

## An Architectural Assessment on Twin Type Official House of Jatiroto Sugar Factory Jatirotoin Lumajang District

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### Abstract

The complex of Jatiroto Sugar Factory is an area of sugar processing industry which has an old building that still survived until recently. The area of official house an interesting part of this sugar factory complex to be further investigated. The official house building of Jatiroto Sugar Factory is almost 100 years old with a fascinating style. The one of building type is the house with twin type. The twin type house building valued based on its architectural quality by using cultural significance valuation on the building. The aim of this research to find the value of twin type official house building which could be a direction for building preservation, then this building could be maintained its originality. The research method is descriptive evaluative method which would be employed on visual and spatial elements of building. The research result an architectural assessment from the twin type official house of Jatiroto Sugar Factory, Lumajang District, which produces a moderate average value so that routine maintenance and maintenance are required, as well as replacement of damaged and destroyed building elements.

**Keywords:** Architectural Value, Descriptive Evaluative Method, Twin Type Official House

### 1. Introduction

Jatiroto Sugar Factory has a complex area of official house which is located around the factory area. This official house is built in a row along the main road which near to the factory area. This official house built in 1928 and now it is about 92 years old. The building of official house is a house which designed for the employees who have a significant position. This official house building has a unique shape, which can be valued to figure certain government period. On that period of time, it can be seen from a cultural value. The cultural value inside the official house can be seen on facade or inside the building. This official house building has fascinating elements to be examined in this research. The facade element, building element, inner house layout value, until ornament detail can depict a uniqueness which happened in that old period that could not be found in this recent period. The main part which can be seen from this official house building of Jatiroto Sugar Factory is the facade of building. The facade element can be the proponent of a building. The elements on facade as door or window design are able to support the building function and activity.

The visual quality is the most important aspect of a building. This factor is also influential to the visual quality from its surrounding area. The visual character will shape a building character which supports the activity performed inside the building. The Sugar Factory of Jatiroto has this attractive visual character. The building in the area of Jatiroto Sugar Factory is called as *loji* area, which has a special style of Dutch colonial architecture. Regarding to the facade of Dutch colonial building, this building will show its own style. This style basically represents about the certain time at that period. This style becomes a special characteristic from a long time ago which can be identified its shape until activity during that period of time. The cultural activity in a long time ago is a historical value for the building or environment.

The style of Jatiroto Sugar Factory which can be identified is on its visual aspect. The visual character can also influence on spatial character which exists on the building. The Jatiroto Sugar Factory is more than 100 years old and the decay or damage of building begins to appear. It makes the building in the area of Jatiroto Sugar Factory is needed to be preserved. The specific uniqueness owned by Jatiroto Sugar Factory is an interesting aspect to be examined. The change which occurs as the times evolvement has made this building to be neglected and started to damage. The damage on this building will cause the loss of architectural value which is contained within the building.

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This research is aimed to identify the value of official house building which is located in the area of Jatiroto Sugar Factory. The value which is contained in a building can be seen from its physical condition. This value will be a reference to preserve this building. Moreover, this building is a cultural heritage which has special value and meaning and worth to be preserved. The value will be a supportive contribution to increase the physical quality of a cultural heritage building.

## 2. Materials and Methods

This research exerted descriptive evaluative method by explaining the physical condition of building in the research area. The physical condition of building is seen from all elements of building. From the descriptive evaluation on physical building, this research continued to evaluative method. This method aimed to assess the physical building through scoring step. The scoring assessment done due to the physical condition of building that has been explained. Antariksa, (2011) has explained that the evaluative method done by determining the cultural significance value of building according to certain criteria. The criteria determination aimed to assess the building with low, medium, or high grade or use of numerical assessment. The criteria adjusted into the building element conditions. Each grade would have different value quality. The research quality is also used on the different value quality. The score assessment divided into three levels: low for 1, medium for 2, and high for 3 which based on cultural significance value.

