Assessment of New Sustainable Housing Project in Gdynia Using Justification Tools for Health-Promoting Urban Design and Architecture

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INTRODUCTION

The objectives of the paper are as follows:

1. The main objective is to present an assessment of a new flagship of sustainable housing projects in Gdynia using justification tools for health-promoting urban design and architecture.

2. The additional objective presents potential strategies on how to improve the health-promoting qualities of that housing projects through urban planning and design.

3. The case study example presents the justification tools for health-promoting urban design and architecture.

It aims to shed further light on practical ways to implement the theoretical research on health-promoting urban places into the practice of eco-neighborhoods design and improve the quality of life through urban planning and design. The outcomes of this paper may provide a refinement to existing literature and implementation models of health-promoting urban design and architecture. They can provide theoretical and methodological guidance for further empirical research.

There is a plethora of research on the impact of urban design on human well-being. Gesler (1996: 96, 2005) proposed the concept of therapeutic landscape. He defined therapeutic landscapes as follows:

"physical and built environments, social conditions and human perceptions combine to produce an atmosphere which is conducive to healing."

Based on therapeutic landscapes, the concept of health-promoting places was coined to define the everyday places that unite the qualities of therapeutic landscapes, i.e., material aspects, social constructions, symbolic significances, and allegories of positive aspects of human health and well-being to influence people physical, mental and spiritual healing (Trojanowska and Sas-Bojarska, 2018). Considerable research evidences the importance of regular contact with nature for health promotion and longevity (CABE, 2010; Edwards and Tsouro, 2008; Marcus and Sachs, 2014; Salingaros and Masden, 2008; Takano et al., 2002; Ulrich, 2008; Webster et al., 2014). Research document that urban design can promote health and longevity (Alexander et al., 1977; Antonovsky, 1996; Bell, 2012, 2017; Corburn, 2009; Register, 2006; Wakefield and McMullan, 2006). Mouratidis (2021), after extensive literature review, listed the following categories of urban planning strategies for improving subjective well-being (SWB) in cities: integration of urban nature, easy access to socially inclusive public spaces, high-quality communal...
spaces, easy and equitable access to a diversity of facilities and services, active travel and public transport, development of information and communications technology, maintenance of urban spaces, noise reduction, aesthetic quality, socio-spatial equity, and knowledgeable evidence-based urban planning processes.

Those research findings provide valuable insights. However, the identified gap in knowledge concerns the implementation strategies. The research question is how to put these findings into the planning practice? To what extent are the modern sustainable neighborhoods designed according to research evidence? The sustainable development and high quality of life pair in contemporary eco-neighborhoods. We can find examples of sustainable buyers in many European countries: e.g., Hammarby Sjöstad in Stockholm, Vauban in Fribourg, Eva Lanxmeer in Amsterdam, and over 50 certified eco-neighborhoods in France. This study focuses on a flagship project developed in Gdynia, Poland. There are numerous challenges and opportunities for urban development in Poland (Denis et al., 2021). Some are similar to the worldwide situation, but specific local circumstances result from historical and geopolitical struggles of central European post-communist societies.

**STUDY AREA: NEW NEIGHBORHOOD STRIVING FOR SUSTAINABLE DEVELOPMENT**

In Gdynia, at the tip of northern Poland, an ambitious new housing project was launched at the beginning of the XXI century (Figure 1). The garden city ideas and charter for new urbanism provided the theoretical bases for this development. The charrette and workshops were organized in 2012, from 22 to 25 May 2012, in the new kindergarten at Staniszewskiego street. All the stakeholders: representatives of Gdynia Municipal Office, urban planners from the Gdański University of Technology, specialists from the Hossa S.A.–major investor and developer, and representatives of the local community, as well as local and international well-known experts.

For three days, the Charette focused on three standard solutions for:
1. Effective transportation strategies,
2. Sustainable development of the districts and creation of local workplaces, and
3. Design of friendly public space.

A vital part of Charette was a meeting with the local community, which gathered around 80 people.

Part of the ambitious project set in 2012 has already been constructed until 2019. This new neighborhood was chosen for assessment using a series of justification tools. The fulfillment of sustainable development goals was evaluated for the stage of development as it was in the summer of 2019. At the same time, the creation of health-promoting urban places was assessed using the tool prepared to evaluate therapeutic landscapes and the qualities of walkways. The new neighborhood boundaries encompass approx. 27 km², which is 20% of the area of the entire city. 45% of the new neighborhood area is covered by forest–A Tri-City Landscape Protection Park. The development of the new neighborhood was set a priority among the town spatial policies.

