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Revitalization of Amsterdam Fort as a Historical Museum and Preservation of Maluku's Cultural Heritage

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revitalization, Amsterdam Fortress, History museums, Cultural heritage preservation, conservation architecture

Abstract
Amsterdam Fort is a historical cultural heritage building located in Hila Village, Central Maluku Regency, Maluku Province, Indonesia. As a colonial heritage with significant historical, architectural, and cultural value, this fort possesses substantial potential for development as an educational facility and historical tourism destination. However, its current utilization remains suboptimal, necessitating revitalization efforts. This research aims to formulate a revitalization concept for Amsterdam Fort as a History Museum and Center for the Preservation of Maluku Cultural Heritage by applying conservation architecture and contextual architecture approaches. The research employed a qualitative-descriptive method with an adaptive reuse strategy. Data collection techniques include field observations, photographic documentation, structured interviews, and literature studies. Data analysis encompasses site, climate, circulation, noise, vegetation, and functional activity analyses. The findings reveal that the revitalization concept successfully integrates historical preservation with contemporary functions through spatial zoning, separated circulation systems, utilization of sea views, and application of local materials adaptive to tropical coastal climates. Conservation and contextual approaches effectively maintain building authenticity while presenting supporting facilities harmonious with the historical character. This revitalization is expected to restore Amsterdam Fort's role as an educational centre, cultural preservation hub, research facility, and historical tourism destination that increases public awareness of cultural heritage preservation and strengthens Maluku's cultural identity. Furthermore, this revitalization contributes to sustainable tourism development and local economic growth. This research provides practical implications as design recommendations for local governments and cultural heritage agencies, as well as theoretical contributions to developing revitalization models based on conservation architecture and contextual approaches.

INTRODUCTION

The archipelago region of Indonesia holds extraordinary historical and cultural wealth, particularly in Maluku, which was known as the world's spice producer from the 15th to the 17th centuries. Historical records show that Maluku became the centre of nutmeg and clove trade, which were highly valuable in the international market, attracting European nations such as the Portuguese, Spanish, Dutch, and English to control this region. This competition left historical traces in the form of colonial forts that still stand today as silent witnesses to the archipelago's historical journey. Lukito et al. (2025) emphasize that the Maluku Spice Islands have been a region of major interest for centuries as a source of spices, with forts reflecting the importance of this region in global trade since the 16th century.

One important colonial relic is Amsterdam Fort, located in Hila Village, Ambon Island. This fort was first built by the Portuguese around 1512 as a trading lodge, then strengthened and expanded by the Dutch in the 17th century after they conquered Maluku in 1605. Based on compiled data, the construction of the stone fort was initiated by Governor-General Jaan Ottens in 1637 and completed by Arnold de Vlaming van Oudshoorn in 1649-1656, named Amsterdam Fort. This fort had a strategic role at the time as a spice trade centre, storage warehouse, and VOC defence base in Maluku, with characteristic architecture shaped like a house (Blok Huis) with three floors reflecting 17th-century Dutch colonial architecture. Currently, Amsterdam Fort has been designated as a National Cultural Heritage through Ministerial Decree No. 013/M/1999 and reinforced by Ministerial Decree No. 111/M/2018, yet its utilization remains suboptimal.

Previous research on the revitalization of colonial forts in Indonesia has demonstrated various approaches and important findings. Mawaddah & Erniwati (2025) examined the preservation of Van der Capellen Fort in Tanah Datar Regency, which underwent functional transformation from a colonial post to a tourism office through a preservation process consisting of three stages: protection, development, and utilization. Lukito et al. (2025) researched fort heritage in Ternate, North Maluku, focusing on Fort Oranje and Fort Kastela, which are part of heritage tourism initiatives, revealing the dynamics between preservation, tourism promotion, and community empowerment. This study found that the revitalization of colonial forts by local communities demonstrates how present needs and cultural identity shape the interpretation and preservation of historical sites. Other research on the application of adaptive reuse methods to five colonial forts in Java identified five patterns of transformation, while studies in Surakarta identified that the quality of Fort Vastenburg as a historical public space falls into the "sufficient" category with a score of 3.32 out of 5 based on user perceptions. Research on adaptive reuse in Kayutangan, Malang, shows that the application of this method can revitalize historical buildings and enhance community socio-economic activities, though it focuses on urban areas in Java, not yet encompassing the context of coastal forts in Maluku with different climatic, social, and cultural characteristics. Similarly, Putri et al. (2026) demonstrate that the revitalization of Fort Willem I in Ambarawa into an open history laboratory can synergize pure and applied history through inquiry-based educational zoning, reinforcing the relevance of adaptive reuse strategies for Dutch colonial forts in Indonesia.

Despite various studies having been conducted, the research gap lies in the absence of a comprehensive study on the revitalization of Amsterdam Fort that integrates conservation architecture and contextual architecture approaches in designing a history museum and Maluku cultural heritage preservation centre. Existing research predominantly addresses historical aspects and physical restoration, as well as tourism promotion through social media, without examining in depth how this fort can be revitalized with new functions relevant to modern societal needs. Furthermore, the research on adaptive reuse in Kayutangan, Malang, demonstrates that this method can revitalize historical buildings and enhance community socio-economic activities; however, this research focuses on urban areas in Java and has not encompassed the context of coastal forts in Maluku with different climatic, social, and cultural characteristics. This gap becomes more evident when considering that the process of revitalizing colonial forts by local communities shows different dynamics compared to preservation efforts carried out solely by the government.

