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Problems of historicity in the conservation of the pioneering reinforced concrete buildings in Taiwan

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Abstract

In Taiwan, the majority of historical buildings designated as 'national cultural property' are wooden southern Chinese style buildings. However, reinforced concrete buildings constructed in the beginning of the twentieth century started to attract the attention of both scholars and preservationists in recent years and the conservation of these historical buildings has become an important issue in Taiwan. Debates and problems of historicity emerge because the experience in the conservation of these pioneering reinforced concrete buildings has not yet accumulated.

1 Introduction

The conservation of historical buildings does not attempt to create a new 'past'. It tries to bridge the gap between the past and the future; it tries to construct a mediate way that could forge a link with the past -- in order to increase one's awareness of a place's cultural roots. A sense of the past is equally as important as the sense of the future to the built environment. According to this notion, the attachment to the originality of historical buildings becomes a critical issue in historical conservation. However, dilemmas exist in practice in Taiwan because the regulations on the issue of originality in Taiwan Cultural Property Preservation Act of 1982 are contradictory to several actual considerations. These considerations include the durability of the historical buildings, the lack of original building records and the strong renovation demand of the owners of the historical buildings.

In order to meet above considerations, new materials, new techniques, new apparatus and new additions have become unavoidable. However, new solutions may conflict, at different levels, with the historicity of the original buildings. This paper, from an architectural historian point of view, tries to explore and discuss the problems of historicity facing architectural professionals when they are involved in the conservation of the pioneering reinforced concrete buildings in Taiwan.

2 Development and Decay of Pioneering Reinforced Concrete Buildings in Taiwan

Reinforced concrete buildings, prolific and versatile, stamped in the Western World the image of modernity in the beginning of the twentieth century, has extend the possibility of spatial and formal expression in architecture and provided the built world with durability and firmness. F. Coignet (1814-88), J. Monier (1823-1906), F. Hennebique (1842-1921) and A. Perret (1874-1954) were pioneers in the circle. A fact little known to the Western scholars studying the development of reinforced concrete and to the surprise of them is that reinforced concrete buildings were developed in Taiwan by Japanese civil engineers as early as in the beginning of the twentieth century.

Taiwan, the island province of China, became the first overseas colony of Japan in 1895 due to the treaty signed by the Chinese and Japanese Governments. Since then, the Japanese civil engineers and architects have made their appearance in Taiwan, so did the Western building types and techniques which are totally alien to the traditional architecture in Taiwan. During the Japanese Occupied Period between 1895 and 1945, Taiwan was treated by Japanese architectural professionals as a paradise for building development. They imported or invented new building types and techniques so as to testify their satisfaction before applying them to Japan. Among many types of experimental buildings executed by the Japanese architectural professionals in Taiwan, so called pioneering reinforced concrete buildings are of great importance since they marked the arrival of real modern development of Taiwanese architecture.

Reinforced concrete, though its techniques were not mature when compared with today's building standard, started to be applied in the structure of the Colony Governor's Residence in Taipei according to the suggestion of civil engineer Togawa Yoshitaro as early as in 1901. (Figure 1) In this building, sections of steel rail were used as the reinforcement in the reinforced concrete balcony. It was so experimental that this achievement was the most pioneering in the whole Asia because at that time reinforced concrete techniques have not yet reached its maturity even in Japan and in the West.

However, such experimental building techniques continued to be applied in many governmental and military buildings at the beginning of the twentieth century. In 1905, Togawa Yoshitaro helped to design the first reinforced concrete floor in Taiwan in the Governor's Research Institute.

Figure 1: Colony Governor's Residence, the first building partly constructed in reinforced concrete in Taiwan.

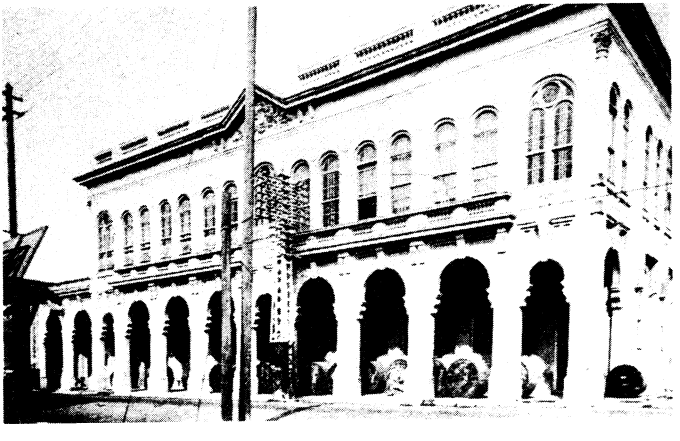

Figure 2: Taipei Telephone Exchange, the first building completely constructed in reinforced concrete in Taiwan.

