

Adaptive reuse approach toward changes in the visual character of conservation buildings

A case study of Semarang Gallery

Amalia Devitasari*, Atik Suprapti, Bangun I. R. Harsritanto 

Master of Architecture Study Program, Faculty of Engineering, Universitas Diponegoro
Jl. Prof. Soedarto SH, Tembalang, Semarang, Indonesia



ARTICLE INFO	ABSTRACT
<p><i>Article history:</i> Received May 27, 2021 Received in revised form June 11, 2021 Accepted July 04, 2021 Available online December 01, 2021</p> <p><i>Keywords:</i> Adaptive reuse Conservation Semarang gallery Visual character</p> <p>*Corresponding author: Amalia Devitasari Master of Architecture Study Program, Faculty of Engineering, Universitas Diponegoro, Indonesia Email: amaliadevitasari@student.undip.ac.id</p>	<p><i>Semarang Gallery is the conservation project result of Cultural Heritage Buildings reused with new adaptive functions, which tend to cause changes in the visual character of the building. Therefore, this study aims to determine the level of change in the visual character of the exterior, interior, and close range of Semarang Gallery due to the adaptive reuse approach. This is a qualitative research with data analyzed using graphical and descriptive methods. The analysis showed that the adaptive reuse approach changes the typology of the existing building, which requires adapting to technical improvements in almost all aspects, thereby causing changes to the visual character of the exterior, interior, and close range to different significance levels. The result showed that changes that are in line with conservation principles increase the value of the parameter function, while those that are not in line eliminate the uniqueness of the visual character.</i></p>

Introduction

Semarang Gallery is a conservation project listed in the “Inventory and Documentation of Cultural Heritage Buildings and Areas in Semarang City” published by Bappeda (Development Planning Agency at Sub-National Level) in 2006 (Panggabean 2014). This building has a historical significance and is used for various functions. Initially, the existing site was used as a priest's residence and a place of worship for Catholics, although it was later destroyed in 1822. However, the new Semarang Gallery was built in 1918. It was originally used as an insurance company, namely De Indische Lloyd, in 1937. Afterward, it was used for several purposes, including a motorcycle warehouse, pharmaceutical company, and finally as a syrup factory in 1998. However,

after being abandoned for years, the ownership of the building was transferred to Chris Dharmawan, a collector and art lover, in 2007. Dharmawan reused the building as an art gallery after the conservation process was completed in 2008. Furthermore, in 2021, a café that served as a supporting function was opened.

Conservation is a general term used to describe the various activities needed to maintain the sustainability of a Cultural Heritage Building (UNESCO Office Jakarta and Kemendikbud RI 2015). Its principles have been regulated in Law Number 11 of 2010 concerning Cultural Conservation Building (Sujana 2017). Semarang Gallery is different from other ordinary buildings due to its cultural significance (Australia ICOMOS 2013). During the conservation process, certain contrasts were discovered. In

addition, various damages were also found, thereby eliminating the uniqueness of its visual character. Therefore, the preservation architects were faced with the challenge of renovating the building for other new functions. This is known as the adaptive reuse approach (SPUR and San Francisco Architectural Heritage, “Adapt, Transform, Reuse”), because users were no longer satisfied with the building and its visual characters (Purwantiasning, Mauliani, and Aqli 2013). The adaptive reuse approach comprises 2 aspects due to changes in building functions (Shahi et al. 2020). New additions led to several impacts on the environment, scale, contrast, mass, rhythm, and texture (Disli 2019).

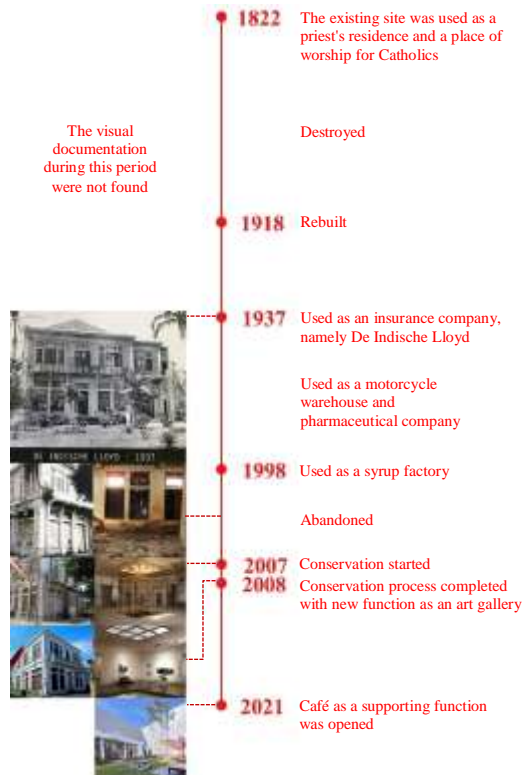


Figure 1. Timeline of the journey in using Semarang gallery's existing building from pre to post-conservation with a new function as an art gallery and cafe

The implementation of the functional changes is related to the typological approach, while the new additions are associated with the technical aspect. These are strategic approaches in reusing Cultural Heritage Buildings to meet current needs (Plevoets and Van Cleempoel 2012). In converting this building into an art gallery and

café, the preservation architects encountered several technical difficulties considering the new additions to the interiors and exteriors limited by the existing structural layout. Furthermore, these additions were strategically recommended to distinguish between the old and the new structures, in accordance with the fact that the existing building no longer meets the current space requirements (Torres 2009), while taking into account compatibility with mass, size, scale, and architectural elements (Grimmer and Weeks 2010).

