

Thought on Contemporary Architectural Regionalism from the Perspective of Construction

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Abstract

Regional architecture is a manifestation of the diversity of architecture in different regions. However, in the rapidly developing modern society, regional factors are ignored in the development of architecture, resulting in the monotony of regional architecture and its form division. The so-called constructivism today is essentially based on the change of construction mode in the 19th century due to the emergence of new materials such as cast iron, and the resulting discussion about the relationship between architectural form, structure and materials. Taking regional architecture as the research object, this paper analyzes the significance of constructivism, tries to explore a kind of construction logic problem hidden in contemporary architecture under the influence of regional factors, and summarizes new design ideas and reflection dimensions for today's regional architectures.

Keywords

Regional architecture; Regionalism; Construct; Build; Space; Structure Materials, Sustainability.

1. DEVELOPMENT OF REGIONAL ARCHITECTURE THEORY AND CONSTRUCTION THEORY

Generally speaking, the regional architecture theory has evolved into a state of mutual integration after experiencing a process of constant game with modernism. In the 1920s, Lewis Mumford's understanding of regional architecture had begun to rise to the category of theoretical research. In his books *Stick and Stone* and *American Architecture and Civilization* (1924), he advocated Regionalism and what he called "the form of modernism with its local and cultural features." [9] Later, in 1981, Alexander Tzonis and his wife put forward the architectural theory of "critical regionalism" for the first time. They believed that criticism maintained the architectural essence of regions and individuals, and opposed the architectural convergence and inflation caused by globalization. In the late 1980s, Kenneth Frampton formally discussed "critical regionalism" as an angle of architectural thinking and integrated it with the concept of "construction" After the 1990s, some famous western scholars also continued to develop the relevant theories of Regionalism and advance the process of discussion on design thinking. In his article *Towards an Authentic Regionalism*, William J.R. Curtis emphasized that architects should abandon the gaudy surface of architecture and really goes deep into the region to establish an objective and real regionalized buildings.

The word "construction" comes from the Greek word *tekhne*, which is from the Indo-European stem *tekhn-* ("woodwork" or "carpenter"), and relates to the Sanskrit word *taksan* ("carpenter", "builder"). All these words are rooted in the source of architectural construction, namely the carpenter or builder. [7] Kenneth Frampton pointed out in his book *Studies in*

Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture that, “the foundation of architecture is to build, and is the creation process and method of buildings that architects use materials to construct them into a whole”, “construction should reflect building structure and constitution, and even is a direct expression, which is in line with the tectonic culture”. [7] Thus it can be seen that “construction” is not only the emphasis on materials and technology in the construction process, but also shows the manual traces of construction and the expressive potential inside and outside the building.

With the expansion and development of regionalism theory and construction theory in modern times, regional creation has more generalized constructivist significance, which is mainly manifested in the construction of regional structure and material system, the creation of regional space system, the collective vernacular construction and the sustainable regional construction of architecture.

2. CONSTRUCTION OF REGIONAL STRUCTURE AND MATERIAL SYSTEM

In the development of new regional architecture creation, many architects based their starting point of creation on the structural form and material characteristics of basis traditional regional architectures at a particular region. For example, many Indian architects like Balkrishna Doshi had lived for a long time in rural India and drew new creation basis from the local traditional architectures. Renzo Piano also had stayed at New Caledonia to study the unique structure form of the local villages and extract and improve it.

From this perspective, the renewal of structural forms belongs to the development of regional adaptability, while the re-interpretation of materials has the characteristics of adapting to local conditions, rather than the simple symbolic meaning of early regionalism.



