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Reinventing the Future: A New Lifestyle

Hamza Ali Chowdhry and Mehwish Bandealy

Department of Architecture and Design

COMSATS Institute of Information Technology, Islamabad, Pakistan

***Abstract*:** *Nowadays most people prefer living in urban centers. A multi-storey residential building provides a suitable solution for the implied housing demand in high density cities. A number of designers and investors are just improving supply on the existing demand with the aim to satisfy the need of people, resulting in no more than mass products. Environmental and economic issues in many situations are ignored which are also needed to be addressed. There is a huge opportunity in each project for owners, developers and designers with profitable investment and to obtain environmental benefits. The research effort has been focused on a possible design strategy to make good use of the maximum resources available and to preserve the natural environment. Design possibility has been introduced while playing with the rigidity of the grid in order to redefine the perception of views by incorporating green spaces within the structure. Adopting this approach, building would most likely contribute in urban landscape by providing an interesting landmark. A project should incorporate available interesting techniques, while catering to the essential environmental criteria, which are relevant to the predicted future.*

Keywords: *sustainable living, green space, multi-storey residential buildings, contemporary architecture, Internal/External Views.*

1. Introduction

Any enriched architectural design can only be perceived through an idea which is in an open-ended conceptual setting, a daring approach, in order to further push the boundaries, and a consistent development, which would ensure the quality of any project. Through this paper, a paradigm of how the very situation of a site, design preferences for achieving a futuristic landmark, and a "*design concept-idea*" after integration, through extensive iterations, can take generative expression (innovative architectural form), is presented. It can be acted as a system for achieving architectural designs. This Presented production system will introduce how *Partial exposure* - a concept inferred from filtered light through trees during day and night - was implemented by the authors while designing a residential building. It is a demonstration of an adopted strategy for achieving a tectonic unit strengthening the contemporary urban fibre of Islamabad, Pakistan, by utilizing various shape rules. Presented research will demonstrate imposed environmental limitations on designers, improved economical perception and a balance between demand, need and a desire of the available customer. It has been proposed that the environment of the area should impact the major design decisions during the design development, making the project suitable for its very environment. Each design must reflect its implied situation and the same must not function at any similar position. Also another possible potential of the project has been highlighted by identifying the shared resourced that can be consumed for the welfare of green environment and the dwellings.

The notion of design concept set forth at the earlier stage has undergone extensive investigations and development which were then translated into a machine readable format in order to provide a foundation for precise calculations. The reason for this contribution is to familiarize the audience with research based design

and possible relationship between tangible form - a combination of shapes and volumes - and its function, where designers put themselves as the users of a future building. They then predict the appropriate circulation pattern and building composition corresponding to the implied physical conditions while analysing the expected user needs. This combination should vary for each project. Each designer has a unique aesthetic sense and perception about human behaviour depending upon their own personal life experiences. Moreover, not a single systematic approach exists for transforming information into a physical model, therefore, the designers always have to come up with their own strategies for applying the theoretical database into a design process.

The said project's ongoing development was overseen by the qualified academic faculty and a dedicated supervisor. Its final compilation was tested through an evaluation carried out by the experienced practicing field professionals and the results were then analysed by comparing them with the set objectives and building functionality. The project happened to be amongst the few outstanding projects of the year.

2. Background

A concept does serve as a tool for the development of advanced design solutions for designers. Therefore, it has been under discussion by designers, architects and theorists [1]. The Stronger the idea behind any artwork, the stronger would be its impact providing appropriate enrichment time and creative thinking.

"The concept is often at the nucleus of a design, to be gradually refined and subtly considered as a process proceeds [2]"

For an architectural artifact just coming up with a concept would never work. Indeed the transition of concept into innovative, tangible, functional design solution makes architecture quite difficult-and at the same time exceptionally fascinating. The concept will make a key statement and later detail design will support this very idea [3]. It would reflect the social, cultural and economic changes occurring within society.

Sotirios D.Kotsopoulos identifies two approaches for creative design by Schon and Gero [4].

Schon(1963)was in favor for transforming old concepts by addressing new context in order to come up with projective model for new situations. While according to Gero(1998), already observed patterns provided basis for a concept, which could be used for designers future needs. He draws examples from the genetic engineering.

The inspiration for the research is based upon the author's observation and the already existing potential of the context.

