

Characteristics of the Two-storied Japanese-style Wooden Gate Designed by Architect Kingo Tatsuno in Takeo Onsen

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Abstract—Architect Kingo Tatsuno is a modern architect who led the world of Japanese architects in modern age and designed many modern architecture from Tokyo station. His Tatsuno and Kasai Architects Office designed the new building called the Shinkan and the two-storied gate called the Romon of the Takeo Onsen in Takeo, Saga, Japan. Although the two-storied gate was originally planned as three gates, only one gate was realized, so we can call it uncompleted gate. In this paper, focusing on the uncompleted gate we aim to clarify the characteristics of expression of Japanese wooden modern architecture designed by architect Kingo Tatsuno.

Index Terms—architect Kingo Tatsuno, modern architecture, mix of western style and Japanese style, symmetry, symbolic building

I. INTRODUCTION

A. Personal History of Kingo Tatsuno

Kingo Tatsuno (1854~1919), as seen in Fig. 1, is one of the first Japanese modern architects studied under Prof. Josiah Conder, a British architect, at the Imperial College of Engineering in the Meiji era. Tatsuno passed the first entrance examination of the department of Koburyo under the Ministry of Engineering in 1873 when he was 20 years old. Its name was renamed to the Imperial College of Engineering in 1877, when he was a student. At that time, Prof. Josiah Conder started to teach design in the College which mainly had classes of construction and material. Conder taught architecture mainly in architecture design and tour of building. It advanced art education [1].

Tatsuno was graduated from the College of Engineering at the top of the department in 1879 when he was 26 years old, then he was selected as the first student

went to study in London. After he arrived in London, he worked also at the architect Cupid office during five months and learned business of architecture as a trainee at Willian Burgess (hereafter, Burgess) architecture office beside studying in the department of architecture and in the department of art. Tatsuno returned to Japan in 1883 after he went around to France and Italy (refer to [2], [3]).

Tatsuno did good job both in architecture business and in education after he came back. He assumed the post of a professor of the College of Engineering after Prof. Josiah Conder in 1884. He established Tatsuno architecture office (hereafter T office) in Ginza of Tokyo in 1886. Soon after he retired from the College, he established Tatsuno Kasai architecture office in Ginza of Tokyo in 1902 (hereafter, TT office). He also established Tatsuno Kataoka architecture office in Osaka in 1905 (hereafter, TO office), then his work widened to all of Japan.

Tatsuno designed many buildings in Japan using western-style and introduced western building technology into Japan. Thus, Tatsuno led Japanese architecture field of modern age. On the other hand, Tatsuno designed also some Japanese-style buildings even though not so many. Besides, Tatsuno introduced classes of Japanese architecture in the Imperial University of Tokyo to cultivate field of Japanese-style architecture as mentioned in [4], although he led modernization and westernization of architecture in Japan as an elder statesman in the Meiji and Taisho eras.



Figure 1. Tatsuno's portrait.

B. Literature Review

M. Kawakami researches on Tatsuno's study abroad in Europe using his field notes [2], [3]. Fujimori mentions that Tatsuno produced remarkable achievement both in education and in construction field of Japan [5]. Ouchi studies about Tokyo station and points out that construction using red-brick and granite is one of the

Tatsuno's Characteristics [6]-[8]. He also states that this characteristic was affected by Queen Anne style.

"Report of preservation and repair of the Takeo-onsen-shinkan" [9] is a comprehensive study report of the Takeo-onsen-shinkan (hereafter, the Shinkan) which is the main target of this study.

Inamori et al. [10] report on three axes formed by the Shinkan and the two-storied gates called the Romons, and put their changes in order using location plans.