- 1) Aesthetical value (E), it seen from a shape condition which still represented an authentic building and also condition of house layout which still proper to the authentic building.
- 2) Historical value (S), it seen from building age. The older age of building would represent the higher value.
- 3) Utility value (G), it seen from the building function which in accordance with the authentic building. The function of building depended on the activity performed in recent time.
- 4) Architectural value (A), it seen from the building elements. The building element value still has similarity or not with the authentic building. The building addition or reductional so noticed.
- 5) Building shape authenticity (B), it seen from the total space or room whether it still same or not to the authentic building. The addition or reductional so included into assessment aspects.
- 6) Maintenance (T), it seen from the level of damage on building element. The percentage of building remain examined from the damage on room and also aspect of building cleanliness.

The low value stated when the physical condition of building much damaged, while the high value stated when the physical condition of building still good. Based on the valuation result, it acquired that the building with a low grade would have more potential for renovation or restoration which enabled this building to lose more authenticity value. On the other hand, when the building has a whole high grade, it would be potential for this building to preserve the authenticity.

This research focused on the twin type official house building which located in the area of Jatiroto Sugar factory. (Figure 1) There two houses which have twin type; the houses addressed on 5<sup>th</sup> and 6<sup>th</sup> Ranupakis Street and another house on 13<sup>th</sup> and 14<sup>th</sup> of the same street. To collect the data, the observation is done directly in the research area to see the physical condition of building. (Figure 2, Figure 3, and Figure 4)



Figure 1. House layout in Jatiroto Sugar Factory, Ranupakis Street.  
Source: (Vembrista, 2017)



Figure 2. House image, 5<sup>th</sup> and 6<sup>th</sup>Ranupakis Street.



Figure 3. House image, 13<sup>th</sup>Ranupakis Street.



Figure 4. House image, 14<sup>th</sup>RanupakisStreet.

### 3. Literature Reviews

The building has a different typology from other buildings which able to be particular characteristics in an area (Harimu *et al.*, 2012; Kariszta *et al.*, 2008). The visual or spatial building character important factors to be investigated in order to identify whether the building needed to be preserved or not (Estin *et al.*, 2017; Fajarwati *et al.*, 2011; Handayani, 2011; Prameswari *et al.*, 2017; Putra & Ridjal, 2017; Sukarno *et al.*, 2014). The maintenance of building would regard this building to be able to fulfill the function as before or give new function. Besides, the preservation direction could also make this building as the image of area (Azizu *et al.*, 2011; Permataasri *et al.*, 2013) which has a specific historical value and future learning for the society also the local government asset (Kurniawan, 2017).

The visual character of building generally identified on façade, color, texture, material, window type, and roof (Antariksa, 2012) has defined from (Ashfa, 2007). Meanwhile, according to (Krier & Vorreiter, 1988), he has explained that the composition of façade should consider several requirements from vertical and horizontal structure, material, color, and decorative element aspects. (Krier & Vorreiter, 1988) has also divided the supporting architectural elements of façade: 1).

The door would be a direction set of room inside the building. The proportion of a door which is mostly used 1:2 or 1:3. The size of door could indicate the different meaning. The spatial function could affect the door position. Moreover, the other aspect which could affect the door position room boundary formed by a spatial relation; 2). Window. The window arrangement should consider these aspects: Geometric proportion of façade, Composition arrangement, Consideration on geometric proportion harmony, Arrangement between windows, Window should be able to show certain symbols within a façade. The window type could be categorized into several basic types. The window type divided into four: a). Turning, horizontal, and vertical type; b). Hanging, side hanging, top hanging, bottom hanging type; c). Folding type; d). Sliding, vertical, and horizontal type; 3). Wall: The building wall a part of building which could present an art arrangement of building. The wall the most biased part to be exposed for a building work; 4). Roof. The roof a head part of building which propped the other building parts, for example the wall; 4). Sun shading. The façade adapted to the weather because of its ornaments on wall; it often named as sun shading.

