Korea Green Building Design Code and Role of Architect

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-Green AsiARCH 2018
Why Green Building?

Since 1960s, Korea has achieved rapid developments of cities and buildings and now the cities have entered into a period of stability. From now on, Urban Regeneration and Green Building would become a task for cities and buildings in Korea.

- Existing Building = 7.10 million buildings/3,376,000,000 m²
- Approximately 230,000 buildings are under construction every year (150,000 new buildings, remodeling of 55,000 buildings, others 25,000 buildings)
- Construction Investment Size = 195 billion US dollar (15% of GDP) (OECD average 13%)
- Construction Production Size = 59 billion US dollar (4.5% of GDP)
- Architectural Design Market = Approx. 2.7 billion US dollar

Current condition of existing buildings in Korea (based on area)
Architects face **new challenge** to reduce 26.9% of CO2, compared to 2010, through buildings by **2020**

- Currently buildings take 25% of CO2/ Emission and 21% of energy consumption
- 4% of self-sufficiency in energy / New Renewable energy ratio of 2%
- In Seoul, buildings use 63% of energy (Consolidation of Design Standard)
- In 2012, 「Green Building Construction Support Law」 is established
- Green Building becomes a significant issue to Architectural Design Industry

**Seoul in 2018**
Heat wave, Fine dust,
Ozone…

Climate change → Climate **crisis**

How is your country coping with the global **Heat wave**?
Why Green & ZEB?

Korea's Green Building Support Law will become ZEB mandatory by 2025 under PH standards in 2018 is reinforced.

2018: PASSIVE HOUSE ➔ 2025: ZERO ENERGY BUILDING (ZEB)
# Green Building Code

Korea Green Building Code has been established in 1979 and it has been highly upgraded since 2017. It priorly applies to public buildings and is promoted to be applied to private building

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Green Building Code

Energy Efficiency Rating System (2013~)

- Comprised of 10 grades (Grade 1 ~ 10)
- Application = Detached housing, Apartment, Office, building with 500㎡ or above
- Central Government Act = Compulsory for public service facility with over 500㎡ (Grade 1), public rental housing with over 500 households (Grade 2), private building with over 3,000㎡ or 500 households (Grade 7 or above)
- Local authority (Seoul) = building over 3,000㎡, apartment housing with over 20 households = Above Grade 2 (application to the private)
- Accomplishment (‘01~’13) = 2,121 buildings certified
- Incentive for the private = Appeasement of Building regulation (floor area ratio, height etc.), tax reduction
Green Building Code

-G-SEED (2018: 2016-2 version)

Green Standard for Energy and Environmental Design-

- 4 grades in total (Grade 1 ~ Grade 4)
- Central Government Act = compulsory for public service facility with above 3,000 m² (Above Grade 2), Apartment housing with over 500 households (Above Grade 2)
- Local authority (Seoul) = compulsory for building with over 3,000 m², apartment housing with over 20 households (Above Grade 2) (application to the private)

G-SEED Symbol
Green Building Code

Development of Submission of Energy Saving Plan (2013~)

- Application = building with 500 m² or above with above 65 points from EPI (Energy Performance Index)
- Central Government Act = public (74 points or above), private (65 points or above)
- Seoul (Application to the private) = building over 10,000 m², apartment housing with 200 households or above (74 points or above)
- Applied since September, 2013 (Approximately 15,000 buildings per annum)

Total Building Annual Energy Use System (2013~)

- Application = apartment housing with over 100 households (below 190 km/h/m² y), office building (below 280 km/h/m² y)
- Planned to be applied to every building by 2020

Zero Energy Building Certification System (2017~2025)

- Application = Public building pilot project
- Planned to be applied to every building by 2025
Role of Architect

Development of Green Building Code is providing new opportunities and challenge to Architectural Design Market.

