



中國建築科學研究院

China Academy of Building Research

Development & Opportunities of Lightweight Steel Structure Houses in China

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CABR Introduction

Founded in 1953, China Academy of Building Research (CABR), which used to be the largest comprehensive research institution affiliated to Ministry of Construction, was transferred into a scientific enterprise under the management of the State-owned Assets Supervision and Administration Commission of the State Council, P. R. China.

Up till the end of 2003, CABR has done a superior job in research & development. 2215 projects related to scientific research and 453 standards /codes completed, among which 91 won national awards and 373 provincial/ministerial ones, and 167 patents granted.

CABR now employs 1,131 staffs, among which are 2 academicians, 1 design master, 146 professors and 310 senior engineers, including 21 tutors Ph.D. and 57 for master degree. CABR boasts 3 research fields authorized to confer Ph.D. degrees and 5 fields to confer Master degree as well as a post-doctoral working station.

Research & Development

- ❖ **Structure Engineering**
- ❖ **Foundation Engineering**
- ❖ **Seismic Engineering**
- ❖ **HVAC**
- ❖ **Software Design & Application**
- ❖ **Building Physics & Environment**
- ❖ **Engineering Disaster Prevention**
- ❖ **Building Machinery**
- ❖ **Basic Technique & Industrialization of Houses**



Standards & Codes

Standards and codes are technical basis of construction engineering. For years , CABR has been devoting to the writing & administrating of major standards and codes and played an irreplaceable role in compilation of standard documents on construction engineering .

Major standards and code are as:

Unified Standard for Acceptance of Building Construction

Loading Code for Design of Building structures

Code for seismic design of Buildings

Code for design of Building Foundations

Technical specification for Design of Concrete Structures in High-rise Buildings

Code for Acceptance of Construction Quality of Concrete structures

Quality Test Centers at National Level

National Center for Quality Supervision and Test of Construction Engineering
National Center for Quality Supervision and Test of Air Conditioning Equipments
National Center for Quality Supervision and Test of Elevators
National Center for Test of Chemical Building Materials
National center for test of Solar Heaters
Center for Test of Heating Engineering, Ministry of Construction



CABR Organizations



Lightweight Steel Structure

- Thin-walled steel unit
- Lightweight steel skeleton
- One story Building
two Story Building
Multi-Story Building



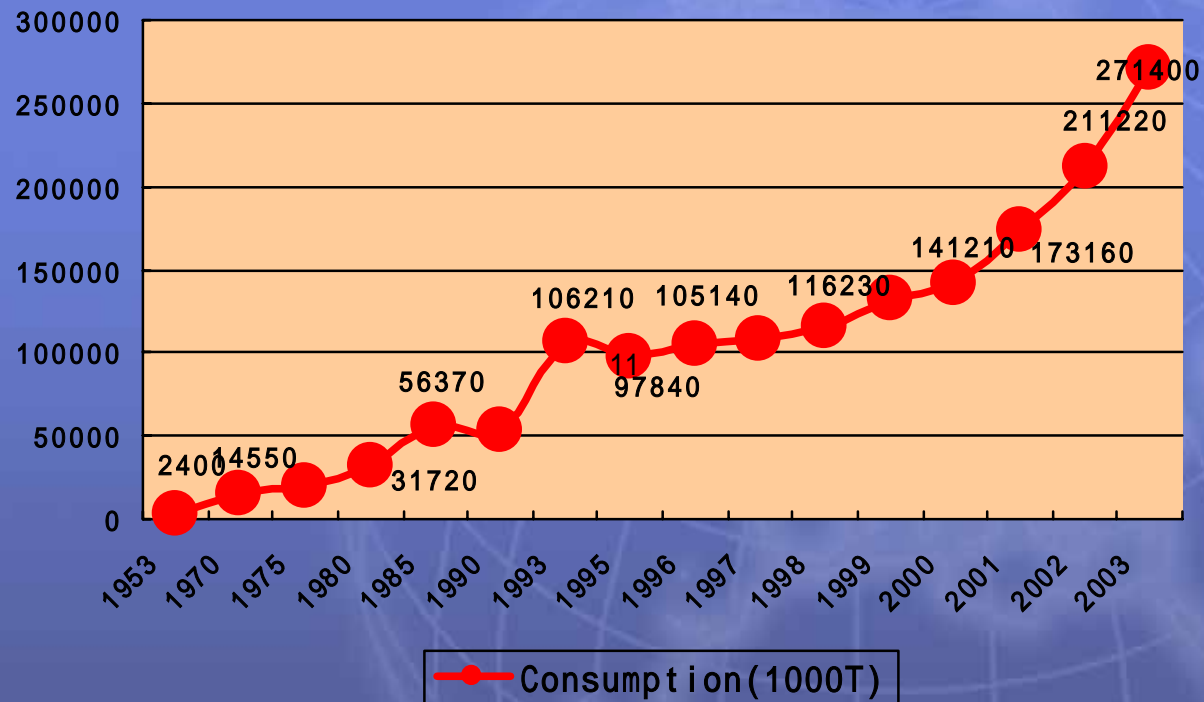
Lightweight steel structure in China

Advantages of Lightweight Steel Structures

- **Fast**
- **Good seismic performances**
- **Easy disassembly & relocation**
- **Standardized manufacture**
- **Excellent performance**
- **Competitive overall cost**
- **Environment-friendly**

Current Situation of Lightweight Steel Structure Houses in China

- China's consumption of steel reached an unprecedented world record of 271.4 million tons.
- Steel consumed in steel structure buildings is less than 2% of the total output in China



Current Situation of Lightweight Steel Structure Houses in China

- The government encourage the application
- Domestic and international building materials manufacturers compete for preemptive opportunities
- Lightweight steel structures are not widely applied in housing industry



Lightweight steel structure villa in Hangzhou, China

Factors holding the development of Lightweight Steel Structure Houses

- Imperfect Standards & Codes
- Difficulties in promotion of new housing system
- Construction qualification (Contractor Licenses)
- Construction cost not generally accepted



Measures by China

- Establish a number of pilot projects.
- Work out the technical code for lightweight steel structures
- Solve the problems of the fire prevention, anticorrosion, heat & sound insulation and earthquake resistance of steels
- Summarize and spread the experience of pilot projects
- Train the professionals and workers for further technical support.



Lightweight steel structure villa in Tianjin, China

Prospect for Lightweight Steel Structure Houses

- Solid clay bricks are progressively banned to be used in large and medium-sized cities by authorities.
- To realize the industrialization and improve the overall level of housing industry, China need lightweight steel structure houses.
- Concept of “green, environment-friendly and energy-efficient” is well revealed, which will provide an easier access to the solution of deterioration of China’s living environment.

Opportunities for Member Countries

- **Suggestions for those who are planning to enter China's market:**
 - 1. Seek for a R&D institute as a partner for technical development and transference
 - 2. Establish a base and conduct demo projects by introducing suitable industrialized construction system in line with the local demands
 - 3. Use local materials & labor and equipped the local professionals and operators with skills of the system
 - 4. Consider the quality & comfort economically
 - 5. Seek for the participation & support from the governments.
 - 6. Realize local manufacture and supply chains and large scale manufacturing to dominate the market

Conclusion

- Though obstacles ahead, the development of lightweight steel structure houses will enjoy a broad & prosperous future.
- People of China will undoubtedly understand the advantages of the new housing system and be willing to improve their living conditions, which will surely result in a tremendous change in China's urban & rural living environment.



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THANK YOU!