The urgency of this research is based on the current condition of Amsterdam Fort, which has not been optimally utilized as an educational and tourism asset. Although it has been designated as a National Cultural Heritage, the building's physical condition has suffered damage due to age, humid coastal climate, and lack of maintenance. Research by Umasugi et al. (2022) identified that Cultural Heritage in Hila and Kaitetu Villages is worthy of revitalization into historical tourism, with potential in the form of artifacts and living culture

(traditions and customs), yet this potential is not supported by government attention and lacks community awareness to preserve these unique features, resulting in a decline in the vitality of Cultural Heritage. This research identified that the decline in cultural heritage vitality in this area is caused by a lack of government attention and low public awareness to preserve the uniqueness of the area. Moreover, physical restoration efforts undertaken by the Ministry of Education and Culture have not been accompanied by planned functional revitalization, so the fort only serves passively without a historical narrative attractive to the younger generation. The lack of visual appeal and function makes the fort appear merely as an old building, without a historical narrative that appeals to the younger generation, and the number of tourist visits has decreased due to limited supporting facilities and lack of innovation in management.

The novelty of this research lies in the integrated approach combining conservation architecture and contextual architecture in designing the revitalization of Amsterdam Fort. Unlike previous research that focused more on historical aspects or tourism promotion, this research formulates a revitalization design concept that comprehensively covers architectural aspects, spatial planning, structure, utility systems, materials, and landscape while maintaining the historical value and authenticity of the building. This approach adopts the principle of adaptive reuse defined as a strategy that connects the building's history, its surrounding environment, and the community, while adapting the design to tropical coastal climate conditions and the local cultural context of the Maluku community. Mısırlısoy and Günçe (2016) emphasize that a holistic adaptive reuse strategy must consider building, urban, and social criteria together to prevent an arbitrary selection of new functions for heritage buildings, while Zhang et al. (2025) further show that architectural, cultural, and technical factors are deeply interconnected in shaping a sustainable adaptive reuse framework. Furthermore, this research enriches Bollack's (2013) findings on five categories of adaptive reuse application by identifying conservation and contextual approaches relevant to coastal forts in Maluku. The novelty also lies in the application of local architectural elements such as Baileo as a symbol of togetherness and social interaction of the Maluku people, integrated into the museum and cultural centre design.

The objectives of this research are: (1) to identify and analyze the existing conditions of Amsterdam Fort from architectural, historical, and functional aspects as a cultural heritage; (2) to formulate a revitalization concept for Amsterdam Fort that integrates the function of a history museum with a Maluku cultural heritage preservation center; and (3) to produce an architectural revitalization design that combines heritage values with contemporary needs through conservation architecture and contextual architecture approaches.

The benefits of this research include theoretical benefits in the form of developing a revitalization model for cultural heritage based on conservation architecture and contextual approaches, as well as practical benefits in the form of design recommendations for local governments and Cultural Heritage Preservation Agencies in managing Amsterdam Fort. This research is also expected to increase public awareness of the importance of preserving cultural heritage, strengthen Maluku's cultural identity, and encourage the development of sustainable cultural tourism and local economic improvement, in line with Throsby's (2017) argument that culturally sustainable development requires heritage policies to safeguard cultural values while generating tangible economic benefits for local communities. Through this revitalization, Amsterdam Fort not only functions as a historical heritage object but also as a center of cultural activities that support sustainable preservation and contribute to the development of the tourism sector and the regional economy. Thus, the revitalization of Amsterdam Fort can serve as a model for other cultural heritage revitalization efforts in Indonesia, particularly in the Maluku region.

METHOD

This study used an adaptive reuse and conservation approach with a heritage-based architectural *design*. This approach aims to maintain the historical value and authenticity of the Amsterdam Fortress while adapting its function as a history museum and cultural public space. The strategies implemented include the conservation of historical elements, rehabilitation of damaged parts of buildings, adaptation of spatial functions for educational and cultural activities, and the provision of historical interpretation media through galleries and visual information. This aligns with Augustiniok et al. (2025), who argue that adaptive reuse should be understood as a values-based design process in which architectural interventions are calibrated to preserve the layered historical, social, and material significance of a heritage building.

The research approach includes historical, heritage architecture, contextual, and cultural tourism approaches. The historical approach is used to examine the history and development of the Amsterdam Fort, while the heritage approach focuses on the preservation of the original architectural character. The contextual approach adapts the design to environmental conditions, local culture, and tropical climate, while the cultural tourism approach is geared towards creating an educational, recreative, and interactive historical tourism area. This is consistent with Choi and Park's (2021) finding that contextual compatibility in heritage-dense environments depends on the interplay between heritage intensity, context density, and regulatory constraints, as well as AlFadalat and Al-Azhari (2022), who demonstrate that a contextual design approach helps new architectural interventions harmonize with the historic character and surrounding environment of a site.

Data collection is carried out through primary data and secondary data. Primary data was obtained through field observations, documentation, and interviews with the community, area managers, local governments, and visitors, since Oladeji et al. (2022) stress that active community participation in the conservation and management of cultural heritage resources is essential for producing revitalization outcomes that are locally accepted and sustainable. Secondary data were obtained from literature studies, scientific journals, spatial planning documents, historical data of the Amsterdam Fortress, area revitalization books, museum design standards, and cultural tourism references.

Analysis was carried out on aspects of the site, climate, circulation, noise, vegetation and landscape, as well as the function and activities of the area. The results of the analysis were used as the basis for the preparation of design concepts which included the concept of site, zoning, building shape, structure, utilities, landscape, and circulation of the area. The synthesis of all these stages resulted in a design for the revitalization of Amsterdam Fortress as a historical museum and cultural heritage preservation area that maintains historical value while supporting the development of modern, comfortable, educational, and sustainable cultural tourism. The location of the research is in Hila Village, Leihitu District, Central Maluku Regency, Maluku Province, which was chosen because it has high historical value and great potential as a cultural tourism destination.