The local private development company Hossa is constructing the vast majority of the new neighborhood. This housing project is still under construction, but six housing complexes are already mostly finished and inhabited: Sokółka I, Fort Forest, Sokółka II, Sokółka-Zelenisz, Patric Róży, and Wiczlino-Ogród. Their design and materials differ. They are sold to individual buyers, and the offer is diversified to target various budgets. There are apartments offered for different price ranges. Fort Forest is the most upscale and expensive, Patric Róży and Wiczlino-Ogród more affordable. Part of the social and commercial infrastructure of the new neighborhood has also been constructed (Figure 2 and Figure 3). Gdynia-Zachód is a flagship urban development based on a new urbanism charter. The charrette and workshops were organized

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**Figure 1.** Location of case study. (a) Map of Poland, Source: Authors own elaboration; (b) Map of Gdynia, 1 - Gdynia Zachód, 2 – Gdynia city centre (Source: Authors own elaboration using map: http://gdyniazachod.pl/index.php?parent_id=71&menu_id=1)
to invite public participation in this project. Therefore, this neighborhood was chosen for this study.

**METHODS**

This study assessed the Gdynia-Zachód neighborhood with two justification tools developed by the researcher: the universal standard for health-promoting places and eco-neighborhoods design. This research was also performed to demonstrate the practical usage of the universal standards. The universal standards for the design are ready-to-use tools for the designers, developers, and the general public. They can be used to assess the therapeutic and health-promoting qualities of public space and the sustainable development of any housing project. They can also be used as justification tools to explain the design decisions to inhabitants, decision-makers, and local authorities. They are based on long-term research and field studies followed by theory triangulation (Trojanowska, 2021a, 2021b).

For this study, the researcher used two universal patterns simultaneously.

1. The universal standard for health-promoting places (Appendix A) can be used as an audit tool to determine the potential health-promoting qualities of urban places (Trojanowska, 2021a).

2. The universal standard for sustainable eco-neighborhoods (Appendix B) can be used as an audit tool to determine the potential health promotion qualities of neighborhoods and residential projects (Trojanowska, 2018).

The first tool evaluates the therapeutic qualities of public open green space–public park and walkability of pathways leading to open green space. The second one assesses the basic sustainability standards and lifestyle quality. The project is still under development, but it was assumed a good moment for the assessment to justify future design decisions.

One researcher visited the housing project several times over four years–2018-2021 and assessed the entire new neighborhood, treated as a large-scale public park of the new generation with buildings and roads inside. The presence of fences and gated communities were perceived as the major obstacle at this assessment phase.
RESULTS OF ASSESSMENT WITH THE UNIVERSAL STANDARD FOR HEALTH-PROMOTING PLACES AND SUSTAINABLE ECO-NEIGHBORHOOD DESIGN

Both a thick binary and a detailed assessment were performed when applicable.

The thick binary assessment has two categories (0, 1):
- No, not observed - 0,
- Yes, satisfactory - 1,

Data NA stands for data not available.

There are some criteria where the points count is not applicable.

The results of both rough and detailed assessments were put in Table 1 and Table 2.

The assessment of therapeutic qualities determined the following strong points of the park: natural scenic beauty, associated with opportunities for physical and mental regeneration in the forest and landscaped gardens, and protecting biodiversity and wildlife. These points are crucial and responsible for this neighborhood’s popularity among users. The polluted surface waters, especially the Kacza river, need urgent remediation.

On the other hand, the assessment helped to determine opportunities for improvement: lack of comfortable seating along the walkways for the elderly and disabled (with backrests and armrests), limited places with recreational equipment for various age groups of children and adults, neither community gardens nor edible plants, and no garden pavilions to provide shelter. Other points for possible improvement included: drinking fountains, better pronounced focal points and pockets of activities, and equipment to facilitate meetings and gatherings, e.g., an open-air theatre.

The organization of space and functions was assessed as highly satisfactory. However, there is a place for improvement of urban composition. The structure could be more orderly organized, and focal points could be more pronounced. Another suggestion is to plant more edible plants.

There are numerous opportunities for improvement in the placemaking category, e.g., organization of temporary events, installation of exhibitions, and community gardens.

The new neighborhood scored almost all the points when it comes to sustainable development.

