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KNIL Magazijnen; The creative and learning cluster of plastic waste

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Bandung, Indonesia

Reflection Paper

MSc 4 Graduation Studio Heritage & Architecture Bandung Shared Heritage lab **2018 - 2019** Introduction

"A project about social integration and equality in a system that addresses environmental pollution, while conserving and creating a new cultural layer in the heritage site of "Knil Magazijnen".

SHARED HERITAGE LAB BANDUNG

The studio's focus is in Indonesia and the colonial city of Bandung in particular as part of a collaboration between ITB, TU Delft and the Dutch Ministry of Education, Culture and Science. The studio focuses on the investigation of the main backbones that affected Bandung's urban, social and economic development. Today, these historic backbones act as boundaries between different communities, enhancing social segregation and inequality between the formal and informal setting of the city. Bandung constitutes a former Dutch Colonial city, which was gradually transformed into a mega-city of the global South, unable to relieve the social, economical and political pressures that modernization brought upon. The studio embraces the cross-disciplinary character of architecture and necessitates the cooperation of students between various department such as Heritage and Architecture, Engineering, Landscape Architecture and Urbanism as well as a group of Indonesian students. The goal is within this cross-disciplinary environment to come up with creative ideas and solutions in order to transform the city of Bandung from the degraded, unfair, and seriously polluted environment into a healthy, resilient and thriving city, where people from different social and economic groups can integrate and grow together. This automatically implies the need to understand the context and its history to the fullest.

PERSONAL VIEW

In the 21st century, a challenging era for architects and engineers, where globalization and the consumer-capitalist oriented lifestyle is spreading across the constantly increasing population, the urban centres are rapidly expanding to unprecedented levels, dimensions. Mega-cities are developing around the globe, unable to address the social needs for housing,

infrastructure, employment opportunities and social inclusion and thus segregation dominates in the cityscape.

Heritage, is a key to understand how urban built environment developed throughout history, closely associated with political, economic and social events that offer valuable insight into how the urban centres came to the shape they have today and thus why they fail to alleviate social pressures. Consequently, for me its not about "Shared Heritage" between different countries that share a common past, but it is about *Heritage* that needs to be shared so that we can work towards a common future. Its about overcoming national borders and working together for the benefit of the people. Evidently, even though we are dealing with structures of the past, sustainability and the current environmental issues are equally important. It is about social sustainability and its integration with the social impact of the existing heritage site. Shared Heritage should be for all people and not just for the more affluent part of the population which led me to the combination of a social and environmental problem that demands the participation of different people for different areas of expertise and knowhow.

In "The squatter Settlement: An architecture that works" Turner suggested that people in "barriadas" experience greater freedom in shaping their built environment than people in western city centres, reflecting critically on the role of the architect. He showed how the power of such communities lies on their understanding of adaptability of space to serve the constantly changing needs and behavioural patterns of the community which I thought is equally if not more important in heritage design so that the value of the existing monument can be brought forward.

FASCINATION

On my way to Indonesia I had no particular vision on my graduation project. I new that I wanted it to be for the people, but I wanted to first explore and become familiar with the context and then come up with a strategy. During our field trip to Indonesia and our investigation of the railway backbone, I immediately became fascinated in two things; the social segregation between the South part of the city and the North - more affluent neighbourhoods and the transformation of the colonial railway track into a landfill area as a result of this segregation. From this point onward, it was almost impossible for me to look at the two problems separately, which led me to the investigation and the search for a system or a combination of systems that could deal with these problems in an integrated way. With the railway dividing the city into two parts, into two different worlds, transforming Bandung into a resilient and healthy city seems a very distant dream unless a new system of integrating the needs of the two different worlds is established.

At the same time, the waste pollution in Indonesia has a tremendous magnitude. Especially plastic waste pollution which soon became my main focus has catastrophic consequences not only to Bandung and other cities like Jakarta but to the planet itself, with Indonesia being the second country after China to contribute in the plastic pollution of the oceans. Currently even though the government's goals are set really high, there is a an evident stagnation in the management of the problem. My research therefore, began with the investigation and exploration of the values and the historical importance of the railway itself, its current condition, and lead to its future possibilities. Simultaneously, research into the plastic waste problem and its potential for reuse and up-cycling was investigated to establish the more technical framework but also to reflect on whether or not the two problems could be combined.