RESULTS AND DISCUSSION

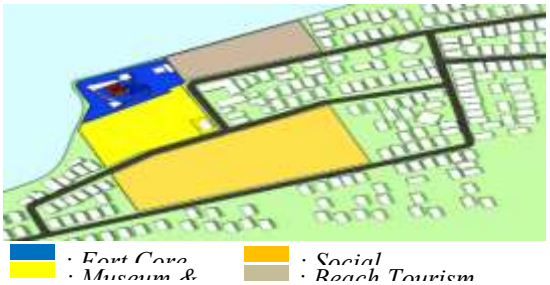
In the Design of the Revitalization of the Amsterdam Fortress as a Museum of History and Preservation of the Cultural Heritage of Maluku, a concept is needed that can apply the design, the concept is expected to meet the principles that can be taken from various stages in the analysis that has been described. So that a design is obtained in accordance with approaches, principles, and social integration that emphasizes the preservation of heritage buildings, strengthening local cultural identity, developing socio-cultural spaces, and utilizing the potential of coastal areas.

The concept of designing the Revitalization of Amsterdam Fort as a Museum of History and Preservation of Maluku Cultural Heritage is the result of the analysis that has been

described in the previous chapter. The design concept is intended to make it easier at the time of design and to make the design results have character and characteristics. The idea of this design concept is the result of an object study. With that, it is hoped that it will be a good concept.

Site Concept Site Location: Hila Village, Leihitu District, Central Maluku Regency, Maluku Province

Figure:1 Site Achievement Analysis of Amsterdam Fort



Source: Author's Analysis, 2026.

Site Allocation:

As a historical museum and cultural center of Maluku that functions for historical preservation, cultural education, heritage tourism, and community social space

Site Description:

- Location: Hila Village, Leihitu District, Central Maluku Regency, Maluku Province
- Site area: + 15.190 m2 / + 1.5 ha
- Building Floor Coefficients / KLB: (± 0.4 – 1.0)
- Building Base Coefficient / KDB: (± 20% – 40%)
- Green Base Coefficient / KDH: (± 40% – 60%)
- Building Boundary Line / GSB: 10 – 25 m from the road axle.

Site Boundaries

As a historical museum and cultural center of Maluku that functions for historical preservation, cultural education, heritage tourism, and community social space

Site Achievements:

Figure 2. Site Acclimatization Analysis

Source: Author's Analysis, 2026.

From the image above, the following data is obtained:

Access A is on the main road with a road width of ± 7 m that can be passed by cars, cars and motorcycles and this is the main road from the access from the center of Ambon City. Access B is ± 5 m wide road can be passed by cars and motorcycles, but this road is an access road from the direction of Allang Village.

Thus, it will be planned for the concept of site achievement to be chosen, namely on Access A, because the road access is wider than access B and the direction from the city center.
Acclimatization:

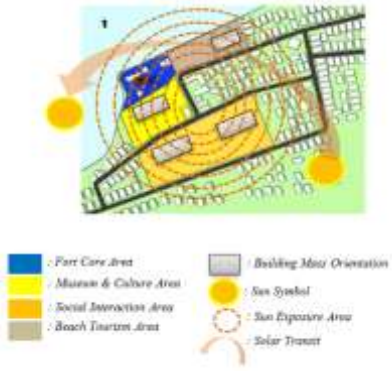


Figure 3. Site Circulation Analysis
Source: Author's Analysis, 2026.

From the acclimatization image above, the following data is obtained:

The concept of acclimatization in the design area utilizes coastal tropical climate conditions by optimizing the orientation of the building to the movement of the sun and wind. The position of the tread on the water's edge allows the building to obtain natural wind flow from the sea, helping to increase thermal comfort and reduce the use of artificial coolers.

Yellow areas indicate the zone that receives the highest intensity of sunlight, so design strategies such as the use of shade vegetation, canopies, secondary skins, and controlled openings are needed to reduce overheating in buildings. Meanwhile, green open spaces around the area serve as catchment areas while helping to lower the ambient temperature through natural cooling effects.

This acclimatization concept aims to create buildings that are responsive to the local climate, maximize natural lighting and ventilation, reduce energy consumption, and improve building user comfort in a sustainable manner. This strategy is supported by Nematchoua et al. (2020), who found that the combination of thermal insulation, external shading, and appropriate envelope materials can significantly improve thermal comfort and reduce cooling energy demand in buildings located in coastal tropical climates.

Circulation in the Footprint:

Figure 4. Outdoor Layout Analysis
Source: Author's Analysis, 2026.

From the circulation image in the footprint above, the following data was obtained:

Based on the diagram, the concept of circulation in the tread is designed by separating movement paths based on user functions to create safe, comfortable, and efficient access. The

main access area is on the south side of the site which is directly connected to the main city road, making it easier for visitors to reach the building area.

The circulation of vehicles entering and exiting is regulated through separate lanes to avoid movement conflicts and congestion in the area. The vehicle lane leads to the parking area placed around the building to facilitate user access to the main facility. Meanwhile, pedestrian circulation is designed to connect parking areas, open spaces, and main buildings through a safe and convenient pedestrian path.

The circulation arrangement also considers the relationship between zones within the area, namely the main building zone, the supporting zone, and the open space. With an organized circulation pattern, user mobility can take place more effectively, increase visitor comfort, and optimally support regional activities.

Outdoor Layout:

Figure 5. Keyplan View Analysis
Source: Author's Analysis, 2026.

From the picture of the outdoor layout above, the following data was obtained:

Based on the diagram, the concept of the outdoor layout of the area is divided into active zones and passive zones to create an orderly, comfortable, and supportive environment for various user activities. Active zones are placed in areas that have a high intensity of activities, such as the main building area, plazas, gathering spaces, and public areas that are the center of visitor activities. The placement of this active zone aims to facilitate access and increase social interaction in the area.