TABLE I. LIST OF TATSUNO'S WORK

	Name	Location	Completion year	Existence in present	Symmetry	Structure	Style
1	Head office, Bank of Japan	Tokyo	1896	Yes	Yes	Stone/Brick	Western
2	Moji-seibu branch, Bank of Japan	Fukuoka	1898	No	Both	Brick	Western
3	Osaka branch, Bank of Japan	Osaka	1903	No	Yes	Stone/Brick	Western
4	Tokyo Fire Insurance	Tokyo	1905	No	No	Brick	Western
5	Kyoto branch, Bank of Japan	Kyoto	1906	Yes	Yes	Brick	Western
6	Hamatera park station	Osaka	1907	Yes	Yes	Wood	Western
7	Kobe branch, Daiichi Bank	Hyogo	1908	Yes	Yes	Brick	Western
8	Sumo jyo setukan	Tokyo	1908	No	Yes	Steel-frame	Islamic
9	Nara hotel	Nara	1908	Yes	No	Wood	Japanese
10	Guard office, Meiji-senmon school	Fukuoka	1909	Yes	Yes	Wood	Western
11	Kyusyu branch, Nihonseimei Insurance co.	Fukuoka	1909	Yes	No	Brick	Western
12	Head office, Morioka Bank	Iwate	1911	Yes	Yes	Brick	Western
13	Asakusa Kokugikan	Tokyo	1911	No	No	Wood	Islamic
14	Kokugikan of Korea	Korea	1912	Yes	Yes	Stone	Western
15	Otaru branch, Bank of Japan	Hokkaido	1912	Yes	Yes	Stone/Brick	Western
16	Osaka Education Life Insurance co.	Osaka	1912	Yes	Yes	Brick	Western
17	House Matsumoto	Fukuoka	1912	Yes	No	Wood	Western
18	Sanjyusan Bank	Oita	1913	Yes	No	Brick	Western
19	Annex of Shioyu	Osaka	1913	Yes	No	Wood	Japanese
20	Tokyo station	Tokyo	1914	Yes	Both	Steel-frame Brick	Western
21	Shinbashi station	Tokyo	1914	No	Yes	Brick	Western
22	Kyoto branch, Japan Life Insurance co.	Kyoto	1914	Yes	Yes	Stone/Brick	Western
23	Shinkan and Romon, Takeo-onsen	Saga	1915	Yes	Yes	Wood	Japanese
24	Yahata branch, Hyakusanjyu Bank	Fukuoka	1915	Yes	Yes	RC	Western
25	Hakodate library	Hokkaido	1916	Yes	No	RC	Western
26	Kyoto branch, Yamaguchi Bank	Kyoto	1916	Yes	Yes	Brick	Western
27	Kyobashi branch, Daiichi General Insurance co.	Tokyo	1916	No	No	Steel-frame Brick	Western
28	Shiseido	Tokyo	1916	No	Yes	Brick	Western
29	Inawa second power plant	Fukushima	1917	Yes	Yes	Wood	Western
30	Ikeda branch, Kashima Bank	Osaka	1918	Yes	Both	Brick	Western
31	Osaka Central Public Hall	Osaka	1919	Yes	Yes	Brick	Western

C. Aim and Method of Study

Focusing on Japanese-style wooden building designed by architect Tatsuno, we especially pay attention to the Romons. The aim of this study is to elucidate about characteristics of Japanese-style building designed by Tatsuno. First, we collect his works from the collected works of Tatsuno. Then, we find characteristics of Tatsuno's works.

Next, we elucidate how is the characteristics taken into Japanese-style works of Tatsuno. We additionally analyze a plan and design of the Shinkan and the Romon. Finally, we clarify representation of Japanese-style buildings of Tatsuno.

II. ANALYSIS OF THE SHINKAN AND THE ROMON

A. Position of the Takeo-onsen in Tatsuno's Work

We made a list of Tatsuno's works (see Table) including works by the T office, TT office and TO office, even though Tatsuno did not directly design. We checked categories of existence in present, symmetry, structure, and style based on the past study [11], [12]. There were 19 symmetry buildings from 31 works. As per structure, we could count stone and brick constructions up to 19 works. Regarding style, western-style were counted up to 26 works.

Most of his works were western-style as we expected. Besides, it was obvious that the Shinkan was only symmetry building among a few wooden buildings designed by Tatsuno and his offices.

B. Outline of the Target Buildings

The Shinkan and the Romon of Takeo-onsen located in Takeo city, Saga prefecture, are the wooden works completed by TT office in 1915. At that time, Takeo-onsen company planned to introduce a resort in Takeo-onsen district, then the company requested Tatsuno to plan and design buildings.

C. Analysis of the Target Buildings

The appearances of the target buildings are categorized into shinkabe-style wall and irimoya-style roof. Shinkabe-style is a type of building wall shows columns to the outside. Irimoya-style roof is one of the typical Japanese traditional roofs. On the other hand, the basement is made of brick like western style.

As mentioned above, the Shinkan and the Romon are only symmetry buildings among the wooden buildings designed by Tatsuno and his offices. The Shinkan has symmetry with a centered axis of the main entrance in both of the 1 and 2 floors, and also with wings projecting out to both left and right, as shown in Figs. 2, 3(a) and 3(b). Here, Fig. 2 is the appearance of the building, and Figs 3 (a) and (b) are the plans of the 1st and 2nd floor, respectively. Fig. 4 is the original plan of the Shinkan at the beginning of the construction also indicating the piping for onsen. These plan and section show that TT office planned symmetry as western style from the beginning of design.

