8th International Conference on
Architecture Research and Design (AR+DC)
November 1-2, 2016

# Off the grid!, (N)either roof (N) or floor

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**Abstract**

To construct a place, one may consider creating a shelter, or a ground plane that would accommodate people's activities. Located in suburban part of the city of Surabaya, area of Tambaksari with its dense population is lacking for such a place. There are two fundamental requirements to raise the quality of living in the area. Provide a sheltered space for communal and a confined space for the youth playground and recreational activities are the two requirements. Two activities that was scattered at the beginning. For such, we proposed a single slab of concrete to accommodate both requirements. Which the slab will serve as a roof for the street vendors as a trigger for people to gather on the ground floor, and its also serve as a ground plane for playground on the upper floor. Connected with a continuous ramp and large voids, both activities on different floor will be interrelated both visually and physically. An important note in this project is to present the centralization of street vendors, which is naturally reluctant to be centralized, its unique qualities such as the randomness, the complexity, less-perceived boundary onto the site leads to irregular concrete slab shape decision to accommodate such uniqueness. Irregular shape ultimately becomes a problem for conventional structural grid. Parameterized random position of column then applied to the area of the floor. Furthermore triangular grid are introduced to connect the column as structural beam. The result is uncommon form both aesthetically and structurally piece of architecture.

*Keywords:* space; place; street vendor; playground

## 1. Introduction

### *1.1 Centralized Street Vendors*

PKL Tambaksari is one of the realization of centralized street vendor program proposed by the municipality of Surabaya. The existing condition is random existence of street vendor which is distracting the conformity of Main Street's traffic. The idea behind the centralized street vendor is to make easier access, cleaner, and safer both for passengers, buyer, seller, and the environment.

The idea to centralize street vendor is really helpful as pragmatic solution. But rethinking about the characteristics of street vendor itself, there are many problems arise. Street vendor is a form of market which is self construct and organic. These characteristics caused by the seller's decision to occupy their considerable points to sell freely. This freedom later creates random circulation or access. Another characteristic is the randomness itself

creates the definition of street vendor's space. One might sees street vendor market as a whole rather than as a sum of modules. To see or to think about it as a whole brings notion of less rigid boundary and this means contradict with the idea of centralized PKL area.

Considering the centralized street vendor and the problems within the idea is leading to several consequences to put onto the design. The design itself must provide the following points, clean or low maintenance yet attractive, centralized yet accommodating randomness, safe yet bringing enjoyment and playful, and ordered but also less perceived boundary.

### *1.2 The Site, Area of Tambaksari*

Stadium in Tambaksari area is considered as the biggest soccer stadium in Surabaya. Its size definitely makes it a landmark. As a landmark it must bring the opportunity for public to gather and to enjoying the place. In fact, stadium area is becoming desolate by time. There is no active events at the noon (see Fig. 1(a) & Fig.1(b)) and at night (see Fig. 1(c)) there only a few street vendors selling around the stadium. To prevent this acute desolation and gain the importance of stadium area, there is a need of a trigger to revitalize the area.

Fig. 1(a). Photo of site

Fig. 1(b). Photo of site

Fig. 1(c). Activities on Tambaksari at night

Fig. 1(d). Tambaksari Stadium

Sentra PKL Tambaksari along with other project in the area, are designed to be the trigger. Centralized street vendor can be a new destination for people to make transaction and gather in the area. This purpose mainly inhibited by the lack of shaded area at the most part of the site. Narrow Street (see Fig. 1.6). is one of the characteristic of Tambaksari area, worth to noted is that narrow Street gives more intimacy among the people as good as the passenger with the skin of the building. Therefore Narrow Street embodies the persistent expression and people in local area, Kampong area.

*1.3 Requirement of Tambaksari Area*

Crowded neighborhood is also one of the characteristic of the surrounding. Since its density occupy a lot of space. It lessens the possibility to enable urban open space. Urban open space is often appreciated for the recreational opportunities it provides (see Fig. 1.5). Recreation in urban open space may include active recreation such as organized sports and individual exercise or passive recreation, which may simply entail being in the open space. Time spent in an urban open space for recreation offers a reprieve from the urban environment.