This paradigm used will demonstrate how context can dictate a design development process by reinterpreting the concept of partial exposure. The living units have been arranged in order to provide natural ventilation, light and views. Perceived organization of shapes has been translated into a solid/void arrangement, tested aesthetically and structurally.

3. Understanding Function and Market Trend

As mentioned earlier, due to lack of one uniform set of principles to be followed; architects employ tentative methods. The quest to achieve a functional combination, gradually leads the designer through a logical thought process, the output of which must be productive. It should at least result in one design solution addressing the problem at hand.

The site and context, however, have certain impact on the design. These have to be taken into consideration to take maximum advantage of the potentials presented by the site and to avoid negative impact on the users and the environment. Developing a form from function or the idea of enforcing function within a particular form are quite well-known in architecture, but if both were developed parallel and then evaluated in terms of functional criteria the answer is not that simple. Considering the prevailing trend in current market, designer and the client - usually a layman - are generally the evaluators for the functional aspects of proposed circulation patterns within the required spaces. In order to understand the problematic configuration of spaces in a better way, existing similar projects were visited, analysed and their employed approaches were also tried during the design

development phase. This gives us a clear idea of current methods being used in the region, which allowed us an intuitive understanding for available architectural forms.

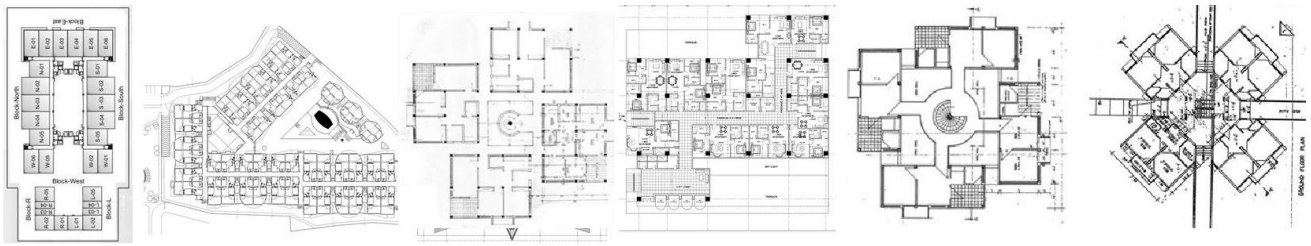

Fig. 1: From Left to right Typical Floor Plans of Silver Oaks, Khudad Heights, G-7 Flats, 57C[5], G-8 Apartments

To achieve maximum sale area, the total allowed covered area has been considered. There have been numerous conversation and debates about this, but at the end the designer cannot forgo the demands of the client or the developer. Even though, this is a design constraint, the designers have tried not to compromise on the quality of living space provided for their future users. Lift lobbies, leisure zone in basement, roof garden and designed landscape at ground floor serves as the central space for the building, bringing together people while functions are allocated as per the users required privacy.

Bedrooms are placed along building envelope in order to ensure maximum natural light and view – An open floor plan strategy has been adopted to ensure commodious spaces. The kitchen, maid accommodation and toilets are allocated near circulation. Contrary to the ongoing standard approach for every project "Designing from inside out" approach has been adopted where users experience is the key consideration, also referred to as design development from the user's perspective. Building form takes shapes by achieving the desired experience, function and user requirements. Such Buildings usually are intended for promoting social interaction amongst the users [13].

4. The Margallah View Condos.

The proposed design belongs to a plot located at the corner of a row of multi-storey buildings in F-10, Islamabad, overlooking Margallah hills on one side F-9 Park on the other. The site has been allocated for future multi-storey residential building under the urban plan of Islamabad.

The Margallah view condos. Comprises of 158 units in total, staggered vertically in10 stories. The 143 meter length facing the Margallah Hills is designed in a way that provides both views, light and ventilation to not just the condos but also the space like the lift lobbies, multipurpose hall, praying area etc.After numerous developments in the quest to replace the typical flat façade models the authors envisioned a Layered façade strategy.

