POPULATION AGEING AS A CHALLENGE FOR ARCHITECTURAL AND URBAN DESIGN. CASE STUDY: CONCEPT OF HYBRID SENIOR UNIT IN CRACOW (POLAND)

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Abstract

The patterns of declining fertility and mortality over the past two decades have led to significant shifts in the age structure of the world's population. Although most advanced in Europe and North America, population ageing is occurring, or will soon begin, in all major areas of the world (United Nations, 2013). How these cities are facing that challenge? Will future cities and architectural designs be inspiring by a greying population? Due to a growing problem of society ageing, the topic of architectural design of senior housing developments is more and more relevant in a global context.

This paper proposes a series of design questions of how urban design and architectural ideas could contribute towards improvement life condition in future cities. Design solutions related to a series of case studies of senior housing are presented, with the main focus on the diploma concept of the Hybrid Senior Unit in Cracow (Poland) aimed at a multifaceted integration: architectural, urban and social.

How to Be Old

It is easy to be young, (Everybody is,

at first.) It is not easy
to be old. It takes time.
Youth is given; age is achieved.
One must work a magic to mix with time
in order to become old. (...)

In time one will be very old.
In time, one's life will be accomplished.
And in time, in time, the doll—
like new, though ancient—will be found.
[May Swenson][1]

Introduction

Population Ageing is taking place in nearly all the countries of the world, also Poland. According to the recent assessment of World Population Ageing (United Nations, 2013), the share of older people (aged 60 years or older) increased from 9 per cent in 1994 to 12 percent in 2014, and is expected to reach 21 percent by 2050. What more: the older population is itself ageing. The share of older persons aged 80 years or over (the 'oldest old') within the older population was 14 percent in 2013 and is projected to reach 19 percent in 2050. If this projection is realized, there will be around 2 billions of older people (over 60), included 392 million people aged 80 years or over by 2050. These figures make impressive headlines for breathtaking reports on Ageing Population and Urbanization, which are being discussed at conferences globally, but such statistics are meaningless without asking how these cities are facing that challenge, and mostly, will the future cities and architectural design be inspiring-ageing?
How to plan our habitats in the field of health, social welfare, economy and spatial planning, when the number of pensioned is highly increasing. How would it reflect on urban-space, living-space and whole attitude to housing environment issues?
This paper proposes a series of design questions of how urban design and architectural ideas could contribute towards improvement life condition in cities. Design solutions related to a series of case studies of senior housing are presented, with the main focus on the diploma concept of the Hybrid Senior Unit in Cracow (Poland) aimed at a multifaceted integration: architectural, urban and social.

Background

A booming senior population, changing household structural dynamics and increasing wealth have created the conditions for a new growth market: providing housing for seniors. Senior housing has been a hot topic and a strong commercial real estate investment class for several years. "*According to Real Capital Analytics, senior housing and care facilities year-over-year sales volume increased by 30 percent in the second quarter of 2014. This asset class*

[1] Swenson, May; Poems Old and New. Mariner Books, 2000.

*encompasses various niches; it is no longer just your grandparents' nursing home or your parents' 55+ community" (*Graphe, 2014*)*. Due to the current situation and forecasts, the senior housing design is a huge challenge. There are more and more research, reports, rankings as well as competitions[2] that are trying to identify the key features that create adult-friendly environment.

The recent ranking of Best Cities for Successful Aging (Milken Institute, 2014) indicates several separate factors that most effect the quality of life for older adults. These include not only health and wellness, crime rates and weather, transport, economic and job conditions, but also housing and social engagement factors that help create safe, affordable and connected communities. Regarding the features that especially belong to the problematic of senior housing, there are many factors highlighted by the Global Age-Friendly Cities: A Guide[3] (divided into 9 groups: Affordability, Essential Services, Design, Modifications, Maintenance, Ageing in Place, Community Integration, Living Environment). From an architectural and urban perspective, the following features seem to be the most important:

- Housing is made of appropriate materials and well-structured.
- There is sufficient space to enable older people to move around freely.
- Housing is appropriately equipped to meet environmental conditions (e.g. appropriate air-conditioning or heating).
- Housing is adapted for older people, with even surfaces, passages wide enough for wheelchairs, and appropriately designed bathrooms, toilets and kitchens.
- Housing is modified for older people as needed.
- Housing is not overcrowded.
- Equipment for housing modifications is readily available.
- Housing is located close to services and facilities.
- Affordable services are provided to enable older people to remain at home, to "age in place".
- Housing design facilitates continued integration of older people into the community.
- A range of appropriate and affordable housing options is available for older people, including frail and disabled older people, in the local area.
- Older people's housing is integrated in the surrounding community. (WHO, 2007, pp. 35-36)