An area or environment must be balanced, well ordered but no less enjoyment. Play is a range of voluntary, intrinsically motivated activities normally associated with recreational pleasure and enjoyment. Less serious and outside the ordinary structure of behavior. Stressful daily life needs activity to release the tension and activity needs place. The place takes its importance as agent of healthy environment maker (see Fig. 1.7).

The existing PKL ensuring safety of customers, limited flow of the road as far as environmental hygiene issues. Another major problem is the chosen site is not located at the main street and doesn't have any visible signs to approaching the site. Problem three, PKL itself is traditionally organic or not centered as it has intended. This habit can be a unique as identity of PKL itself, besides become a challenge for the design.

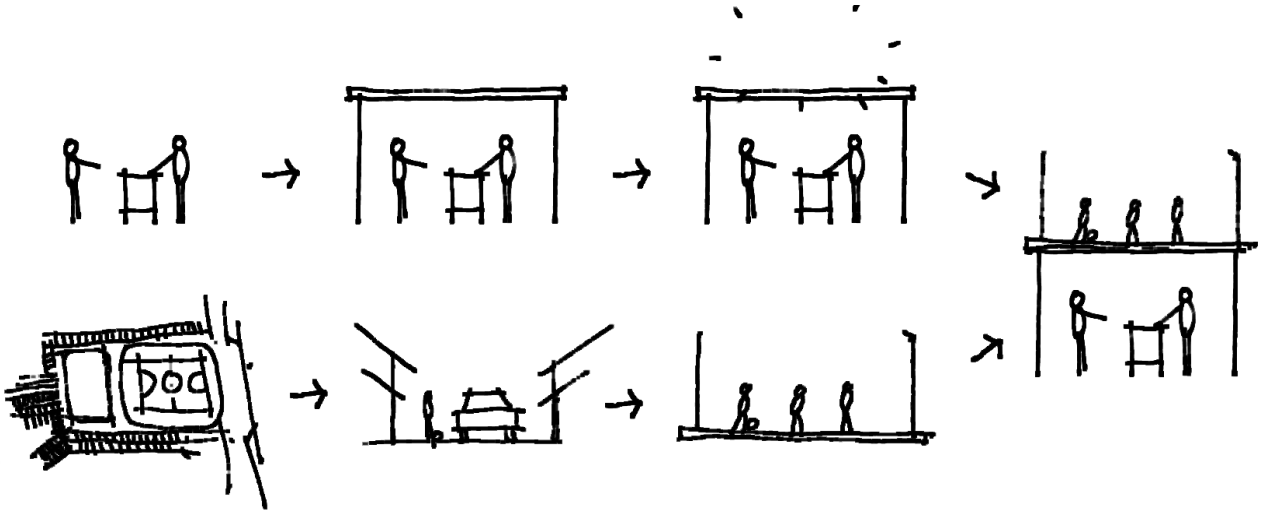

Fig. 1(e). Diagram of Requirement & Solution

The main problem leads to the requirement of the design. Requirements such as raising the quality of living within the area, emphasizing on uniqueness of PKL itself onto the site and the shape of design itself must be recognizable enough to be a unique sign of area. First and main observed event is transaction in PKL area. Thus, this

transaction demands shelter to offer conformity. Shelter can be made by various materials; since it is using concrete material, this also gives possibility to put another activity onto the concrete slab.

Further observation on the environment is less amount of public space. The space itself occupied by housing and the street Events happen on the street dominated by traffic and in the same time pedestrian way. While the street going to be quiet by the vehicles, some kids often use it as a playing ground. Despite its safety issue, this event gives exact premise of open space need in the environment. Combining the possibility of another shelter usage and open space need as playing ground is the immediate response to the requirements.