The results of the detailed evaluation of access to the park demonstrated some deficiencies. The researcher evaluated nine streets and observed some sidewalks and drainage weaknesses on Dulina, Staniszewskiego, Bryły, Sokola, and Wiczlińska street. What was noted was the lack of seating along all of the roads leading to the park, which could hinder the frequency of park visits, especially among the elderly. Street greenery could also be improved, and rain gardens installed.

The assessment for sustainable eco-neighborhood design was performed for the entire new neighborhood. Both a thick binary and a detailed evaluation were conducted when applicable. The thick binary assessment has three categories (0, ½, 1):

- No, not observed - 0,
- Yes, satisfactory - 1,
- Partially - ½,

Data NA stands for data not available.

There are some criteria where the points count is not applicable. The results of both rough and detailed assessments are presented in Table 3.

DISCUSSION

The project is still under construction, but some points to consider: the space next to the new buildings was well-maintained and inviting. There are some benches as well as playgrounds for children. The space in between the development–resembles natural meadows. Open green space can be perceived as a park of the new generation. However, there are public spaces with no visible human maintenance. The significant drawbacks are lack of seating, lighting, and sometimes even pedestrian paths. They should be installed to increase the user’s comfort. Another question is the scale of the neighborhood. There is only one sports field for such a large-scale project. There should be multiples installed in various open green areas–close to the apartment buildings (Gerlach-Springs et al., 1998; Marcus and Barnes, 1995, 1999; Trojanowska, 2017, 2018, 2019, 2020; Trojanowska and Sas-Bojarska, 2018; Wilkinson & Marmot, 2003). One of the significant drawbacks is the fencing which separates public spaces. Gated communities hinder the possibilities of strolls and communication of people from various parts of this residential project (CABE, 2010).

The primary question about health-promoting places is the quality of living for the first pioneering inhabitants. The public park should be developed first. It should be a priority over the development of apartment blocks. The detailed evaluation of access to the park demonstrated some deficiencies. Nine streets were evaluated, and some sidewalks and drainage deficiencies were observed: Dulina, Staniszewskiego, Bryły, Sokola, and Wiczlińska street. What was noted was the lack of seating along the roads leading to the park, which could hinder the frequency of park visits, especially among the elderly (CABE, 2010; Corburn, 2009). Street greenery and rain gardens installation could also be improved.

The project included the development of agricultural land in a controlled manner. There is no place for growth in Gdynia. The city is located between the hills covered by scenic parks and shorelines. Therefore, behind the forested hills, the terrain to the west was chosen for development. The significant advantages are the scenic beauty of this place and the environmental qualities of the natural landscape (Bell, 2012).

The drawbacks are typical for new neighborhoods: homogeneity of housing blocks, lack of commercial offers to cater to everyday needs, and no local workplaces (CABE, 2010). The dwellers have to commute to their workplaces, adding traffic and wasting much time traveling. Gradually, the functional diversity is growing, as new nurseries,
kindergartens, and public facilities are being constructed in the neighborhood.

Table 1. Assessment of health-promoting urban landscapes–Gdynia Zachód neighborhood