During the design process various tectonic possibilities of positioning the living units were tested to capture partial exposure - the concept (a feeling of sitting under a tree during sizzling weather and shining light through branches in dark) within the enclosed structure – The thought processes started out by analysing the potentials of the site and setting goals for obtaining the best possible results for those potentials. The views and the placement with the regards to the site were a really big plus. To provide the user with maximum views of the Margallah Hills, large scale recesses were created. This in turn led to the integration of natural light and ventilation in the design. Moreover a vertical grid supports the façade which creates a porous envelop for the building and which in turn also ensures that the building has the required strength. The illustrations of the final proposed design are as given below:

Fig. 2: Margallah View Condos a design proposal by the authors

Frequent Discussion with professional structural engineers was part of the design process. Essential counter balance load was ensured for each moment arm to support every cantilever block in order to avoid any major hazard. Graphics within research paper presents highlights for some of the illustrations to make the process clear, however, extensive sketches, physical models and schematics were undertaken during design process. The shared retrospective presents only the deduced strategy for a design possibility employing major design decisions including deployed arrangements of a façade configuration, incorporated green spaces, and interactive environment. The actual process however does comprise of an evolution through numerous sketches and physical models.

5. Partial Exposure

This concept played a key role in architecturally exploring the natural phenomenon of filtered light through the leaves and branches of a tree, and experiencing the novel idea of sitting under a tree shade in scorching weather.

One of the major drawbacks in the bylaws was that only 15 percent of the total area was supposed to be dedicated for landscape while the rest could be built upon, resulting in a rather solid mass. The concept was reinterpreted by integrating form, function and natural green spaces - eliminating boundaries between life on ground floor and life on 10^{th} floor. 57 percent of covered area has been turned into green spaces for providing users with as much opportunities to experience nature and to give back to the environment some of the area that has been built up.

The designers have tried to capture the views of Margallah hill throughout the building by calculating sightlines from selected portions of a structure. The progression of spaces has been kept in mind throughout the design process. The idea of narrow space culminating into a bigger, more airy space has been implemented in the design. However the solid/void combinations are arbitrary. Possible architectural definitions of the concept that can be implemented were jotted down including play of tangible/intangible spaces, indoor outdoor configuration, variation in building function, provided combination of facilities, preserving original typography and vegetation, capturing the sensation of moderately exposed indoor environment, a new benchmark for Asian contemporary architecture by incorporating traditional values and modern trends and a play of artificial illumination of building structure. Architectural expression of the concept being partially exposed – solid/void composition does produce positive impression on urban land scape and better integration of interior/exterior spaces and natural human interaction within the building.

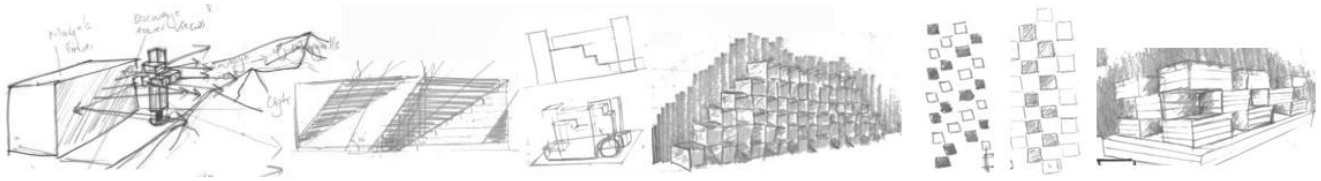

Fig. 3: Overall design development, by the authors

Right from the beginning the idea of a typical flat façade approach was rejected - all the options above are the possible variations for achieving the same concept which provides various level of permeability. Although there were various options, not all of them matured fully due to a variety of reasons. Focus was then shifted towards only one which seemed to have the utmost potential.

The general steps involved in the process include. (a) Composition of living units along urban façade, (b) Introducing structural support and ensure building services through common vertical points in building. Getting clear about the adopted option trigged the development of Sketches, schematics, physical models and healthy discussions with professionals. Indoor environment was initially merged with outdoor surroundings using three basic arrangements.

Fig. 4: Basic arrangement of living units, from left to right, level A, level B, level C, superimposed ABC(elevations) and a Site schema highlighting area being discussed (Top view of structure).

Total building mass has been divided into 9 equal parts (from top), highlighted part contains 3 of them - A at the top right corner (rear side along existing structure), B middle and C along the building maximum façade limit facing Margallah Hill (front facade). The available complete façade canvas has been divided into 33 equal parts (in elevation). 11 for each division - further living units are placed in each A, B and C (in elevation) such that each unit has a view for living spaces and natural air circulation. In Super imposed ABC character of the three levels, white represents voids through every level. Central part B includes a dedicated vertical circulation, providing access to each unit. Roof of a unit below, will provides a domestic green terrace for the upper unit. The application of this additive technique has a colossal impact on overall building envelope yet the net square footage as compared to typical designs in market remains same. Instead of relying solely on planning within 2 dimensions, the idea was to utilize the Z-axis while designing - which itself brings into play the fourth dimension that is a movement of natural light and shadows within intended user experience. Since it comprises of roof terraces and did incorporate indoor plants at every level, the design of the building will reflect the natural climatic change during different seasons by varying its texture and welcoming local birds to live here.