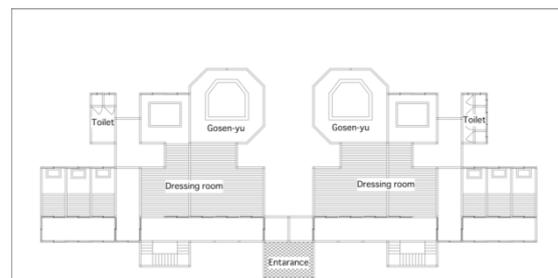
The function of the rooms in the Shinkan is also symmetry. The past study [2] makes it obvious that the Shinkan was originally designed in western style. There is

a bathtub called Gosen-yu in the Shinkan, which shape is hexagonal-shaped and is very characteristic. In addition, the shape of the roof of Gosen-yu is an octagon as shown in Fig. 5. When TT office designs a dome of a building of western style like Tokyo station, he often uses an octagonal ceiling as shown in Fig. 6.

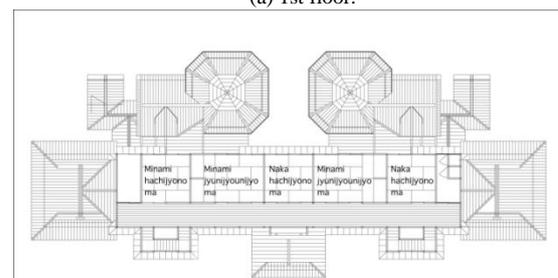
Although the Shinkan was originally designed in western style at the early stage, it was changed to Japanese style of a complete plan of the Shinkan. Nevertheless, we can know that the shape of the octagon is consistently used for the roof of Gosen-yu.



Figure 2. Appearance of the Shinkan



(a) 1st floor.



(b) 2nd floor.

Figure 3. Plan of the Shinkan.

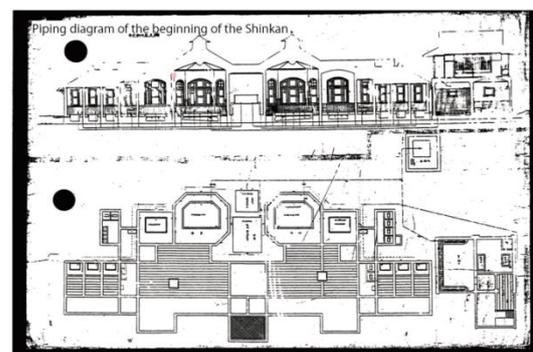


Figure 4. Original plan of the Shinkan at the beginning of construction (showing also piping diagram).



Figure 5. The roof of the Gosen-yu.



Figure 6. The ceiling of Tokyo station's dom

D. Analysis of the Romon

The Romon in Takeo-onsen is vermilion-lacquered and two-storied Tempyo-Ryugu-tsukuri style building without using nails as shown in Fig. 7. Tempyo-Ryugu-tsukuri is one of the traditional styles of Japan and is normally painted simply with white plaster on the podium, but in case of the Romon the podium is made with decorated stone masonry. The Romon is a very Tatsuno-style building because he normally sticks to the lower level decoration.

At the beginning of design, TT office planned to build three Romons in Takeo-onsen. It is obvious from the original plan of the Takeo-onsen which was found in the restoration survey as shown in Fig. 8. Fig. 9 is a redrawn plan of the original plan of Takeo-onsen. As shown in Fig. 9, three Romons called Tonan (southeast)-Romon, Higashi (east)-Romon, and Tohoku (northeast)-Romon from the left side were planned. As the building of the Romons had a shop on the right side, the plan was basically asymmetry. Three Romons were planned as a rectangular shape with longer frontage side than depth. Takeo-onsen has long shape with three Romons like Tokyo station as a typical feature of Tatsuno-style. Yet, it is so pity that the original plan was not realized because of problems caused by budget, so only Tonan-Romon was built and is standing until now.

As we mentioned above, the whole building plan of three Romons seems asymmetric because a shop is attached, but when only the part of three Romons is focused on, it is possible to extract another fact. Namely, there is a symmetric axis in the center of the Higashi-Romon. The

Tonan-Romon stands on the left, and the Tohoku-Romon stands on the right. Therefore, we can find a relation among three Romons symmetric. Furthermore, there is obviously written "porte-cochere" in the plan of the Shinkan. Fig. 10 is the plan we plot the building plans of the Shinkan and the three Romons on the location plan. We could know that Tatsuno was planning a circulation for visitors to enter the Shinkan from the Tonan-Romon and to go out from the Tohoku-Romon while taking on vehicles.