## 2. Design Process & Method

### *2.1 Methods*

The overall design method are using a very pragmatic approach according the parameter provide by the requirement from the site and activities. *The Force-Based Framework* (Plowright, 2014) are used to underlying the rational thought behind the design method for this project. Parametric method are used as a tool to input the requirement of the site and activities as a parameter to generate and drives geometric shape. Both digital and analog/manual parametric were used by the project. Utilizing both hand drawn sketch and computer software to compose the geometric shape (see Fig. 2(a)).

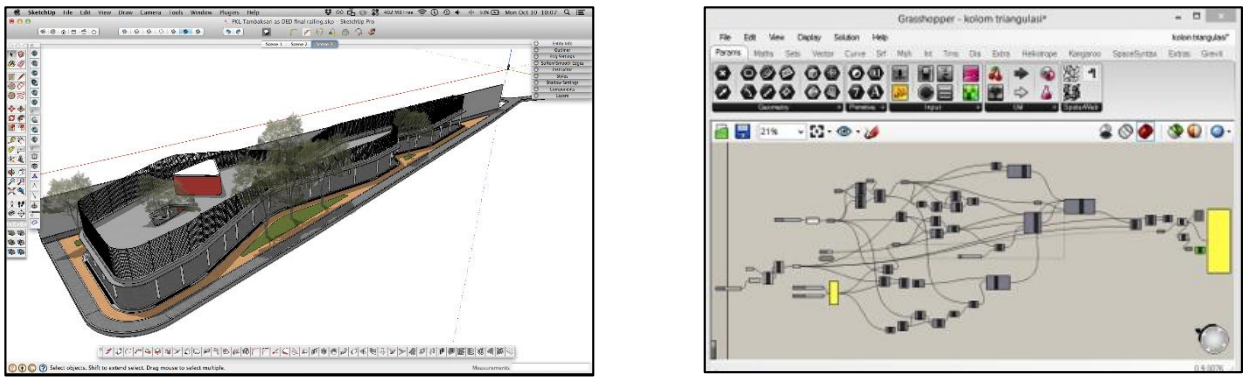


Fig. 2(a). Computer generated model and Grasshopper Script for the geometry

### *2.1 Program Sketch*

Sketching is the first step to visualize the thought and context. This sketch is evolving following the context and later seeing the possibility to generate the concept. The real condition is simplified to its essence subjects and events which happened on the site. There are some considerations for initial sketch (see Fig. 1.(e));

1. Transaction

PKL main activity is transaction. There are some of minimal physical attribute for this kind of transaction. The most important element is the display. On this display many kind of goods has put on. Then the communication and agreement between buyer and seller happen. One display to another is various. So it gives specific characteristics and nuances.

2. Continuum – Transaction

Transaction itself can be temporary or persistence depending on the needs of buyer and supply of seller. Since the existing PKL occur very often, it can be concluded it towards persistence rather than temporary. The continuum course of action in transaction later creates more permanent physical attribute and occurrence. The basic effort is putting roof to give a sign of stability and convenience of behavior.

3. Adding Value

The roof itself essentially is a slab which has two possibilities, it serves as a roof / a shelter and as a floor – a ground. For the upper floor. It simultaneously provide two requirement with only one solution. Since the upper floor will act as the space for playground for the kids around the neighborhood. It will provide an added value to the otherwise no-kids environment street vendor.

4. Synthesize

Since the roof itself has a possibilities to be a ground for another purpose and play activity needs place (see Fig. 2.4). Therefore it will make sense to put that ground as playing activity. Sketch is not in the exact dimension of the site so it leads to draw the concept onto the site modeling. Site modeling is intentionally excluded from its surrounding to make it easier to evaluate.

*2.2 Design*

The form of ground floor follows the shape of the site. Triangle-like shape gives dynamic expression of each side (see Fig. 2.(a)). Since it is very stable in its correlation amid the side, therefore to maximizing the square meters, such are is used completely except the area by the offset needed for circulation. Second floor is determined by projecting the ground floor (see Fig. 2.(b)). This methods has many visual disadvantage. The length of second floor slab is span at almost about 70 meter long. It's considered as bulky, massive, gigantic size compared to surrounding. There are also structural ineffectiveness with this kind of shape, the action to trim the length of the second floor is needed to compensate such problem.

