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ENVIRONMENTAL FORMATION OF FACADES

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Abstract. *This paper raises the questions of environmental design of facade planes in urbarchitecture, remodeling of existing bulks applying the vegetation material. Environmental interventions in general sense can render the constructed areas and structures in them less globalistic, esthetically more valuable, historically and culturally more significant and to affect the space in a way for all to feel better in it. It is possible to establish new patterns of reforming of artifact building values, as well as a model for a more creative acting in multicultural space. Natural, floral and other vegetative structures in combination with artifact forms allow a conceptually different, non-globalistic approach in which new, fuller forms create a dynamic and recognizable exterior ecourbarchitectonic space. Physical structures with environmental bulks masking the rigid, inadequate commanding geometry, improve the general conditions and atone for the urban crisis. It is our opinion that an environmental approach in formation of facade planes, be them horizontal or vertical, is an indispensable position in city-building. We are persuaded by the numerous examples in the world, where environmental-scientific analysis in the area of urban design of space produced fantastic realizations of micro and macro ambiance entities.*

Key words: *environmentalism, design, facade, remodeling, space, urbarchitecture.*

1. INTRODUCTION

"The built up reality and architectural creations, irrespective of the relation of architecture and the environment, and irrespective of the time of emergence, visual values and functional importance, are per se the cultural creations of the highest order. By the fact that something has been built it contains human aspirations towards identity, needs, living experience, richness of expression and personal and collective memory, which is a condition of every cognizance and its development."[1]

Large planetary climate changes which manifested in the first decade of this century, brought about different designers' considerations in shaping of physical structures in many urban agglomerations. This is particularly prominent in terms of shaping the cladding, fa-

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cade planes, which as artifact, utilitarian systems have been realized most often of steel, concrete and glass without understanding of the ongoing quest for correlation with natural materials and forms. Such established and cliché concept of mass production of structures without souls and ideas, particularly in great cities, is marked by an alarming anti-environmental design of structures which had obvious negative effects on users' accommodation and on deterioration of general spatial features – visual, esthetic, cultural – in one word on many various situations and on the development of urbanity in general. In many cites, old houses with their patina and character are disappearing on a daily basis; with them vanish the identities of places and values created for decades, and in their stead, ready-made structures are formed, a pattern which supports the rising pressure to build. Nowadays, it is necessary to discontinue such "planning" of unisonance and comprehensively consider the non-environmental urban architecture and immerse oneself into cultural urbarchitectonic diversity of ambiance entities, into artistic, organic, ecologic conception of buildings. It is a par excellence issue of returning nature into urban matrices, an issue of eco-friendly urbarchitecture which efficiently uses the local circumstances and implements materials which preserve natural resources, do not have toxic and other harmful effects on humans and the environment, save energy and water and contribute to a healthy working and natural environment, through the appearance of façade planes, even though they might appear as a mere decoration.

We are dealing here with induced chaos and permanent "cramming of space", with irresponsible occupation of the best parts for arrangement of micro and macro ambiance areas, with non-environmental and non-integrated facade envelopes of structures. Understanding, ambitions of planners, designers and builders to create artistic, green vertical, horizontal and inclined volumes of physical structures which are strategically and culturally integrated with nature, bore fruit in a very small number of instances.

2. EXPOSITION

New ideas of the French botanist Patrick Blanc to shape the façade planes of the houses with vegetative materials, garden plants and flower gardens, were a veritable modern revolution that happened in the cities around the globe at the beginning of this century. The way of understanding modification and arrangement of multi-layered urbarchitectonic space by means of environmental materials was changed as well as understanding of cultural varieties in urban design. In some places a just treatment of the nature was established and harmonization of various spatial values of forms and details was performed. A regulation tool was set up, for an urban process in which the standard of building with vegetative materials essentially changes environment, its geometrical and visual identity, micro-climatic conditions and coordinates which define not only physical but also social space is defined. Emergence of vertical parks on façade surfaces of houses, as well as on roof areas, represents a new challenge and philosophy of environmental design of dynamic, creative frameworks for a different organization and understanding of city morphology and of its territorial values. One of the main tasks of architects and town planners nowadays is to introduce engineering-environmental diversity of dimensions into their designs, to develop and offer a wide spectrum of functions and facilities for near urban future. A wonderful potential lies in environmental façades.

From the rich "green" opus of Patrick Blanc, in the period between 1994 and 2011we will single out the representative, beautiful constructed designs which affected the development of environmental ideas in the designs for numerous buildings at the beginning of this century.