The plan of the Romons is similar to that of Tokyo station which is a masterpiece designed by Tatsuno (see, Fig. 11) to make a porte-cochere in the center of the building. The Shinkan and the Romon in Takeo-onsen is the next work of Tokyo station by Tatsuno, and their completed years are very closed. We can find a lot of relations between Tokyo station and the Romons of Takeo-onsen.



Figure 7. The Romon in present.

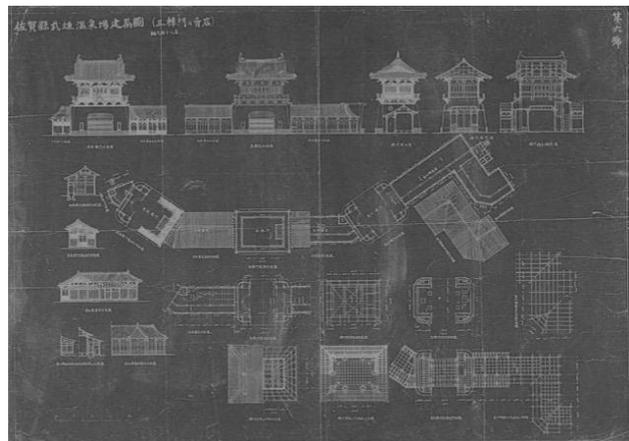


Figure 8. Original plot of Takeo-onsen.

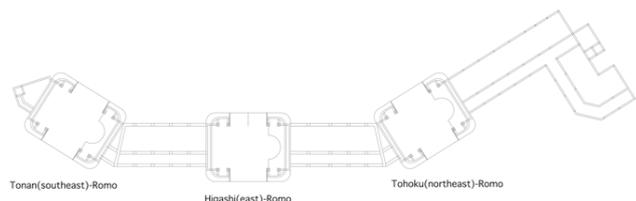


Figure 9. Redrawn plan of the Romon of Takeo-onsen.

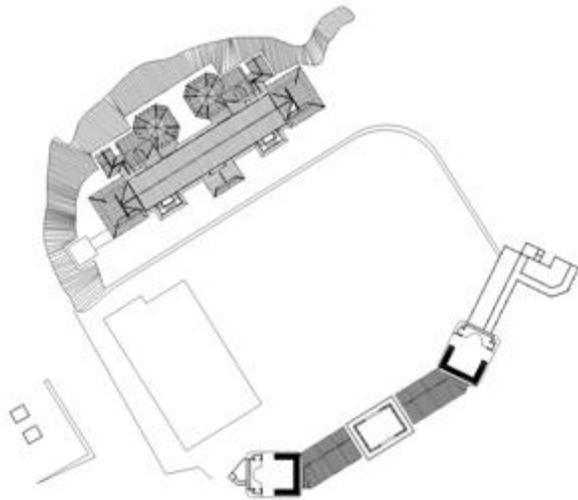


Figure 10. Plot of Takeo-onsen.

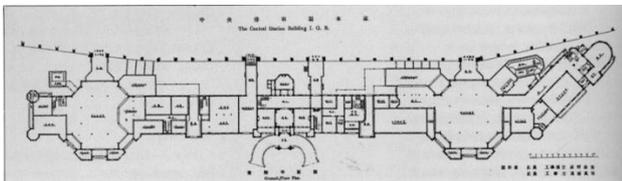
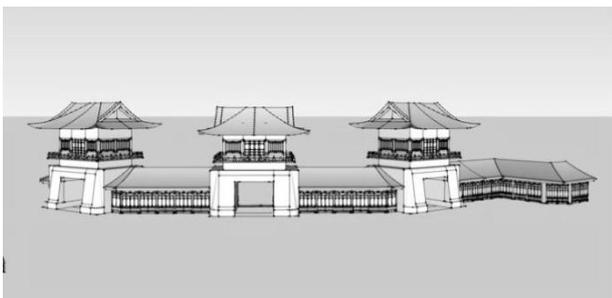


Figure 11. Plan of Tokyo station [13].