AMBITION

The most important conclusion of my research was that the social and spatial separation that the railway creates, this boundary-condition is the primary reason behind the lack of integrated and organized solutions behind the plastic waste problem. The main reason behind the environmental pollution is the lack of awareness and the different consequences it has for the low-income communities relative to high-income communities which results to a different attitude towards addressing the problem. The more organic-kampung like urban structures are fighting on their own to improve the situation while the more structured urban setting unaffected thus completely disregarding the problem. By striving thus for social and spatial inclusion and integration while conserving an existing monument an additional more technical system of managing plastic waste could be incorporated to address both issues. Consequently the goal of the project became the integration of two systems/cycles, the people - from different worlds and areas of expertise - and plastic waste, on an urban, neighbourhood and building scale (Figure 4.). The result was a multi-functional complex with technical facilities to manage waste material and an educational, and a creative sector accompanied by public, communal spaces aiming at the public's integration into the waste system. On an urban scale the railway is replaced by a new green belt with a tram line that works both for moving people and goods/ waste from within the city to outside recycling plants, waste banks, etc. reinstating the value of the industrial system. On a neighbourhood scale, the project strives for integration by offering a crossdisciplinary programme from a Recycling Plant to a Creative Industry situated at the heritage complex where people from the surrounding kampung can develop and expand their interest in up-cycling plastic waste while people from the more structure

urban environment can learn, engage, research and push innovation. In addition, a new development outside the heritage complex that works along with the new tram line and offers flexible and transformable space for the recycling waste management and communal facilities for the densely populated kampung, so as to achieve the necessary transition condition between the kampung area and the heritage site.

Last but not least on a building level the design strives for balance between publicly accessible functions and the more controlled working environment.

REFLECTION

In this reflection paper I will reflect on the process of my graduation project, how the ambition and my aims where developed, how the subject is relevant to the general architectural discourse, its relevance to wider social and environmental issues as well as the relation between my research and design process. For the purpose of this paper therefore and the correlation to the studio I will focus on my research in terms of the cultural valuation and assessment and thus what the role of heritage and the heritage architect can be.



Figure 1. Urban Plan - New Tram line

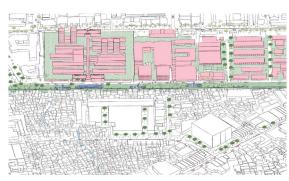


Figure 2. Neighbourhood scale - New tram line



THE CREATIVE AND LEARNING CLUSTER OF PLASTIC WASTE

Figure 3. Programme integration

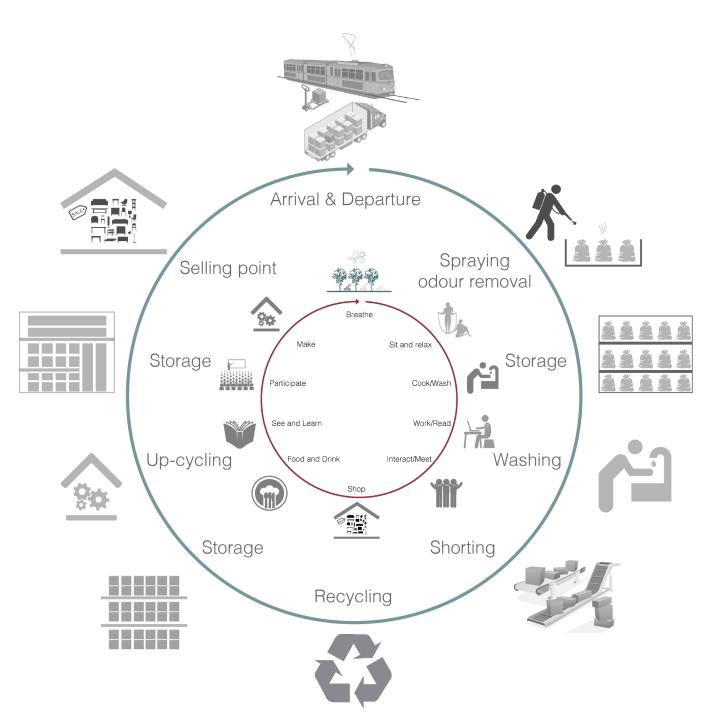


Figure 4. Integration of Waste cycle with the public cycle.