According to Lippsmeier (1980), the building façade element has some components which might affect the building façade: roof, wall, and floor. The building face identified from the roof as head of building, wall, door, and window as the body of building, and floor as the base of building (Handayani, 2011; Harimu *et al.*, 2012; Kurniawan, 2017; Putra *et al.*, 2017). The building part consist of listplank, ventilation, and ornament too (Handayani, 2011). The element of living house building of Jatiroto Sugar Factory into part of roof, wall, column, and floor (Pamungkas, 2000). The building part into two characters: visual and spatial character. The visual character identified from roof, wall, balustrade, door, window, column, plafond, and floor. While, the spatial character divided into room organization, room design, room orientation, room circulation, room function, and room connection (Estin *et al.*, 2017; Fajarwati *et al.*, 2011; Prameswari *et al.*, 2017; Sukarno *et al.*, 2014). The building mass and blueprint can be assessed too (Estin *et al.*, 2017).

The building elements that have been mentioned above by some researchers would be valued in sub-variable. The sub-variable used to identify the building part which then valued by using certain indicators. Some researchers have said that the sub-variables used to identify building visual element color, texture, material, detail, and motive (Estin *et al.*, 2017; Fajarwati *et al.*, 2011; Handinoto, 1996; Harimu *et al.*, 2012; Krier & Vorreiter, 1988; Prameswari *et al.*, 2017; Putra *et al.*, 2017; Sukarno *et al.*, 2014).

The physical character of living house building is shaped by the arrangement of building elements. The mass of colonial living house building massive and has a whole mass or two building masses which could be combined with the circulation that has roof part which seemed like a room. The roof shape on colonial living house building in saddle or shield roof shape or even both of them with the cover of clay tile. Most of the roof shapes a pointed roof. Further, that there two building types in Jatiroto Sugar Factory: stilts house and basic house (Pamungkas, 2000).

The type of building wall divided into painted wall and wall with additional ornaments in forms of brick or rivers tone. The building façade which generally seen as the appearance of living house in colonial period seemed to be glorious and monumental. The type of opening element on the building comprised of window, door, balustrade, and ventilation. The wood material of door often added with the element of *krepyak* and glass materials. The majority of colonial house building style in Indonesia implemented *indische* empire style. The building floor in colonial period used tile and stucco plaster. The benefit of *terraszso* tended to make the inner room cooler. The colonial living house building commonly has difference of height between outer floor and inner floor which aimed to reduce sand or dust (Karisztia *et al.*, 2008).

The character of living house building with symmetrical building façade would follow the blueprint and have door as the predominate element on building façade (Fajarwati *et al.*, 2011). Basically, the colonial living house building is also decorated by building columns and other additional building elements. The identification standard to classify the architectural building must insert these five elements: Massing, Façade composition, Windows and doors, Element and details, Color and material combination (Adenan *et al.*, 2012; Parolek *et al.*, 2008). According to (Handinoto, 1996), the building elements which could support the façade or building: 1). Gable, the ornament added on the façade of building, triangular shape, and follow the roof formation. The gable is also referred to a triangular part which located on the side of building and under the chimney; 2). Tower, the tower has various shapes, it could be round, hexagon, slender rectangular, or other shapes and combined to the gable in front of the building tower which functioned as the marker of entrance door on the front of house building; 3). *Dormer*, the window on roof was functioned for ventilation and lighting; 4). *Tympanon* (wind-catcher), it is a symbol of pre-Christian period in form of sun wheel and horse head. The use of heart and *salib* is an embodiment of Christian period symbol; 5). Balustrade, it is a building guardrail which usually used cast-concrete material which functioned as the boarder for balcony or building deck; 6). *Bouwenlichtb* (ventilation), it a building opening which functioned for thermal and health convenience, as to circulate the air into and out of building,

