

# Green Modular Housing SYSTEM

A design can't make a significant change, but a system can.

## HOW COULD WE CREATE THE UTOPIAN OF OUR GREEN HOMES IN URBAN SCALE?

Numbers of urban houses appear in our metropolitan cities nowadays. Some were designed with green concepts, but many weren't. As a result, the architects who try to make the cities better, keep failing. As we realized, one house design can't change the civilization. It should started from the city's system itself. Considering about this thing, we decide not to focus on a green building design, but on to find a new SYSTEM that can make a holistic change in urban housing. In this case, a new modular system was developed as an answer. With this system, everyone could become architect of their own home. Everyone design effectiveness can be checked through simulation first. Through the new module which founded in this system, everyone can make efficient living space in limited urban building sites.

The idea aims to create a new Urban Housing concept in a Metropolitan City. In this case, Jakarta, an unmanaged developing metropolitan city, was chosen to be the target of this idea. The dwelling problem in Jakarta appear as a result of inappropriate housing system, which is organized by the government. Therefore, in order to achieve a better urban green homes in our metropolitan cities; effective, affordable, and eco-friendly method in designing was needed. As an answer, a new system based on research of Indonesians' body size was suggested. This method was developed from modular design system, just with more specific characteristic.

The idea is to make a C-Module (a module of a certain size that is surrounded by massive walls on three sides) that can provide space that can accommodate the house activities in everyday life. With the dimension of  $2.4 \times 2.4 \times 2.4 \text{ m}^3$ , a single block of C-module could provide spaces for a bed room, living room, kitchen, dining room, or even vertical circulation. C -Module itself is a self-supporting structure composed from *combideck* composite panels which could be arrange up to a medium-rise building. The combination of C modules allows various of space formation possibilities. This allow people to have their own "living shape". It's also economically sustainable and allows users to custom their own house, by adjusting their needs and budget.

As a consideration, those C-Modules will be mass produced in industrial area nearby the metropolitan city. In this Jakarta city context, Kerawang and Tangerang that located about 20 km from the city center could become examples. Through this, there will be less transportation load, or in the other words will save more time and money. This C-Module chunk won't become pollutant for the environment, because it could be reuse again, just like container. As an addition, the use of this C-Module will also save more than 60% of energy consumption.

This C-Module could overcome five main problems (Shop House, Typical Cluster House, Communal House, Custom House, and Vertical Housing / Flat) in living system was founded in Jakarta. Shop House, Typical Cluster House, and Communal House, was taken as an example in the application of this C-Module system. In outline, C-Module combination designs, based on simulation that could overcome tropical climate challenges, was created. The designs also prioritizes active and passive approach in order to maximize effectiveness and efficiency. Moreover, designs approach left no foot print and preserve the amount of permeable surface approximately 75-90%. Imagine if this design system is fully implemented in the city of Jakarta. It could be a solver to its annual issues like flood, traffic density, unaffordable dwellings, and uncomfortable local climate.

### **PROTOTYPE OF SHOP HOUSE**

Effectiveness and efficiency always become the main priority in Jakarta nowadays. We rarely find a shop-house site that still provide open green space. Rigid and massive building commonly become a general typology. In this prototype design, an exclusive space within the row of monotone shop houses was made. It also provides different flexible layout and zoning—which could split private area of the house and public area of the shop, so they won't interfere each other.

### **PROTOTYPE OF COMMUNAL HOUSE**

Indonesian neighboring housing culture is still influence the lifestyle of Jakarta citizens today . Lot of vertical housing/flat were proven fail to provide adequate space for socializing. By the various combination chances that could be created by the C-Module, this design prototype offer various space experiences on each floor—while at the same time aesthetically providing different vista for each user. This was realized through the 4-5 story buildings, which included shared and communal spaces almost on every floor.

## **PROTOTYPE OF GROWING CLUSTER HOUSE**

Conventional houses can't easily "grow", but not with the C-Modular System. It is proven that cluster house designs today are lack of interaction. They actually have a lot of potential to be better in this case if they could be combined as one housing system. This is what is offered by this prototype design. On the other hand, the design also included with a bio cooling system through water pool and wind tunnel that provide comfort to the dwellers. As shown in the simulation, the combination of which could become the best way to encounter the uncomfortable Jakarta living environment.