Figure 1. Renzo Piano's Jean Marie Tjibaou Cultural Center (1993-1998)

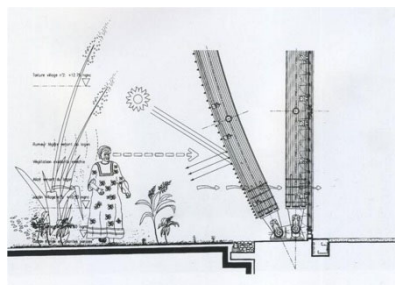


Figure 2. Structural Details of Renzo Piano's Jean Marie Tjibaou Cultural Center

Piano's understanding of the development of indigenous culture is to familiarize its history, environment and beliefs, and then to be as faithful to the traditions of the people as possible. Specifically, natural elements such as wind, light and plants were considered while using traditional materials and construction methods (Figure 2).

The structural and functional forms of the Caledonian hut, as well as its architectural and social characteristics, were adopted and replicated. The Center consists of ten “houses” (Figure 3), each of different sizes, with a height of between 20 and 28 meters.

With regard to the Center’s structure, Piano especially showed his respect to and development of regional origin. The ten “huts” made up the Cultural Center are arranged like a village. The engineering of the “hut” is based on, but by no means limited to, traditional local techniques. In this way, they designed a double-skinned form (Figure 4) that captures and modulates the tropical winds that blow over the islands for regional climate adaptation.



Figure 3. Ten Houses in Tjibaou Cultural Center

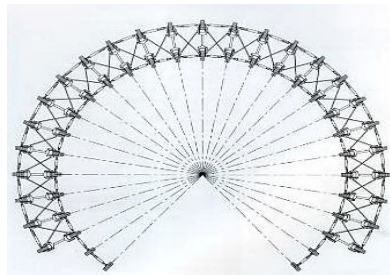


Figure 4. Structural Unit of Renzo Piano’s Jean Marie Tjibaou Cultural Center

Kengo Kuma's Hiroshige Ando Museum (1998-2000)

While reflecting the regional characteristics of materials, taking regional materials as a design consideration is an in-depth development of regional design in the contemporary “construction” perspective. This kind of design starts with a different consideration of material (Figure 5).

For example, Japanese architect Kengo Kuma used hornbeam and fir, which are abundant in Japan, for the construction of the Hiroshige Ando Museum. Taking advantage of the high and straight nature of the wood, especially when looking down from high places, this sense of alignment happens to harmonize with the local environment. The selection of wood meets the requirements of the owner of the Museum: 1. Using local traditional materials; 2. Reflecting the characteristics of rich layers and prominent vertical lines in Hiroshige Ando’s ukiyoe-style architecture.

Kengo Kuma and a local carpenter created a wooden grid that overlaps with each other (Figure 6). He discovered the characteristics of the wood strips, as well as the characteristics of the trees on the hillside, to design the Museum's expression of the lines.



Figure 5. Hiroshige Ando Museum



Figure 6. Structure and Material Features of Hiroshige Ando Museum

3. CONSTRUCTION OF REGIONAL SPACE SYSTEM

This method is based on an overall “construction” view to explore the regional space atmosphere, with a humanized way to integrate the regional factors into a new space system. In fact, it is the new continuation and abstract variation of some functional space, structural space and behavioral space formed within the region, so that a specific region can produce adaptive development.

Hageneiland House designed by MVRDV (1997-2001)

Located at a site surrounded by the sea in Ypenburg, Netherlands, the architects designed 37 residential units with 119 houses (Figure 7). On the basis of Radburn’s zoning model, the area is designed as an “island” where there is no car and you can only walk (Figure 8). [6] Cars can only park on the outside and not enter the area. As a result, a series of outdoor spaces are created, and according to their orientation, can be built into gardens, play areas, or grassy areas with paths. This design approach is completely different from that of new urbanism, mainly because the designer does not rely on the urban context or specific urban structure, but on the “construction” of regional environment and spaces with the regional characteristics provided at the site.