Therefore, the size of *bouwenlicht* adjusted to the weather condition and its positioning avoided from the direct sunlight; 7). *Windwijzer* (weather vane), it an additional ornament which functioned as the weather vane and its position is on building rooftop; 8). *Nok Acroterie* (rooftop decoration), this ornament initially made from reed leaves which were utilized in the farmers' house in Dutch, while in Indonesia, this ornament made from cement or concrete materials. This ornament laid on the top part of roof; 9). *Geveltoppen* (top ornament on the front roof), the shape of *voorschot*, it a triangular ornament which laid on the front house and decorated by wooden board in vertical shape which contained of a symbolic meaning. The *oelbord/oelenbret* a wooden board carved and depicted in the shape of inverted swan with the meaning of light bearer or territory owner. Sometimes, the *indische* symbol substituted by a shape of *kalpataru* tree and *macelaar* decoration in form of wooden board which seemed as palm tree or vertically tapped human; 10). Decoration on Building Body, column decoration in colonial building has three famous types: Doric, Ionic, and Corinthian type. The addition of building column mostly found on classical colonial style with Roman or Greek style. Those columns usually exposed especially on the porch part of colonial building. (Table 1)

Table 1. Building Parts According to Researchers

No.	Building Element	Sub-variable
1.	<b>Roof</b> (Kuniawan, 2017); (Handayani, 2011); (Krier, 1988); (Harimu <i>et al.</i> , 2012); (Putra <i>et al.</i> , 2017); (Sukarno <i>et al.</i> , 2014); (Fajarwati <i>et al.</i> , 2011); (Estin <i>et al.</i> , 2017); (Prameswari <i>et al.</i> , 2017); (Pamungkas, 2000)	
2.	<b>Wall</b> (Kuniawan, 2017); Krier (1988); (Harimu <i>et al.</i> , 2012); (Putra <i>et al.</i> , 2017); (Sukarno <i>et al.</i> , 2014); (Fajarwati <i>et al.</i> , 2011); (Estin <i>et al.</i> , 2017); (Prameswari <i>et al.</i> , 2017); (Pamungkas, 2000)	
3.	<b>Door</b> (Kuniawan, 2017); (Handayani, 2011); Krier (1988); (Harimu <i>et al.</i> , 2012); (Putra <i>et al.</i> , 2017); (Sukarno <i>et al.</i> , 2014); (Fajarwati <i>et al.</i> , 2011); (Estin <i>et al.</i> , 2017); (Prameswari <i>et al.</i> , 2017); (Parolek <i>et al.</i> , 2016)	<b>Colour, texture, material, detail, and motive</b> (Handinoto, 1996); (Krier, 1988); (Harimu <i>et al.</i> , 2012); (Putra <i>et al.</i> , 2017); (Sukarno <i>et al.</i> , 2014); (Fajarwati <i>et al.</i> , 2011); (Estin <i>et al.</i> , 2017); (Prameswari <i>et al.</i> , 2017)
4.	<b>Window</b> (Kuniawan, 2017); (Handayani, 2011); Krier (1988); (Harimu <i>et al.</i> , 2012); (Putra <i>et al.</i> , 2017); (Sukarno <i>et al.</i> , 2014); (Fajarwati <i>et al.</i> , 2011); (Estin <i>et al.</i> , 2017); (Prameswari <i>et al.</i> , 2017); (Parolek 2016)	
5.	<b>Floor</b> (Kuniawan, 2017); (Harimu <i>et al.</i> , 2012); (Estin <i>et al.</i> , 2017); (Prameswari <i>et al.</i> , 2017); (Pamungkas, 2000)	
6.	<b>Column</b> (Sukarno <i>et al.</i> , 2014); (Fajarwati <i>et al.</i> , 2011); (Estin <i>et al.</i> , 2017); (Prameswari <i>et al.</i> , 2017); (Handinoto, 1996); (Pamungkas, 2000)	
7.	<b>Ornament</b> (Handayani, 2011)	