Reflection Paper

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1. Context & Cultural Value Assessment

CONTEXT

Being a European, non Dutch, non Indonesian student implied a different perspective on the exploration of the shared Heritage between Indonesia and the Netherlands, subsequently, my role became that of an observer which attempted to reflect critically on the events of the Dutch Colonial period in Bandung and its consequences in the urban development, by advocating and reflecting on the people. In order to understand how the city developed and consequently how the urban settlements spread to what it has become now a mega city it was important to refer to literature, archival material to draw time-lines and construct chrono-mappings. This way the context of the city and the consequences of the railway that was constructed by the Dutch during the colonial period where brought to the fore. The railway had become a boundary through the city historically to separate the Dutch from the native population and then developed to today's border between the affluent and less fortunate population. At the same time, it showed how the Colonial infrastructure was functional when constructed because of its location outside the city's edge whereas today it is crossing through it, contributing to a tremendous extent to the enormous traffic congestion of the city. Evidently there is a need for transforming the existing system into something that the people can benefit from on the contrary to its history up to now. At the same time, exploring, walking through the area during our field trip and observing how people interacted or not with area, how they where placing their food on the railway tracks or using it to burn their excess waste was of great importance to come up with a story, a programme and a strategy for the design. It was about the intangible values a spatial entity such as the railway can have and the social values associated with it.

CULTURAL VALUE ASSESSMENT

Being part of the Heritage and Architecture studio meant that the interventions into the existing urban and building fabric had to be done in "harmony" with the tangible and intangible values of the site/buildings. For this reason, the cultural value assessment method found in the text books of the Heritage and Architecture studio "Heritage-Based Design" and "Designing from Heritage: Strategies for Conservation and Conversion" was implemented. This led to a better understanding of the site and the buildings of the military complex "Knil Magazijnen" at Jl. Gudang Selatan 22, in its present state and evolution throughout the city's development.

More specifically, "KNIL Magazijnen" is located between Jl. Gudang Seletan and Jl. Gudang Utara, just outside city centre of Bandung, Indonesia. It was used as a storage unit for the military district during the Dutch colonial period (1900s – 1942), the Japanese occupation (1942 – 1945) and after the

Indonesian independence until 1990. Today the complex is rented out to private individuals for light industry and social activities reflecting the need for a transition to a more open use of the complex. We estimated the date of origin, based on historical maps, to be between 1900 - 1905, with later additions before 1942. The complex consists of 19 buildings which are enclosed by a perimeter wall. The wall has historical value because it reflects its military past and age value due to its natural decay and craft-work. Their spatial arrangement is organised along a central axis / servicing system that served the purpose of the former use and which has age and historical value because it reflects the history of the place and its use as a storage. Moreover, it has art and rarity value considering of its uniqueness in the context. The warehouses are constructed with load bearing brick masonry

walls and timber roof structures. On the exterior the patina, the articulated mouldings and the wooden shutters characterize the buildings. The load bearing construction of the warehouses has use value considering it allows for flexibility and adaptability of the interior environment and the repetitive rhythm of the facade openings. Besides, the timber roof structure has historical and rarity value because of the uniqueness of the material used. Smaller elements such as the wrought iron tension rods on the exterior and the cast iron column of the entrance building show significant art value as they reflect the architect's intention to balance technical and aesthetic aspects. Furthermore the entrance building, on the south side of the complex, has historical and art value because it constitutes an example of imperial architectural style - "Beaux-arts" that reflects the colonial past of "KNIL Magazijne".