Human, Sustainable, Vital, Attractive – looking for a Perfect Space, in which we would like to live when we grow old

The diversity of the features listed by reports and rankings shows that an integrated approach in the context of an ageing society seems to be a major source of success of cities in the XXI century. It means that an attractive urban and architectural environment should be well adapted to the needs of the inhabitants (aging society), in harmony with a functioning economy (having

[2] i.e.: Age-Friendly Innovation Competition, The Philips Livable Cities Award Philips Livable Cities Award, Access City Award.

[3] The Guide highlights eight areas of urban living. Apart from the area of housing, there are: outdoor spaces and buildings; transportation; social participation; respect and social inclusion; civic participation and employment; communication and information; and community support and health services.

regards "the silver economy"[4]), assuring good social relations (integration and countering social exclusion)[5].

Particular attentions in architectural and urban design process should be paid to social role of common areas as integration sites. Presence of people in the space, adding vitality to it, is tantamount to the life of a city (or - in smaller scale – of a neighbourhood). Therefore, leaving free space or designing space for living seems to be a key task of rehabilitation initiatives. Hence, a designer should often start not with a concept of the building, but of the "area between" - the common area to be used by all residents, the place where community life could flourish and make the place alive (makes the place safer and nicer to live in). Evoking the concept of a "city as a machine in motion" it must be said that *it is the people that set the city in motion. A city must be filled with people in motion. Today, a human being is becoming rarity in the city"* (Pawłowska, 1996). Hence, it is the architecture itself, the spatial arrangement that we should use to encourage a user not only to enter, but also to stay for some time in this space, meet and spend time with other people. *"Research shows that people prefer semi-closed areas while fully-closed space arouses anxiety and sense of claustrophobia in the case of high-rise building"* (Schneider-Skalska, 2004, pp. 51).

It seems, therefore, that low rise high density type of arrangement is a perfect solution for residential areas, enabling residents or visitors to use green passages and spaces to move around human scale buildings. Yet, it should be remembered that clear space needs to be left between the buildings, allowing for taking a look into the distance or encouraging people from outside to pass through the area. As G. Schneider-Skalska puts it: *"openness plays a fundamental role in evaluating residential space"* (2004, pp.106). Surprisingly enough, this openness of space very often translates into greater openness of its residents. Highly disadvantageous phenomenon is enclosed housing estates, so popular nowadays. They create inaccessible areas - excluded from walkway network. Low rise buildings have also psychological advantages. Living (or staying for long periods, e.g. at work) at heights (above 5th storey) may have adverse effect on human health. "*This is explained by a simple mechanism: apartments situated at high levels take people off the ground; they separate them from normal daily social interactions taking place on the streets, pavements, gardens, or porches. People are left to themselves in their apartments and going out to the world requires from them making a decision which is formal and uncomfortable. So, if they have no particular purpose to go out, they'd rather stay in, alone."* (Schneider-Skalska, 2004)

Another issue is the need to belong or - looking from the perspective of the designed space - the need for identity of the place (may manifest itself in the building façades or unique spatial arrangement). We tend to describe a place with some distinctive features as a place with the soul. We are able to identify with it and feel at home there. It seems reasonable to treat residential premises dedicated to older people as any other residential space. The arguments

[4] „The Silver Economy" covers new market opportunities arising from public and consumer expenditure related to the rights, needs and demands of the (growing) population over 50.

[5] An integrated approach in the context of urban reneval and ageing socjety, is developed by, i.e.: A. Labus, Starzejące się społeczeństwa europejskie XXI wieku w koncepcjach odnowy miejskiej, Wydawnictwo Politechniki Slaskiej; Gliwice 2014, G. Korzeniak (ed.), Zintegrowane planowanie rozwoju miast, IRM, Kraków 2011 and A. Zborowski (ed.), Demograficzne i społeczne uwarunkowania rewitalizacji miast w Polsce; Instytut Rozwoju Miast; Kraków 2009.

presented above should be given adequate consideration when designing facilities for senior citizens, addressing the needs of the society at the present stage of development.

