces noise.
- Less people on the worksite. Provides an instant working platform. Other activities can usually start immediately after erection;
- Reliable quality control system, since most of the work is done under factory controlled conditions, regardless of the weather.
- Increasing need for speed (Brazil is growing up fast and the last two years)
- Needs of infrastructure (high speedy train,airports expansions,ports,bridges ,etcWorld Cup and Olympic Games).
- Increased durability by using higher strength concrete.

# INFRAESTRUCTURE AND AFFORDABLE HOUSING

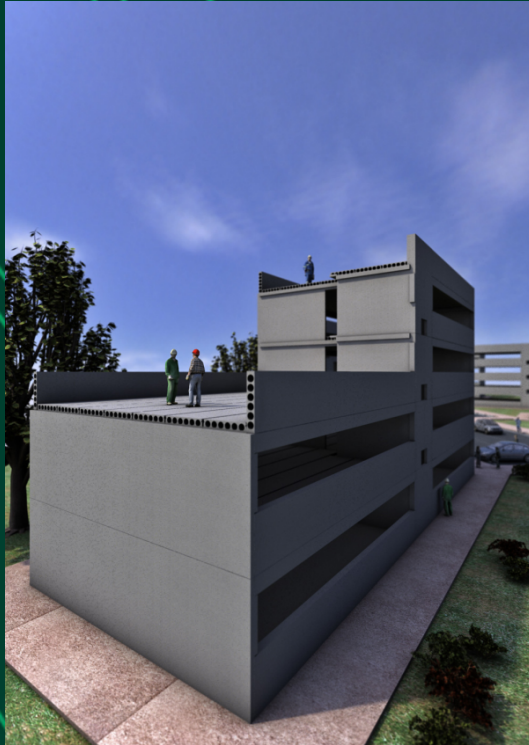
## Government Program – Minha Casa Minha Vida

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# BRAZILIAN PRECAST SOLUTIONS

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# ABCIC (BRAZILIAN PRECAST CONCRETE ASSOCIATION)

- Founded in 2001, it has ten years.
- There are 105 members (producers, suppliers, technical professionals and entity partners)
- Main actions:
- ABCIC CERTIFICATION PROGRAM (Third Part Certification CTE- Technical Center of Buildings), for firms in the precast concrete industry. Level 1,2 and 3 (quality, safety and environment).

# QUALITY PROGRAM

- Based on PCI plants certification. Focused in the process and product. In accordance with the Brazilian Standards - NBR 9062 “Design and Execution of Precast Concrete Structures” applicable to the sector .
- A program that is growing and developing since its beginning, 7 years ago.
- 21 plants certified



# ABCIC MAIN ACTIONS

- Partners with universities, in special UFSCar(Federal University of São Carlos and USP, Politechnical of São Paulo (Prof. Mounir EL Debs)and Prof. Marcelo Ferreira.
- NETPRE UFSCar – Research and Development laboratory in precast concrete structures .
- Standards: Representatives on committees of ABNT (Brazilian Technical Standards Associations ) ABNT NBR 9062 Project and Execution of Precast Structures. In Progress Hollow Core Slabs.



# ABCIC MAIN ACTIONS

- Technical Committes: Tax,PRECAST PILES, TECHNICAL,AFFORDABLE HOUSING AND SAFETY.
- Courses Basic, Advanced and University

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# ABCIC International Seminar

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# ABCIC/ABECE SEMINAR PRECAST CONCRETE AND THE WORLD CUP 2014

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# NUEVO VALÈNCIA

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# ABCIC MAIN ACTIONS

- Relations with national and international institutes and associations:  
IAB, IBRACON, ABECE, IABr, FIESP, FIB (Comission 6), PCI, British Precast Association, fib-cerib).

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# ABCIC MAIN ACTIONS

- Conferences, conventions, exhibitions, awards programs: ABCIC International Seminar (every 2 years); Concreteshow (Exhibitions and Seminar); Winner ARCHITECTS COMPETITION (Students and Professional).

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# CONCRETESHOW

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# ABCIC MAIN ACTIONS

## Periodicals and Publications

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**Abcic**  
Associação Brasileira da Construção Industrializada de Concreto

informativo nº6 • novembro 2009

**5º Prêmio Nacional**  
Conheça os estudantes de arquitetura que venceram o concurso de pré-fabricados de concreto

**Copa de 2014**  
Evento debate a pré-fabricação como solução para viabilizar as obras nos estádios brasileiros

**Cobertura**  
Ile de Pré-Moldado, idealizada pela Abcic, foi um dos destaques da Concrete Show

Profissionais de diferentes países se reúnem na USP, em São Carlos, para debater questões relacionadas ao pré-moldado



Livro: Pré-Moldado de Concreto  
Coletânea de  
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Pré-Moldados de Concreto



Livro:  
**Estacas  
Pré-fabricadas**

Adquira seu exemplar:  
R\$ 100,00

# ABCIC STRUCTURE

- Approved in last General Assembly ,25th August
- EXECUTIVE DIRECTORY:  
Executive President:Íria Lícia Oliva Doniak and 4 directors from Precast Firms(administrative,Technical,Development and Marketing).
- Created the Presidium: Carlos Alberto Gennari- Presidium President,Murilo Cassol Vice-President and 9 elected presidum members and de ex presidents .

# LOW SELF-WEIGHT



→ Portal frame (roof structure integrated to the system).

→ Economical Solutions.

→ With or without ties.