The complex's proximity to the railway justifies its use as a storage space. The entrance building was the connection point between the railway and the warehouses, inspecting and provisioning the goods to the warehouses through the trolley track system. Today, "KNIL Magazijne" works as a buffer zone between the formal military neighbourhood and the informal settlement south of the railway.

CONCLUSION

The aim of the project is to deal with a societal and an environmental problem within a heritage complex so as to create a showcase of approaching similar conditions and of how to unlock heritage sites to the people. The problem statement therefore which is twofold, demands for a design that integrates in "harmony" two new systems. One for the public, its movement and need for space and integration into the urban setting and one that could work along with utilitarian -still functional- servicing system of the military complex (trolley track) and deal with waste in an efficient and effective way, creating a healthier working environment.

One would say that the that filling in an industrial complex with a new industrial programme is an easy task however the whole aim of this project was to do that in a way that the shared heritage is brought on to the public and waste is just a temporary layer that deals with a current problem where as the public integration and the kampung - military community integration is the more permanent layer and the biggest challenge of my graduation project. Reflecting thus to the value assessment shows immediately the importance of the main "Beaux-arts" building, the conflict with the perimeter wall which has historical and age value and the trolley track which is centrally placed and has both rarity, historical and art value and should be seen. For this reason, I decided to focus on the south edge of the military complex to explore the opportunities, obligations and dilemmas of a future design along with more technical aspects such as climate control, rainwater management which I will present in the following chapters.













Figure 5 -10. Railway backbone exploration

2. Shared Heritage Vision

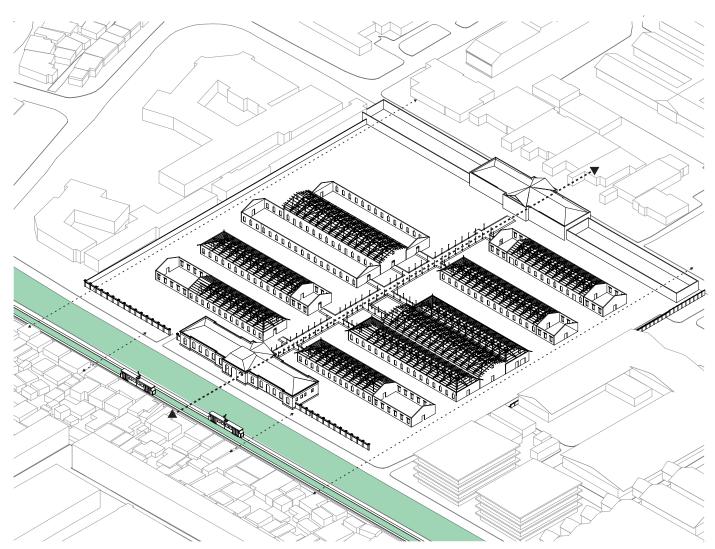


Figure 11. Starting points of the design. Interpretation of existing values.

"Shared Heritage" is, in my opinion, as stated in the beginning, a tool to overcome borders, to learn from our rich past and thus to transform these borders into transitions/connections to a sustainable future.

This vision is therefore what led me to the development of this complicated project and what made the integration of those two systems and the crossing of borders the guiding themes behind my design process and affected my decisions in the various obligations, opportunities and dilemmas that arose regarding the intervention to the existing site.

More specifically, the master plan of the whole complex came by first referring to the original function of the buildings and then reinterpreting that according to the programme requirements and the need to create a transition zone between the kampung and the heritage site and a second transition form Gudang Selatan through the wall into the interior of the complex.

Consequently this led to two different intervention zones that had to work both for the public/communal functions and the working environment of managing waste linked to the new tram line, where the waste cycle had to overlap with the public cycle. One connecting the heritage site to the kampung and one that should invite people to bridge the perimeter wall which has great meaning for the heritage site.

Architecturally, the design comprises of two new structures, one outside the wall and one inside the wall where the industrial character of the complex is reinterpreted with the use of up-cycled plastic so that the "raise awareness" component of the programme is also brought to the fore while it highlights to the public how useful plastic is as a resource while simultaneously creates a harmonious contrast between the weathered existing fabric and the new design constructed from a very durable material.