Meanwhile, passive zones are placed on buffer areas that serve as green spaces, parks, infiltration areas, and other landscaping elements. This zone acts as a counterweight to the area by providing visual comfort, reducing noise, improving air quality, and creating a calmer and cooler atmosphere.

The arrangement between active and passive spaces is carried out in a dispersed and interconnected manner so that a harmonious spatial transition is created. With this concept, the outdoor layout not only supports the function of the building and visitor activities, but also improves the quality of the area's environment aesthetically, ecologically, and functionally.

View:

Figure 6. Noise and Pollution Analysis
Source: Author's Analysis, 2026.

Figure 7. Zoning Based on Noise
Source: Author's Analysis, 2026.

From the Analysis view image above, the following data is obtained:

Based on the analysis in the images, the Fort Amsterdam area has excellent visual potential because it is located in a coastal area and has strong historical value. View analysis is carried out to identify the best direction of view that can be used in the development of revitalization areas.

View A leads to the sea and coastal areas which provide a panoramic view of the outdoors with high visual quality. This direction is the main potential because it presents a natural atmosphere, good lighting, and a direct connection between the fort and the aquatic environment.

View B is the direction of view towards the west side of the area which also leads to the water area. This view gives an open impression and strengthens the character of Fort Amsterdam as a defensive building located on the beach.

View C leads to the main access and residential area in the southern part. This view is important as an orientation for visitors and serves as the main visual point towards the fort building from the area entrance.

View D leads to the development area and the area around the fort. This direction has the potential to be used as a supporting zone, open space, and supporting activity area that maintains the visual dominance of Fort Amsterdam as the main object.

Overall, the concept of the view of the area is directed to maximize the potential of the sea panorama and maintain the visibility of Fort Amsterdam as a landmark of the region, thus creating a strong visual connection between historic buildings, coastal environments, and revitalization development areas. This approach is expected to improve the quality of the space experience, the aesthetic value of the area, and the attraction of historical and cultural tourism in Maluku.

Noise:

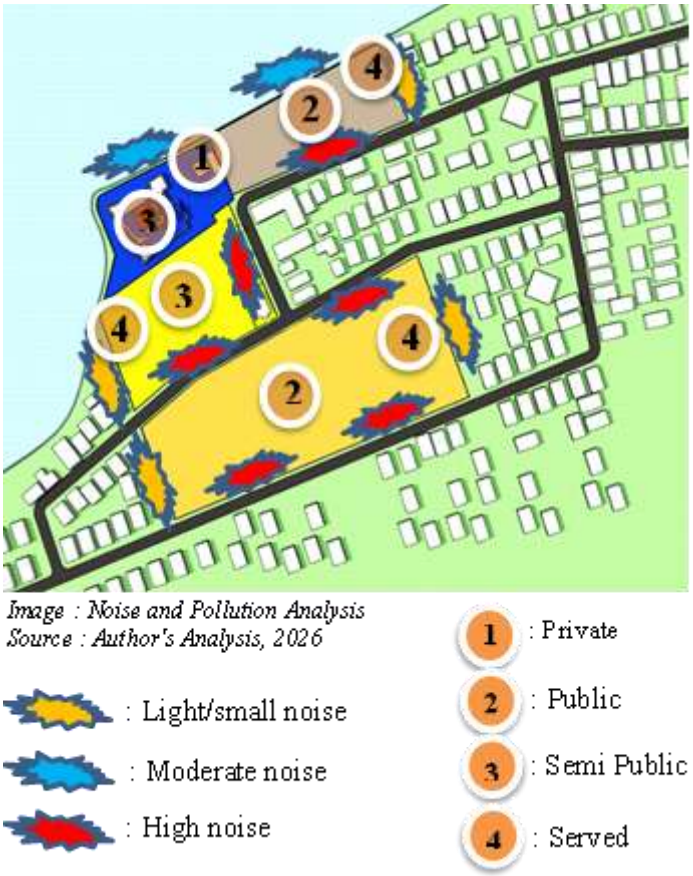


Image : Noise and Pollution Analysis
Source : Author's Analysis, 2026

Figure 8. Main Structure Concept
Source: Author's Design, 2026.

From the noise analysis image above, the following data is obtained:

Based on the noise analysis diagram, the source of noise in the area comes from road traffic activities, residential areas, and community activities around the site. The noise level is then divided into several zones to determine the appropriate spatial function in the revitalization area of the Amsterdam Fortress.

Zone 1 (Low Noise) is in the area of Fort Amsterdam which is relatively far from the main road and has a direct influence from the coastal environment. This area has quiet conditions so it is very suitable for main functions such as history museums, exhibition rooms, educational rooms, and cultural heritage conservation areas that require a conducive atmosphere.

Zone 2 (Moderate Noise) is in a development area that still receives the influence of sound from surrounding activities but is not too dominant. This zone can be used as an open space, educational park, recreational area, and supporting facilities that still require the comfort of visitors.

Zone 3 (Very Low Noise) is located in the core of the Amsterdam Fortress area. This area is the quietest zone and has high historical value so it needs to be maintained as a center for preservation, conservation, and educational activities with minimal disturbances.

Zone 4 (High Noise) is along the road corridor and the boundary of the area that is directly adjacent to vehicle activities and settlements. This area serves as a buffer zone with the addition of vegetation, shade trees, gardens, and other landscaping elements to reduce noise before reaching the main area.

Overall, the concept of noise control is carried out through the placement of building functions based on noise levels, the use of green spaces as natural buffers, and the regulation of area zoning. With this approach, the Amsterdam Fort area as a museum and cultural heritage preservation center can maintain its comfort, tranquility, and environmental quality so as to support educational activities, historical tourism, and cultural preservation optimally.