#### 4. Research Findings

The first house is a house which addressed on 5<sup>th</sup> and 6<sup>th</sup>Ranupakis Street. This house is in twin type building which could be seen from the building façade. Generally, the house shape dominated by rectangle shape on the blueprint and triangular on the front part. The blueprint or front of first house building is symmetrical. The room arrangement inside the building also split into sides and equal proportion. The symmetrical building could be identified by drawing a vertical line on the blueprint. The total space on whole building mass is 30 rooms. Furthermore, the building orientation directed to northeast.

The building roof is in saddle shape and ground tile material. On the front area of building, the saddle roof got a level difference, so the smaller saddle roof was positioned on the upper part which would affect to stacked roof. On the garage area, the roof is in shield shape, while the back area in saddle shape roof the roof has declivity level of 40°. (Figure 5)

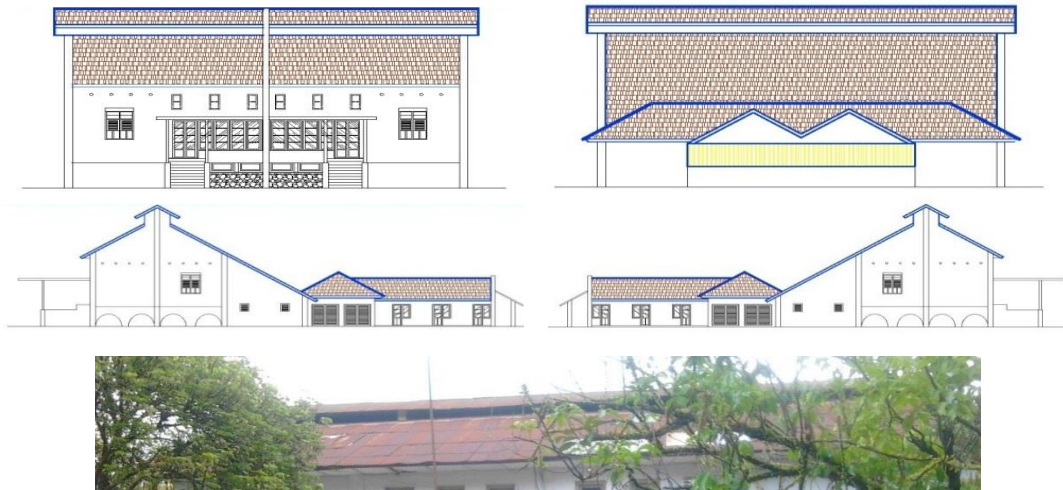


Figure 5. Roof shape of first housespace.

The wall became a room divider which exerted brick wall and door as the connector among the rooms. The door made from wooden and glass material. The door with ornament is in a hollow rectangle and inverted diagonal trellis decoration. The window in first house has seven types of window with wooden and glass material. (Figure 6)



Figure 6. Door and window shape of first house.

The floor made from hexagonal tile materials with dimension of 20cm x 20cm. the hexagonal tile arranged to resemble flowers with different colors, which raised the ornament effect on the floor pattern. The column in front porch of house used cast concrete material with dimension of 30cm at the bottom and 15cm at the top part. The height of column is approximately 4.6m. (Figure 7)



Figure 7. Floor pattern shape of first house.

