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Research Article

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

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ABSTRACT

This paper presents the assessment of Gdynia-Zachód–a new sustainable housing project in Gdynia. This assessment uses a series of justification tools: the universal standard for health-promoting places and the universal standard for eco-neighborhood design. 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. Gdynia-Zachód is a flagship urban development based on a new urbanism charter. The charette and workshops were organized to invite public participation in this project. The project is still under development, but it was assumed it is a good moment for the assessment to justify future design decisions. This study also demonstrated the practical usage of the universal standards as justification tools.

Keywords: eco-neighborhoods, health-promoting urban places, universal pattern, assessment tools

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 Tsouros, 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

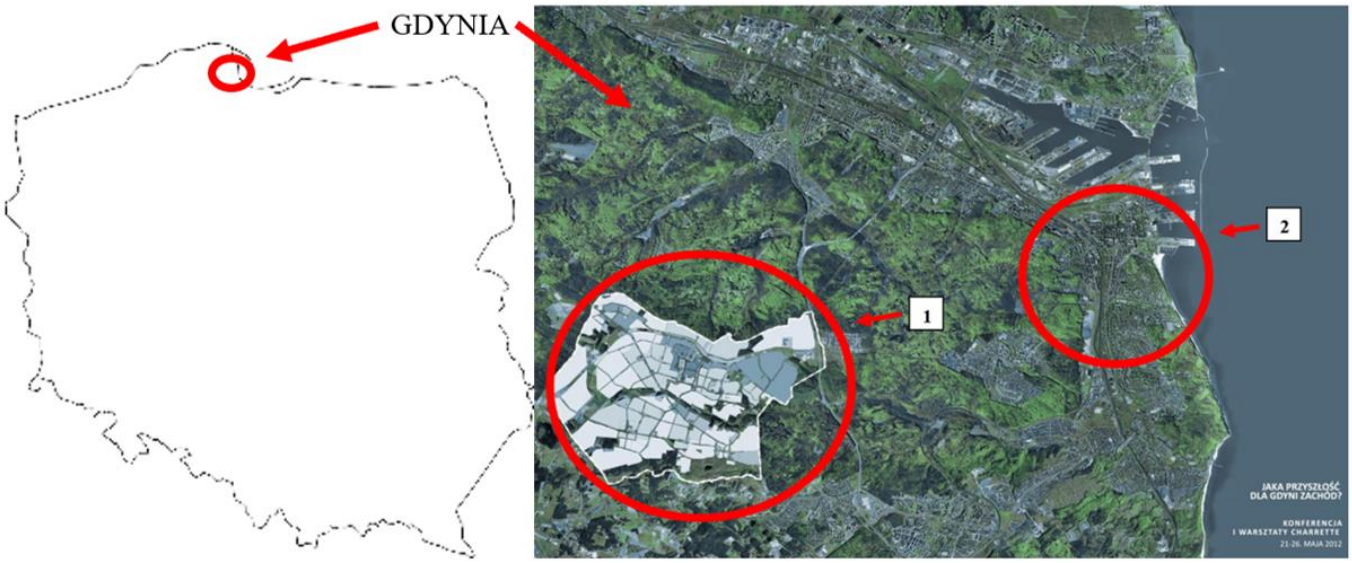

Figure 1. Location of case study. (a) Map of Poland, Source: Authors own elaboration; (b) Map of Gdynia, 1 - Gdynia Zachód, 2 – Gdynia city centre (Source: Authors own elaboration using map: http://gdyniazachod.pl/index.php?parent_id=71&menu_id=1)

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 neighborhoods 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-communistic 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 Gdańsk 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 km^2, 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, Patio 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, Patio 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 charette and workshops were organized

Figure 2. Goose happily sunbathing in front of Fort Forest & the colorful playground and rainwater basin in Fort Forest-upscale residential part of Gdynia Zachód housing project. Photo source: Author

Figure 3. Sport field in the center of Gdynia Zachód housing project (left) & Permeable parking (Patio róży-affordable complex) in Gdynia Zachód housing project (right). Photo source: Author