Zoning:

Image : Zoning Based on Noise
Source : Author's Analysis, 2026

Figure 9. Foundation Structure Concept (Footplate Foundation)
Source: Author's Design, 2026.

From the zoning image above, the following data is obtained:

Based on the zoning diagram, the design area is divided into three main zones, namely private zones, semi-public zones, and public zones. The division of this zone is carried out to regulate the level of accessibility of users and create an orderly spatial relationship according to the functions and needs of activities in the revitalization area of the Amsterdam Fortress.

The Private Zone is located in the area of Amsterdam Fortress as the main object of cultural heritage preservation. This zone has a more limited level of access because it functions as a conservation area, museum management, collection storage room, administrative room, and facilities that require special supervision to maintain the authenticity and security of historic buildings.

The Semi-Public Zone is located in a transition area that connects the private zone and the public zone. This zone functions as a supporting area such as an education room, temporary exhibition gallery, information center, discussion room, and visitor service facilities. Users can access this area with certain settings so as to maintain the comfort and safety of the area.

The Public Zone is placed in an area that has high accessibility and can be used by all visitors. This zone functions as an open space, park, plaza, cultural activity area, and recreational facilities that support social and tourism activities. Its placement in an easily accessible part aims to increase community interaction with the area without disturbing the conservation area.

Overall, the zoning concept is applied to create regularity in the function of the space, control visitor access, protect cultural heritage areas, and increase the comfort and effectiveness of activities in the revitalized area of the Amsterdam Fortress. With a clear division of zones, the relationship between the functions of preservation, education, culture, and tourism can run

in harmony and sustainably. This is reinforced by Chan et al. (2024), who found that the effectiveness of heritage building revitalization shapes visitors' cultural identity and emotional place attachment, which in turn encourages positive, sustained engagement with the revitalized site.

Building Concept
Main Structure Concept:

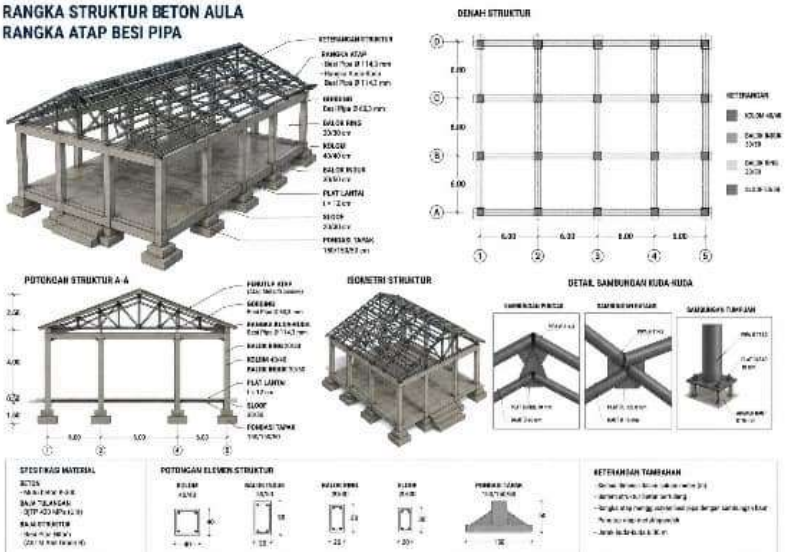


Figure 10. Reinforced Concrete Column Concept
Source: Author's Design, 2026.

From the concept picture of the main structure above, the following data is obtained:

It can be seen that concrete trusses and steel roof trusses can be applied to buildings to be planned such as multipurpose room buildings, museums as a whole to improve efficiency during the implementation of buildings.

Concept of Lower Structure (Foundation):

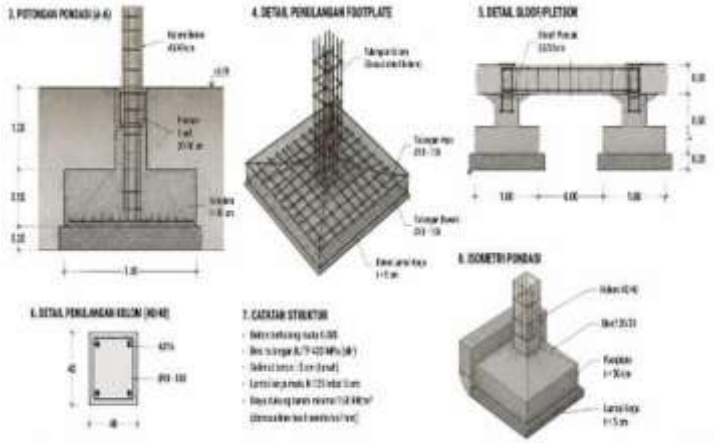


Figure 11. Reinforced Concrete Ring Beam Concept
Source: Author's Design, 2026.

From the concept picture of the main structure above, the following data is obtained:

The footplate foundation was chosen because it is in accordance with the character of museum buildings and heritage areas which have a medium load, low structure, and require efficient construction methods and are easy to work.

Concept of Middle Structure (Column) :

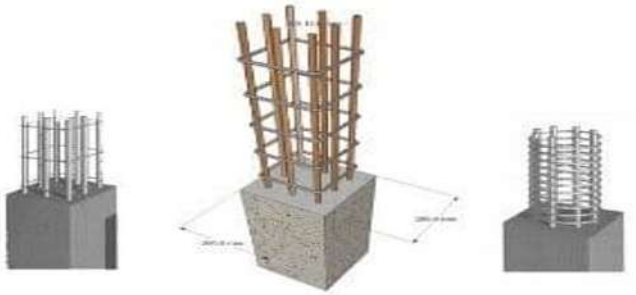


Figure 12. Light Steel Roof Truss Concept
Source: Author's Design, 2026.