|                      | Rough assessment | Detailed assessment | Suggestions for improvement |
|----------------------|------------------|---------------------|-----------------------------|
| **UNIVERSAL DESIGN** |                  |                     |                             |
| Place                | NA               |                     |                             |
| Area, approximately  | 25km²            |                     |                             |
| Location             | Surrounded by a forest | Western part of city limits, dense natural forest between the city center and new neighborhood |
| Surrounding urban pattern | Loose urban tissue | Single and multifamily buildings, rural development |
| **Environmental characteristics** |         |                     |                             |
| Soil quality         | Good             | Good                | Former agricultural soils, no traces of pollution |
| Water quality        | Bad quality of surface waters¹ | Non-potable water in the ponds, polluted waters of the Kacza river | The polluted waters needs urgent remediation |
| Air quality          | Good⁰           | Good air circulation |                             |
| Biodiversity         | Rich in species | Forest habitat for many species of insects and birds |                             |
| **Forms of nature protection** |         | No                  | No                          |
| **Universal accessibility** | Accessible | Pathways are wide and even, majority of neighborhood is accessible | Accessibility could be improved |
| Access to park       | NA              |                     |                             |
| Distance to potential users | Less than 500m, over 500m | People who live in surrounding buildings, people who use public transport, inhabitants of Gdynia who are strolling along the paths in the forest |                             |
| Public transport stops | Yes           | Numerous bus stops  |                             |
| Walkways to park     | Multiple         | Additional evaluation of streets leading to park presented below |                             |
| **PARK’S FUNCTIONAL PROGRAM** |         |                     |                             |
| Psychological and physical regeneration | 1 | Numerous possibilities |                             |
| Natural landscapes   | 1               | Natural forests and meadows |                             |
| Green open space     | 1               | multiples            |                             |
| Place to rest in the sun and in the shade | 1 | Multiples in close proximity to houses, lack of seating along walkways further away from the houses | The benches have no backrests neither armrests |
| Place to rest in silence and solitude | 1 | Multiples in close proximity to houses, lack of seating along walkways further away from the houses |                             |
| Possibility to observe other people | 1 | There are many places to observe activities of other people |                             |
| Possibility to observe animals | 1 | There are many places to observe wildlife |                             |
| Social contacts enhancement | 1 | |                             |
| Organization of events inside the park | 1 | Open green areas can serve to organize events | It would be useful to build garden pavilions with running potable water and electricity |
| Gathering place for groups | 1 | There are spatial possibilities to organize meetings |                             |
| **Physical activity promotion** |         |                     |                             |
| Sports and recreational infrastructure | 1 | Limited places with recreational infrastructure for various age groups | Provide more places with recreational infrastructure for various age groups |
| Community gardens    | 0               | There are no community gardens | Install community gardens. Generous space of new neighborhood offers possibilities for organizing the community gardens |
| **Catering for basic needs** |         |                     |                             |
| Safety and security  | 1               | Assessed as safe place. The neighborhood is well maintained, clean and offers good visibility | It would be useful to install movable chairs, and various benches with back and armrests along the walkways |
| Places to sit and rest | 1           | There are numerous benches | It would be useful to install garden pavilions |
| Shelter              | 0               |                     |                             |
| Restrooms            | 0               |                     | It would be useful to construct public toilets next to places with recreational infrastructure, playgrounds, sport fields, etc. |
| Drinking water       | 0               |                     | It would be useful to install drinking fountains along the fountains and next to places with recreational infrastructure, playgrounds, sport fields, etc. |
Table 1 (Continued). Assessment of health-promoting urban landscapes—Gdynia Zachód neighborhood

| Rough assessment | Detailed assessment                                                                 | Suggestions for improvement                                                                 |
|------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| **Food**         | 0                                                                                     | It would be useful to allow construction of a food stands next to places with recreational infrastructure, playgrounds, playfields, etc. |
| **ORGANISATION OF SPACE AND FUNCTIONS** |                                                                                       |                                                                                             |
| The park spatial composition follows the surrounding urban pattern | Park fills the space between the buildings, fills the urban tissue |                                                                                             |
| Architectural variety of urban environment | To some extend we can observe the architectural variety, however some housing complexes are constructed with repeated buildings |                                                                                             |
| Focal points and landmarks | It would be useful to install focal points that would be more pronounced |                                                                                             |
| Structure of interiors and connections |                                                                                       | The structure could be more orderly organized and focal points could be more pronounced    |
| Long vistas (Extent) | Yes, the neighborhood offers numerous long vistas                                         |                                                                                             |
| Pathways with views | Yes                                                                                  |                                                                                             |
| Invisible fragments of the scene (Vista engaging the imagination) | Yes, numerous designed vistas                                                          |                                                                                             |
| Mystery, fascination | Forest trails offers the feeling of mystery and fascination                             |                                                                                             |
| Framed views | Numerous framed views                                                               |                                                                                             |
| Human scale | The neighborhood is designed in human scale                                           |                                                                                             |
| Optimal level of complexity | Yes                                                                                  |                                                                                             |
| Natural surfaces | Yes                                                                                  |                                                                                             |
| Engaging features | Multiple elements attract human attention                                           |                                                                                             |
| Risk/Peril | Multiple elements offer the subjective feeling of overcoming controlled risk |                                                                                             |
| Movement | Water, greenery                                                                      |                                                                                             |
| Presence of water | Presence of water increases the recreational values of space |                                                                                             |
| Sensory stimuli design |                                                                                       |                                                                                             |
| Sensory stimuli: Sight | Numerous elements                                                                  |                                                                                             |
| Sensory stimuli: Hearing | Plants                                                                               |                                                                                             |
| Sensory stimuli: Smell | Plants                                                                               |                                                                                             |
| Sensory stimuli: Touch | Plants                                                                               |                                                                                             |
| Sensory stimuli: Taste | 0                                                                                     | It would be useful to plant edible plants                                                  |
| **PLACEMAKING** |                                                                                       |                                                                                             |
| Works of art | 0                                                                                     | It could be interesting to organize temporary exhibitions of sculpture                        |
| Monuments in the park | No                                                                                     | It could be interesting to install a table with this place history                           |
| Historic places | 1                                                                                     | Remaining rural development                                                                  |
| Culture and connection to the past |                                                                                       |                                                                                             |
| Thematic gardens | 0                                                                                     | It could be interesting to install thematic gardens, e.g. community gardens                  |
| Personalization | 1                                                                                     | During organized events                                                                      |
| Animation of place | 1                                                                                     | During organized events                                                                      |
| Community engagement |                                                                                       |                                                                                             |
| Personalizing the architectural process | Yes, the names of people involved in the project are known                             |                                                                                             |
| Participation of all stakeholders, including inhabitants and users | The charrettes, meetings, and other forms of organized participation                      |                                                                                             |
| Determining the rules of conduct and self-management | Yes, the rules of conduct are determined |                                                                                             |
| **Space for social contact** |                                                                                       |                                                                                             |
| Third places | Numerous places: cafes, restaurants, clubs, shops, etc.                              |                                                                                             |
| Fourth places | 1                                                                                     | Interesting in-between spaces, public open spaces, cafes, shops, etc.                       |
Table 1 (Continued). Assessment of health-promoting urban landscapes–Gdynia Zachód neighborhood

