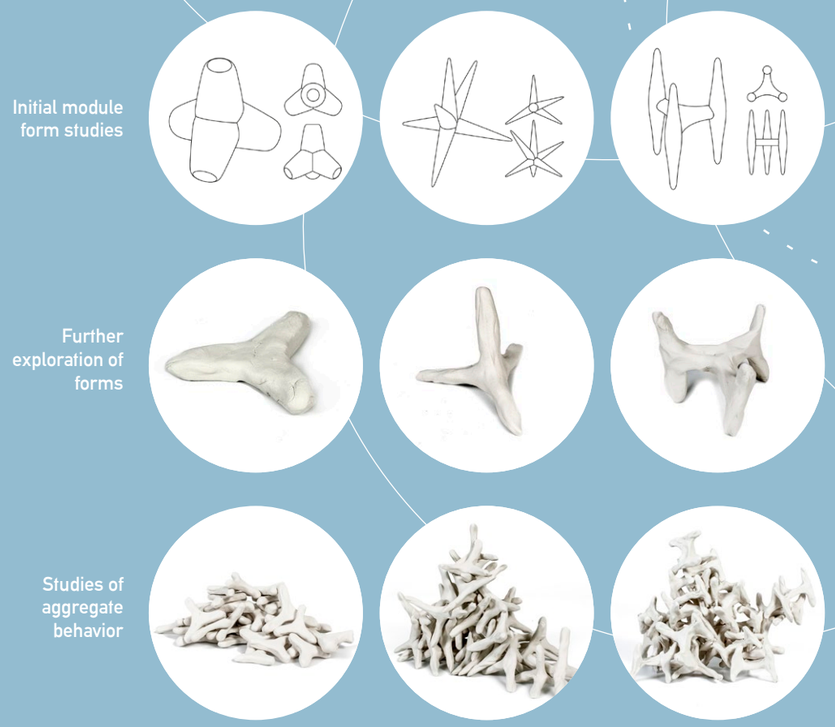
WE AGGREGATE

WE AGGREGATE aims to apply the concept of aggregate architecture in the creation of new spaces and objects while democratizing the process of sharing and obtaining such ideas. The name WE AGGREGATE is two-fold: first referring to the physical act of aggregating and making, and second as a proclamation of "we are the aggregate" parts contributing to this larger collection of information.

This project first explores one example of an application of aggregate architecture through the design of a shading structure, then goes further in proposing an online platform that could facilitate the exchanging of 3D files and information about how individuals can upload and download their own aggregative systems and learn/teach of ways these designs could be applied.



Exploration of different structural possibilities

WE DESIGN

Karola Dierichs and Achim Menges of the Institute for Computational Design and Construction in Stuttgart have coined the term "aggregate architecture," defining it as "material systems consisting of large masses of granules—designed or natural—interacting with each other only through loose, frictional contact" (Dierichs et al. 2013). As a result, when applied to architectural design, the idea challenges the conventional notion of architecture as fixed and permanent, and instead suggests an architecture that is ever-evolving and impermanent. By designing the smaller component and through the aggregation of many of these modular elements, it presents a new bottom-up approach to form-finding that uses no joints or adhesives.

Although the modular element is where the architect assumes the most design control, the geometry is determined more by the behavior of its aggregation. Depending on module characteristics such as material, size, thickness, and arm length, the behavior of the sum of these parts changes in density and structural stability.

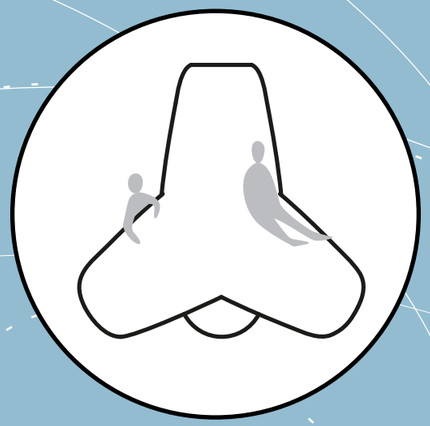
Our study first began with the concrete beach tetrapod form, a real-life application of aggregate architecture where large concrete modules are stacked without added joinery and collectively form a barrier for wave dissipation. We then explored other wave dissipation block forms and decided to investigate the tribar form.

In an area of metropolitan Tokyo with as much density and high property values as Ginza, there is a need to innovate with what little space is available for use, such as in-between spaces and sidewalks. As such, an idea that is applicable at all different scales becomes advantageous. As one example of how aggregate architecture can be applied in an area with much urban density, this project proposes the creation of a shading structure that can be suspended between buildings, or as self-supporting structures on sidewalks.

WE EXCHANGE

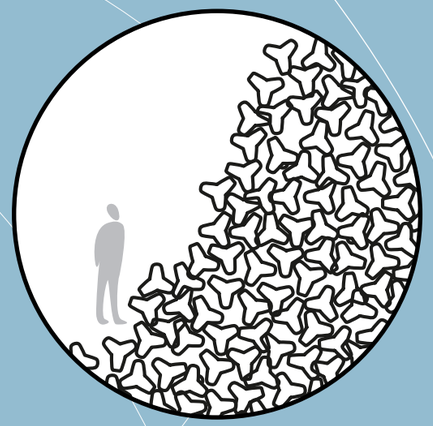
The WE AGGREGATE website provides a public platform where people can exchange different aggregate ideas and share photos and feedback, essentially facilitating a global process of design trial and error. Individuals or groups can upload 3D files of their components (similar to Sketchup's 3D Warehouse) or photos of themselves if they have tried the DIY (similar to food recipe websites) and share information about its potential applications. Using the project mentioned earlier as an example, we would upload a .3dm or .dwg file of our component and provide images of how and at what scale we produced the parts for our shading structure, explain the materials used, write details of what worked and what needs improvement, and suggestions for other applications. Users can then comment and discuss suggestions for improvements (similar to softwar forums where individuals ask a question and people offer different ways of solving the problem).