From the concept image of the central structure above, the following data is obtained:

The reinforced concrete column structure is chosen on because it has good strength, stability, and resistance to the conditions of coastal tropical climates.

Upper Structure Concept (Beam Ring):

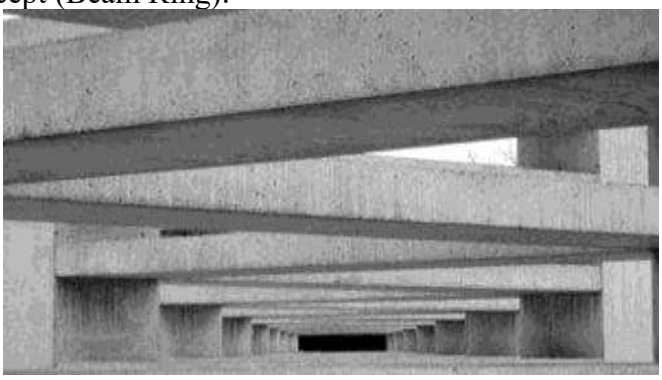


Figure 13. Homogeneous Tile Flooring Material
Source: Author's Compilation, 2026.

From the concept picture of the upper structure above, the following data is obtained:

The upper structure using reinforced concrete was chosen because it has good strength, stability, and resistance to coastal tropical climatic conditions and is able to support the function of historical museum buildings and public spaces safely and for a long time.

Upper Structure Concept (Roof Frame):

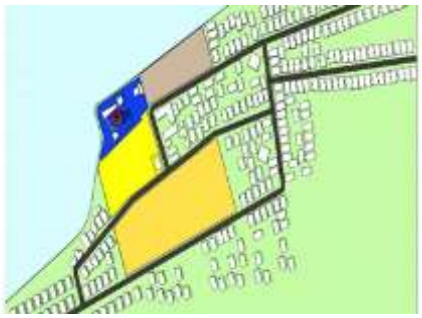


Figure 14. Andesite Natural Stone Flooring Material
Source: Author's Compilation, 2026.

From the concept picture of the upper structure above, the following data is obtained:

Because it has a light weight but is still strong and sturdy in supporting the weight of the roof. This material is resistant to rust, termites, and weathering, making it more durable and requires minimal maintenance. In addition, the installation of mild steel is faster and more precise because it is made with a fabrication system.

Concept of Building/Material Scope

Floor Covering: (Homogeneous Tile)

Figure 15. Paving Block Material

Source: Author's Compilation, 2026.

Homogeneus Tile is able to adapt the concept of heritage architecture through the use of natural colors and motifs so as to create a comfortable, clean space atmosphere that supports the cultural and historical character of the Amsterdam Fort area.

Floor Covering: (Andesite Natural Stone)

Figure 16. Red Brick Wall Material

Source: Author's Compilation, 2026.

The use of andesite natural stone flooring supports the design concept of the area because it gives a natural, sturdy, and aesthetic impression. This material has high resistance to weather,

is safe for pedestrians because it is not slippery, and is able to blend with vegetation elements and the surrounding environment. In addition, natural stone also strengthens the character of the area which is oriented towards preservation, comfort, and environmental sustainability.

Floor Covering: (Paving Block)

Figure 17. Gypsum Ceiling Material
Source: Author's Compilation, 2026.

The use of paving blocks in the area supports the concept of outdoor space design that is functional, neat, and environmentally friendly. Regular installation patterns provide aesthetic value and strengthen the character of pedestrian areas and open spaces. In addition, paving blocks have good water absorption so that they help reduce inundation and support the drainage system of the area. This material is also easy to install and maintain, so it is suitable for use in circulation areas, plazas, and public spaces that require comfort and resistance to user activities.

Wall Pairs: (Red Brick)

Figure 18. PVC Ceiling Material
Source: Author's Compilation, 2026.

The use of red brick on the walls of buildings supports a design concept that prioritizes strength, durability, and natural impression. This material has a sturdy character and is able to provide thermal comfort because it can absorb heat well. Additionally, red brick is easy to blend with a variety of architectural styles, including traditional, contextual, and cultural heritage buildings. Its use also reinforces local values and creates a simple, warm and durable building that is resistant to tropical climatic conditions.

Ceiling Pair: (Gypsum Board)

Figure 19. Metal Tile Roof Material
Source: Author's Compilation, 2026.

The use of gypsum ceilings supports the concept of neat, modern, and aesthetic interior design. Its smooth surface makes it easy to form various ceiling models, including a drop ceiling as shown in the picture. The combination of gypsum with indirect lighting is able to create a comfortable, elegant, and luxurious atmosphere of the space. In addition, gypsum ceilings have a light weight, are easy to install, and are able to hide mechanical and electrical installations so that the appearance of the space becomes cleaner and more orderly.

Ceiling Pair: (PVC)

Figure 20. MEP Utility System Concept
Source: Author's Design, 2026.

The use of PVC ceilings supports the concept of interior design that is modern, practical, and easy to maintain. The appearance of wood motifs as in the picture gives a warm, natural, and elegant impression without requiring special care like real wood materials. In addition, PVC ceilings have good resistance to water, termites, and moisture, making them very suitable for use in buildings in tropical climates. This material is also lightweight, easy to install, and able to create a neat and visually comfortable space.

Roof Cover: (Metal Tile Roof)

Figure 21. Clean Water System Concept
Source: Author's Design, 2026.