Figure 7. Hageneiland Housing Unit designed by MVRDV

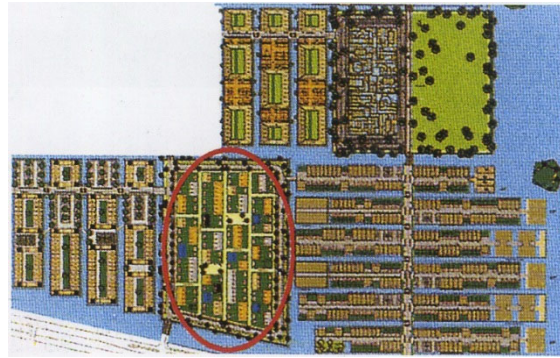


Figure 8. General Layout of Hageneiland Housing Area

4. COLLECTIVE VERNACULAR CONSTRUCTION

The so-called collectivized vernacular construction explores the possibility of constructing regional group buildings, especially “civilian houses”, from the perspective of “construction” mode. This method is generally applicable to large-scale residential groups and is characterized by convenience, rapidness and low cost.

For example, the Aranya Low Cost Housing (1981-1990) (Figure 9) was designed by the Indian architect B. V. Doshi and built by local residents. He laid the basic functional units and foundations, and the rest was built by the residents themselves. (In this case, the architect Doshi built the toilet units with the most general characteristics and in fixed mode, and laid the foundation for each household, and then residents built the rest parts). This design unit is changeable and provides a viable means for local residents to extend their house by themselves (Figure 10).



Figure 9. Aranya Low Cost Housing

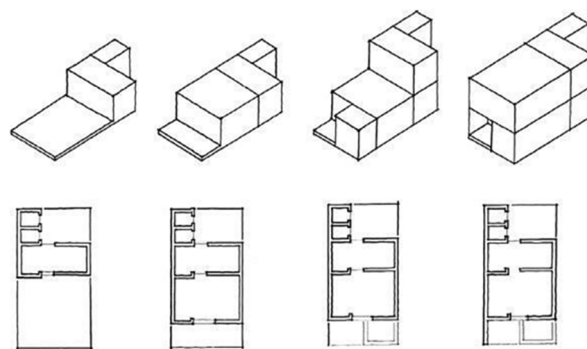


Figure 10. Unit Construction Patten of Aranya Low Cost Housing

5. REGIONAL CONSTRUCTION OF SUSTAINABLE ARCHITECTURES

In 1987, Mrs. Brundtland, Prime Minister of Norway, first put forward the concept of sustainable development in her report. She said: "Sustainable development is development that meets the needs of the present without jeopardizing the ability of future generations to meet their own needs." (The "Sustainable Development" strategy proposed and elaborated in the report "Our Common Future" submitted by Mrs. Brundtland has played an important role in promoting international cooperation on global environmental protection)

In the process of regional architecture development, the integration of theories of sustainable development with regional regionalism in fact focuses on the use of ecological theory and green building principle. On the basis of inheriting regional context according to local economic level, technical measures are taken and improved; from the aspects of architectural form and suitability technology, local natural and humanistic environment are dealt with and an emphasis is given to resource-saving and the creation of healthy and comfortable environment to help the natural ecological environment develop in a balanced manner.

For example, the Santa Clarita Transit Maintenance Facility (Figure 11) in California, USA designed by HOK is half powered by local abundant solar energy. Local straw is used as the building material for the walls, and drought-tolerant local plants are selected. According to HOK, green building design aims at the sustainability of the overall environment, which can be divided into six goals: protecting the ecosystem and supporting the endurance and resilience of the natural system; sustainable, renewable development suitable for community; efficiently using of geographical resources, including energy, water, materials and land; creating a healthy indoor and outdoor environment; phasing out pollution and waste; reducing the use of fossil fuels and replacing them with recyclable and renewable fuels. [11]



Figure 11. The Santa Clarita Transit Maintenance Facility

6. SUMMARY

Throughout the development process of regional architecture and the continuous improvement of its theories, we can clearly clarify a train of thought, that is, regionalism and modernism are not incompatible opposites, but are going towards the same in the continuous revision. In this process, constructivism is actually a kind of internal catalyst, integrating the system framework of regional architecture from many aspects, such as region, terrain, internal and external space, structure, material, and construction method. This is also the way to the construction of future buildings.

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