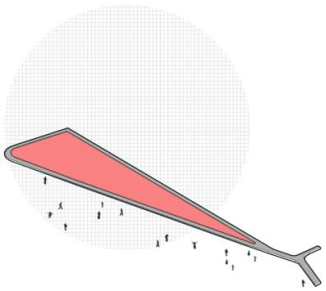

Fig. 2(a). Triangular shape of the site

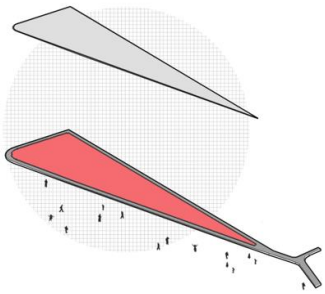

Fig. 2(b). Projection of the site

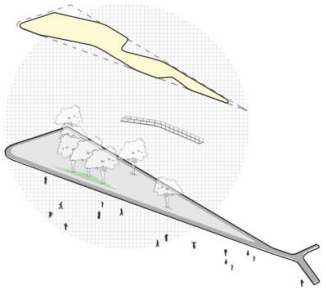

Fig. 2(c). Trimming the shape of plane

Parameter used to trim the gigantic floor shape are generated by the vegetation occupancy with the consideration of aesthetical, convenience, and accessibility. The result of trimming is the new shape of single flat floor. This new shape has many advantages such as flexibility, unique, and intriguing both visually and physically (see Fig. 2.(c)). Circulation within this building between ground floor and upper floor flows seamlessly with provided ramp. Seamless circulation brings convenience to passenger for both circulation between the floors and enjoying the building as recreational activity.

Structural consequence will be a major challenge of this new shape. Organic like slab shape have more complex column arrangement, since the ground floor is almost exact triangle. The differences of shape between the

floors create a significant impact for every endeavor. Using the regular grid will generate rigid boundary, especially for the beam and column, and not compatible enough with the shape of organic like shape of second floor, since it will be too many inefficiency for the dimension of the beam considering it consistency versus the irregular shape of the floor.

### *2.3 Solution for the challenge of the new shape*

The column placement is the key action to determine the structural grid of beam (see Fig. 2.(e)). Since the main idea is to give notion of less perceived boundary while the second floor is also an irregular shape, then proposing a random grid of structure for column placement is a reasonable decision. Random grid is generated by parametric approach, using the same imaginary radius and intersection of the radius. The result is random placement of column with the same distance to one and another.

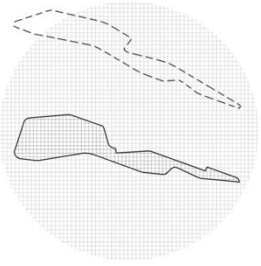

Fig. 2(d). Plane Shape

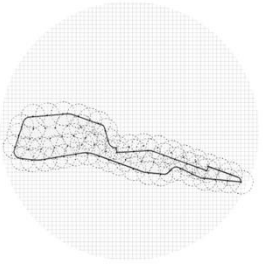

Fig. 2(e). Column coverage Diagram

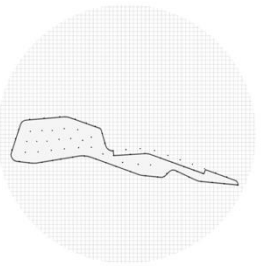

Fig. 2(f). Column Placement

Figure 2(g) shows the technique of column placement using nodes and its radius to intersect one to another. In this script maximum and minimum value is included. This value is determined by structural consideration. Figure 2(g) shows the column placement, the green nodes. The green nodes can be connected through the script and this connection later going to be the triangulation beam. The green lines is triangulation beam, many of this lines will be trimmed and modify to fit with its shape. Figure 2(h) shows the flexibility of using this triangulation; it can be seen how the lines can connect even dimension of the anterior and the posterior of the shape is different.