Contemporary examples of old people's facilities - solutions that work

a) Yew Tree Lodge, Hillingdon (UK)

Yew Tree Lodge complex of assisted living homes in Hillingdon was built in 2009, based on the design by Duggan Morris Architects. Each unit is comprised of a bedroom, a living room with adjoining kitchen and a bathroom adapted for physically disabled people. Apart from 12 residential units, the building also accommodates common living rooms and kitchens. Elegant, simple architectonic form perfectly matches the English tradition. Modern detail is a sublime accent on the brickwork façade finishing.

Figure 2. Yew Tree Lodge, Hillingdon

Source: Photo by Edmund Sumner, online: http://dugganmorrisarchitects.com/, (date of access: 2016-03-01); http://www.designboom.com/architecture/duggan-morris-architects-yew-tree-lodge/, (date of access: 2016-03-12)

It was assumed that the residents of the complex would be old people (both couples and persons living alone). Each apartment is autonomous, equipped with emergency buttons to call for medical help, if necessary. Residents may, via building manager, order cleaning or catering services. Particular emphasis is placed on expanding neighbourly relations. To facilitate it, there is a common living room and a garden; there are also various initiatives organized (e.g. afternoon culture and entertainment events). Such facilities - although they are interesting solution for people capable of living on their own but requiring some assistance - are not common in Poland yet. Maybe it will be a “missing link” between independent living and having 24-hour medical care provided by a nursing home.

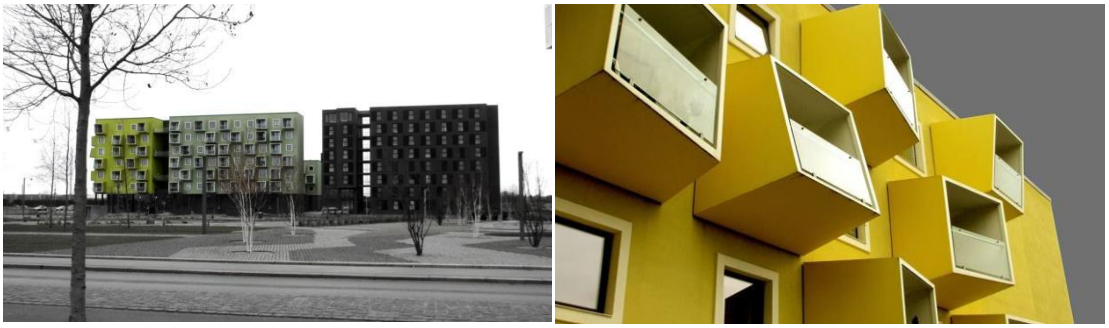
b) Haugmotun Sykehjem, Notodden (Norway) - a house for people suffering from extensive dementia.

Despite harsh climate of Northern Europe, the lives of residents of the centre concentrate in the garden. It is a unique garden - a sensor one. The centre has been designed by landscape architecture studio of Nils Skaarer, based on the research by Ellen Elizabeth Grefsrød. Special emphasis was put on the scents of plants and the sounds they produced when moved by the wind. There is also water here - its sounds complement the sensor picture created by the whole garden. Another important element of the garden are typical farm animals. The garden has a very positive influence on people staying here - by observing familiar forms, catching familiar scents or sounds, they can more easily recall the events from their lives. Residents are encouraged to angle in the stream running across the area, and to look after the farm animals kept in the complex.

c) Ørestad Plejecenter, Copenhagen (Denmark)

Senior citizens' house accommodating 114 residents, situated in the Ørestad was designed by JJW Arkitekter. It is adjusted to the needs of people requiring continuous, often quite extensive, assistance. The residents are aged from 57 to 104; many of them stay in the centre permanently. Any person who is not able to live on their own, can apply for admission to the Ørestad Plejecenter; the costs of staying are paid by the government. Ørestad Plejecenter combines attractive architectural form with well-designed functionality.

Figure 3. Ørestad Plejecenter – façade, detail



Source: Photo by Ida Mikołajska

The building has a characteristic design of balconies - on one side of the building they face the street, on the other - the garden. Vivid colours of the façade finishing surprisingly well harmonize with the surroundings - they have been appreciated not only by the Scandinavians. The centre has become a cult example of unconventional approach to the form of such facilities. There are so many people wishing to visit the centre, coming from all around the world, that the institution had to employ a special person to guide the visitors. Although the building is situated in the city, occupying a quarter, its functional arrangement was inspired by a traditional Danish homestead. The rooms (mostly single, with only two intended for couples) are comfortable and

- although rather small - allow for separating the sleeping area with a sliding wall. Each room has a balcony. Although bedrooms and bathrooms have no individual or unique features and resemble hospital interiors, the living area is furnished and arranged individually, e.g. with pieces of furniture and mementoes taken by residents from their former homes. Rooms are arranged into small neighbourhood units (4-10 rooms per unit), with common areas and kitchens. Interior design of common areas - although it may seem rather cold - has typical Scandinavian character and is well accepted by the residents[6].

