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May 2010

New CIB Publication

TG57 - Industrialisation in Construction

New Perspective in Industrialisation in Construction A State-of-the-Art Report



Publication 329

ISBN 978-3-906800-17-2

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Background

Industrialisation in Construction is defined as a rationalisation of the work processes in the industry to reach cost efficiency, higher productivity and quality. It involves a change of thinking and practice to improve the production of construction to produce a high quality, customised built environment, through an integrated process, optimising standardisation, organisation, cost and value, mechanisation and automation.

Several aspects are usually linked with industrialisation such as: Use of mechanical power and tools, use of computerised steering systems and tools, production in a continuous process, continues improvement of

efficiency, standardisation of products, prefabrication, rationalisation, modularisation and mass production.

Drivers to industrialise construction include the need for Safety, better quality control, better occupational health, better environmental care, cheaper production and the lack of skilled labour.

This book is divided in 4 main sections:

- Context
- Strategies
- Methods and Tools
- Products

In the last chapter some successful examples of industrialisation are shown.

This wide range of internationally recognized personalities from academia and business gives the book a broad focus, which is in line with the industrialisation approach.

Context

The context of industrialisation shows that industrialisation not only creates new opportunities, it also forces the construction industry to adapt new practices. Industrialisation enables the construction industry to manage material and energy flows better. Optimised material management stands at the beginning of environmental careful construction. It is a condition for sustainable construction. The most powerful driver behind the second industrial revolution was - and still is - the emergence of computer technology, while the three-dimensional reproduction technology will facilitate the next big step forward in industrialisation.



Modular housing construction quickly developed with the rise of industrialised production

Strategies

Strategies of industrialisation will overcome the constraint between the large series of identical products from industrialised suppliers and the clients' aim for individualism. Industrialisation therefore requires a cultural change or paradigm shift.

The methods and tools already available to help industrialisation in the construction sector to take a step forward are numerous. They vary from robotizing of traditional craftwork to completely new techniques especially designed for application in industrialised construction. Industrialisation in construction is expected to solve problems inherent to traditional construction such as occupational health issues and waste generation, but it also causes new problems typical of industrialised construction such as a need for standardised measurement methods and the observation of strict tolerances for prefabricated components, produced by a variety of suppliers.



The NEXT-21 prototypical project in Osaka

Another constraint to industrialisation is the lack of suitable information technology and the reluctance among the labour force to adapt to emerging information technology.

Last but not least there are many good examples of contractors with a vision and even some with experience with full industrialised construction systems.

Synthesize

This book synthesizes the worldwide state of the art and state of practice in industrialisation in construction. Therefore it targets researchers as well as practitioners. This publication gives a very thorough insight into new innovated concepts on which research is currently focusing as well as into the further development of existing concepts. For practitioners it provides the state of practice.

The book contributes to the enhancement of the product of the construction process by providing concepts for value-added individual buildings according to the mass customisation approach. It also targets the increasing productivity of construction industry by using the computer supported digital chain to design, produce and maintain these value-added individual buildings. Hence it makes a significant contribution to the future development in research and practice.

Availability

The publication is available as an electronic report with 457 pages and is free downloadable from the CIB website (see [here](#)).

In the near future the publication will also be free downloadable from ICONDA@CIBlibrary.

A hardcopy of the book is available at ETH Zurich, Switzerland via tg57@ibb.baug.ethz.ch.

Additional Information

For additional information about the CIB TG57 contact the Coordinators: Gerhard Girmscheid girmscheid@ibb.baug.ethz.ch and Frits Scheublin Frits.Scheublin@live.nl.



You can find more information on the activities of CIB TG57 at www.cibworld.nl - Databases - select "Go to Database" - in the shown search engine: type TG57 in the field "Commission number".

The assistant and support was realised by Thomas Rinas, ETH, Zurich.