The assessment analysis on cultural significance value based on these criteria: aesthetical value, historical value, utility value, architectural value, shape authenticity value, and maintenance value. The assessment is done by examining the value quality result which would be divided into three categories. (Table 2)

Table 2. Architectural Assessment of First House

No.	Variable of Architectural Criteria	Score of Cultural Significance Criteria						Score Quality	Assessment
		E	S	G	A	B	T		
1.	Roof	3	2	3	3	3	2	16	High
2.	Wall	3	2	3	2	3	2	15	Medium
3.	Door	3	2	3	3	3	2	16	High
4.	Window	3	2	3	3	3	2	16	High
5.	Floor	3	2	3	3	3	2	16	High
6.	Column	2	2	3	2	2	2	13	Medium
7.	Ornament	2	2	2	2	2	2	12	Medium
Total								104	
Mean								14,9	Medium

The architectural mean vale on first house 14,9, thus, it referred to the medium potential assessment of preservation. The result of medium architectural assessment would enable the building to get a medium change or renovation, so the building did not change wholly. The damaged part should only be restored. The damage level of first house in the part of building elements as wall and roof parts. The bottom part of wall is old and discolored. The most of wall and roof parts collapsed and crumbled. (Figure 8)



Figure 8. Building decay of first house.

The second house a twin type house building which could be identified from the front building appearance. Commonly, the shape of house is dominated with rectangle shape on the blueprint, and triangular on the exterior. The blueprint or exterior of second house is symmetrical. The room arrangement inside building is also split and equally proportion. The building orientation headed to east. The total room in these second house 15 rooms on a single building mass, so the total space are 30 rooms on two building masses. (Figure 9)



Figure 9. Roof shape of second house.

The wall is a divider between rooms which used brick wall and door as the connector between rooms. The door made from wooden and glass material with the total of six door types. The window of second house has nine types which made from wooden and glass material. The certain window is also in *jalousi* model. The floor made from tile material with dimension of 20cm x 20cm. The building ornament on porch area made from cast concrete material. (Figure 10)



Figure 10. Door and window shape of second house.

The assessment analysis on cultural significance value based on these criteria: aesthetical value, historical value, utility value, architectural value, shape authenticity value, and maintenance value. The assessment is done by examining the result of value quality which would be divided into three categories. (Table 3)

Table 3. Architectural Assessment of Second House

No.	Variable of Architectural Criteria	Score of Cultural Significance Criteria						Score Quality	Assessment
		E	S	G	A	B	T		
1.	Roof	3	2	3	3	2	1	14	Medium
2.	Wall	3	2	3	3	2	1	14	Medium
3.	Door	3	2	3	3	3	2	16	High
4.	Window	3	2	3	3	3	2	16	High
5.	Floor	2	2	3	3	3	1	14	Medium
6.	Column	2	2	2	2	3	2	13	Medium
7.	Ornament	2	2	2	2	3	2	13	Medium
							Total	100	
							Mean	14,3	Medium

The architectural mean value on second house 14,3, thus, it referred to a medium potential assessment of preservation. The medium assessment affected the second house to deserve the medium renovation level. The building parts which must be renovated were collapsed and crumbles roof. The wall part must be cleaned. Moreover, the element of door and window is still in a good condition. (Figure 11)



Figure 11. Building decay of second house.

**5. Conclusion**

The architectural assessment value on two twin type official houses in the area of Jatiroto Sugar Factory referred to the score 14,9 and 14,2. Thus, it resulted to the mediate potential assessment. The medium value made those twin type houses to be included into a medium potential assessment of preservation.



The medium potential assessment was categorized into conservation or rehabilitation. The level of physical renovation which allowed in this assessment is medium category. Visually, the roof and wall part of building showed the high score to have renovation by painting in original similar color. The hollowed roof part is replaced by new material plafond with the color of original building. The floor, door, and window needed to a periodic maintenance by cleaning up regularly and painting the moldy part. If the door and window broken, they should be replaced by the new material which could resemble the original material. The original material made from wood, so it could be maintained by varnish coating in order to make the durable door and window, and the last step was repainting.

Spatially, the room pattern in this house building enough to maintain the current room pattern or arrangement. To reutilize the empty rooms due to the original building function or utilize the empty rooms for new function to prevent empty space neglect. In addition, it should maintain the similar room layout as the original building. The reutilization of empty room is also able to keep the space cleanliness inside the building.

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