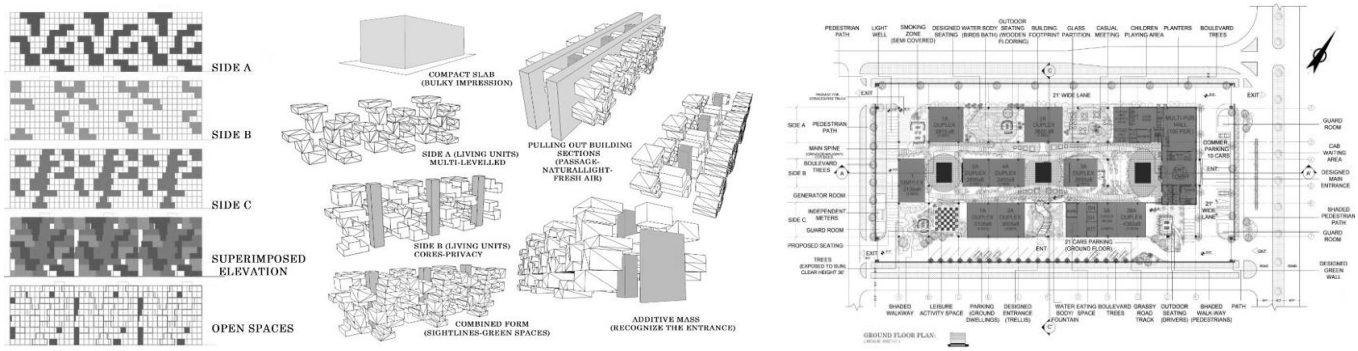

Fig. 5: From Left to right: compiled 2D arrangement of living units (elevation), 3D illustration of the performed schema (general perspective). Solid / Void footprint of structure (ground floor).

All three levels of selected portion were then used for the remaining two parts to give it a complete form. This can be noticed in the smooth vertical circulation. Stability has been ensured through 3 cores in between each permutation, in order to further enhance the penetrated natural light within the building, horizontal building sections are pulled out - and these openings were deemed to act as building lungs. The living units are connected by covered bridges throughout the building.

Extreme left is an evidence for completely discouraging the strategy of utilising all available area. However in order to balance the economics, effected negatively by subtracting horizontal sections - more living units were added towards North/East and South/West façade, taking advantage of the direct exposure to natural light and

views. Overall, the final design differs to some extent balancing the needs but remains within conceptual framework of partial exposure.

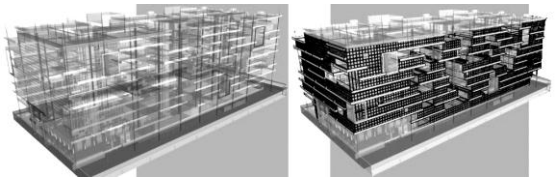

Fig.6: Coexistence of structural main grid / Column Provision and vertical façade grid support.

6. Improved economic Concept

Because of the non-availability of small house plots, and as a result of the availability of upper middle class catchment within Islamabad, makes it a potential place for customer to purchase the proposed living Units having comparatively high cost because of the additional reinforcement required - A survey was carried out by comparing the already available options for the customers that shows that the range within which a customer can purchase is from 90,00,000/- PKR to 240 million PKR (Centaurus Penthouse). Moreover internationally this has been observed that similar projects that contribute towards the urban landscape being landmark are always kept high in demand, as presented by MVRDV, The Why Factory in their ongoing research of skyscrapers[6], reflected in Habitat 67 [7] and Simmons Hall by Steven Hall. According to Todd Jersey Advertising cost incurred for such buildings decreases significantly since media is generally interested in their promotion and operating costs are reduced by 50%-70%-[8] Current on-going development is a clear interference with nature; Urbanization pressure is turning our cities into a concrete jungle. [9] Design strategies must be introduced in order to bring back the similar effect which our building structures usually lose. Steven W. Peck in a report Greenbacks from green roofs [10] highlights 20 quantitative and qualitative benefits, while discussing economic benefits he did mention increased value of a proposed property by 6-15% having green spaces. This improved concept is already being implemented in the country through an upcoming architectural proposal for Karachi City Centre (KHICC), Karachi, Pakistan. Having objective of New City in new Area"Greening the City Centre" which is in a process for being a benchmark for future urban high-rise development. The idea of a botanical garden has been introduced for a community where overall green content is 30-40% and 25% area has been dedicated for the garden [11].