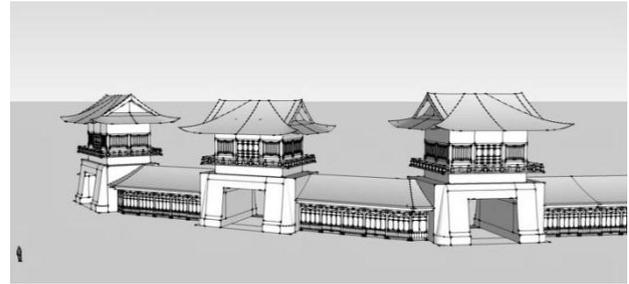
E. Analysis by CG

Romon originally means a gate and it should be normally standing alone as only one building. In case of the Romon of Takeo-onsen, only one building was consequently built, although Tatsuno planned three Romons. Considering the history, we have a strong interest in the spatial meaning of the three Romons, so we make CGs as shown in Figs. 12 (a) and (b) to reproduce the three Romons and to discuss how it was viewing from the scenery.

Looking the CGs we reproduced, we can find out that high buildings are accents in the whole building composition linking three two-storied romons by one-storied buildings of shop. We can understand that such outward appearance is very similar to the appearance of Tokyo station (see Fig. 13), one of the Tatsuno's masterpieces, that is also clarified by the above-mentioned analysis of the previous section D.



(a) Viewing from the front.



(b) Viewing from western side.

Figure 12. Outer CG view of the three Romons.



Figure 13. Outer view of Tokyo station.

F. Summary

The analysis of the plan of Takeo-onsen clarified that Tatsuno had not made Japanese-style buildings for the Takeo-onsen, namely that he had created a new wooden Japanese-style building introducing elements of the western style which Tatsuno studied in Europe into Japanese architectural style.

Moreover, we could find out that the three Romons had had similar or common points to Tokyo station as the building composition.

III. CONCLUSION

In Tatsuno's later life, he said that style should not be created artificially but be formed naturally, and that the future's style of Japan would be gradually established while Japanese traditional style would cover the western-style structure like outer skin [14].

As we mentioned above, the Shinkansen shows that Japanese-style vermilion-lacquered wooden building stands on western-style technology such as brick basement, and that Tatsuno uses western-style elements in a Japanese-style building. We think that these factors should be the symbols developing for the future Japanese style which Tatsuno considered in his later life.

Furthermore, there are similarities to Tokyo station in the composition method of the configuration of the Romons. In case of the main building of Tokyo station he designed an axis with the Miyuki street which leads to the Imperial Palace, and in case of the three Romons of Takeo-onsen an axis is also considered, so they have identical parts. Tatsuno designs the three Japanese-style Romons in Takeo-onsen district by the same thinking way of Tokyo station. We think that Tatsuno designed the three Romons as it was the symbol in Takeo-onsen district like Tokyo station in Tokyo.

IV. FUTURE STUDY

Comparison of the three Romons in Takeo-onsen and Tokyo station is being performed more deeply as a development for the future study. Although the Romons are related to Tokyo station also in the design meaning, it is necessary to make clear not only the relationship between the Romon and Tokyo station but also their routes of design.

Therefore, we would now compare the construction of Takeo-onsen with some construction works designed by Burgess who was a Tatsuno's teacher in England mentioned in the section I. Combinations with shapes like the Shinkan in Takeo-onsen different from square-shape buildings might be also discussed viewing from Burgess's works.



Figure 14. Tower house [15].

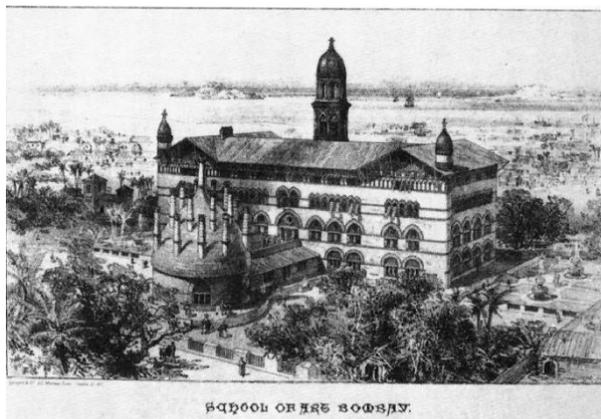


Figure 15. Bombay Art School Proposal [15].

Here, we show a photo of the tower house and a sketch of Bombay Art School designed by Burgess as shown in Figs. 14 and 15, respectively. They have circular parts combined with rectangle body. As designing the Shinkan and the Romon in Takeo-onsen hot spring facilities, western-style elements were brought into Japanese-style construction at the place. Then, commitment to decoration is here, and such as making it vermilion-lacquered, is seen. We think that the way of thinking for design with the motto

of Burgess like his constructions and establishing of fine arts is strongly related to commitment to Tatsuno's decoration.

We also think influences of the way of thinking appear on the Shinkan and Romon in Takeo-onsen through Tatsuno's design. We would like to advance this comparing study between the works of Tatsuno and Burgess.

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