Figure 4. Ørestad Plejecenter – typical floor plan / plan of a single residential unit

Source: online: http://www.jjw.dk/?projekt=orestad-plejecenter, date of access: 2016-03-10.

Figure 5. Ørestad Plejecenter – common areas

Source: Photo by Ida Mikołajska

Residents of the centre have usually considerable walking difficulties and problems with taking longer walks or trips. Therefore, the common garden - plays a very important role in the complex. There are many hard surface areas to facilitate wheelchair movement. There is also a place adapted to serve as a boulodrome.

[6] Date based on an interivew and web page of the institution; online: https://www.google.pl/maps, (date of access: 2016-02-23).

Figure 6. Ørestad Plejecenter – a wheelchair-bike walk / electronic seal

Source: Photo by Ida Mikołajska

In spring, summer and autumn, picnics are organized at least once a week for all residents. An interesting element of equipment are wheelchair-bikes allowing for taking a resident for a ride. They are a perfect solution when a younger family member comes to visit a resident and they can both go for a ride. Another unusual device is an electronic seal - a feat of engineering (not convincing to everyone, though) that can be hugged, responses to touch, and produces sounds. The seals have been introduced because, unfortunately, keeping real pets here is very limited for hygiene reasons. According to the personnel, the seals have proven very useful in many cases.

A Concept of Hybrid Senior Unit in Cracow (Poland) - an attempt at synthesis

Poland is also faced with the phenomenon of an ageing society. From the beginning of century the number of children and youth is decreasing rapidly. Drastic changes in the demographic structure is not only influenced by natural factors (difference between births and deaths) and elongation of an average lifespan but also an impact of emigration of Poles (especially after Polish accession to the European Union and the gradual reduction of barriers to access to labor market) (Główny Urząd Statystyczny, 2012).

Theoretically, a model of multi-generation family (3 - 4 generations live together - helping one another) is still dominating in Poland. This model is still perceived as the best, however, real lives of many Poles considerably differ from the theoretical assumptions. Young generation is constantly on the move, has less and less time to take care of the family and home. A response to the changing way of life is the emergence of various care facilities, so called "old people's homes". Yet, there are still very few such facilities intended for people who are no longer able to live on their own. A separate category, still very rare, are day clubs, universities of the third age, activities in culture centres, book clubs for the retired etc. Having analyzed the current tendencies of evolving needs of the Polish society and examples of foreign senior centres, the authors of the present paper have proposed a solution that may adjusted to Polish reality, offering a synthesis of desired features of a place addressed to the elderly.

Multi-faceted architectural and urban planning renewal concept

This paragraph presents a concept of hybrid senior unit in Cracow - a diploma project of Ida Mikolajska, developed in the Faculty of Architecture of the Cracow University of Technology[7]. The project is an attempt of the integration of greenery and architecture, adapting the development to the needs of elderly residents, focusing in particular on the needs of the disabled, creating social space that allows the care home residents to integrate with other residents of the development, thus enhancing the former's quality of life.

The area selected for the planned complex is particularly attractive - a former manor and a park in Cracow. The area is well communicated with the city centre and serviced by public transport, only 200 m distance from a tram terminus (approach to the city center takes ~20min). The main street running towards the city centre is only in a 200 m distance from the complex so getting to the city center by car is easy and takes only 14 -25 minutes (in rush hours). Due to extensive vegetation, despite traffic artery nearby, the area is peaceful and quiet, offering atmosphere typical for single family housing area. A true advantage of the location is greenery, complemented by a Park Jerzmanowskich. The historical complex was entered in national register of monuments. The first manor was built in this place in XVII century and in 1810 the Park was brought into being.

