Design Policy for Realizing Sustainable Building

Offering the optimum environmental proposal to clients
by taking advantage of the characteristics of multi-disciplinary contractors

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For building aiming at a sustainable society, here we propose design guidelines feasible in design-build activities after sharing the concept of BUILT ENVIRONMENT and exemplifying design considerations.
The proposal aims to present principles and steps for an environmental response in design activities that respond to a variety of environmental issues including CO_2 reduction, conservation of biodiversity, countermeasures against the heat island phenomenon, resource circulation (recycling), and improving intellectual productivity at work places. Such an approach will achieve the maximum environmental quality and the minimum environmental load in building, which is not only private property but also social property, and help design-build activities contribute to global-scale sustainable development and promote the prosperity of all people from the viewpoint of diversified values, including qualitative social, historic, and human values inherent in building, as well as quantitative values.

Sharing concepts of the BUILT ENVIRONMENT for building

For building, which not only involves private property but also social property, pluralistic and comprehensive environmental considerations are required both at a global macro level and a human/biological micro level. Based on these understandings, it should be commonly recognized that approaches required for building emerge from the following three viewpoints.

Three viewpoints of environmental response classified by scale
1. Global
2. Regional
3. Human activities

Exemplification of environmental design considerations

1. Environmental design considerations from a global viewpoint

Realize sustainable construction from a global viewpoint by reducing CO_2 and other greenhouse gases on the basis of the principles of sustainable development and the principles and mechanisms set forth in two international conventions: the Framework Convention on Climate Change (including reduction of CO_2) and the Convention on Biological Diversity.

Environmental design considerations (exemplification)

(1) Energy saving:	design and operation in a way that minimizes fossil energy consumption
(2) Renewable energy:	design that promotes the use of on-site renewable energy
(3) Long life building:	design and operation of buildings that are long lasting and can be used for a long time
(4) Eco-materials:	promoting the use of recycled materials and other eco-materials that emit less CO_2
(5) Off-site CO_2:	use of off-site emissions trading system where on-site reduction of emissions is impossible
(6) Life cycle management:	development and use of a system that enables consistent life cycle management throughout the processes of design, construction, operation, renovation, and disposal

2. Environmental design considerations from a regional viewpoint

Realize sustainable building from a regional viewpoint by mitigation of heat island phenomenon, consideration of biodiversity, and assessment-based consideration of environmental impact for surrounding areas.

Environmental design considerations (exemplification)

(1) Mitigation of heat island phenomenon:	greening of exteriors, roofs, and walls, water-retaining pavements, sprinkling and watering, etc.
(2) Consideration of biodiversity:	consideration of diversity of plants, animals, and the entire ecosystem
(3) Contact between human beings and nature:	consideration of landscape, history, and local communities
(4) Consideration of regional impact:	assessment-based consideration of pollution of soil, air and water, and traffic volume
(5) Consideration of neighborhood:	consideration of sun shadow, noise, vibration, odor, waste, and other nuisances
(6) Regional prevention from weather disaster:	heavy rain, blast, tornado, lightning strike, heavy snowfall, etc.

3. Environmental design considerations from human activities viewpoint

Realize sustainable construction from a life viewpoint through approaches to improve safety, health, convenience, and comfort of living environment.

Environmental design considerations (exemplification)

(1) Safety:	safe environment:	prevention from disaster, crime and daily accidents, safety for the vulnerable, etc.
(2) Health:	air quality:	countermeasures against chemical pollutants, odor, poor cleanliness, infection, etc.
(3) Convenience:	functional productivity:	modules, circulations, office standards, ICT environment, etc.
(4) Comfort:	creative productivity:	thermal environment, light environment, sound environment, etc.
(5) Space design:	feeling environment:	view, dimensions, color, texture, community, greening, amenity, etc.
(6) Modifiability:	flexibility:	changeability, expandability, redundancy, ease of movement, storage capacity, etc.

Design policy for realizing sustainable building

To realize future-focused sustainable building, adequate design considerations are necessary in the light of future environmental performance throughout the entire life cycle consisting of design, construction, operation, renovation, and disposal. Multi-disciplinary contractors covering all stages of the life cycle in their business are the first to assume accountability for environmental performance throughout the life cycle beginning from design.

Four items of accountability related to the life cycle
1. Building
2. Human beings
3. Business feasibility
4. Construction method

1. Design policy for Building Life Cycle

Multi-disciplinary contractors are required to have consistent policies for sustainable building at the respective steps of design, construction, operation, renovation, and disposal from the viewpoint of building life cycle management. They are also required to clarify consistent responsibility for technology and framework for quality and performance and assume accountability throughout the life cycle with respect to designs and systems with workability and maintenance performance taken into account.

2. Design policy for Friendliness to Human Beings

In addition to ensuring that the internal and external environment is based on minimum standards for inhabitants and users, multi-disciplinary contractors are required to assume responsibility for continuously aiming at building based on optimal standards, which is easier to use, more comfortable, and more stimulating to intellectual creativity. They must conduct design works while always keeping in mind that the environment of a building is a place where new values will be created for human beings.

3. Design policy considering Business Feasibility

Multi-disciplinary contractors are required to be accountable for design works conducted with full consideration to the business effects required of a building in comparison with environmental investment cost. Further, in terms of business effects, the entire environmental design must be balanced well against business values including qualitative performance and various other values without placing excessive importance on quantitative performance that is easy to quantify and put into an index.

4. Design policy for Method of Construction and Renovation

Environmental design and proposals must be precisely realizable, incorporating structural work method, unitization, and other production-stage means from the viewpoint of consistently considering the environment at the time of construction and thereafter. At completion of design works, multi-disciplinary contractors assume accountability for the methods of construction and renovation as needed.