Reinforced concrete continues to be used in the Second Brigade of Japanese Army in Tainan and many other governmental buildings. In 1908, Taipei Telephone Exchange designed by structural engineer Tokumi Tsuneo became the first building completely constructed in reinforced concrete. (Figure 2)

Since then, the application of reinforced concrete became a fashion as well as a symbol of modernity for those who in favor of progress in building development. When compared with the development of the reinforced concrete buildings in Japan and other areas in Asia, reinforced concrete buildings constructed in the early twentieth century in Taiwan are pioneering in terms of their development. One interesting phenomenon of this development is that, due to the unconfidence in the new materials and new techniques, the Japanese architectural professionals, when applying reinforced concrete in building design at that time, still could not emancipate themselves from the architectonics of wooden and masonry buildings. Most of these pioneering reinforced concrete buildings in Taiwan did not take advantages of the liberal and plastic property of the material and monumental historical styles remain the most common expressions that were at odds with the freedom of reinforced concrete.

After more than seventy years continuous use, pioneering reinforced concrete buildings in Taiwan started to decay. Factors behind their decay are multifold. Firstly, improper restorations were executed when different Chinese governmental offices took over and occupied these buildings when Taiwan was return to China in 1945 in order to repair the damage bombarded by the Allied Air Force during the second World War. Incorrect and destructive alternations were also made in order to accommodate functions different from the original ones. Secondly, Taiwan's location within the seismic zone witnesses frequent earthquakes that cause occasional damage, especially cracks, to the historical buildings. Because abundant rainfall and hot humid climate of Taiwan, such cracks then, provide paths for ingress of carbon dioxide and moisture which form the corrosive hazard to the reinforcement.

3 Discourse on Historicity in Conservation

Etymologically speaking, historicity means historical actuality and the importance of history as a standard of value. In the conservation of historical buildings, historicity used to imply the retention of every character of the old buildings. However, this implication can easily be misunderstood and misinterpreted by those who in favor of a frozen past. There is no doubt that the distinguishing original characters of a historical building shall not be destroyed is the primary guideline in building conservation. We shall not argue that the removal or alternations of historical significance in a historical building should be avoided. However, this does not mean that the alternation of a historical building regarding the issue of historicity should be completely banned even in the situation that such alternations do not destroy

historical significance and will enhance the quality and durability of the historical buildings.

The theory and practice of historical conservation began in Taiwan in 1977 when Lin An-Tai Residence Compound built around 1822 faced the crisis of demolition. Cultural Property Preservation Act was put into force in 1982 and became the only legislative basis for the preservation work in Taiwan. According to the regulations of this act, a historical building must preserve its original appearance in built form, spatial organization and building materials without any alternation when it was designated as a national cultural property. If any repair or restoration is needed, the work must be compatibly executed with original building materials according to building's original conditions. Since there exists no flexibility as to the originality of the historical buildings, originality-versus-alternation debate becomes an increasing focus in building conservation. Almost every architectural professional involved in building conservation will have to face the following problems regarding the issue of historicity.

The first problem is the choice and judgment between historicity and durability. The durability of many pioneering reinforced concrete buildings will be questioned if their original structures can not be strengthened. Due to the lack of experience in aggregate constituents and the efficient use of reinforcement, the structural condition of most pioneering reinforced concrete buildings have seriously decayed after decades' use and exposure to climatic elements. For example, in the case of the Tainan City Hall (original Tainan Prefecture Hall) built in 1916, brick fragments was used as aggregate and the position of the reinforcement was too homogenous. According to the cube crushing test, the weakest compression is only sixty-five kilograms per square centimeter, which is far below the contemporary standard. If historicity is taken serious consideration and alternations completely discouraged, the durability of many pioneering reinforced concrete buildings will be skeptical.

The second problem is the insufficiency of the original building drawings and documents. Many graphic and written records of the buildings together with millions of other archives were taken over by Chinese Governments at different administrative levels when the Japanese left Taiwan in 1945. After decades of negligence, most of original records of pioneering reinforced buildings are either destroyed, missing or misplaced in different governmental offices inaccessible to preservationists. Since most pioneering reinforced concrete buildings only constructed partly in reinforced concrete, the repair or restoration according to their originality becomes extremely difficult without original drawings and records. For example, when the

position and size of the reinforcement are unknown, the calculation and investigation of the strength of the structure will become a problem although some non-destructive tests using equipment such as Schmidt rebound hammer and ultrasonic pulse velocity apparatus can be helpful. Since the application of reinforced concrete is not systematic and consistent in most pioneering reinforced concrete buildings in Taiwan, the destructive tests are always needed in order to assess individual parts of the structure. Many professionals tend to skip this time-consuming process. In many cases, restoration becomes a task of new design by the professionals. The historicity of historical buildings thus is affected.