Adopting “The Architectural Character Checklist” in the “U.S. Preservation Briefs 17” by Nelson (1988), changes in the visual character of the Semarang Gallery conservation building were identified by closely analyzing both the exteriors, interiors, and close range. Changes that are inconsistent with the conservation principles regarding these 3 aspects eliminate the building's uniqueness. According to Kuipers and de Jonge (2017), the most difficult layers to renovate in a Cultural Heritage Building are the site, facade, and structure. Renovating these 3 aspects means changing the Cultural Conservation Building as a whole. Meanwhile, the interior layers, supporting facilities, and layout encounter slight changes. This study aims to determine the level of change in the exterior, interior, and close-range visual characters of the Semarang Gallery conservation building due to the adaptive reuse approach.

Method

This study is focused on the level of change in the visual character of the Semarang Gallery conservation building based on certain parameters, such as facade, roof, and opening (exterior), order of space, interior features, and exposed structures (interior), and textures (close-range), using the adaptive reuse approach. A qualitative method was adopted, in addition, the data collection and analysis process are reported as follows.

1. Primary data in the form of information on the current conditions of the exteriors, interiors, and close-range visual characters of the Semarang Gallery was obtained through field observations after the conservation process.
2. Primary data in the form of information on the historical building along with the existing condition of its visual character from the pre

to the post-conservation processes was collected through in-depth interviews with the owners and preservation architects. This was supported by the visual documentation obtained from the building manager.

3. Secondary data in the form of theoretical information obtained from books, guidelines, journals, and articles related to the adaptive reuse approach and visual characters in the conservation process was extracted from the literature study as complementary.
4. Graphical analysis in the form of digital depictions was carried out on the existing conditions of the Semarang Gallery's visual characters before and after the conservation process.
5. Descriptive analysis in the form of explanations, demonstrations, and descriptions of historical data along with the Semarang Gallery conservation process elaborated with theoretical information is shown in a tabular form.
6. The concluding aspect was in the form of findings from the exterior, interior, and close-range visual characters of the Semarang Gallery conservation building using the adaptive reuse approach based on the predetermined parameters.

Result and discussion

Adaptive reuse approach to changes in exterior visual character

The level of change in the exterior visual character using the adaptive reuse approach is determined by analyzing its impact on the functions and new additions to the facade, roof, and openings, shown as follows.

Façade

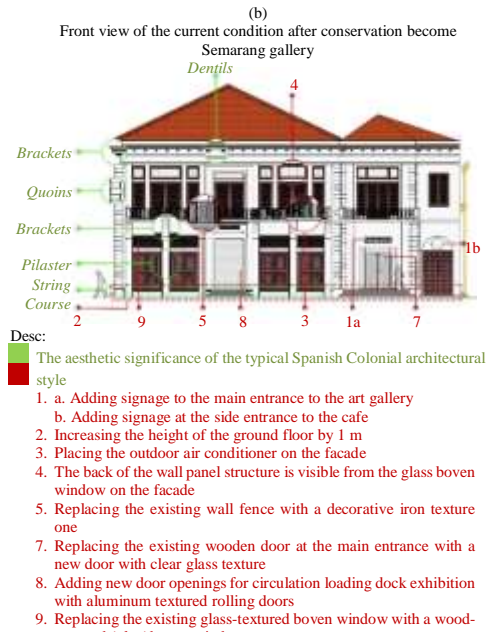
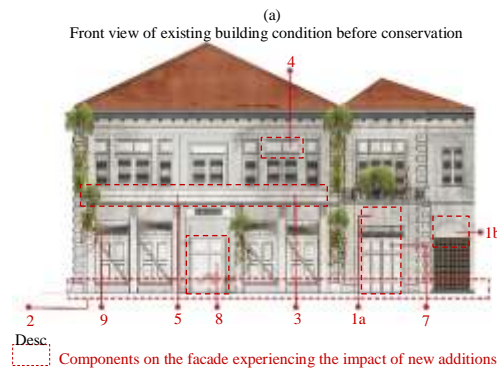
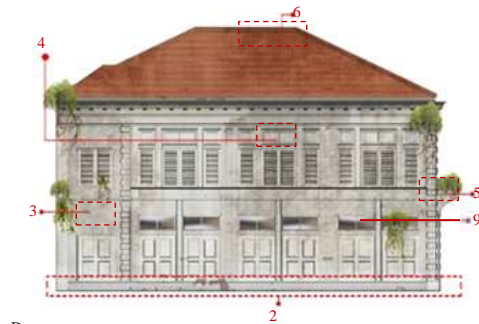


Figure 2. (a) Front view of existing building conditions before conservation. (b) Front view of the current condition after conservation as a result of the new additions

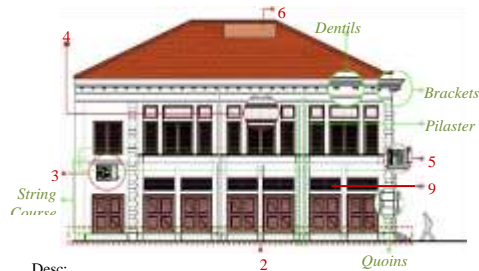
Figures 2, 3, and 4 show that the changes as an art gallery and café require new additions to the facade of the Semarang Gallery because the initial condition was unsatisfactory. First, additional signage proportional to the size of the opening door, serving as a form of limited intervention, was discovered at the main and side entrances to the art gallery and café, respectively, to define its new functions. Second, the ground floor was increased by 1 m in height to prevent chemical damage due to tidal water. Third, the existing wall fence on the balcony was replaced with a similar texture and decorative model to maintain the rhythm of the facade appearance. Therefore, at first glance, it does not appear like new elements were added. Fourth, an outdoor AC installation is placed on the facade to eliminate the distinctiveness of the exterior visual character because it causes pollution (Soeroso 2007). On the contrary, its placement on the facade led to the installation of air conditioners in the interior features of the art gallery. Fifth, the back of the wall panel structure is visible from the glass boven windows on the facade. This forms a strategic intervention to define the new functions of an art gallery.

