REFRAMING IMAGERIES OF
INDUSTRIAL SURPLUS

RECYCLED BRICK FACTORY X URBAN MINING

AR3A010 Graduation Reflection (2023/24 Q1)
Amanda Hwa De Ai - 5720494

TU Delft Faculty of Architecture
Graduation Studio
Methods of Analysis & Imagination

Tutors
Klaske Havik
Jorge Mejía Hernández
Willemijn Wilms Floet

Figure(s) 1: Social media representation of Tallinn. Source: extracted from the Instagram accounts of students from the Methods of Analysis and Imagination Graduation Studio.

My fascination with the imageries of surplus sparked when I undertook the task of compiling a catalogue of Instagram posts by students from the Methods of Analysis and Imagination Graduation Studio during the two-week field trip in Tallinn. The photos show how Tallinn consists of various architectural types built by different regimes as well as hidden waste and decay left behind by the period of industrialisation (Figure 1).

The Kopli peninsular was planned as a large urban plan for military production, including supporting facilities such as vocational training facilities, worker houses and a brick factory called Maleva Quarter. After Estonia's independence and the gradual shift into service-based industries, the extinction of the industrial landscape left behind patches of dysfunctional space (Figure 2). Being by-products generated from modernisation, industrial surplus is deemed functionless - the remainder of what is useful, and thereby valueless (Kim, 2017). These spaces - characterised by messy, unsanitised textures, are no longer recognised as part of the city's image and are isolated from human activity (Tsing et al., 2017).

Nevertheless, we should not let industrial surplus become permanent forms of waste but rather reinvent them as valuable aspects of our urban ecosystem. Thus, a series of research questions were posed at the beginning of this project to investigate existing values of industrial surplus and ways of giving legibility to spaces of this nature.

The proposed program of a recycled brick production complex utilises the brick-making factories left behind in Maleva Quarter after the depletion of the local clay quarry. The complex includes facilities for industrial research and production while housing exhibition halls and showrooms open to the public. The masterplan design also reinserts relevance to the surrounding fringe spaces such as the adjacent landfill hill and train tracks (Figure 3).

Figure 2: Kopli tour route by *Hidden Tallinn*. Source: by author.

Figure 3: Proposed masterplan. Source: by author.

The key design technique proposed is urban mining - reclaiming construction waste and turning it into productive architectural components (Bahamon & Sanjines, 2010). Methods of harvesting existing urban stock and their application as building materials in modern construction practices were thoroughly researched during the design process. The design strategy was centred around available waste materials in the area and their limitations and properties for building. The result is a material-focused design, much like spolia - where the structure of old buildings drives the project's visual and structural expression. The ingenuous use of waste material in design aims to create value from previously unimportant places and functionless objects.

With the rise of environmental consciousness, sustainability and material circularity are key issues in the current construction landscape. As seen in Tallinn, there is already an increasing awareness of the use and disposal of resources among architects, developers and government authorities. There are various studies on the issues concerning the use of construction waste as building material such as its structural integrity and other limitations. Some companies also specialise in supplying sustainable materials such as recycled brick and earth-based plasters and setting up waste collection centres. My graduation work is part of this collective effort to ensure that we maximise the potential of depleting building materials and negate the negative impacts of our industry.

The design methodology starts with identifying raw materials on site with reuse potential such as leftover bricks, precast concrete elements and steel beams. A second trip to Tallinn resulted in a harvest map of various waste materials scattered around the site, which would define the textures of the proposed design. Further study was also done on the two existing buildings that would be incorporated into the new design proposal. Then, various ways of reusing waste material as architectural components were tested, resulting in four strategies that would be implemented for different parts of the design. These strategies vary depending on the existing structural systems of the buildings, the desired spatial quality (e.g. low corridors or double-height spaces) and the characteristics of waste material sourced. Finally, the design strategies were compared in terms of their composition to evaluate whether the final design achieved the goal of material sustainability (Figure 4).