- 1988: First green wall, made at the Museum of Science and Industry in Paris
- 1994: Garden Festival of Chaumont-sur-Loire
- 1998: Green wall at the Fondation Cartier in Paris
- 2000: Green wall at the Aquarium in Genoa, Italy
- 2001: Green wall at the Perhsing Hall Hotel in Paris
- 2003: Wall of the French Embassy in New Delhi
- 2004: Administrative building of the Quai Branly Museum (a museum of indigenous arts) in Paris
- 2005: North face of the shopping centre in Avignon
- 2005: Vinet Square in Bordeaux (with Michel Desvigne)
- 2006: Wall in the Weleda, 8th arrondissement of Paris
- 2007: Wall on the shop BHV Hommes (BHV for men), 4th arrondissement of Paris
- 2007: Green wall at CaixaForum Madrid
- 2008: Arch at the roundabout at the Grand Theatre of Provence at Aix-en-Provence
- 2008: Green wall at Galeria Przymorze, shopping centre in Gdańsk, Poland
- 2009: Athenaeum Hotel, Piccadilly, London, UK
- 2010: Ronald Lu & Partners, Hong Kong
- 2011: New *Vertical Garden* - Mur Vegetal, for Drew School: A major Green Wall project in San Francisco

Impressive environmental-urban images of space are found in the works of also significant environmental builders, architects and planners, who saw the interpolation of "green culture" in the interior and exterior space as an opportunity for quality changes in the built-up space, vision for arrangement of future public and private attractive façade surfaces, Intellectually and creatively, they recognized that changes of identity of urbarchitectonic space come through functional interaction with nature, through interpolation of vegetation surfaces into all city districts and that the comfort of the owners, their urban culture and environmental awareness is closely related to environmental volumes conceived in this manner.

The façade planes that are environmentally designed by using vegetative material, provide a phenomenological potential for alleviation of conflict situations in space, to alleviated the pressure to build with artifact materials, to improve the esthetic state of affairs of devastated areas, strongly affect not only the geometrical appearance of physical structures and in general order in construction of space, but essentially determine the cultural and living space coordinates. It is important to point out that by placing the vegetative materials on the exiting and new façade planes of urbarchitectonic physical structures, of mostly sharp-angled forms, an innovative change, renovation and restoration of urban agglomerations is enabled, with minimum investments. Vegetative "green" material has an influential, environmentally-regulatory, harmonizing function in urban space. It opens opportunities for new ideas, offers evasion of globalist approaches to solving of particular urbarchitectonic designing issues. In the new transformed framework, in new

environmental surrounding with vegetative materials on façade planes, vertical, horizontal or sloped, they have a multiple redefining function. They seriously affect human behavior, change of local traditions and historicity of a location.

Such tendencies and the quality of activities and life on streets, squares and plazas and generally in the buildings can be observed in the usage of eco-urban space on the examples of ne environmental cities: Masdar, Songdo, Dongtan, Chongqing, Astana etc. We can observe the patterns of new architectural conceptualization with important changes, where the ratio between the artifact and natural physical structures – vegetative and water is even 50:50%. In these urban agglomerations symbiosis of artifact and environmental natural materials reached maximum presence and fascinating culture of urban-green, coloration, built-up forms. In the vertical gardens, with carefully chosen vegetative material and minimum maintenance requirements which do not call for the land area, the plants can grow on the building walls. There are over 2500 of such plant species in Malaysia! Those horizontal areas in cities, which have been occupied in the cities by asphalt, concrete, steel and glass, can be compensated for by the vertical wall parks and gardens, and they can introduce a new, more imaginative urbarchitectonic-esthetic dynamics, synthesis of values in space of a wider meaning and move the limits in urbarchitecture. We are persuaded by the examples from the world: green vertical park on the building "Edificio Consorcio" in Santiago – Chile - Fig.1.

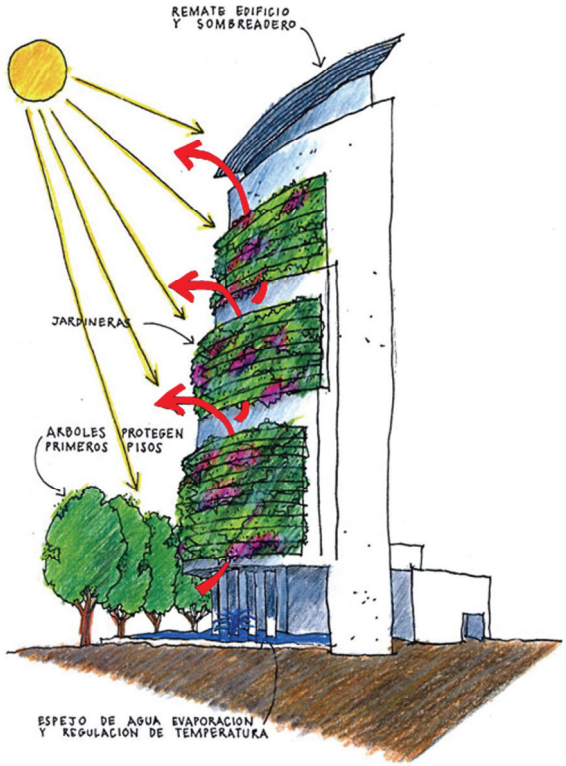

Fig. 1. "Edificio Consorcio" Building - Santiago, Chile. Arch. Enrique Browne, Borja Huidobro

Fig. 2. "Edeficio Consorcio" Green wall - Santiago, Chile. Arch. Enrique Browne, Borja Huidobro

Fig. 2, "BHV Home" in Paris - Fig.3, "Nanjing Eco Housing" - , BDP in China - Fig.4**,** Vegetal Wall, "Museum Quai de Branly" in Paris - Fig.5, vertical wall of Patrick Blanc, patented in 1988 for the house in the center of the city of Avignon, France - Fig.6, "Southbank, Triptych" in Melbourne - Fig.7 etc.