(c)
 Side view of existing building condition before conservation



Desc: Components on the facade experiencing the impact of new additions

(d)
 Side view of the current condition after conservation become Semarang Gallery

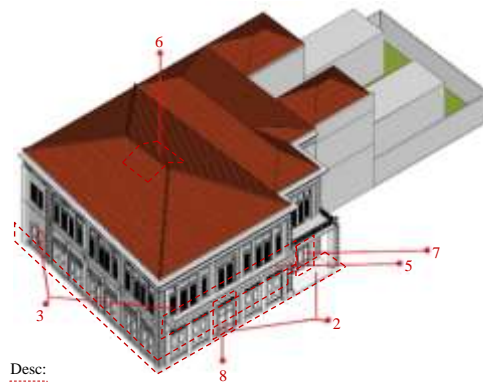


Desc:
 ■ The aesthetic significance of the typical Spanish Colonial architectural style
 ■ The impact of the new addition to defining function changes:
 2. Increasing the height of the ground floor by 1 m
 3. Placing the outdoor air conditioner on the facade
 4. The back of the wall panel structure is visible from the glass boven window on the facade
 5. Replacing the existing wall fence with a decorative iron texture one
 6. Replacing the existing clay roof tile with a clear glass texture

Figure 3. (c) Side view of existing building condition before conservation. (d) Side view of the current condition after conservation as a result of the new additions

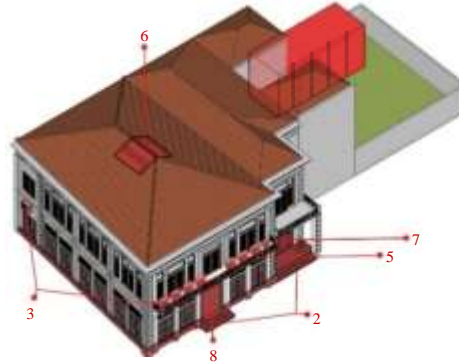
Figures 2, 3, and 4 prove that the new additions to the facade do not cause a significant change in the exterior visual characters. The preservation architects failed to change the facade rhythm of the Semarang Gallery, which has a distinctive aesthetic significance similar to the Spanish Colonial architectural style. The new additions tend to increase its functional values, which are important for art galleries and cafes' performance by adding signage and increasing the ground floor height. However, the new additions have a contrasting impact on the interior features, such as causing visual pollution on the facade, thereby eliminating the uniqueness of its exterior.

(e)
 Axonometry of the existing facade condition before conservation



Desc: Components on the facade experiencing the impact of new additions

(f)
 Axonometry of facade current condition after conservation become Semarang Gallery



Desc:
 ■ The impact of the new addition to defining function changes:
 2. Increasing the height of the ground floor by 1 m
 3. Placing the outdoor air conditioner on the facade
 5. Replacing the existing wall fence with a decorative iron texture one
 6. Replacing the existing clay roof tile with a clear glass texture
 7. Replacing the existing wooden door at the main entrance with a new door with clear glass texture
 8. Added new door openings for circulation loading dock exhibition with aluminum textured rolling doors

Figure 4. (e) Axonometry of the existing facade condition before conservation. (f) Axonometry of the current facade condition after conservation as a result of the new additions

Roof

Figures 3 and 4 show that changes to the roof structure have an insignificant impact on the exterior visual character. This is because it is invisible from the main facade or front view and is only felt in the interior features, as shown in figures 3 and 4. These changes are due to the impact of the clear glass texture used to replace the clay type on the existing roof tile perpendicular to the skylight and void areas. The replacement is a strategic intervention important

for the art gallery performance. Figures 2, 3, and 4 also show that the preservation architects failed to change the shape of the typical pyramid roof of the colonial era.

Opening

Figures 2, 3, and 4 show that almost all exterior door and window openings of the Semarang Gallery were not used for the proper circulation of air and natural lighting into the building and enjoying views. This led to certain changes besides the art gallery requires the addition of wall panels on the interior features. It also serves as a strategic intervention to cover the wall sides with openings to be used to exhibit art works. The new additions to the interior features have a contrasting impact on the openings that tend not to function properly, apart from doors at the main and side entrances opened to visitors. Moreover, a new opening with aluminum textured roller doors was also added for the exhibition of the loading dock, as shown in number 8 of figures 2 and 4. The preservation architects replaced the existing wooden door at the main entrance with clear glass textured material, as shown in number 7 of figures 2 and 4. They also replaced the existing glass-textured boven window with a wooden jalusi to restore its uniqueness, as shown in number 9 of figures 2 and 3.

Figures 2, 3, and 4 show that changes in the function and texture of these openings have an insignificant impact on the exterior visual characters. They were renovated to increase their functions which are important for the performance of art galleries and cafes'. The preservation architects failed to change the pattern and shape with a gigantic size typical of colonial-era relics in the form of jalusi wooden texture (Purnomo, Waani, and Wuisang 2017).

Adaptive reuse approach towards changes in interior visual character

The level of changes in the interior visual character of the Semarang Gallery conservation building using the adaptive reuse approach was determined by analyzing its impact on the order of space, inner features, and exposed structures as follows.

Order of space

Figures 5 and 6 show that the impact of these changes on the order of space were identified by analyzing the existing pre and post-conservation current plan. The preservation architects changed

the order of existing undefined spaces to accommodate certain activities. This was realized through strategic intervention to add new spaces in the existing building (Wong 2016). This aims to increase the values of relevant spatial functions in respect to the art gallery and café performances while paying attention to the structural layout of the existing interiors and exteriors (W. Maer, Lumantarna, and M. Laurens 2012).