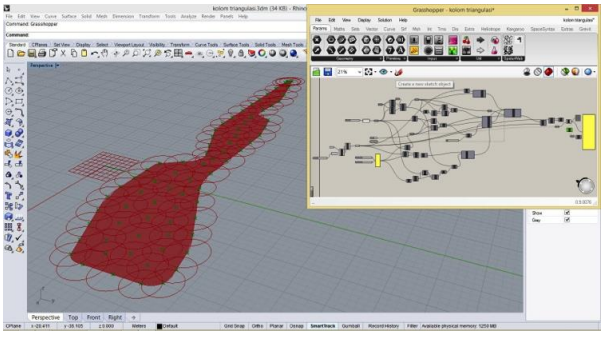

Fig. 2(g). Grasshopper script for column placement

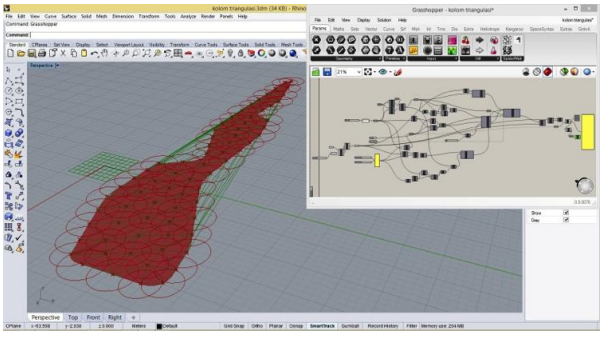

Fig. 2(h). Grasshopper script for column beam triangulation

*2.4 Consequence of the design program*

Random placement of column is causing the using of triangulation method for the position of each beam which connecting column (see Fig. 2(1)). Triangulation gives more chance to accommodate the peripheral modification and therefore there is no problem to modify the shape of the ground floor. Since the irregularity is main idea of this design (see Fig. 2(j)).

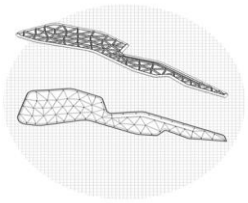

Fig. 2(i). Column and beam placement

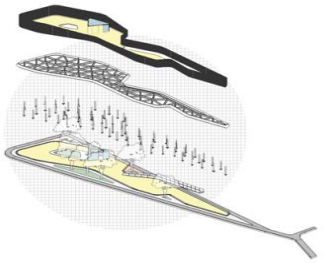

Fig. 2(j). Explode diagram

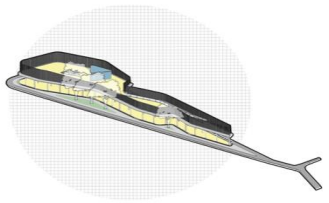

Fig. 2(k). Final Form

As the irregular column are enabled, there will be endless configuration of street vendor placement. Irregular and various placements will strongly sensed by the accommodation of orientation or size which varies to one and another street vendor. A ramp connects ground floor with upper floor. A ramp itself will create more fluent and inclusive access for user. Despite its simplicity will visually contrast with its surrounding. The design will appear simple, seems effortless, lean, but effective, irregular, accommodate randomness and attractive in the same time (see Fig. 2(k)).

## 3. Final Thought and Conclusion

Space created by the design is emphasizing on juxtaposition between random and planned. Randomness can be seen as the flexibility toward the possibility given to design. Randomness is acknowledgement of chaotic condition which is given while design purpose is usually acknowledgement of order which is a goal. To control such of contradictory elements need relevant method. The method is determined by the complexity of requirement or problem and leads to using computational method, in this case is parametric method. Triangulation later becomes the single solution to answer the randomness and planned. Triangulation can provide high flexibility to accommodate the complexity within the design.

In this design emphasizing on method becomes more relevant rather than focusing on merely result. Method itself like a tool has specific task and characteristic. To such of different problem need different tool. This project is a kind of endeavor to highlight in using method for form making in design.

There are two dispositions of using method. At first place, it becomes main driving force to generate exact different result although the same problem can be solved by other tools. Or at second place, the solution is known

before and to approach it, the method will be a solution provider. In this design the solution itself is vaguely appear and parametric method is used to generating clearer solution as well as the form has appeared.

**References**

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