3. Design Process

DESIGN PROCESS - HERITAGE BASED DESIGN

Based on the chronological maps that our literature and archival material brought to the fore, the complex was accompanied by two additional structures outside the main building that offered a transition between the railway and the main building of the complex. The remaining edge zone was green, famous as a banana garden. Nowadays the setting around the complex has changed completely with the densely populated kampung living practically on the train tracks while the military warehouses deteriorate partially empty. The transformation of the railway into a green belt to facilitate movement and alleviate traffic congestion thus was not enough to achieve integration. Consequently, the original condition of the complex offered the opportunity for a new modular structure that could accommodate both the waste managing facilities and offer to the kampung people flexible communal space for a variety of uses from cooking and washing to commercial activity, meeting and relaxing.

At the same time, this new structure should work in harmony with the main building so that the colonial character of the main complex could be seen again. Moreover, it implied that the new structure should be open in the north-south axis so that Jl. Gudang Selatan - the colonial garden city concept street could embrace a more vibrant atmosphere like the small still very active alleys of the kampung.

The second intervention zone is behind the perimeter wall left and right of the main Beauxart building. Two existing structures - added at a later period in the evolution of the site, severely deteriorated and lacking the historical value of the rest of the complex are removed so that a new volume is introduced in both locations. Similarly to the previous intervention the new structure should also be flexible in order to accommodate public private functions. However the most important dilemma in this area was how to engage the

perimeter wall and what architectural language could work in harmony with the main building which as an entity is one of the most important elements of the complex. How to provide the new programme with the necessary space and at the same time respect and enhance the qualities of the existing site.

Last but not least the interventions conclude with an extension to the exiting warehouses and a furniture-like infill of the green areas in between. The new public function of the warehouses was in conflict with the need of more storage space, which led to a reinterpretation of the vernacular storage space or the climatic approach of the existing structures and the introduction of a new structure that could accommodate a second mezzanine floor for public use and an attic space for storage.

All interventions aim at enhancing the qualities of the complex and are implemented by reinterpreting historical values of the monument or the context.

THE PAVILION

The new pavilion structure had to be flexible in change of function from private to public so that both commercial activities and communal spaces as well as working environment for the waste management should be incorporated. A horizontal distribution of the needed space, like the existing warehouses would result in the creation of the same boundary condition that I am trying to overcome and thus was in conflict with the main concept.

The grid of the perimeter wall was thus used to divide the available surface area into sections and from that three walled sections and one green section where combined to form a single pavilion unit, which allowed for visual and direct access from the kampung to Jl. Gudang Selatan and the heritage site. In front of the main building however a bigger section was left as open green space

so as to accommodate the tram stop, and reestablish the central axis of the main building as the main public circulation in and out of the complex while at the same time it reinstated the main building and its grandeur character in relation to the surroundings.

More specifically, the ground floor needed to respond to both streets, Jl. Gudang Selatan, the colonial garden city street and the new walk way along the green belt of the new tram line. Consequently, and due to the very narrow site a third route dividing the building in to in the eastwest direction was introduced to accommodate circulation and services creating a sheltered street atmosphere inside the pavilion. The same walkway was used at the full height of the building to bring more light and boost air flow and thus address the more technical requirements of storing waste material.

The idea was that since the ground floor needed to be completely permeable and integrated with the surrounding green and built environment the level of privacy would increase vertically with 3 floors being the maximum expansion. Furthermore, the facade itself was approached in a similar way with flexible components that can be shaped according to the users preference. Plants and trees are also used to make a more natural transition between the green belt and the interior of the new structure while in the waste pavilion scenario plants help to filter the air coming out of the building.

In this way this area can both accommodate the waste managing facilities but also create a vibrant new street atmosphere for the two communities that can be expanded and transformed from public to private and vice versa.