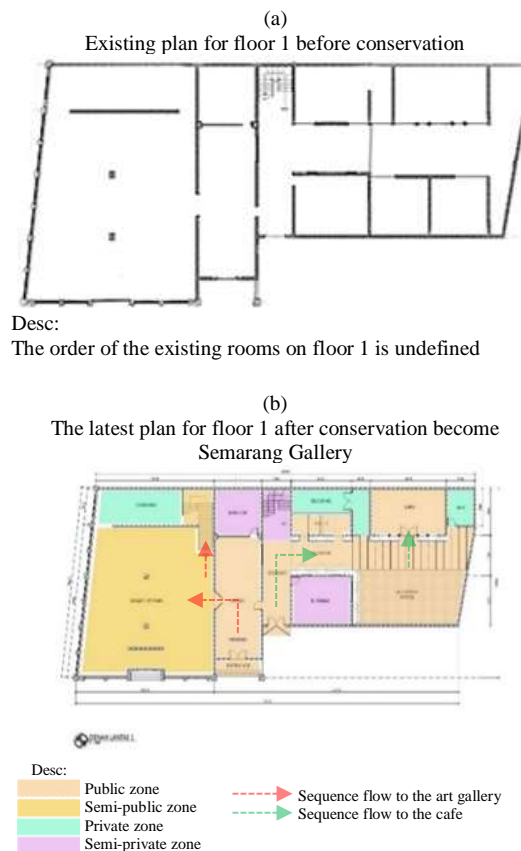
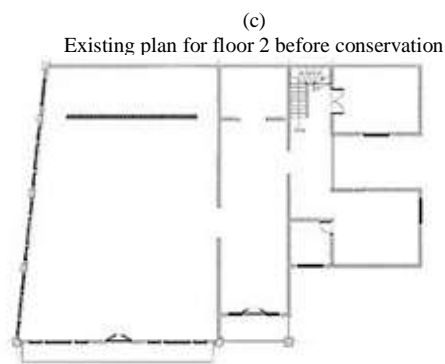


Figure 5. (a) Existing plan for floor 1 before conservation. (b) The latest plan for floor 1 after conservation as a result of the new addition



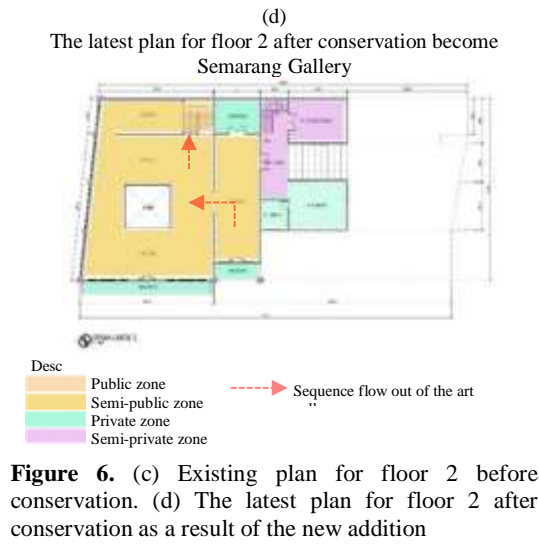


Figure 6. (c) Existing plan for floor 2 before conservation. (d) The latest plan for floor 2 after conservation as a result of the new addition

Consequently, the new spaces are grouped into 4 zones. This includes a public zone comprising the main and side entrances, foyer, lobby, café, corridor, toilet, and outdoor spaces. The semi-public zone consists of an art gallery, while that of the private includes a warehouse, electrical mechanical, and service rooms, as well as the manager's bedroom. The last is the semi-private zone which includes the living, and management rooms, balcony, and guest bedroom.

The visitors' movements were usually from the art gallery to the café or vice versa. Figures 5 and 6 show that changes in the order of spaces caused a significant impact on the interior visual characters because the sequence or narrative flow of visitors' movements becomes non-linear or irregular.

Interior features

Figures 7 and 8 show certain changes in the internal features, which significantly impacted the interior visual character. The addition of functional elements creates a contrasting effect changing the space scale, thereby causing it to become double volume (Sari 2005). These functional elements consist of wall partitions, panels, stairs, and voids, as a form of strategic intervention to define an art gallery.

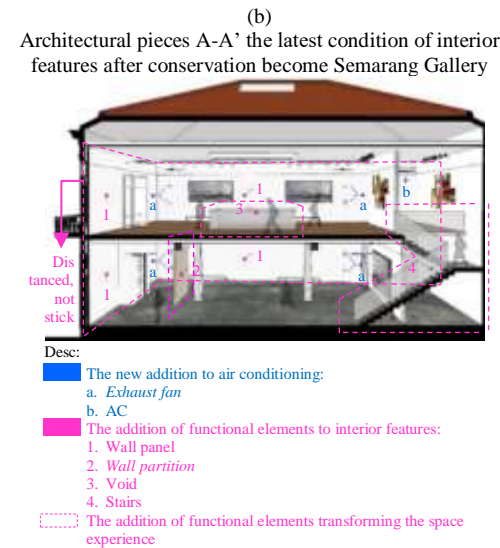
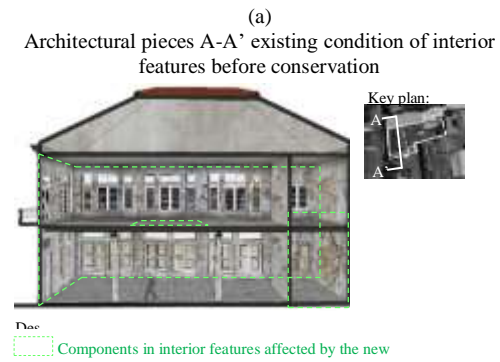


