

Methods of using Parametric design in solving slum areas in Egypt

(Study Case: Ezzbat Khaer Allah Slums)

Researcher. Mina Saad Ibrahim Eskander

PHD in Decoration Dept. Applied Arts Faculty-Helwan Uni.

drminart@hotmail.com

Summary:

The Arab Republic of Egypt suffers from urban problems resulting from population inflation and increased urban growth, hence the problem of randomness that penetrated as cancer took many archaeological sites in its path, and in addition to that, informal areas became overlooking many major streets such as the Nile Cornice and the Ring Road.

1-The research sheds light on the intellectual development in design trends through the use of Parametric Design technology in which computer design programs are used to produce designs based on engineering principles and concepts with mathematical logic inspired by nature.

2-The researcher chose the area of "Ezzbat Khaer Allah" (a case study) where the problem of slums appears with the presence of archaeological areas inside (such as Megra El Ayoon wall - the area of El Sabaa Banaat), and because it overlooks the Nile Cornice on one side and passes through the middle of the ring road.

The importance of the research is in answering the question of how to use the parametric design technique in creating aesthetic murals with decorative characters (to suit the history of the Islamic Tulun antiquity) to separate the "wall of Megra El Ayoon " from its random background (the rest of "Ezzbat Khaer Allah" slums) in a way that is commensurate with the nature of the archaeological place to create the appropriate atmosphere for the visitors of the place without harming them by the ugliness of the region, which contributes to raising cultural awareness and belonging to the people of the region as well, besides protecting those monuments (from neglect and destruction), in addition to increasing the touristic areas which increasing the national income of Egypt .

The geographical location of the slums in "Ezzbat Khaer Allah":

The "Ezzbat Khaer Allah" area consists of the official division of the borders of four different neighborhoods: "Msr El Kadima", "Dar El-Salam", "El-Basateen", and " El-Khalifa" neighborhood.

(Figure 1) shows the "Ezzbat Khaer Allah" site.



The Ring Road:

(Fig. 5) The boundaries of "Ezzbat Khaer Allah" and the ring road have been dividing them.

The ring road was completed in the 1990s and as a result of that, "Ezzbat Khaer Allah" was divided into two parts: The largest area of "Ezzbaa" is in the northern part, the area in the south is smaller and it is called "Istable Antar". The construction of the Ring Road contributed to raising the value of land and real estate in the area due to the compensation paid by the government to the houses owners. That compensation enabled many of the residents who were evicted from their homes to buy lands and real estate inside the estate, as they preferred to stay in the farm and not go to live outside it. The ring road also facilitated access to "Ezzbat Khaer Allah" and contributed to its connection to all Cairo neighborhoods, since the ring road is one of the most vital movement axes in Cairo. Since that time, people have begun to pay attention to the quality of their housing construction, as they feel the high value of real estate in the area.

(Fig. 6) Pictures of "Ezzbaa" from the top of the Ring Road.



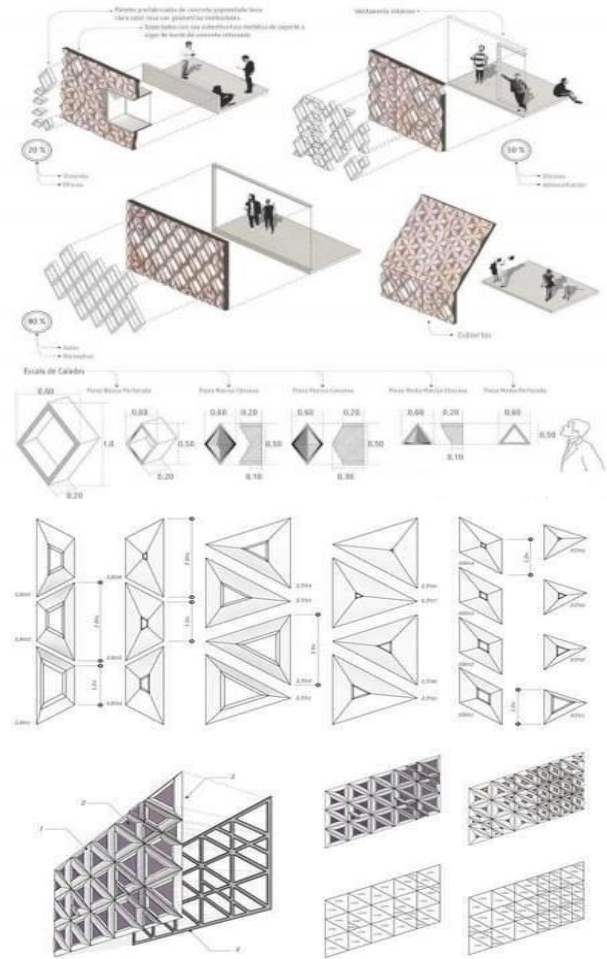
It appears in (Figure 6) the randomness in construction and finishing of the facades, which negatively affects the cultural image of Greater Cairo. As an attempt by the neighborhood to solve the problem, he erected a solid concrete wall bearing more random colors, in order to cover the general view of the farm for the Ring Road visitors, which made the matter uglier.