The use of metal tile roofs supports the concept of building design that prioritizes strength, efficiency, and aesthetics. Its shape that resembles conventional tiles gives it a neat and elegant appearance, while the metal material makes the roof lighter thereby reducing the burden on the building structure. In addition, metal tile roofs have good resistance to weather, corrosion, and termites, making them suitable for use in tropical climates. Its use also supports the concept of a building that is modern, durable, and easy to maintain.

MEP Utility Concept

Figure 22. Wastewater System Concept
Source: Author's Design, 2026.

The application of the MEP (Mechanical, Electrical, Plumbing) system supports the concept of safe, comfortable, and functional building design. Mechanical systems such as HVAC, ventilation, and ducting function to maintain air quality and thermal comfort in the building. The electrical system includes electrical panels, lighting, transformers, CCTV, and fire alarm systems that ensure the safety and smooth operation of the building. Meanwhile, plumbing systems include the provision of clean water, dirty water disposal, fire fighting installations, WTP (Water Treatment Plant), and STP (Sewage Treatment Plant) that support environmental health and building sustainability.

The integration of the entire MEP system is designed efficiently so as not to interfere with the aesthetics of the building, while being able to improve comfort, safety, and quality of service for building users.

Mechanical Concepts

Clean Water System

Figure 23. Rainwater Drainage System Concept
Source: Author's Design, 2026.

The application of clean water systems supports the concept of healthy, comfortable, and sustainable building design. This system functions to provide water needs for user activities, such as sanitation, cleanliness, and building operations. The water distribution is designed efficiently through reservoirs and piping networks so that the water supply can reach the entire building area well.

In addition to ensuring water availability, the clean water system also supports user comfort and improves the quality of building services. The planning is carried out in an integrated manner with other utility systems so that building operations run optimally, efficiently, and environmentally friendly.

Dirty Water System

Figure 24. Space Circulation Concept
Source: Author's Design, 2026.

The application of a dirty water system supports the concept of a healthy, hygienic, and environmentally friendly building design. This system functions to accommodate and distribute wastewater from bathrooms, sinks, kitchens, and service areas to wastewater treatment plants (STPs) before being discharged into municipal or environmental drains.

Dirty water system planning is carried out in an integrated manner to prevent environmental pollution, maintain the cleanliness of the area, and improve the comfort of building users. With good management, this system supports efficient and sustainable building operations.

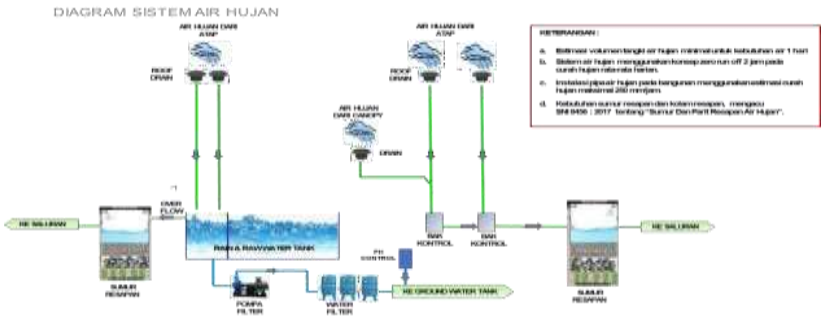


Figure 25. Rainwater System
Source: Author's Design, 2026.

The application of rainwater systems supports the concept of sustainable and environmentally responsive building design. This system functions to collect and channel rainwater from roofs and open areas through gutters and drainage channels to infiltration wells or sewers.

Good rainwater system planning can reduce the risk of inundation and flooding in the area, while helping to maintain environmental balance. In addition, integrated rainwater management supports the comfort of the area, increases soil permeability, and creates a more organized and environmentally friendly environment. As demonstrated by Matos et al. (2024), a well-designed rainwater harvesting system can provide significant water-supply and economic benefits while supporting the sustainability of a building's overall water resource management.

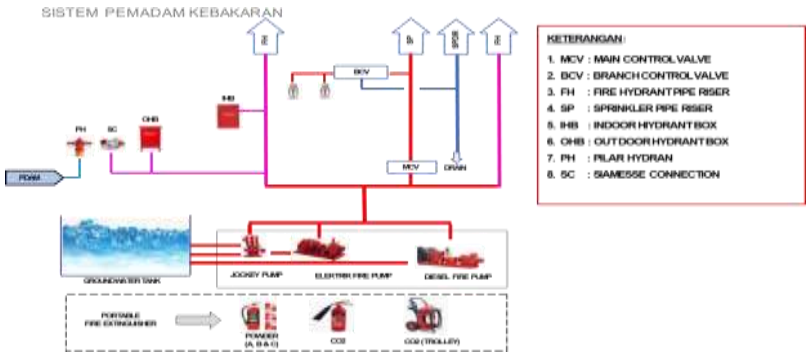


Figure 26. Fire System
Source: Author's Design, 2026.

The fire extinguishing system in the revitalization of the Amsterdam Fortress is designed to protect historic buildings, visitors, and supporting facilities without compromising its cultural heritage value. The system includes smoke detectors, fire alarms, fire extinguishers, and hydrants that are strategically placed to support rapid fire management. In addition, a clear evacuation route and access for firefighters are provided so that the safety of the area is guaranteed and the building's function as a historical tourist destination can run well. This precaution is critical given Garcia-Castillo et al.'s (2023) finding that current fire safety codes rarely address the peculiarities of heritage and historic buildings, making the reconciliation of fire protection with heritage preservation a persistent challenge worldwide.

Space Concept

The spatial concept is designed based on functional relationships, user comfort, and efficiency of circulation between spaces. The spatial arrangement is divided into public, semi-public, private, and service zones so that activities in the building can run regularly and do not interfere with each other. In addition, the spatial layout is arranged by considering natural lighting, air conditioning, building orientation, and ease of access so that a comfortable, functional, and suitable space is created according to the needs of building users.

