

Graduation Reflection

Lilani Oei

Technical University of Delft - MSc Architecture

AE Studio 25/26

4848039

My graduation project explores how architectural knowledge embedded in indigenous building techniques can inspire new ways of designing with reclaimed materials in a contemporary urban context. This ambition fits naturally within the Architecture track and the MSc AUBS programme, which emphasise material awareness, contextual design, and sustainable building cultures. By studying indigenous construction logics and applying them to a pavilion design for Rotterdam's MuseumPark, the project connects ancient global architectural intelligence with local material realities.

The starting point of the project was broad research into indigenous construction traditions, which I organised into four recurring principles: Stack, Wrap, Fill, and Scaffold, based on the book 'Heterogeneous Constructions' by B. Schneider, A. Forrest and Y. Vobis. These principles describe how materials can be combined or assembled through techniques grounded in gravitational force, centric force, infilled planes, and externally supported structures. Analysing these through drawings and case studies helped me understand how communities around the world develop intelligent and resilient building systems using only what is locally available. Rather than viewing them as "primitive," the research revealed them as sophisticated responses to climate, context, and material scarcity. The main conclusion was that, through awareness of material value combined with creativity and construction logic, buildings and components can be designed that are both innovative and locally sustainable.

This research strongly shaped the design phase. I translated each construction principle into a prototype made entirely from reclaimed materials harvested in the Rotterdam region. Designing with what already exists, rather than with endless hypothetical possibilities, forced me to think in the same resourceful manner as the builders I had studied. This changed the design process: form followed the logic and behaviour of these found materials. The prototypes demonstrate how distinct forms of structural intelligence arise directly from the possibilities and limitations of material. This process grounded the project and made it less abstract, teaching me that tectonic design emerges from working with real matter.

The outcome of the research proved essential in the final design phase of the graduation project. I chose to design a pavilion for Museumpark in Rotterdam, a place framed by art institutions yet lacking artistry and liveliness in the public space that connects them. The proposal consists of two buildings: one that embraces a small open-air theatre and includes a gastronomic function, and another that hosts a bookstore with reading tables and an open-air exhibition space. Together, they stimulate live art, culture, and public engagement. The main structure of the pavilion is designed entirely from materials harvested from Museum Boijmans Van Beuningen, located directly behind the site. The museum is currently under renovation, and a substantial 1997 wing will be demolished. This wing, which is still in excellent condition, provided an ideal material inventory for the project. Using the insights from the research, I designed building components in the form of walls, columns, and roofs based on the four principles. Their combination and configuration shape the two distinct buildings that form the pavilion.

The academic and societal value of the project lies in reframing indigenous knowledge as a source of construction logic rather than visual inspiration. Academically, the four construction principles form a framework that others can use to analyse or generate tectonic systems. Societally, the project suggests a shift in how building resources are understood in the Netherlands: instead of relying solely on new bio-based or industrial materials, we can treat the city itself as a material bank. Reusing parts of the Boijmans wing allowed me to explore the ethical dimension of circular design, not only reducing waste, but also extending the life of materials that still carry architectural value.

The project's results are transferable in several ways. The analytical framework can be applied to other case studies. The prototypes demonstrate how hybrid structural systems can be made from reclaimed materials and the design approach; harvesting, designing components, and assembling them before shaping a final architectural concept, can support many future circular design projects.

Two additional reflections emerged during the process. First, working with harvested materials changed my understanding of architectural authorship. I could not impose a preconceived form and then search for materials to match it; instead, the design emerged from what was found, making me a collaborator with the materials rather than their controller. Secondly, the project led me to rethink Rotterdam as a kind of "urban landscape," analogous to the natural landscapes of indigenous contexts. There, builders respond to an ecology of clay, wood, reeds; here, the ecology consists of industrial remains, demolition streams, and forgotten components. Treating these as meaningful resources opens up a new architectural language that is both contemporary and rooted in place.

In conclusion, my graduation project demonstrates how tectonic principles embedded in indigenous building traditions can inspire new ways of designing with reclaimed materials in the city. Through research, prototyping, and the final pavilion design, I developed an approach that values material intelligence, tectonics, contextual responsiveness, and circularity. These lessons have shaped my understanding of architecture as a practice grounded not only in form, but in the careful and creative use of the resources already around us- an approach that I will carry with me into the field.