Figure 7. (a) Architectural pieces A-A' existing condition of interior features before conservation. (b) Architectural pieces A-A' latest condition of interior features after conservation as a result of new additions



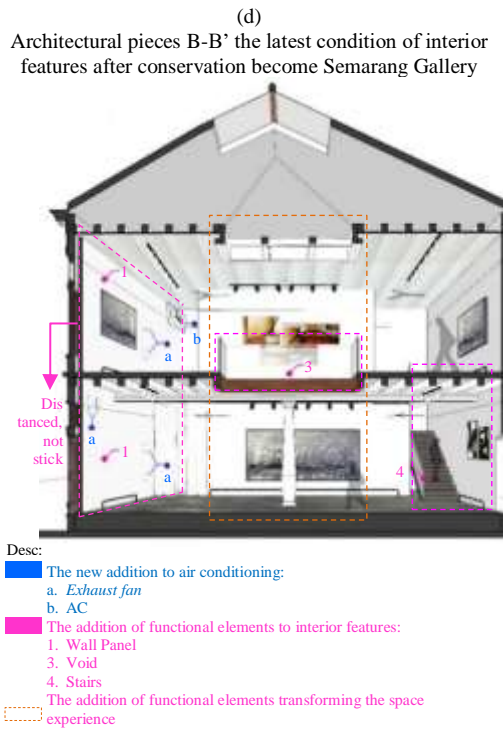


Figure 8. (c) Architectural pieces B-B' existing condition of interior features before conservation. (d) Architectural pieces B-B' latest condition of interior features after conservation as a result of new additions

The interior location of the functional elements is based on certain considerations, which refers to the gigantic scale of the building while paying attention to the existing interior structural layout. Therefore, it is proportional to exhibit 2 and 3-dimensional works of art. Figures 7 and 8 shows that the addition of wall panel elements is built with an unattached structure, distanced from the existing wall therefore it tends to be dismantled without leaving a trace. The addition of a wall partition element distracts the visitors as well as the exhibition loading dock. The stairs and void elements are strategically placed at an easy-to-see location to attract visitors, namely in the room corner and between the 2 existing columns, which are right at the center of the art gallery. These interventions create a transparent link between the 1st and 2nd floors and the artworks on display, thereby increasing the interior features' functional values after conservation. Figures 7 and 8 also show the installations of air conditioners and exhaust fans placed on the wall panels.

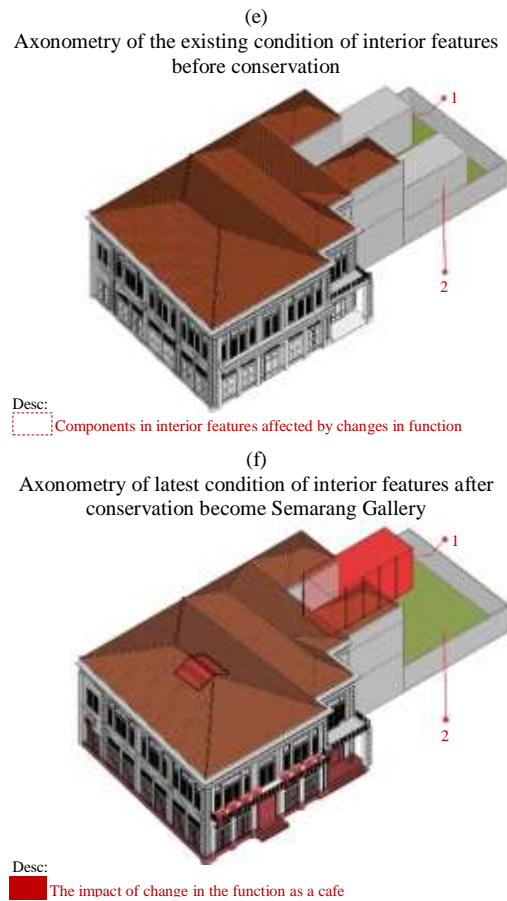


Figure 9. (e) Axonometry of the existing condition of interior features before conservation. (f) Axonometry of latest condition of interior features after conservation as a result of new additions

Figure 9 number 1 shows that structures contradicting the cultural significance were demolished. It is currently being converted into an outdoor space, enjoyed by visitors, and relevant for its performance. Figure 9 number 2 shows a newly erected room. In addition, rescue and physical repairs were carried out using concrete. The structures were currently converted into a café, thereby resembling a new building in the Semarang Gallery (Lucchi 2020).

Exposed structure

Figures 8 and 9 show that changes in the exposed structure caused a significant impact on the interior visual characters. The existing teak wood beam shape changes and seems incomplete due to the impact of the void addition that was excluded in the building's initial plan.

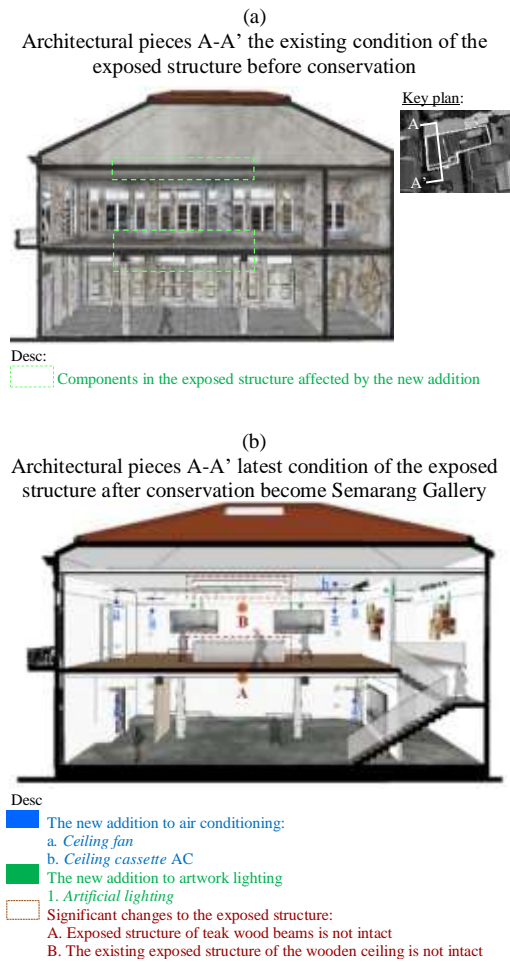


Figure 10. (a) Architectural pieces A-A' the existing condition of the exposed structure before conservation. (b) Architectural pieces A-A' latest condition of the exposed structure after conservation as a result of new additions