A NEW STORAGE SPACE

The second intervention in the area behind the wall required a lot of experimentation because it needed again to be able to change from public to private to accommodate the needs of the current population but also future needs in a way that respects the historical and age value of the existing fabric. The solution came with the combination of different design aspects and values such as the obligation to maintain the wall as it is, the need for more storage space and the concept of inviting the people by showing them a glimpse of what is happening behind the wall. The result was a reinterpretation of the existing volume with a balcony overhang on the first floor, above the perimeter wall with a very transparent facade that reveals the inner activity to the street while on the ground floor the same facade is pushed back behind the wall creating a unique semi outdoor space where the perimeter wall serves its function as a wall instead of a boundary and thus can reflect upon the whole history and evolution of the complex in just a few steps after entering while the rest of the activity is revealed to him by approaching the main building and the central axis of the complex. The permeable/transparent facade of this new structure not only had to work in harmony with the imperial building and the perimeter wall but also with the very repetitive rhythm of the load bearing wall of the inner warehouses.

In this new structure a new trolley track (elevated) is introduced so that the movement of the goods (waste/up-cycled products) is separated from the people's circulation and movement around the complex (visitors or staff). The reason behind the introduction of a new servicing system was first of all, the fact that the existing trolley track is one of the most valuable elements of the complex, it is centrally located and should be used by the people so that they can experience the original system without interacting with the temporary layer

of waste at all times. Yet, the old trolley track system is extended to facilitate the transportation of goods within the storages without imposing such a strong structure as the elevated trolley track which connects to the new system and facilitates the east -west movement of products as in the original situation for small scale products and after they have been recycled and thus do not constitute a waste product anymore.

A HYBRID STORAGE SPACE

The last intervention area is in the existing warehouses. The conflict between its public use and thus the possibility of the visitor to experience the full height of the original structure and the need for more storage space including both ends of the plastic cycle. The solution came by looking deeper into the Indonesian tradition and referring to the vernacular storage structures resulting in a hybrid storage space with colonial and local characteristics. A new structure is added inside the existing warehouse that allows the public functions to use an additional mezzanine floor for more resting, relaxing and experience the new space while at the same time the roof structure is used as an attic space to provide the needed storage. The attic space allows wind flow through it in all directions and thus contributes to a better ventilated and climate protected public ground floor. Last but not least because of the very minimal and utilitarian detail of the roof of the existing warehouse and the lack of a gutter system an additional furniture like structure (similar to the storage structure used in the working spaces) is added to the in-between outdoor green space that supports the gutter of the warehouses and directs the water into the filtering system situated also in the garden area creating also an interesting experience of the outdoor environment of the complex again reinterpreting the utilitarian and functional character of the heritage site. An additional green escape from the

overcrowded atmosphere of the city.

THE IMPERIAL BUILDING

The imperial building was the main entrance point of the goods into the system and from there into the warehouses. The middle section was used for inspection and thus the floor is raised higher than the trolley track and element which reveals the former use and thus should be maintained while the other two sections left and right we assume that they were used as administration offices. The main entrance building has historical and age value as well as art value and constitutes the main building entity that reflects the Dutch colonial character of the complex. Consequently the function maintains public for drinking and eating, a resting stop of people before they leave the monument with views towards the tram stop so that its also works as a waiting booth. The middle section remains a passage with information desks and directions for the remaining complex. So that in a way the visitor takes the role of the goods in the former use of the complex. Again with the idea that the visitor reflects on the journey and learns form our Shared heritage and thus it becomes easier to make the borders into connections in the future.

For a significant period of time not having a fixed programme but a big master-plan and concentrating on two zones that needed a different approach because of the different context in which they where situated as well as their need to serve both public and private functions with very specific requirements and logistics such as cleaning and sorting the waste or how high the recycling plant is or odour removal processes as well as providing the necessary storage space based on what is needed caused a lot of confusion in a significant period of time during the design process with multiple alterations of the design without having a

clear direction and diving in to too technical aspects which did not add anything to the project leaving less time to think about the materialization and the actual detailing that affects the experience of the visitor and the architectural impact of the intervention. It also reduced significantly the innovative use of plastic in way that acts as a showcase of what plastic can do but rather it worked as an industrial language to the new structures which however can have the colours and vibrant atmosphere that users want and they can be repaired and maintained on site. It became more of a design of systems either public or private and a design of layers. Layers of the past, layers of the present and layers of the future. Yet with more time to develop that aspect of project I believe that in the end the design can serve its ambition of integration while extending the life of the existing monument and showing how similar strategies can be applied into other areas along the railway where the north and south edge are isolated from each other combining both working and living programs.