Fig. 7: Karachi City Centre (KHICC) illustration

7. Energy Optimization Key Aspects at a Glance

Islamabad is currently facing serious water shortages [12], therefore, current shortage has been addressed through rain water harvesting, grey water collection, its treatment and recycling in order to meet the demand of proposed roof terraces, incorporated green spaces and other daily uses. Incorporated in the design are low flush tanks which result in monthly calculated saving of 2,12000/-PKR. Moreover, for basements redirection of natural light system is proposed comprising of a collector exposed to the sun which directs light into a concentrator and after passing through series of relay lenses with minimum loss of light, illuminates the basements during the day.

8. Conclusion

The process to achieve an innovative design solution varies from one designer to another. One may implicitly think that an effective strategy can only be grasped through defining problem in hand and a conceptual description which an architect would like to explore through design. This might enable designers in achieving a particular user experience or in architecturally exploring certain sensation like suspension or phenomenon like growth. Sharing the work that has already being designed could provide innovative advancement in the field. In addition, collaborative progress towards developing a healthy conceptual framework could transfer design related knowledge into upcoming architectural works. Design concepts in architecture: the porosity paradigm is a paper worth reading in this regard. Architecture, however, should reflect the predicted future needs and current implied demand making use of already accessible technology and available skills.

9. Acknowledgements

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10.References

[1] Sotirios D. Kotsopoulos. "Design Concepts in architecture: The porosity paradigm" pp./para. 3,1.

[2] Andrea Simitch and Val Warke, *The Language of Architecture, 26 Principles Every Architect Should Know*, 1st ed. Beverly, Massachusetts, U.S.A.:Rockport,2014, pp. 18.

[3] Ann Heylighen and Nicole Segers. An Architectural Shift+F7-Supporting concept development through design cases, pp./para. 2,3.

[4] Sotirios D. Kotsopoulos. "Design Concepts in architecture: The porosity paradigm" pp./para. 3,1

[5] A proposed layout of mixed use building proposed by Ar. Nasir Iqbal, author did work on the drawings.

[6] MVRDV. (March 2013) Porous City – Open the tower. Exhibition the 13 Venice Architecture Biennale and at business of design week Hong Kong. Available: http://www.morfae.com/1635-mvrdv/

[7] Gili Merin. (July 2013). AD Classics: Habitat 67 / Moshe Safdie. Available: http://www.archdaily.com/404803/ad-classics-habitat-67-moshe-safdie.

[8] Todd Jersey. (March 2008) "Green Architecture Economic Justification," white paper, Todd Jersey Architecture, Available: http://www.toddjerseyarchitecture.com/green_economic_justification.pdf

[9] Bushra Nayeem, "Implication of building attributes to compensatory green: A case study of residential building in Dhaka city " in proc. 2014 ICEAB Conf., 2014, pp. 1.

[10] Steven W. Peck and Chris Callaghan, "Greenbacks from green roofs: Forging a new industry in Canada," report, Environmental Adaptation Research Group, Canada, 1999, March. Pp. 18-40. Available: http://www.researchgate.net/profile/Brad_Bass/publication/230887928_Greenbacks_from_green_roofs_Forging_a_new_industry_in_Canada/links/0c96052b4deed181df000000.pdf

[11] D.R. A. A. Quraishy (March 2002). Karachi: City to have botanical garden soon. Published Dawn. [Online]. Available: http://www.dawn.com/news/24860/karachi-city-to-have-botanical-garden-soon.

[12] Shafqat Masood (March 2007). "Growing Scarcity of the Water Resource" pp. 4 Available: http://www.pecongress.org.pk/images/upload/books/World-Water-Day-2007(Part-2).pdf

[13] Sejong University, Educating Architecture Students to design buildings from the inside out-Experiences fom a research –based design studio, pp./para. 2, 6.