Figure 7. Plan of the Hybrid Senior Unit

Source: Diploma project. Regeneration of Palace and Park Jerzmanowskich complex. New system of three combined/related structures (supported/assisted living housing, senior center with lodging house and activity hub and conference center) based on historical composition

The Complex craves for regeneration and making it useful. Hence, the idea to convert the manor house and adjacent buildings into a small conference centre, former utility buildings - into senior citizens' centre and to transform the area occupied by neglected allotment gardens - into

[7] A diploma project was developed under the supervision of Jacek Gyurkovich, Prof. PhD, DSc, Eng., Arch, and Ewelina Woźniak-Szpakiewicz, PhD. Eng., Arch.

a quarter of assisted living homes. Newly designed buildings would match the height of the existing ones. Vehicle traffic within the Complex would be limited to the minimum - only privileged vehicles and technical services would be allowed. Underground car park is envisaged. Multi-faceted integration is envisaged on social level - renewal of the area in a manner encouraging people to use it; locating various age groups in adjacent areas (senior citizens' centre, conference centre, schools and kindergarten); introducing new objects facilitating integration and activeness: swimming pool, service provision facilities, cafes, gym. Concurrently - on the urban planning level – regeneration of the park (and integration with greenery system and bike trail network); creating attractive space which encouraging people to use it; refurbishment and giving new functions to unused, neglected buildings having significant aesthetic value; extension of existing buildings in order to enclose inner courtyards and create defined, harmonious inner spaces; construction of a residential quarter, matching the existing tissue and complementing the new organization of the space.

Hybrid – a synergy of complexes having different yet compatible functions

The idea is to create an area for older people requiring continuous care, but also for the self-reliant ones wishing to use the facilities and participate in interesting activities. Therefore, the author have decided to create a complex comprised of three formally separated components, but all located along common communication and composition axis.

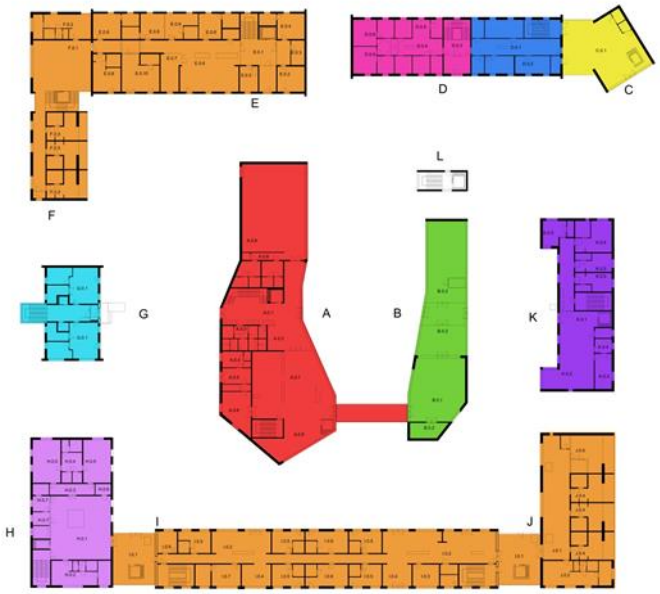
The key design tasks are:
A) The expansion and upgrading of existing 19th century utility buildings within the manor house complex. The buildings are to acquire new function of a Hybrid Senior Unit, with rooms to accommodate approx. 100 residents, a small palliative care unit (18 beds), day care area, full catering service, sports facilities (indoor and outdoor), space for the university of the 3rd age, for organizing celebrations and practising various activities or hobbies.
B) The construction of a new residential quarter, where assisted living homes are to be located. The quarter would consist of 4 rectangular modern buildings that match the existing complex.
C) Upgrading of the manor house – refurbishment of the existing buildings and adapting them to the new functions. Demolition of some buildings presenting no value. Adding new buildings to complement the existing composition layout. Creating a modern courtyard area within the manor house - not to compete with the existing buildings, but to highlight their value.
The overriding objective of the design is compositional, functional, and communicational integration of existing development, preserving its individual character. It is also envisaged that the old historical park will be complemented with - fully developed – other green areas. It will form comprehensive facilities for practising sports and leisure activities and also serve as screen vegetation protecting the area from noise and other nuisances.
The designer’s aim is to avoid constructing a hospital-like building. Anonymous, cold interiors, long corridors, floors separated by stairwells inaccessible to the handicapped - such arrangements prevent creation of space which should be perceived by the residents as their home.

The architect wants to take advantage of the small - human scale - existing buildings. New buildings would be of similar size and proportions. An important element affecting the perception of the space as quiet, cozy, and human-friendly is the use of wood as finishing material. Unique combination of the old and the new and arranged greenery will help to create a unique area with its own identity. Inner courtyard will offer the opportunity to spend time with other people in a friendly environment. Creation of "meeting points" is to encourage residents to take their time outside. The structure of the Complex is to facilitate the development of social relations - a division into small neighbourhood units is proposed, with common kitchens, living rooms, gyms, etc. The Complex is intended for a "new" generation of the retired - people using computers, the Internet, cell phones - in most cases used to numerous activities. It is designed for people enjoying modern architecture. When preparing the design, particular attention was paid to universal solutions - fit for all users, regardless of their physical or mental condition.