Furthermore, the existing wooden ceiling shape was also not intact. This is due to the impact of the newly added exposed structure in the form of skylights as a result of reusing the remaining pieces of the existing teak wood beams combined with a frosted glass texture in a transparent system. The placement is perpendicular to the void, thereby allowing natural light to penetrate the art gallery as a strategic intervention for daylighting.

Figures 10 and 11 show artificial lighting installations, ceiling fans, and cassette AC to the existing teak beams and wooden ceilings. Besides, the interventions increase the function of the exposed structure, which is important for art gallery performance.

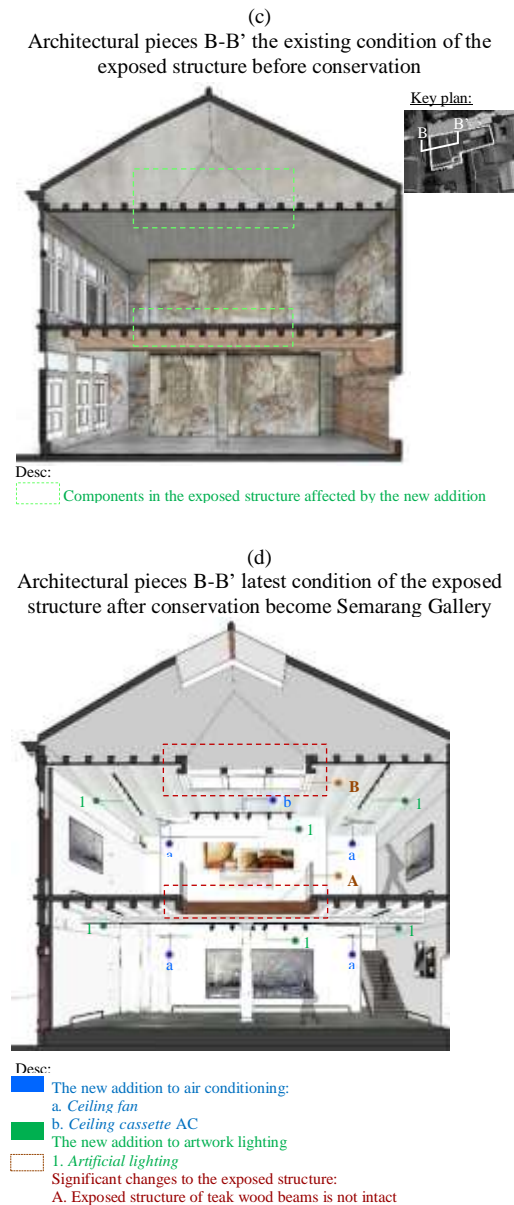


Figure 11. (c) Architectural pieces B-B' the existing condition of the exposed structure before conservation. (d) Architectural pieces B-B' latest condition of exposed structures before conservation as a result of new additions

Adaptive reuse approach toward changes in close range visual characters

The level of change in the close-range visual character of the Semarang Gallery conservation building using the adaptive reuse approach is determined by analyzing its impact in respect to dissimilarities in functions as well as the new textural additions, which are reported as follows.

Texture



Figure 12. Significant changes in the existing exterior and interior textures due to the various types of damage before conservation

Figure 12 shows that the existing texture of Semarang Gallery has undergone significant changes even before conservation. However, during that period, several changes in function lacked a preservation basis. The previous owners handled the existing building like an ordinary one. The traces are evident in the visual documentation, which shows that significant changes in the existing texture occurred because of the various damages. This was due to the fact that the building was abandoned after improper utilization and poor maintenance before conservation.



The latest texture of the main facade



Maintained existing textures Added new textures
Figure 13. The latest texture of the main facade after conservation

Figure 13 shows that even though there are changes to the new functions due to the adaptive reuse approach, during maintenance, the preservation architects fixed the existing damaged textures in accordance with conservation principles. This was realized by maintaining the existing texture that was still intact, including restoring its original condition, which became its specialty. The figure shows the textural restoration of the existing white-painted external walls (figure 13 number 4). The preservation and restoration of the metal texture on the side entrance door (figure 13 number 3) and also the clay texture on the existing roof tile (figure 13 number 2). Although, the contrasting effect of the selected color type in respect to the modern wood paint seems unable to reveal its original texture in the existing outer doors and windows (figure 13 numbers 1 and 4). Figures 13 and 14 also show that the preservation architects tried to add new compatible textures with the existing ones. Therefore, both new and existing textures are expressive in respect to time. These textures are found on the main external facade. This includes the aluminum texture on the rolling door for the exhibition loading dock (figure 13 number 5). Andesite stone texture on the main entrance steps and the door (see figure 13 number 6). The texture of iron is painted white on the decorative fence (figure 13 number 7) and that of clear glass on the new main entrance door (figure 13 number 8).