| PURSUIT OF SUSTAINABLE DEVELOPMENT | Rough assessment | Detailed assessment | Suggestions for improvement |
|------------------------------------|------------------|---------------------|-----------------------------|
| Green infrastructure              | 1                | This neighborhood is an important element of green and blue infrastructure |
| Parks of second (New) generation   | 1                | Can be regarded as such |
| Biodiversity protection            | 1                | Numerous efforts |
| Part of park not available to visitors | 1 | Parts of forest |
| Native plants                      | 1                | yes |
| Native animals                     | 1                | yes |
| Natural maintenance methods        | 1                | yes |
| Sustainable water management       | 1                | yes |
| Rainwater infiltration             | 1                | Porous, permeable surfaces |
| Irrigation with non-potable water  | No               | information |
| Park in a flood risk zone          | 1                | no |
| Urban metabolism                   | 1                | Waste segregation |

Table 2. Assessment of health-promoting urban landscapes–Gdynia Zachód neighbourhood (ACCESS TO PARK)

| Streets                  | Chwarszczynska | A. Dulina | L. Staniszewskiego | J. Bryla | F. Sokola | M. Zaruskiego | Wiczińska | S. Filipkowskiego | A. Krauzego |
|--------------------------|----------------|-----------|--------------------|----------|-----------|----------------|-----------|-------------------|------------|
| Sidewalk infrastructure  |                |           |                    |          |           |                |           |                   |            |
| Width of sidewalks       | Only fragments of street have sidewalks | Narrow | Narrow | Only fragments of street have sidewalks | Narrow | Only fragments of street have sidewalks | Only fragments of street have sidewalks | Only fragments of street have sidewalks | No sidewalk |
| Evenness of surface      | Uneven | Only part of the street has pavement | Partially uneven | Uneven | Partially uneven | Uneven | Partially uneven | Uneven | Only part of the street has pavement |
| Lack of obstructions     | Lack of obstructions | Lack of obstructions | Lack of obstructions | Cars parked on sidewalks | Cars parked on sidewalks | Cars parked on sidewalks | Cars parked on sidewalks | Lack of obstructions | Lack of obstructions |
| Slope                    | Not important | Not important | Not important | Not important | Not important | Not important | Not important | Yes, stairs, ramps for the disabled | Not important | Important |
| Sufficient drainage      | Sufficient | No | Lack of drainage | Lack of drainage | Sufficient | Lack of drainage | Partially lack of drainage | Sufficient drainage | Lack of drainage |
| General conditions       |                |           |                    |          |           |                |           |                   |            |
| Maintenance              | Good | Requires construction | Partially good | Requires construction | Requires renovation | Requires construction | Requires construction | Good | Good | No |
| Overall aesthetics       | Good | Requires construction | Good | Requires construction | Requires renovation | Requires construction | Requires construction | Good | Good | Scenic trail |
| Street art               | No | No | No | No | No | No | No | No | No |
| Sufficient seating       | No | No | No | No | No | No | No | No | No |
| Perceived safety         | Good | No | No | No | No | No | No | good | good |
| Buffering from traffic   | One side has a buffer with greenery | No | No | No | No | No | Partially buffering with greenery | Buffering with greenery | No traffic |
| Street activities        | No | No | No | No | No | No | No | No | No |
| Vacant lots              | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Traffic                  |                |           |                    |          |           |                |           |                   |            |
| Speed                    | Important | Slow | Important | Slow | Slow | Slow | Important | Slow | Slow |
| Volume                   | Important, main road | Little | Little | Little | Little | Little | Important | Little | No traffic |
| Number and safety of crossings | Multiples, safe | No | Multiples, safe | No | No | No | No | No | No |
| Stop signs               | Yes | No | No | No | No | No | No | Yes | No |
| Parking                  | Prohibited | Yes | Yes | Yes | Yes | Yes | Yes | Prohibited | No |