Modern parametric design technique:

The definition of parametric design:

It is a new design style, based on overlapping decorative units, as it uses motifs to adjust the relationships between design elements in new patterns or formats to take on multiple shapes. The formation of the decorations is the basis of the design process, and in our topic we will use Islamic motifs to match them with the nature of the Islamic monuments in the region.

(Fig. 7) shows how to transform the decorative unit into decorative panels, capable of being formed and modified according to the design.

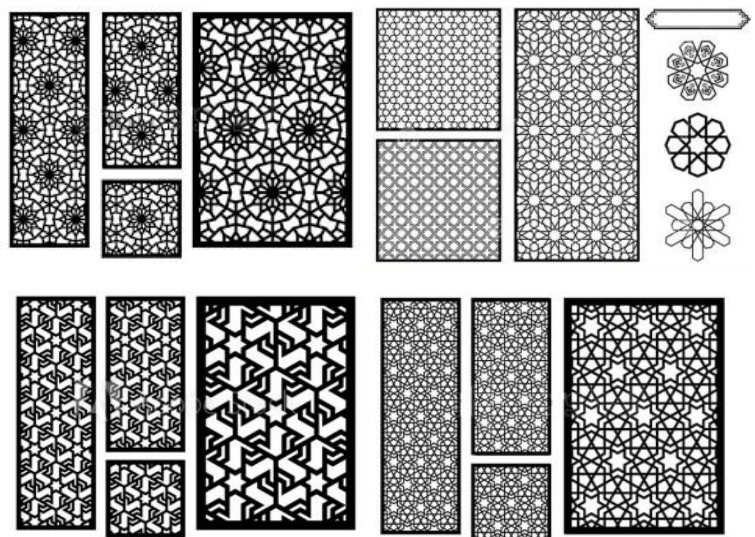


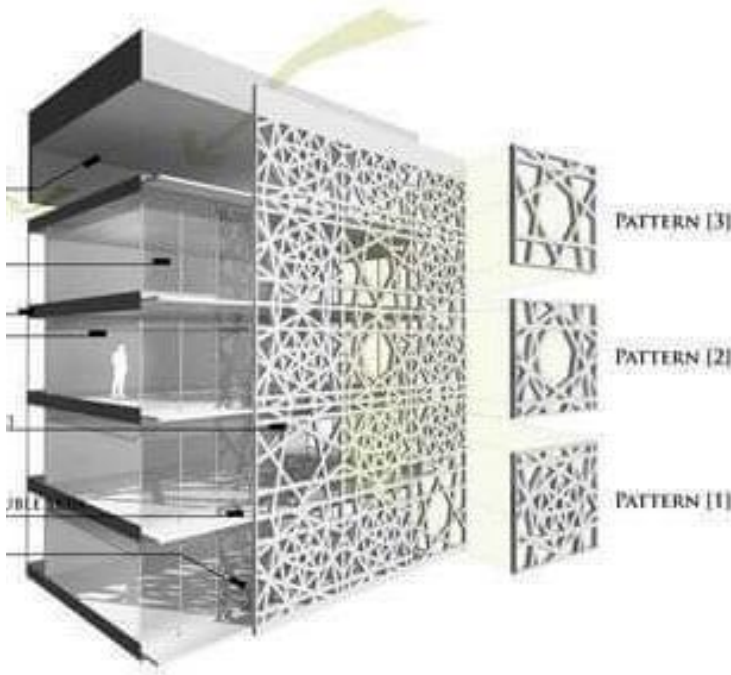
The usage of parametric design In "Ezzbat Khaer Allah":