Fig. 3. A green facade for "BHV Homme", Paris

Fig. 4. "Nanjing Eco Housing", BDP, China

Fig. 5. "Museum Quai de Branly", Vegetal Wall, Paris

Fig. 6. Patrick Blanc, his invention in 1988 calling it "Mur Vegetal" Avignon, France

Fig. 7. "Southbank Triptych", Melbourne

Fig. 8. Green Modular Westfield Living Wall

3. CONCLUSION

We conclude that with the new design of environmental facades, with vegetative materials the following things can be achieved:

- Systemic articulation of the identity of urbarchitectonic space in exterior and interior
- Important impact on users' awareness of urbarchiteconic formation of physical structures
- Better urbanologic vision of space in historical continuity
- Reduction of creative conflicts in non-harmonized space
- Metabolic, environmental esthetics of urbarchitectonic structures
- Longer durability of façade planes
- Higher UV radiation protection, hail and atmospheric precipitation protection
- Reduces potential for possible, partial damage of façade planes
- Protection from damage of façade surfaces
- Protection from excessive atmospheric water presence
- Simple, functional drainage of atmospheric waters
- Efficient thermal protection of interior and exterior space
- Energy efficient physical structure
- Protection from the excessive noise in interior and exterior space
- Balanced micro and macro climatic impact in the immediate surrounding
- Better ventilation and detoxication of space through the moderate air circulation
- Environmental compensation in the living environment for the flora and fauna
- Uniform evaporation of water in the immediate environment
- Regulation of dust retention and filtration of polluted air

- Revitalization of conceptualization of working and living environment of the users
- Establishment of immediate coloration communication with vegetative forms
- Regulation of moisture suction from the surfaces with no waterproofing
- Significant reduction of electromagnetic radiation impacts
- Integration of forms of urbarchitectonic façade planes with vegetation forms
- Arrangement of spatial compositions and murals with artistic, decorative natural materials
- Strategic change in the character of environmentally sustainable building in the living environment
- Global reevaluation of materialization and design of building envelopes
- More modern artistic dynamism of urbarchitectonic façade forms
- Creation of cultural, development regulators for the changes at eh level of each concrete building action
- New reduction of chaotic esthetic tensions in façade surfaces interaction
- Modification of general strategic, planning-engineering vision of urban agglomerations
- Contemporary designing creation of the highest cultural order in various formulations of fifth, sixth and seventh façade plane, in ecourbarchitecture

Generally speaking, by urbarchitectonic – environmental design of facades, we can rearrange the world.

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EKOLOŠKO OBLIKOVANJE FASADA

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U ovom radu otvaraju se pitanja ekološkog rešavanja fasadnih ravni u urbarhitekturi, remodelovanjem postojećih gabarita primenom vegetacionog materijala. Ekološkim intervencijama u generalnom smislu možemo učiniti da izgrađeni prostor i objekti u njemu postanu manje globalistički, estetski vredniji, istorijski i kulturološki značajniji, da utiču na prostor u kome će se korisnici osećati bolje. Moguće je uspostaviti nove obrasce preoblikovanja artefaktnih graditeljskih vrednosti kao i model za kreativnije delovanje u multikulturalnom prostoru. Prirodne, floralne i druge vegetacione strukture u kombinaciji sa artefaktnim formama omogućuju konceptualno drugačiji, neglobalistički pristup u kome novi, sadržajniji oblici formiraju dinamičan i prepoznatljiviji eksterijerni ekourbarhitektonski prostor. Fizičke strukture sa ekološkim gabaritom koje maskiraju krutu, neadekvatnu naredbodavnu geometriju, popravljaju ukupne prilike i ublažavaju urbanu kriznost. Smatramo da je ekološki pristup u oblikovanju fasadnih ravni, bile one horizontalne ili vertikalne, danas nezaobilazna pozicija u gradograditeljstvu. U to nas uveravaju mnogobrojni primeri iz sveta, gde je ekološko-naučnim sagledavanjem u oblasti urbanog dizajna prostora došlo do izvanrednih realizacija mikro i makroambijentalnih celina.

Ključne reči: *ekologija, dizajn, fasada, remodelovanje, prostor, urbarhitektura.*