\(^a\) https://www.gdynia.pl/mieszkaniec/wody-powierzchniowe,3675/monitoring-wod-powierzchniowych,365378

\(^b\) Air Quality Index: Good 8 US AQI, as measured on 31.12.2021, Source: https://www.iqair.com/poland/pomerania/gdynia
Table 2 (Continued). Assessment of health-promoting urban landscapes–Gdynia Zachód neighbourhood (ACCESS TO PARK)

| Streets         | Chwarznińska | A. Dulina | L. Staniszewskiego | J. Bryła | F. Sokola | M. Zaruskiego | Wiczlińska | S. Filipkowskiego | A. Krauzego |
|-----------------|--------------|-----------|--------------------|----------|-----------|---------------|------------|-------------------|------------|
| **User experience** |              |           |                    |          |           |               |            |                   |            |
| Air quality     | Average      | Average   | Average            | Average  | Average   | Average       | Average    | Average           | Good       |
| Noise level     | Important    | Important | Average            | Average  | Average   | Average       | Average    | Average           | Little     |
| Sufficient lighting | Yes    | No        | Average            | Requires construction | Yes | No | Yes | Yes | Yes | No |
| Sunshine and shade | Yes | No | No | No | Yes | No | Trees provide shade | No trees | Trees provide shade |
| Transparency of ground floors of building | Residential buildings | Residential buildings | Residential floors, Property walls | Residential floors | Residential floors, individual parking | Residential floors, walls, individual parking | Residential floors, walls, individual parking | No buildings |

Table 3. Assessment of sustainable development of eco-neighborhood–Gdynia Zachód

| Obligatory requisite | Optional conditions | Rough assessment | Detailed assessment | Suggestions for improvement |
|----------------------|---------------------|------------------|---------------------|-----------------------------|
| **PLANNING OF DEVELOPMENT** | | | | |
| Integrated design | 0 | No |
| Consolidation of social capital | 0 | No |
| Participation | 1 | Yes |
| Space for social contacts | 1 | Yes, numerous places for social contacts of various age groups, e.g. kindergartens, schools, shops, cafes |
| Accessible public transport | 1 | Yes, regular courses of public buses |
| Restraining the suburban sprawl | 1 | Controlled urban sprawl – the neighborhood was built on agricultural land – Gdynia Zachód |
| Revitalization of brownfields | 0 | No |
| Positive economic impact for the city and region | 0 | No |
| **SUSTAINABLE DEVELOPMENT AND INHABITANTS HEALTH PROMOTION** | | | | |
| Open public green space | 1 | Yes |
| Health-promoting urban places | Separate tool for assessment | The universal pattern of design for health-promoting urban places | Separated assessment above |
| Public park in the center to be developed first | 1 | Yes, recreational area with sport fields |
| Therapeutic park | Separate tool for assessment | The universal pattern of design for health-promoting urban places | Separated assessment above |
| New (second) generation of parks | 1 | Yes |
| Community gardens | 0 | no | It would be recommended to facilitate creation of community gardens |
| Green infrastructure grid | | | | |
| Green streets | 1 | Yes, inside the neighborhood |
| Green walls | 1 | Yes, inside the neighborhood |
| Green roofs | 1 | Covering underground parking |
Table 3 (Continued). Assessment of sustainable development of eco-neighborhood–Gdynia Zachód