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, Sokoła, 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; Wilkonson & 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, Sokoła, 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,

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	NA		
Soil quality	Good	Former agricultural soils, no traces of pollution	
Water quality	Bad quality of surface waters[a]	Non-potable water in the ponds, polluted waters of the Kacza river	The polluted waters needs urgent remediation
Air quality	Good[b]	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	
Gathering place for groups	1	There are spatial possibilities to organize meetings	It would be useful to build garden pavilions with running potable water and electricity
Physical activity promotion	1		
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	1		
Safety and security	1	Assessed as safe place. The neighborhood is well maintained, clean and offers good visibility	
Places to sit and rest	1	There are numerous benches	It would be useful to install movable chairs, and various benches with back and armrests along the walkways
Shelter	0		It would be useful to install garden pavilions
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.

kindergartens, and public facilities are being constructed in the neighborhood.

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, sport fields, etc.
ORGANISATION OF SPACE AND FUNCTIONS			
The park spatial composition follows the surrounding urban pattern	1	Park fills the space between the buildings, fills the urban tissue	
Architectural variety of urban environment	1	To some extend we can observe the architectural variety, however some housing complexes are constructed with repeated buildings	
Focal points and landmarks	1	It would be useful to install focal points that would be more pronounced	
Structure of interiors and connections	1		The structure could be more orderly organized and focal points could be more pronounced
Long vistas (Extent)	1	Yes, the neighborhood offers numerous long vistas	
Pathways with views	1	yes	
Invisible fragments of the scene (Vista engaging the imagination)	1	Yes, numerous designed vistas	
Mystery, fascination	1	Forest trails offers the feeling of mystery and fascination	
Framed views	1	Numerous framed views	
Human scale	1	The neighborhood is designed in human scale	
Optimal level of complexity	1	Yes	
Natural surfaces	1	Yes	
Engaging features	1	Multiple elements attract human attention	
Risk/Peril	1	Multiple elements offer the subjective feeling of overcoming controlled risk	
Movement	1	Water, greenery	
Presence of water	1	Presence of water increases the recreational values of space	
Sensory stimuli design	1		
Sensory stimuli: Sight	1	Numerous elements	
Sensory stimuli: Hearing	1	Plants	
Sensory stimuli: Smell	1	Plants	
Sensory stimuli: Touch	1	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	0	No	It could be interesting to install a table with this place history
Historic places	1	Local shrines	
Culture and connection to the past	1	Remaining rural development	
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	1	Yes, the names of people involved in the project are known	
Participation of all stakeholders, including inhabitants and users	1	The charrettes, meetings, and other forms of organized participation	
Determining the rules of conduct and self-management	1	Yes, the rules of conduct are determined	
Space for social contact	1		
Third places	1	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

	Rough assessment	Detailed assessment	Suggestions for improvement
PURSUIT OF SUSTAINABLE DEVELOPMENT			
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	

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

Streets	**Chwarznieńska**	**A. Dulina**	**L. Staniszewskiego**	**J. Bryła**	**F. Sokoła**	**M. Zaruskiego**	**Wiczlińska**	**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	Yes	Yes	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	Lack of obstructions	Lack of obstructions	Lack of obstructions
Slope	Not important	Not important	Not important	Not important	Not important	Not important	Yes, stairs, no 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	Good	Good	No
Overall aesthetics	Good	Requires construction	Good	Requires construction	Requires renovation	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	No	No	No

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

Streets	**Chwarznieńska**	**A. Dulina**	**L. Staniszewskiego**	**J. Bryła**	**F. Sokoła**	**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	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	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		1	Yes	
	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 more 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, theatre, 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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Availability of data and materials: All data generated or analyzed during this study are available for sharing when appropriate request is directed to corresponding author.