EXAMPLES OF IDEAS PEOPLE MAY CONTRIBUTE

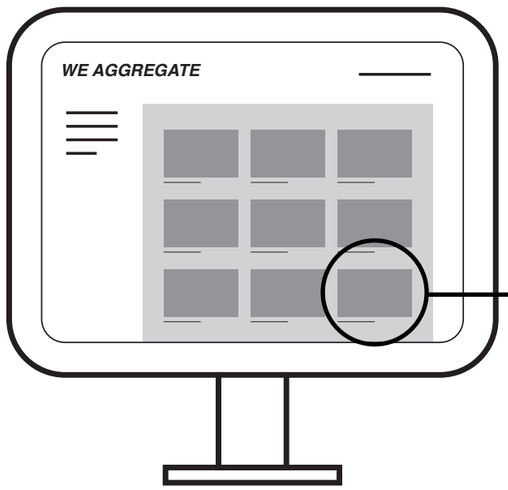


Large interactive sculptures or furniture

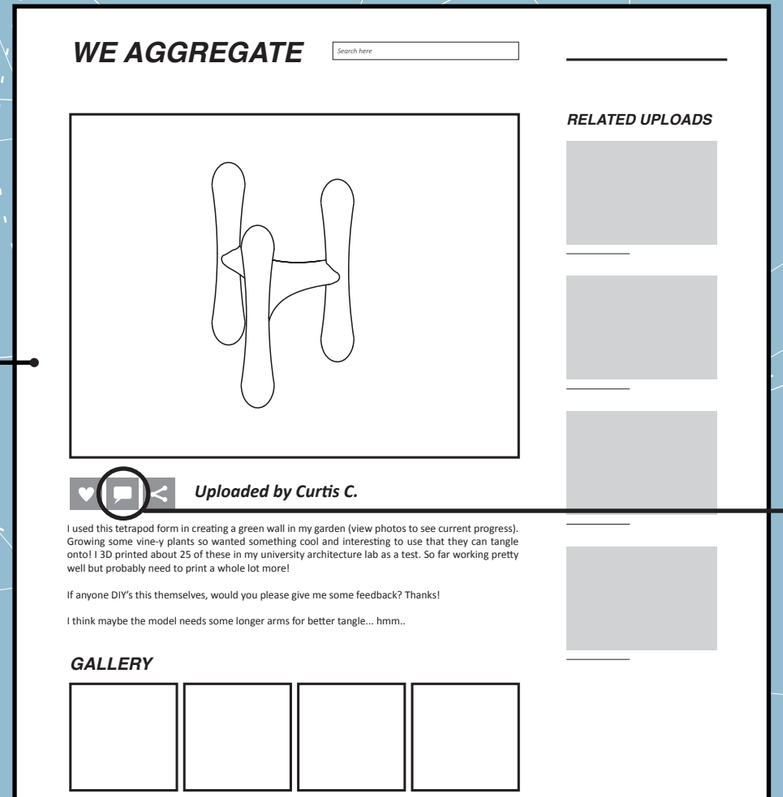
Household items or decoration



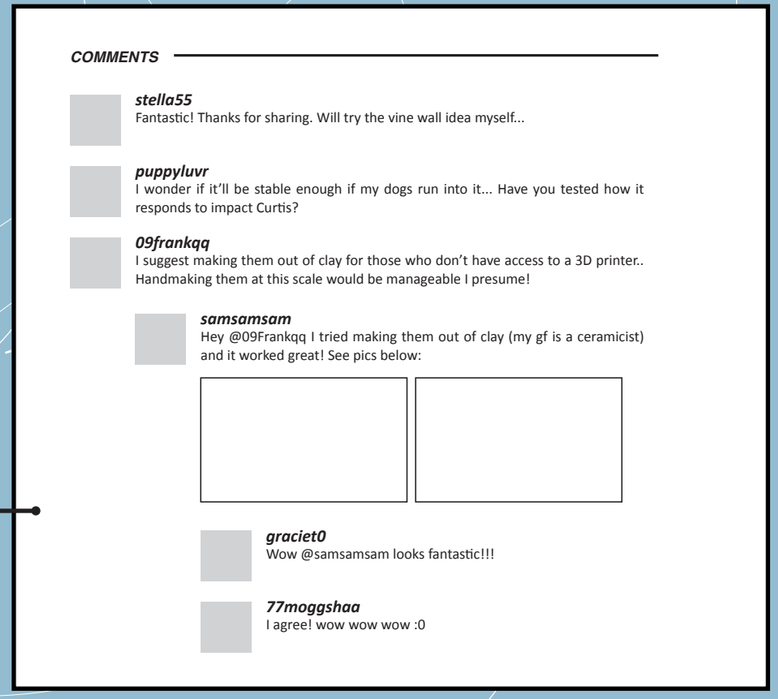
Larger structures



Users upload files and templates on a website



Contributors can explain their own experiences using the aggregates, including program, materials used, etc.



People can comment and suggest alternative uses, materials, etc., or mention what worked/didn't work for them.