The following is a set of designs that depend on the Islamic decorative unit.

The researcher uses the Islamic decorative units using parametric design techniques to create decorative panels bearing the Islamic character of the antiquities in the region, in order to separate them from the bad background of the estate that distorts the general view.

(Fig. 8) Examples of designs based on the decorative unit based on parametric design ideas.





(Figure 9) An imaginative picture of how the parametric design, inspired by Islamic art and executed with its GRC or GRP, is applied to the roofs of the manor buildings in the background of the "Majri al-Ayoun" wall.

It is applied to GRC (1) or GRP (2) with the help of a specialized team of civil engineers specialized in designing roads and bridges (such as the Engineering Authority for the Design of Roads and Bridges). They are installed in

the area between the wall of the eye stream and the slums that are located in the background to be covered and separated as in (Figure 10), and the installation is done as shown in (Figure 9), after studying the wind speed in the area and determining the appropriate height for the separation wall and studying the speed of vehicles and dislocation air, calculate the loads of the partition wall, and find out the correct installation methods and methods by them, Where the pieces can be installed according to the overall design consistent with the heights of the

buildings already on the ground, as a proposal that accepts study and modification on the ground, and as we see in Figure 9, the applied designer can create many alternatives for the same decorative unit and combine them together in one design.



(Figure 10) A map of the area and the green zone is the place designated for implementing the proposed design solutions on the facades of its buildings to block the view.

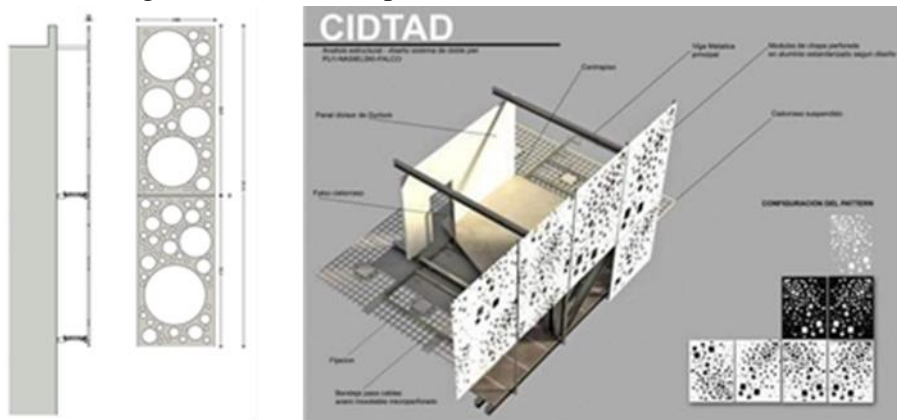
Reinforced Concrete. " G.R.C" Glass fiber)1)
 G.R.P "Glass Reinforced Polyester (Plastics)."(2)

The use of parametric design in treating both sides of the ring road overlooking the "Ezzbat Khaer Allah" area:



(Figure 11) The fence executed on the ring, which distorts the facade.

The designer can also utilize the parametric design to make breaks from its GRC to create an aesthetic separation on both sides of the road instead of the existing ones, as in (Figure 11), after completing the study by the specialized engineers (Engineering Authority for the Construction of Roads and Bridges), we can see the suggested fixation method in (Figure 12) , Which accepts the amendment after reviewing the competent authorities (the Engineering Authority for the Construction of Roads and Bridges) and making the necessary engineering and implementation calculations to achieve integrity and objectivity as a work team aiming to create aesthetics to cover the distorted image of slums on the public road.