In terms of the environmental problem, a new place/destination is created in the city which automatically makes people more involved and thus are more likely to change perspectives and follow the example. The design is dealing with two global issues on a local scale creating a better living environment and promoting a programme that can create business opportunities for a variety of different people.

4. Conclusion

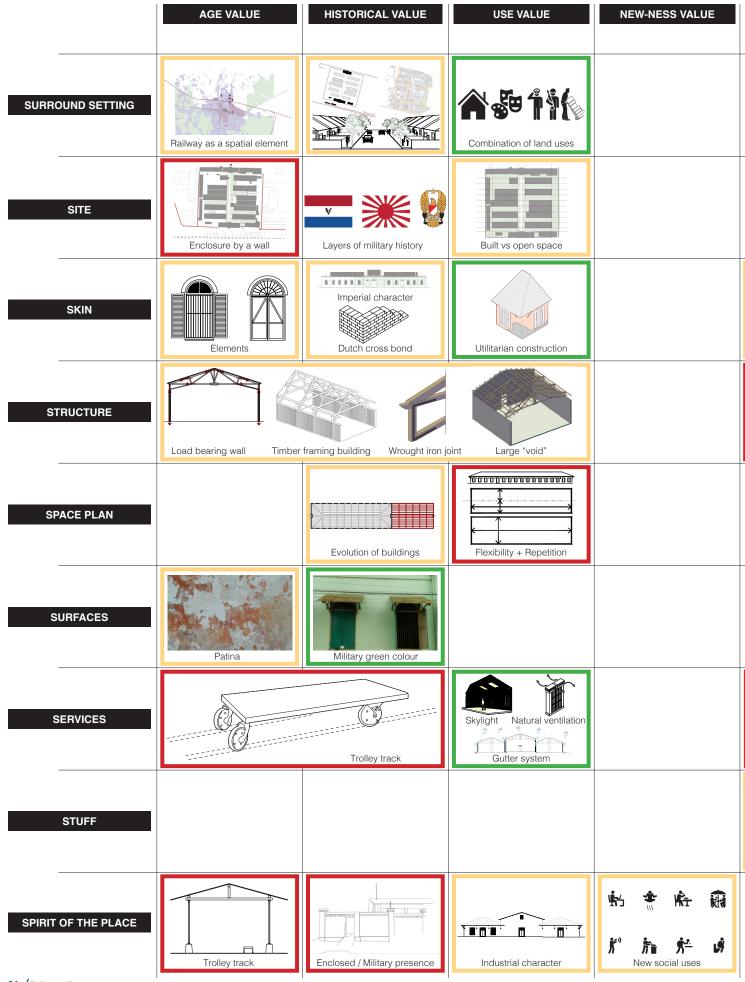
CONCLUSION

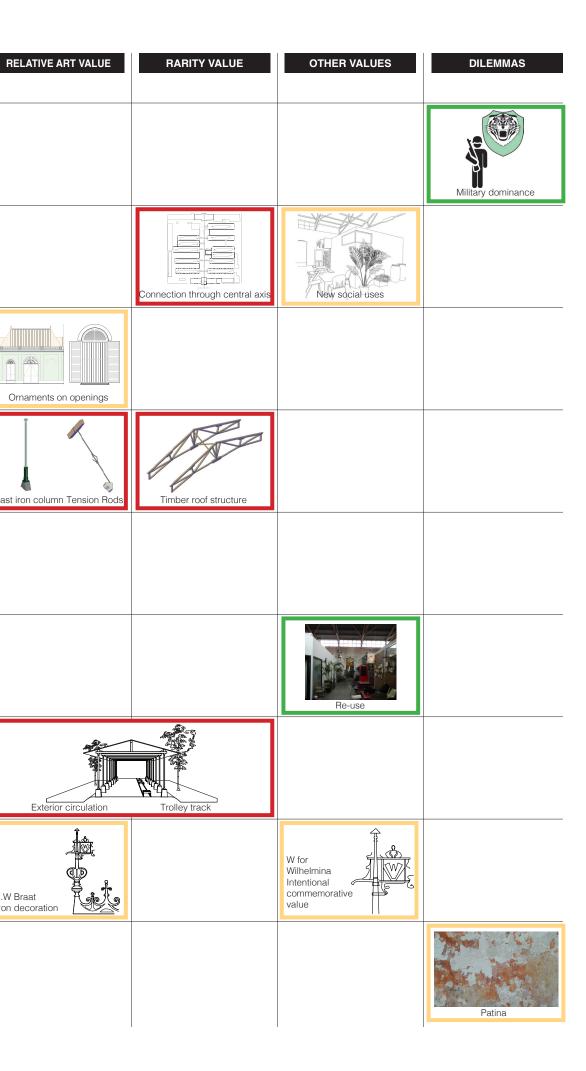
Through this whole design process and the design of these three different interventions zones, the three different moments of introducing the existing site to the public while simultaneously providing flexible working space in a constantly growing mega-city highlighted even more for me the need for the architects to work along with the people so as to provide them with the necessary spatial environments and achieve integration and social inclusion.