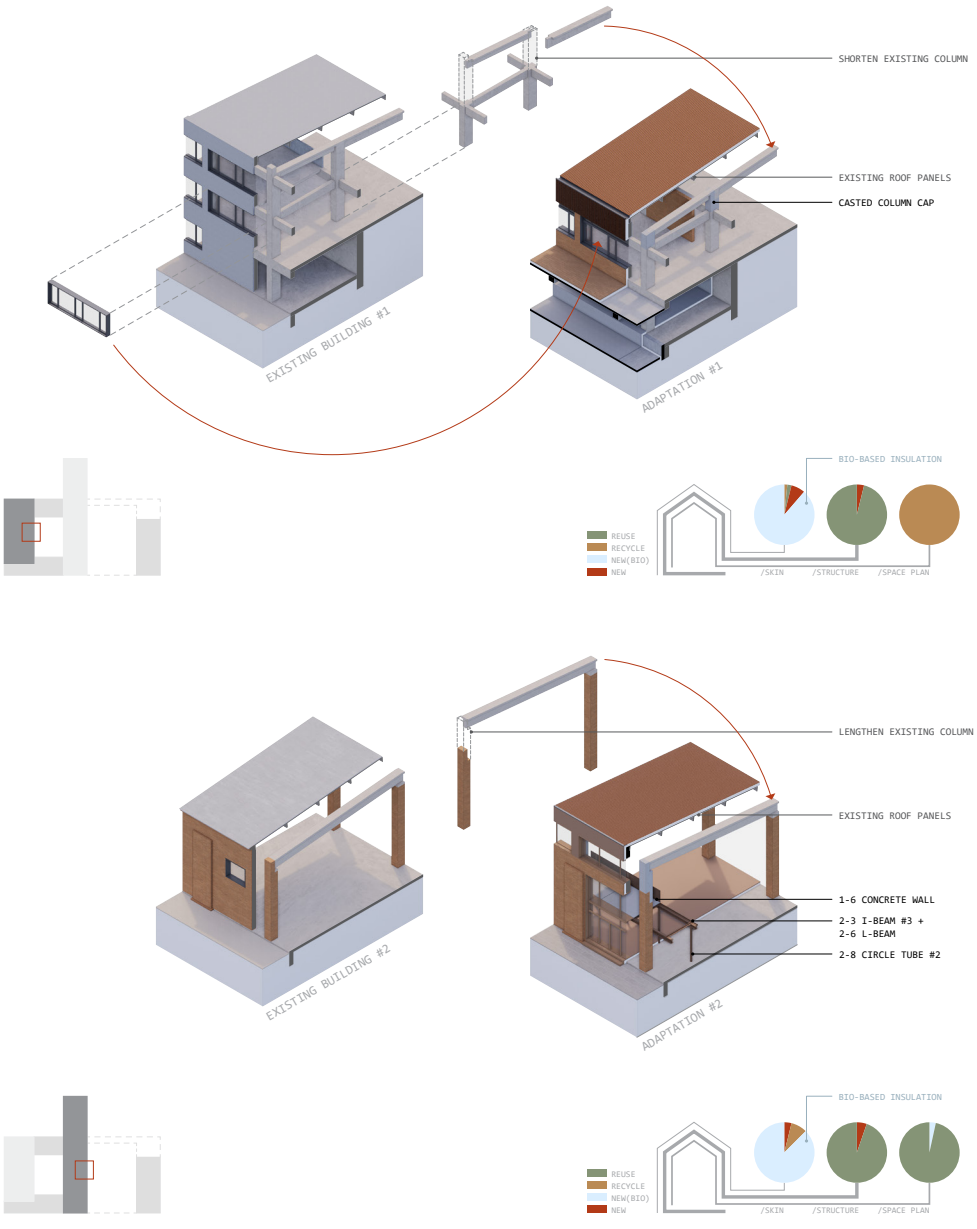

Figure 4: Proposed building strategies and material composition. Source: by author.

Looking back at the design process, there are limitations on the applicability of these strategies in future projects. The specificity of raw materials available on a given site means the results of each project are often ad-hoc and not easily replicable. This contrasts sharply with conventional design methods, where architects typically envision the form and composition of a new construction first and then source materials that fit that vision. In urban mining, the process is inverted: architects identify reusable materials first, and these materials subsequently dictate the form and composition of the building. This reversal of the design process requires a more flexible and adaptive approach, which can be both a challenge and an opportunity.

In terms of construction feasibility, the load-bearing properties and safety of second-life materials must be evaluated on a case-by-case basis. New materials are generally tested and certified to meet industry standards, ensuring reliability and safety. Balancing these requirements with the goal of sustainability and reuse adds complexity to the design process.

Moreover, there were initial concerns about whether the design proposal reflected the concept of reusing waste materials, as the initial renders appeared too 'sterile' and polished, potentially undermining the project's concept of urban mining. To address this, a conscious effort was made to embrace the idea of spolia, where the remnants and structures of old buildings significantly influence the visual and structural expression of the new design. This approach highlights the history and original context of the materials, integrating their past lives into the new construction in a visible and meaningful way.

In conclusion, the key lesson for future projects is an approach or mindset of breathing new life into objects that may not be produced for their eventual use. It encourages a more sustainable and resource-efficient practice in architecture amidst the depletion of building resources. Adopting this mindset could lead to more resilient and adaptive urban environments that honour their past while innovatively preparing for the future.

Reference

Bahamon, A., & Sanjines, M. C. (2010). Rematerial: From Waste To Architecture. National Geographic Books.

Kim, J. H. (2017, February 19). Surplus in neoliberal urban space. https://kjeonghye.wordpress.com/2017/02/19/surplus-in-neoliberal-urban-space/

Tsing, A. L., Bubandt, N., Gan, E., & Swanson, H. A. (2017). Arts of Living on a Damaged Planet: Ghosts and Monsters of the Anthropocene. University of Minnesota Press.