(Fig. 12) the proposed designed fence to be executed on the ring and the proposed method of fixing it also (until the completion of the specialized study), with increasing the height of the separator (if possible after completing the engineering study of the site) to achieve the required height (Sizes have not been added to the proposed designs for fear of their inaccuracy and scientific integrity, but they are easy to calculate after completing the specialized study by road and bridge engineers and setting the main determinants for implementation) We can then cover the buildings completely, and this can be done at the design level by repeating units on top of each other or enlarging some elements and minimizing others in an attempt to create design diversity.

Results:

1- The need to pay attention and develop solutions for slums that are located on lands of a historical and archaeological character, as well as " overlooking major axes, and this may be done through the application of parametric decorative designs (after a thorough study has been completed by an integrated work team, one of the constituents is the artist, the decorated designer). It is very difficult to move its residents or demolish their buildings for fear of the surrounding effects, which puts us in front of the cosmetic solution as the best solution for treatment.

2- The effect of beautification on the general taste of citizens and the consolidation of hygiene habits, love of beauty and belonging to the inhabitants of these slums.

Recommendations:

The recommendations come in three axes, as follows:

Firstly: The role of the designer: The decorated designer must focus on developing appropriate solutions technically and aesthetically, as he is a basic individual dependent on the work team consisting of several specialties to solve the problem, as he is most concerned with the aesthetic process as well as the use of advanced design thinking to overcome obstacles in each slum area to suit its geographical and historical nature.

Secondly: The role of educational institutions: depends on spreading awareness of the importance of caring for the beautification and treatment of slums, and instilling patriotism and the rich history of our dear country in the hearts of its students.

Thirdly: The role of the country: The country must increase the penalties for encroachment on state property, especially lands of an archaeological character. On the other hand, it must assign some authorities to amend or beautify what has been destroyed (such as the Engineering Authority for Roads and Bridges, the Ministry of monuments, The Ministry of Endowments to review the law of encroachment on these lands, the Ministry of Culture, and the Ministry of Tourism to study how to exploit these slums after the amendment to benefit from them as a tourist and expand the tourist area in Egypt and increase the economic and material return of the country).

Also, the country must provide suitable and alternative housing for them in slums, and that it should be within the scope of their financial capacity if possible.

References:

- Dr/ Abd el Kareem, Ahmed " El Tathrat El fasio-sicologia Latkwen Aglafat El mabany El barametria ALa mostkdamy el faragh el mahmary" Kesm el handsa el ma3maria-koliet El Handsa- Gamet el Mansora , Resalet Doctora
- Mohmed Abd El Aal , Ahmed " El manatek El ashweaa bmadenet El Fayoum Drasa Gografia – Nadwet El Omran El ashway bmser", El magles El Alaa Llthakfa , Mayo 2000.
- Dr.m/ Ahmed Soliman, Mohamed "El Gawneb Elgabya Fe Namu El Mantek el Ashweaa – Manhag el tatweer ",Modares bkesm el handsa el maamarea – Kolet El Handsa – Gamet El Zagzig (fraa Banha), baht kher manshowr.

- M.M/ Abd El Gawad Abd El Baky Emam, Omnia , A.Dr/ Abd El khalek , Amal , A.M.Dr/ Abd El Rahaman, Doaa" Nozom El Tashkel El Khwarezmy Kmadkhal Ltasmem El Dakhaly bmosadet El Haseb El Ally " Kasem El Tasmem El Dakhly- Kolet El Fanon El Tatbikia – Gamet Banha – Baht Manshour.
- Dr/ Gowda , Ayman Ali ,Dr/ Radwan , Ahmed Hosny , Dr/ El Arnows, Shrien El Saaid" Madaa Taather El Tatwer El Rakamy Ltasmem El Barametry Alaa Tasmem El Wahdat El Mamartia El Khzafia " Magalet El Amara Wa El Fanon Wa El Aloowm EL Ansanía – El Mogaled El Khames – El Adad El Ashrown – Men Safhet 114 Ela 132 – Mares 2020- Baht Manshour.