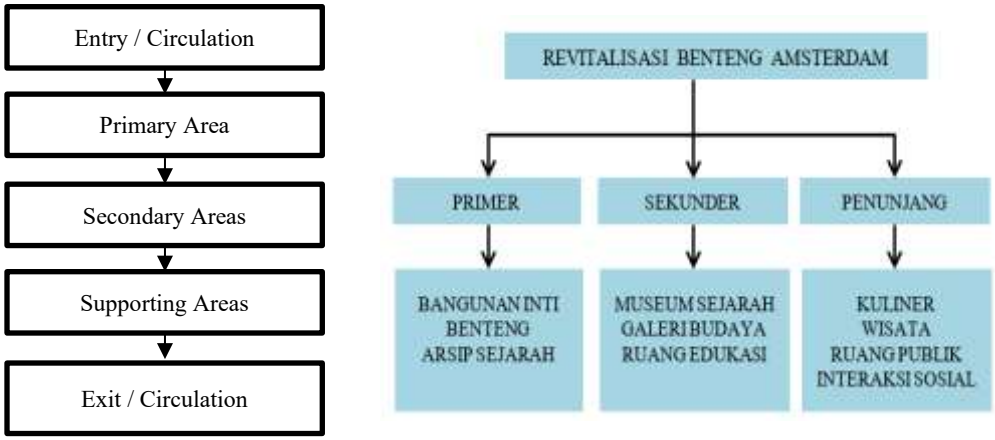


Figure 24. Functional Space Circulation Concept for the Revitalization of Amsterdam Fort

Source: Author's Design, 2026.

In the preparation of the orientation of the room function from the user coming and entering, to the user leaving the location, it will be designed based on the flow of user activity so that the circulation becomes clear, comfortable, and easy to understand. The reception area or entrance is placed in front as the starting point of orientation that connects users to public, semi-public, private, and service areas according to the needs of the activity.

The circulation path is made directional and orderly so that it makes it easier for users to move around without causing movement conflicts. In addition, the building exit area is designed to be directly connected to the main access so that the user entry and exit process can take place safely, efficiently, and well organized. This corridor-based circulation approach is supported by Wang et al. (2025), whose visibility graph analysis of museum layouts found that well-configured pathways and corridors play a crucial role in supporting smooth visitor distribution and reducing cognitive load during navigation.

Concept of Form

The design concept of the Revitalization of the Amsterdam Fort as a Museum of History and Preservation of Maluku Cultural Heritage refers to the approach of historical preservation by maintaining the original character of the fort as a cultural heritage building, while presenting new architectural elements that support the function of museums and cultural spaces. The design form maintains the colonial architectural identity of the main mass of the fort, such as the shape of stone walls, openings, and historical space patterns, so that the historical value and authenticity of the building are maintained.

The development of the new building form was designed with a simple and harmonious approach to tropical modern architecture to the surrounding environment, without eliminating the visual dominance of the fort as the main element of the area. Additional mass forms such as museums, cultural galleries, multipurpose spaces, and culinary areas are made lighter, more open, and adaptive to the coastal climate of Maluku through the use of canopies, wide openings,

and natural air circulation. Within these gallery spaces, Wang et al. (2025) suggest that gamification and immersive interpretive strategies can be integrated to deepen visitors' engagement with the historical and cultural significance of the exhibited heritage.

In addition, the concept of design forms also takes inspiration from the local culture of Maluku through the application of traditional architectural elements such as roof patterns, local materials, and communal spaces that resemble Baileo as a symbol of togetherness and social interaction of the Maluku people. With this concept, the revitalization of the fort not only serves as a place of historical preservation, but also becomes a cultural icon, a space for education, tourism, and a lively and sustainable public activity.

CONCLUSION

Based on the studies and designs carried out, the revitalization of Amsterdam Fort as a History Museum and Center for the Preservation of Maluku Cultural Heritage is a strategic effort to revive the function of the cultural heritage building to be more relevant to the needs of today's society without losing its historical value and authenticity. The Amsterdam Fort has great potential as a means of education, cultural preservation, research, and historical tourism because of its historical value which is closely related to the spice trade and the development of colonialism in Maluku. Through the application of the Conservation Architecture and Contextual Architecture approaches, revitalization is carried out by maintaining the character of colonial architecture which is the identity of the building while presenting a new function in the form of a history museum and a cultural heritage preservation center. The design concept formulated encompasses site concepts that utilize the potential of sea views as an added value to the area, zoning concepts that divide areas based on noise levels and functions, building form concepts that take inspiration from traditional Maluku architectural elements such as Baileo as a symbol of togetherness and social interaction, as well as structural concepts, utility systems, materials, and landscape that support the principles of sustainability and environmental preservation. The revitalization design includes spatial planning into private zones (conservation area, museum management, collection storage), semi-public zones (education rooms, temporary exhibition galleries, information centers), and public zones (open spaces, parks, plazas, cultural activity areas), as well as the development of circulation systems that separate vehicles and pedestrians to create safe, comfortable, and efficient access. This revitalization is expected to improve the quality of the fort's utilization, strengthen Maluku's cultural identity, create an educational, informative, and recreational public space for the community and tourists, and increase public awareness of the importance of preserving cultural heritage. With this revitalization, the Amsterdam Fortress not only functions as a historical heritage object but also as a center of cultural activities that support sustainable preservation of Maluku's cultural heritage and contribute to the development of the tourism sector and the regional economy. This is in line with Zhang and Han (2022), who demonstrate that the vitality of historical and cultural districts is closely tied to how well historical, use, and sustainable values are integrated into their spatial planning.

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