Art gallery interiors floor 1

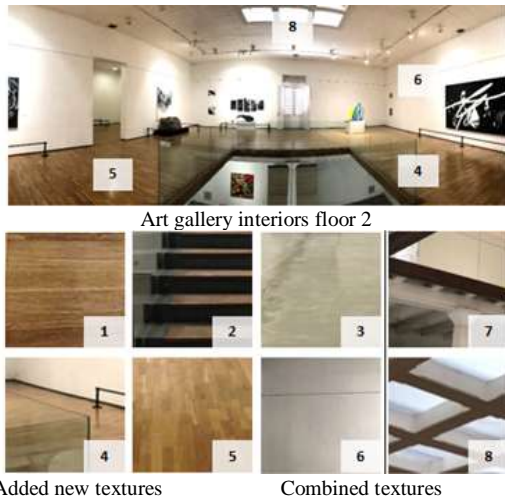


Figure 14. The latest interior texture after conservation

Furthermore, new and modern textures are also found in the art gallery interiors, such as marble ceramic on the partition wall (figure 14 number 1), a combination of exposed concrete, wood, and clear glass on the stairs (figure 14 number 2), epoxy exposed concrete on the first floor (figure 14 number 3), clear glass on railing voids (figure 14 number 4), parquet wood on the second floor (figure 14 number 5), and also the white painted MDF board on the wall panels (figure 14 number 6). Figure 14 also shows that the preservation architects tried to combine new and modern textures with existing ones that are still in good condition into a recently exposed structural system found in art gallery interiors during the conservation process. It is evident in the new clear glass texture combined with the existing concrete structure and teak wood painted in white and brown to form a structural system in the form of voids (figure 14 number 7). Furthermore, it is also shown in the new frosted glass texture combined with teak wood. The remaining beams of the existing exposed structure are painted white and transformed into a new structural system in the form of skylights (figure 14 number 8). The clear glass texture dominates the exterior facade and the art gallery interior. This is because it is considered the most appropriate new texture added to clarify the old ones (Lestari and Alhamdani 2014).

Figures 12, 13, and 14 show that the adaptive reuse approach causes significant changes to the visual character at close range. Changes in the quality of the existing texture of Semarang Gallery, including its installation with the new one, produced a harmonious contrast combination

(Aidarova and Bashirova 2020). They extend the sustainability of the existing texture to increase its functional values that are important for boosting its performance after the conservation period.

Table 1. Changes in the visual character of the exterior, interior, and close range of the Semarang Gallery conservation building using the adaptive reuse approach

Visual character	Parameter	Adaptive reuse approach
Exterior	Facade	The addition of signage, the increased ground floor height, and the replacement of the existing wall fence without changing the rhythm of the Semarang Gallery facade as an aesthetic significance typical of the Spanish Colonial architectural style.
	Facade	The outdoor installation of air conditioning and the back of the wall panel structure visible on the facade create visual pollution.
	Roof	Changes in the roof structure do not alter the shape of the pyramid roof typical of the colonial era.
Interior	Opening	It does not change the pattern and the typical opening shape during the colonial era, although almost all openings are not functioning properly.
	Order of space	The insertion of new spaces changes the sequence or narrative flow of visitors' movements to be non-linear.
	Interior Features	The addition of functional elements transforms the space scale into a double volume.
Close Range Texture	Exposed Structure	Changes in the shape of the existing exposed structure of teak wood beams and wooden ceilings are not intact.
		Changes in the quality of existing textures for the better and their combination with new textures produce a harmonious contrasting mix extending the sustainability of existing textures.

Causing insignificant changes to the visual character
 Causing significant changes to the visual character
 Causing a significant change to the visual character
 Eliminating the uniqueness of the visual character

Conclusion

Based on the findings and discussions mentioned above, it is concluded that the level of change in the exterior, interior, and close-range visual characters of the Semarang Gallery conservation building using the adaptive reuse approach is stated as follows. (1) Changes in function and new additions have an insignificant effect on the

exterior visual character of Semarang Gallery. This is because they slightly affect the existing facades, roofs, and openings characteristics and are still able to boost their relevant values and performances of the new functions, thereby being consistent with the conservation principles. However, new additions to interior features also have a contrasting impact on the facade, eliminating the typical exterior visual characters due to its visual pollution, therefore it is inconsistent with the conservation principles; (2) Changes in function and new additions cause a significant impact on the close range of Semarang Gallery visual character because the quality of the existing textures that have already been damaged was fixed for the better. They were combined with new textures to produce a harmonious contrast blend, increasing its values and the new function's performance; therefore, it is consistent with the conservation principles; (3) Changes in function and new additions cause significant changes in the interior visual character because they have changed the existing order of space, spatial experience, and the scale and any form of exposed structure that increases the value and performance of the new function. Therefore, it is consistent with the conservation principles.

This research shows that using the adaptive reuse approach in the Semarang Gallery conservation process changes the typology of the existing building from the semi-industrial era, which was initially used as warehouses, motorcycle dealers, offices, and factories semi-commercial public. It results from the change in function with the main architectural program in the form of an art gallery and cafe as supporters. This typological change requires the existing building to adapt to technical improvements in almost all aspects due to the new additions. Consequently, it changes the exterior, interior, and close-range visual character to different significance levels. These changes are in line with the conservation principles and increase the value of the parameter function. On the contrary, it is inconsistent and tends to eliminate the visual character uniqueness.