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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	Natural landscapes	**2. Architectural variety of urban environment**	**2. Monuments in the park**	**2. Parks of second (New) generation**	Width of sidewalk
Location	Green open space	Focal points and landmarks	**3. Historic places**	**3. Biodiversity protection**	Evenness of surface
Surrounding urban pattern	Place to rest in the sun and in the shade	Structure of interiors and connections	Culture and connection to the past	Part of park not-available to visitors	Lack of obstructions
2. Environmental characteristics	Place to rest in silence and solitude	Long vistas (Extent)	**4. Thematic gardens**	Native plants	Slope
Soil quality	Possibility to observe other people	Pathways with views	**5. Personalization**	Native animals	Sufficient drainage
Water quality	Possibility to observe animals	Invisible fragments of the scene (Vista engaging the imagination)	**6. Animation of place**	Natural maintenance methods	**2. General conditions**
Air quality	**2. Social contacts enhancement**	Mystery, fascination	**7. Community engagement**	**4. Sustainable water management**	Maintenance
Biodiversity	Organization of events inside the park	Framed views	Personalising the architectural process	Rainwater infiltration	Overall aesthetics
Forms of nature protection	Gathering place for groups	Human scale	Participation of all stakeholders, including inhabitants and users	Irrigation with non-potable water	Street art
3. Universal accessibility	**3. Physical activity promotion**	**3. Optimal level of complexity**	Determining the rules of conduct and self-management	Park in a flood risk zone	Sufficient seating
4. Access to park	Sports and recreational infrastructure	**4. Natural surfaces**	**8. Space for social contact**	**5. Urban metabolism**	Perceived safety
Distance to potential users	Community gardens	**5. Engaging features**	Third places		Buffering from traffic
Public transport stops	**4. Catering for basic needs**	Risk/Peril	Fourth places		Street activities
Walkways to park	Safety and security	Movement			Vacant lots
	Places to sit and rest	**6. Presence of water**			**3. Traffic**
	Shelter	**7. Sensory stimuli design**			Speed
	Restrooms	Sensory stimuli: Sight			Volume
	Drinking water	Sensory stimuli: Hearing			Number and safety of crossings
	Food	Sensory stimuli: Smell			Stop signs
		Sensory stimuli: Touch			Parking
		Sensory stimuli: Taste			**4. User experience**
		Sensory path			Air quality
					Noise level
					Sufficient lighting
					Sunshine and shade
					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
Obligatory requisite	**Integrated design** **Consolidation of social capital** Accessible public transport Restraining the suburban sprawl Positive economic impact for the city and region	**Open public green space** **Public park in the center of neighborhood to be developed first** Green infrastructure grid Water protection Soil protection Air protection Microclimate	Traffic control Friendly public space **Catering for basic needs of inhabitants within walking distance**
Optional conditions	**Consolidation of social capital** Participation Space for social contacts Restraining the suburban sprawl Revitalization of brownfields	**Open public green space** **Public park in the center of neighborhood to be developed first** **Therapeutic park** New (second) generation of parks Community gardens Green infrastructure grid Green streets Green walls Green roofs Biodiversity Protection Enclosure for pets Water protection Sustainable drainage systems Stabilized permeable surfaces Open drainage canals Swales for drainage Swales for infiltration and retention Raingardens Dry basins Artificial wetlands Soil Protection Installations fo phytoremediation Minimizing the building footprint Urban metabolism, “zero” waste Pneumatic waste collection Natural maintenance of green areas Composting green waste Air protection Ecological heating HVAC Natural daylight Energy efficiency of individual buildings Factory landscape Microclimate Acoustic comfort	Traffic control Streets friendly to pedestrians Minimizing roads Friendly public space Easy orientation Ordered spatial composition Architectural diversity Integrating buildings with landscape Architectural details Esthetic qualities of space View through a window Urban furniture Legible hierarchy of public and private space **Catering for basic needs of inhabitants within walking distance** Functional diversity Places for Spiritual renewal: churches, shrines Diversity of housing offer Workplaces Commercial services Education: nursery, kindergarten, primary school, secondary school Sports and recreation facilities Cultural center, cinema, theatre, art galleries

Source: Trojanowska (2018)