| Obligatory requisite                                           | Optional conditions | Rough assessment | Detailed assessment | Suggestions for improvement                      |
|---------------------------------------------------------------|---------------------|------------------|---------------------|--------------------------------------------------|
| Biodiversity protection                                       |                     | 1                | Yes                 |                                                  |
| Enclosure for pets/off-leash dog park                        |                     | 0                | No                  | It would be recommended to provide enclosure for pets/off-leash dog park |
| Water protection                                              | Sustainable drainage systems | 1                | Yes                 |                                                  |
|                                                             | Stabilized permeable surfaces | 1                | Yes                 |                                                  |
|                                                             | Open drainage canals | 1/2              | Partially           |                                                  |
|                                                             | Swales for drainage | 1                | Yes                 |                                                  |
|                                                             | Swales for infiltration and retention | 1    | Yes                 |                                                  |
|                                                             | Raingardens         | 1                | Yes                 |                                                  |
|                                                             | Rainwater basins    | 1                | Yes                 |                                                  |
|                                                             | Dry basins          | 1                | Yes                 |                                                  |
|                                                             | Artificial wetlands | 1                | Yes                 |                                                  |
| Soil protection                                               | Installations for phytoremediation | Data NA           |                      |                                                  |
|                                                             | Minimizing the building perimeter | 1               | Yes                 |                                                  |
|                                                             | Urban metabolism, "zero" waste | 1               | Waste segregation  |                                                  |
|                                                             | Pneumatic waste collection | 0              | No                  |                                                  |
|                                                             | Natural maintenance of green areas | 1              | Yes                 |                                                  |
|                                                             | Composting          | 0                | No                  |                                                  |
| Air protection                                                | Ecological heating  | 1                | Yes                 |                                                  |
|                                                             | HVAC                | Data NA           |                      |                                                  |
|                                                             | Natural daylight    | 1                | Yes                 |                                                  |
|                                                             | Energy efficiency of every building | 1       | Yes                 |                                                  |
|                                                             | Scent landscape     | 1                | Yes                 |                                                  |
| Microclimate                                                  | Acoustic comfort    | 1                | Yes                 |                                                  |
| GUIDELINES AND CRITERIA RELATED TO MASTER PLAN                |                      |                  |                     |                                                  |
| Traffic control                                              |                      |                  |                     |                                                  |
|                                                             | Streets friendly to pedestrians | 1           | Yes                 |                                                  |
|                                                             | Minimizing roads    | 1                | Underground parking |                                                  |
| Friendly public space                                         | Orientation enhancement | 1                | Yes                 |                                                  |
|                                                             | Ordered spatial composition | 1          | Yes                 |                                                  |
|                                                             | Architectural diversity | 1/2             | Partially, forms of buildings | It would be recommended to promote more of architectural variety |
|                                                             | Integrating buildings with landscape | 1         | Yes                 |                                                  |
|                                                             | Architectural details | 1                | Yes, high quality   |                                                  |
|                                                             | Esthetic qualities of space | 1            | Yes                 |                                                  |
|                                                             | View through a window | 1/2              | Partially           |                                                  |
|                                                             | Urban furniture     | 1                | Yes                 |                                                  |
|                                                             | Legible hierarchy of public and private space | 1       | Yes                 |                                                  |
| Catering for basic needs of inhabitants within walking distance | Functional diversity | 1/2              | Limited             | It would be recommended to promote more of functional diversity |
Table 3 (Continued). Assessment of sustainable development of eco-neighborhood—Gdynia Zachód

| Obligatory requisite                                  | Optional conditions | Rough assessment | Detailed assessment | Suggestions for improvement                                                                 |
|-------------------------------------------------------|---------------------|------------------|--------------------|---------------------------------------------------------------------------------------------|
| Places for Spiritual renewal: churches, shrines       |                     | 1                | Multiples          | It would be a good idea to join the shrines with a named trail and provide pedestrian path with comfortable seating and lighting |
| Diversity of housing offer                            |                     | 1/2              | Limited            | It would be recommended to promote diversified housing offer                                   |
| Workplaces                                            |                     | 1/2              | Limited            | It would be recommended to create more workplaces within the neighborhood                     |
| Commercial services catering for everyday needs       |                     | 1/2              | Limited, only a few commerce, not sufficient to cater for everyday needs | It would be recommended to promote commercial services catering for everyday needs             |
| Education: nursery, kindergarten, primary school, secondary school |                  | 1                | Yes                |                                                                                               |
| Health center                                         |                     | 1                | Yes                |                                                                                               |
| Sports and recreation                                  |                     | 1                | Yes                |                                                                                               |
| Cultural center, cinema, theater, art galleries       |                     | 0                | No                 |                                                                                               |

CONCLUSIONS

The universal standards are ready-to-use tools for the designers, developers, and the general public. They can be used to assess the therapeutic and health-promoting qualities of public space and the sustainable development of any housing project. The multicriteria assessment standards can also be used as justification tools to explain the design decisions to inhabitants, decision-makers, and local authorities. The individual assessment of the Gdynia-Zachód housing project demonstrated the vital points that should be developed and revealed some weak points that might be improved.