Senior Citizens' Centre

A key element of the concept is the Senior Citizens' Centre combining residential premises for permanent stay and auxiliary facilities having various functions: medical and rehabilitation assistance, catering, education, leisure, hobbies.

Figure 8. Hybrid Senior Unit - function plan



Source: Diploma project; Senior center - representation of colours: red [A] - Organized activity hub, green [B] - hobby hub + green house, yellow [c] - entrance, navy blue[D]- administration; pink [D] - health and rehabilitation block, orange [E,F,I,J]- pension/lodging house, bright blue [G] -staff apartments, light purple [H] - palliative division, violet [K] - guest house

Separate apartments for complex employees will be located. Due to the size of the complex, the designer plans to create a hotel for visitors. The central point of the composition will be two new buildings of irregular shape: a centre of social life for the residents: the ground floor will

accommodate catering and eating facilities with a large dining room and canteen and a large multi-purpose room. Normally, it can serve as a gym, on special occasions, it can be easily converted into a hall capable of accommodating all residents and employees of the complex. The upper floor of the building will be occupied by the university of the third age and rooms for additional activities. There will be a greenhouse-orangery, where the residents will be able to look after plants and a small carpenter's shop, also accessible to the residents.

Architecture

The decision was to retain all buildings forming the "walls of external arrangement. The existing (retained) buildings - rectangular in shape - are made of bricks, with double-sloped, mostly tiled, roofs and gable walls jutting out of faces of longitudinal façades.

To avoid formal chaos, the following principles have been applied:

- The existing buildings will retain their almost unchanged external form;
- New larger windows will be introduced in the existing buildings (but the historical arrangement will be preserved);
- Glass link buildings will be constructed to link the existing and new buildings.
- Simple colour patter will be applied in new buildings: off white, pale grey, natural wood;
- New elements, constituting extension of the existing ones, will retain their basic form (e.g. double-sloped roofs).

Figure 9. Hybrid Senior Unit

Source: Diploma project

Green common area - meeting and integration place

The internal area of the existing rectangular arrangement of the Senior Citizens' Centre will be enclosed with new corner buildings and divided by means of two new buildings in the centre into two smaller inner courtyards. This will create small inner areas, of human scale and proportions, visually enclosed, with only small clearances allowing for taking a look outside the complex. When being outside, people tend to look for places when they will be sheltered from the back and have a broad view to the front, beyond the area directly in front of them. Access road with walkways (shared zone) is planned in the complex. Lamps located along the road will enable comfortable use of the walkway after dark. Lights will be situated at the height of 120 cm and

directed downwards, not to disturb the persons sleeping on the ground floor. Main road will be complemented by irregularly arranged pathways. Benches, resting areas, swings, tables with chess boards, outdoor working out facilities, etc. will be located along the paths. *"Shape the common land so it has some enclosure and good sunlight; and so that smaller and more private pieces of land and pockets always open onto it; provide communal functions within the land; and connect the different and adjacent pieces of common land to one another to form swaths of connected play space*." (Alexander, 1977, pp. 340)

An architectural form of the complex is characterized by simplicity, which is harmoniously integrated with the surrounding greenery, arranged with a lot of fantasy. Various species of grass and creeping plants are planted in round concrete "pools" of various heights. A wide range of plant species is planned in order to create the effect of a sensor garden. Small trees, also fruit ones, are planned, which bloom beautifully in the spring. Four roofed bike storage places are planned in the Complex. The centre will be equipped not only with ordinary bicycles, but also with tricycles (to give a chance for a ride to people not able to ride a bike) and rickshaws enabling a carer or a visitor to take a wheelchaired person for a ride. The integration of the greenery and the architecture that results in producing wide range of public spaces (different scale and charactes) was one of the main assumption of the presented concept.

Conclusions

Societies permanently face more and more new challenges. It seems that in closest decades one of essential requirements is counteraction to loneliness or even social exclusion of older people. Cities as the centre of cultural, social and political activity, are a hothouse for new ideas that influence other communities. If quoting Jean Nouvel: "*Each new situation requires new architecture*"[8] – the question is – how space should be shaped to provide elderly not only with decent living conditions but also ensure their widest possible participation in social life? What would be the role of architecture in creating age-friendly environment?

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