The third problem is the contradiction between the wants of preservationists and the needs of building owners. Many owners of the historical buildings have refused the designation of their property as national cultural property because they think the goal of historicity is achieved at the sacrifice of their basic rights. In other words, the retention of historical originality of historical buildings is interpreted by many owners of historical buildings as something that will hinder the renovation of the buildings. In some situations, outsiders value historical buildings as "treasure" but owners think the restrictions to any change in the historical buildings are placed everywhere on their access to the standard comforts of modern living.

On the basis of the above observations, my argument is that professionals related to historical conservation must always keep in their mind that we cannot travel back to the past simply by freezing the original appearance of a building. Nostalgically looking back, as many historicists have done, is not appropriate because the complex set of artistic, technological and socio-cultural norms, which conceived historical buildings, have either disappeared or changed. By saying so, I do not mean that it is hopeless for any one to concretize the idea of continuity between the past and the future, though it is not an easy task. However, it is more important to face the fact that new elements within the context of a historical building are inevitable. In other words, to insert a specific novelty into a historical building is more critical than preserving a historical building as a past object.

The conservation of historical buildings for the sake of historicity alone is being viewed with increasing skepticism by many people throughout the world. The controversy of the issues on historicity is whether or not change in a historical building is allowed. My argument, based on the premise that any alternation should not destroy historical significance of the historical buildings, is that original and new parts in a historical building should be seen as continuous rather than separated by an abyss; they should be interpreted as dialectically co-existed rather than dichotomously related. The

possibilities and the potentialities for change in a historical building should be valued and secured. With proper role of new elements taken into serious consideration and through interaction of original and new elements within a building, changes are brought forth while maintain a certain degree of historicity. If we look at the problem from another angle and take the repair objectives into consideration, the durability is by far the most important when compared with three other ones, i.e., structural strength, function and appearance. In other words, to use new elements in order to increasing the durability of historical buildings should be consider by professionals as more important than merely to retain the originality of the building.

Critical alternation in historical buildings has since the late 1970s welcomed by many preservationists and views towards historicity among scholars and architectural professionals also changed in recent years. In 1975. Ipswich Historical Commission stated that "in preservation, there must always be selection; everything old cannot be saved just because it is old. There will always be doubts, disagreements and regrets. In addition, as time goes on, as more research is done, and as changes are made to structures, new and perhaps contradictory evidence will come to light." In 1977, a conference with "Old and New Architecture: Design Relationship" as its theme was held in Washington D.C. due to the understanding of the fact that change is inevitable. Among conference's several objectives, to encourage a dialogue on the theoretical and practical aspects of designing new buildings in existing settings and to gain a greater understanding of design methodology for relating new to old reveal the changing trend among professionals in the conservation circle. In 1980, Sherban Cantacuzino, the Secretary of Royal Art Commissions, has argued in the book *Re/Architecture* that the emphasis of the conservation of historical buildings has shifted from accurate and reverential restoration to a freer and more creative attitude to the changes that a historical building may undergo and from the building as art object to the building as the product of a whole socio-economic system.

4 Conclusion

Conservation of historical buildings merely for the sake of historicity is being viewed with increasing skepticism by many people throughout the world. There is not exception among professionals related to building conservation in Taiwan. Today we cannot totally ignore the existence of new elements in the a historical building just because their newness. Nor can we say that all new elements in a historical building are 'wrong' because their novelty. Some new elements may be good or may possess positive features to the historical buildings. Moreover, we cannot have any objection to the desire of the people in the historical buildings to pursue modern lifestyle.

Historically, buildings grow and change slowly according to owners' interaction and needs. Conservation implies, not the preservation for the sake of itself, but the retention and enhancement of those are good in terms of historicity. Although I have attempted to include as clear the discourse as possible, the paper is by no means completed in terms of the projection of a new attitude towards historicity among preservationists in Taiwan. To develop a new dialectics on historicity is so complicated an issue that to deal with it in a single paper seems impossible. I only pointed out the possibilities and limitations. It will be interesting to see how preservationists in Taiwan testify the validity of my argument in the future.

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