→ Span : 8 to 35m

→ Floor to ceiling high: 3 a 20m

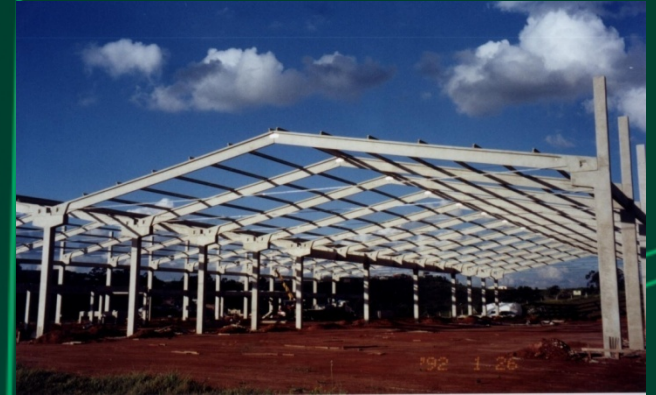
→ Grid: 4 to 12m

→ Roof: fibrocement, ceramic, steel and aluminium.





# LOW SELF-WEIGHT



Portal frame (roof structure integrated to the system).



# HEAVY STRUCTURES

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# ARCHITECTONIC

Architectonic differentiation.

With or without structural function.

Architectural Wall Panels x masonry





# ARCHITECTONIC PANELS



Erection

Transport



# PILES

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# PUBLIC BUILDINGS

- Immense agility in the execution.
- Standardization of public schools.
- Bigger spans, more space in the classes.
- Cost reduction in the execution and maintenance
- FDE/SP e RIOURBE/RJ



July 2005



August 2005



Frei Gaspar State School  
Vargem Pequena- RJ



# Stadium – Pan American Games

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# TYPES OF STRUCTURAL SYSTEMS NOWADAYS

- Frame systems where stability is provided either by the cantilever action of the columns and its foundations by moment resisting connections or by flexural and shear continuity in the frame members. The floors and roof can act as diaphragm (FIB Handbook).
- Braced skeletal structure. Stability is obtained by shear cores, shear walls, etc.
- Bearing walls and/or facades.
- Structural masonry combined with hollow-core, massive floors, beam-block floors and reinforced composite floors.



# MOMENT RESISTANT FRAMES

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# TYPES OF CONNECTIONS USED FOR MULTI-STOREY BUILDINGS

- Foundations to columns:
  - Pocket foundation with concrete joint;
  - Projecting bars;
  - Base plate (welded or not);
- Column to column:
  - Projecting bars;
  - Base plate (welded or not);
- Beam to column:
  - Bolt or grouted dowel;
  - Protruding reinforcement bars
  - Welded connection plate (steel plates);

# MOMENT RESISTING BEAM-COLUMN CONNECTIONS

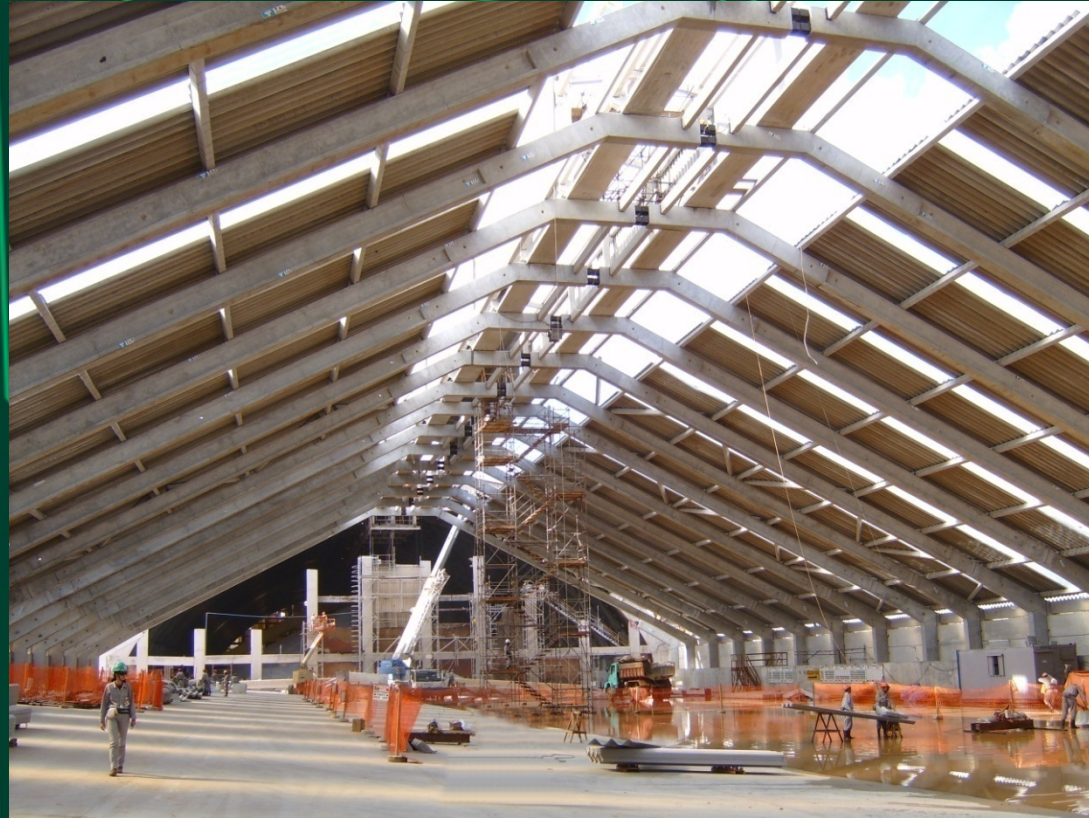
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# PETROBRÁS STORAGE BUILDING

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# WORK SITE

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# CONCLUSION

**The versatility of precast concrete structures, associated with the adoption of advanced technologies and investments in the industries (production line, research, development and quality) allied to ABCIC's support, has demonstrated that the sector moves forward even more, being prepared to bring technical and economical feasible solutions to the enterprises, attending to the national demand.**