Opportunity

- New Design Market (Green Building, Green Remodeling)
- Creation of demand of Energy Consulting
- 2017 New certificates (G SEED Integrated Designer: G-SEED ID)
- Opportunity to contribute for sustainable society

Challenge

- Adaptation and Retraining
- Integration of design and energy technology
- Balance of policy and market (due to 5~20% increase in construction cost)
- Expanding Basics of Green Building
Role of Architect

Korea Institute of Registered Architects (KIRA) is an organization established according to 「Certified Architects Act」 and as a leading group of registered architects in Korea, it makes an effort at Green Building education.

KIRA’s Education Center

- Target of Education = 12,887 people (registered architects)
- Education Period (compulsory) = 40 hours (for 5 years)
- Education Method = online / offline
- Education course = comprised of 125 courses in total with 25 courses about Green Building (20% of total courses)
- G SEED ID: Expert Education 40 hours
Role of Architect

Academy of Environmental-friendly Architectural Design

- Environmental-friendly Architectural Design Academy operated by KIRA.
- This program functions as a core in Korea Green Building Architectural Education for registered architects and is an only education program in Korea.
- The G SEED ID course has been in operation since 2017.

- 2009 ~ Present = 1,113 people have accomplished education
- Comprised of 59 instructors (professors, experts etc.)
- Education Program
  - Expert course = 130 hours training (24 days)
  - G SEED ID course (2017~) = 40 hours training (7 days)
- Education Subject (6 subjects)
  Environmental knowledge / Landscape design / Passive design / Energy Integration design / Materials and Environment Regeneration / Practice of Green Building Certification System

Training System

Primary Level
- Understanding the government’s policies
- Concept of Green Building
- Understanding of Certification System

Intermediate Level
- Passive / Active
- Energy Simulation
- BIM Integration Design

High Level
- Materials
- Long-life Design
- Building Renovation
Examples of Green Building

Samyang Discovery Center
(grand prize in KOREA Green Building Competition 2017)

Samyang Discovery Center is the research and development center for Samyang Group which has nearly a centenarian history since its establishment in 1924, playing a pivotal role in “open innovation,” the goal pursued by the group. As a research laboratory and office in the food and bio industries, this center intends not only to satisfy the functions of work and research required of the R&D center for the headquarters, but also to provide the space that can be shared with local residents, thus realizing a building that enables coexistence and synergy through communication and exchange.

As the main functions of the building, research space was made up of the following zones: the Desk Zone for data analysis; the Lab Zone to prepare for experiments and conduct brief experiments; and the Lab Support Zone to carry out such experiments as to deal with toxic agents or engender mechanical noises. This make-up was to ensure the safety of researchers and the amenity of indoor environmental quality.

As passive design elements, a large-scale atrium was placed at the center of the building to facilitate daylighting and natural ventilation, with facade modules applied by orientations in consideration of solar geometry to enable the optimal indoor environmental condition and energy-saving. Besides, various and reasonable green technologies were utilized in tandem to realize the best sustainable building.
Examples of Green Building

INTEGRATED GREEN DESIGN

Seonyang Discovery Center was planned with a clear goal to create a world-class sustainable research and allied facility that ensures the amenity of high environmental quality as well as environmental protection and energy saving.

To this end, all people concerned of this project made efforts from the beginning to carry out the integrated green design process that develops the project according to the results of discussions over the demands, functions, and performances of sustainable design elements, rather than unconditionally applying universal green design technologies.

The sustainable features of this project is not just to show for achieving the certification, but to ensure the users and the surrounding environment, and to convey the importance of communications between the architect and the owner from the beginning of planning with diagnostica for the sustainability of the building.
Examples of Green Building

Cheongla International Library
(top prize in KOREA Green Building Competition 2017)

Enjoy your library
The library is the center of the local community. A variety of spaces including children's playgrounds and cultural classrooms are stacked together with the library space along with rooftop parks. The layers of each program are visually connected and communicated in various ways through the tilted plate and opening.

Experience the loop of knowledge.
In the Cheongra Library, the book shelf is arranged in line with the decimal classification, and it is proposed to circulate the space of knowledge through the beginning and the end. This is a space of knowledge through the open space floating on the entrance lobby.

GREEN + DESIGN, Integrated design
Examples of Green Building
Thanks!!