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## APPENDIX A

### Universal Standard for Health-Promoting Urban Places

| UNIVERSAL DESIGN | PARK'S FUNCTIONAL PROGRAM | ORGANIZATION OF SPACE AND FUNCTIONS | PLACEMAKING | SUSTAINABILITY | ACCESS TO PARK |
|------------------|---------------------------|------------------------------------|-------------|----------------|----------------|
| 1. Place         | 1. Psychological and physical regeneration | 1. The park spatial composition follows the surrounding urban pattern | 1. Works of art | 1. Green infrastructure | 1. Sidewalk infrastructure |
| Area Location    | Natural landscapes        | 2. Architectural variety of urban environment | 2. Monuments in the park | 2. Parks of second (New) generation | Width of sidewalk |
| Surrounding urban pattern | Green open space | Focal points and landmarks | 3. Historic places | 3. Biodiversity protection | Evenness of surface |
| 2. Environmental characteristics | Place to rest in the sun and in the shade | Structure of interiors and connections | 4. Thematic gardens | Part of park not-available to visitors | Lack of obstructions |
| Soil quality     | Place to rest in silence and solitude | Long vistas (Extent) | 5. Personalization | Native plants | Slope |
| Water quality    | Possibility to observe other people | Pathways with views | 6. Animation of place | Native animals | Sufficient drainage |
| Air quality      | Possibility to observe animals | Invisible fragments of the scene (Vista engaging the imagination) | 7. Community engagement | Natural maintenance methods | 2. General conditions |
| Biodiversity     | 2. Social contacts enhancement | Mystery, fascination | Personalising the architectural process | 4. Sustainable water management | Maintenance |
| Forms of nature protection | Organization of events inside the park | Framed views | Participation of all stakeholders, including inhabitants and users | Rainwater infiltration | Overall aesthetics |
| 3. Universal accessibility | Gathering place for groups | Human scale | Determining the rules of conduct and self-management | Irrigation with non-potable water | Street art |
| 4. Access to park | 3. Physical activity promotion | Optimality of complexity | 5. Urban metabolism | Park in a flood risk zone | Sufficient seating |
| Distance to potential users | Sports and recreational infrastructure | 4. Natural surfaces | 5. Sidewalk infrastructure | 3. Traffic | Perceived safety |
| Public transport stops | Community gardens | 5. Engaging features | | Street activities | |
| Walkways to park | 4. Catering for basic needs | Risk/Peril | | Vacant lots | |
| | Safety and security | Movement | | 4. User experience | |
| | Places to sit and rest | | | Air quality | |
| | Shelter | | | Noise level | |
| | Restrooms | | | Sufficient lighting | |
| | Drinking water | | | Sunshine and shade | |
| | Food | | | Transparency of ground floors of building | |

Source: Trojanowska (2021a)
APPENDIX B

Universal Standard for Sustainable Eco-Neighborhoods

| PLANNING OF DEVELOPMENT | SUSTAINABLE DEVELOPMENT AND INHABITANTS HEALTH PROMOTION | GUIDELINES AND CRITERIA RELATED TO MASTERPLAN |
|-------------------------|----------------------------------------------------------|---------------------------------------------|
| Integrated design       | Open public green space                                  | Traffic control                             |
| Consolidation of social capital | Public park in the center of neighborhood to be developed first | Friendly public space                        |
| Accessible public transport | Green infrastructure grid                               | Catering for basic needs of inhabitants within walking distance |
| Restraining the suburban sprawl | Water protection                                          |                                             |
| Positive economic impact for the city and region | Soil protection                                           |                                             |
|                         | Air protection                                            |                                             |
|                         | Microclimate                                              |                                             |
| Obligatory requisites   |                                                          |                                             |
|                         |                                                          |                                             |
| Optional conditions     |                                                          |                                             |
|                         |                                                          |                                             |

Source: Trojanowska (2018)