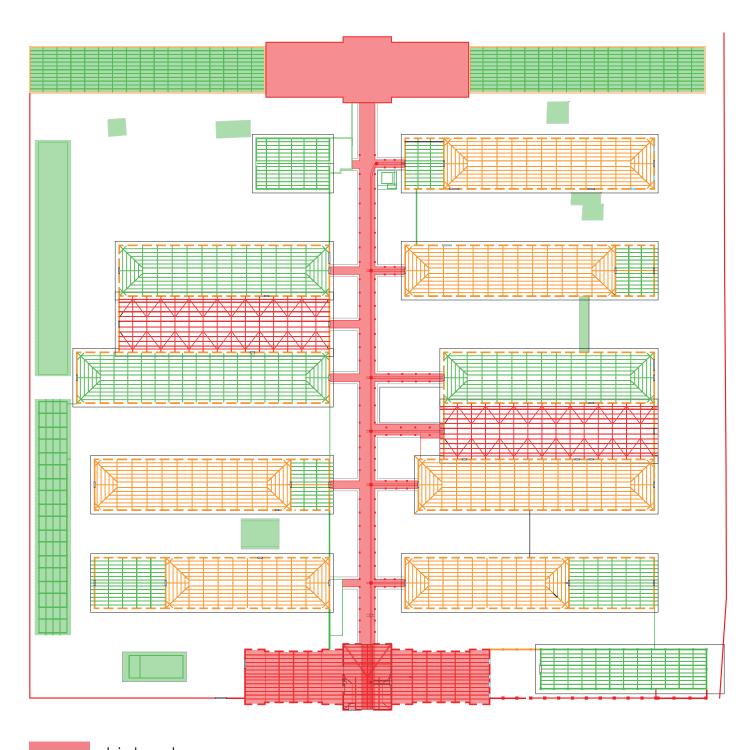
I tried also to keep the heritage site and its tangible and intangible qualities always in mind which resulted in a design of volumes and modular patterns of enclosed spaces and circulation routes based on and integrated into the context, thus serving the constantly changing needs and the constantly changing interests of the people. The design was approached as I said before as a design of layers inspired by Steward Brand's "Shearing layers of change" that aimed at a more sustainable future on an environmental and societal level and a heritage site integrated in the urban life. Heritage design for the people to alleviate societal pressures and if possible contribute to environmental problems can be a powerful tool in protecting, embracing and continuing our history, while "making place" for future generations.

Appendix I

CULTURAL VALUE MATRIX







high value medium value

low value