References

- Aidarova, Galina, and Elza Bashirova. 2020. 'Regional Architecture of Russia: Kazan - Conflicts of the "Old" and "New"'. *IOP Conference Series: Materials Science and Engineering* 890 (1): 012016. <https://doi.org/10.1088/1757-899X/890/1/012016>.
- Australia ICOMOS. 2013. 'The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance'. ICOMOS Open Archive: EPrints on Cultural Heritage. 2013. <http://openarchive.icomos.org/id/eprint/2145/1/ICOMOS-Australia-The-Burra-Charter-2013.pdf>.
- Disli, Gulsen. 2019. 'New Additions to Existing Built Heritage and Their Contributions to Sustainable Development: Cases from Ankara, Turkey'. In *Urban and Architectural Heritage Conservation within Sustainability*. London, United Kingdom: IntechOpen. <https://doi.org/10.5772/intechopen.82734>.
- Grimmer, Anne E., and Kay D. Weeks. 2010. 'New Exterior Additions to Historic Buildings: Preservation Concerns'. Technical Preservation Services. 2010. <https://www.nps.gov/tps/how-to-preserve/briefs/14-exterior-additions.htm>.
- Kuipers, M. C., and W. de Jonge. 2017. *Designing from Heritage: Strategies for Conservation and Conversion*. Delft, Netherlands: Delft University of Technology.
- Lestari, and Muhammad Ridha Alhamdani. 2014. 'Penerapan Material Kaca Dalam Arsitektur'. *LANGKAU BETANG: JURNAL ARSITEKTUR* 1 (2). <https://doi.org/10.26418/lantang.v1i2.18798>.
- Lucchi, Elena. 2020. 'Environmental Risk Management for Museums in Historic Buildings through an Innovative Approach: A Case Study of the Pinacoteca Di Brera in Milan (Italy)'. *Sustainability* 12 (12): 5155. <https://doi.org/10.3390/su12125155>.
- Nelson, Lee H. 1988. 'Architectural Character—Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving Their Character'. Technical Preservation Services. 1988. <https://www.nps.gov/tps/how-to-preserve/briefs/17-architectural-character.htm>.
- Panggabean, Sriayu Aritha. 2014. 'Perubahan Fungsi Dan Struktur Bangunan Cagar Budaya Ditinjau Dari Perspektif Undang-Undang Cagar Budaya'. *Pandecta: Research Law Journal* 9 (2): 173. <https://doi.org/10.15294/pandecta.v9i2.3443>.
- Plevoets, Bie, and Koenraad Van Cleempoel. 2012. 'Creating Sustainable Retail Interiors

- through the Reuse of Historic Buildings'. *Interiors* 3 (3): 271–93. <https://doi.org/10.2752/204191212X13470263747031>.
- Purnomo, Hery, Judi O. Waani, and Cynthia E. V. Wuisang. 2017. 'Gaya & Karakter Visual Arsitektur Kolonial Belanda Di Kawasan Benteng Oranje Ternate'. *Media Matrasain* 14 (1): 23–33. <https://ejournal.unsrat.ac.id/index.php/jmm/article/view/15443/14987>.
- Purwantiasning, Ari Widyati, Lily Mauliani, and Wafirul Aqli. 2013. 'Building Conversion as an Application of Old Building Conservation Comparative Studies: China Town, Singapore–Petak Sembilan, Jakarta'. In *Proceeding International Seminar Genius Loci*. Makassar: Universitas Negeri Makassar. <https://doi.org/10.13140/RG.2.1.2281.3605>.
- Sari, Sriti Mayang. 2005. 'Implementasi Pengalaman Ruang Dalam Desain Interior'. *Dimensi Interior* 3 (2). <https://dimensiinterior.petra.ac.id/index.php/int/article/view/16391>.
- Shahi, Sheida, Mansour Esnaashary Esfahani, Chris Bachmann, and Carl Haas. 2020. 'A Definition Framework for Building Adaptation Projects'. *Sustainable Cities and Society* 63 (December): 102345. <https://doi.org/10.1016/j.scs.2020.102345>.
- Soeroso, Amiluhur. 2007. 'Konservasi Saujana Budaya Kawasan Borobudur: Zonasi Ulang Dengan Pendekatan Ekosistem'. *Jurnal Manusia Dan Lingkungan* 14 (3): 115–26. <https://jurnal.ugm.ac.id/JML/article/view/18669/11962>.
- Sujana, Adang. 2017. 'Adaptasi Bangunan Cagar Budaya Perspektif Indonesia'. In *Seminar Ikatan Peneliti Lingkungan Binaan Indonesia*, A083–90. Ikatan Peneliti Lingkungan Binaan Indonesia. <https://doi.org/10.32315/sem.1.a083>.
- Torres, Zasha Natiana Guzmán. 2009. 'Historic Buildings and Contemporary Additions: The Elements of a Cohesive Design Relationship'. University of Maryland, College Park. https://drum.lib.umd.edu/bitstream/handle/1903/9408/guzman_DRUM_S09.pdf?sequence=1.
- UNESCO Office Jakarta and Kemendikbud RI. 2015. 'Caring for Your Heritage Building: Building Owner's Information'. UNESCO Office Jakarta. 2015. <https://unesdoc.unesco.org/ark:/48223/pf0000243218/PDF/243218eng.pdf.multi>.
- W. Maer, Bisatya, Benjamin Lumantarna, and Joyce M. Laurens. 2012. 'Penataan Elemen Struktural Untuk Menyederhanakan Perilaku Dinamik, Dalam Keterpaduan Dengan Desain Arsitektur'. *DIMENSI (Jurnal Teknik Arsitektur)* 38 (1). <https://doi.org/10.9744/dimensi.38.1.43-54>.
- Wong, Liliane. 2016. *Adaptive Reuse: Extending the Lives of Buildings*. 1st ed. Basel, Switzerland: Birkhäuser.

Author(s) contribution

Amalia Devitasari contributed to the research concepts preparation, methodologies, investigations, data analysis, visualization, articles drafting and revisions.

Atik Suprapti contribute to the research concepts preparation and literature reviews, data analysis, of article drafts preparation and validation.

Bangun I. R. Harsritanto contribute to methodology, supervision, and validation.