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REVITALISATION OF PUBLIC SPACES IN HISTORIC CITIES - adaptation of cities courtyards to climate change in Central Europe

Version 1

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D2.1.2 Revitalizing Traugutta 8 in Łódź - conceptual design - “Water catcher courtyard”

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Peer revised by Politechnika Lubelska, Links foundation

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Revitalizing Traugutta 8 "Water catcher courtyard"

A. Climate-Responsive Courtyard with a Historic Soul

Concealed behind the historic façades of the tenement at Traugutta 8 in the Historic Urban Core of Łódź, Poland, lies a courtyard that is transforming from a utilitarian-circulation space into a vibrant, ecological, and community-centered urban oasis. This revitalization project addresses the pressing challenges of climate change, unadapted infrastructure, and the need to create shared spaces, offering modern solutions in a way that respects the historical heritage of the courtyard and addresses current ecological and social needs.

The Łódź courtyard subject to revitalization is located at Traugutta Street 8, in the city's historic city center. The area is entirely owned by the City of Łódź, regulated by the Local Spatial Development Plan (MPZP), and protected under heritage conservation regulations.

Figure 1 Courtyard at Traugutta 8 in Łódź

The urban layout consists of a front tenement with a gateway passage leading to the inner courtyard, which provides access to the longitudinal rear wings (annexes). The courtyard has a characteristic U-shape, typical of inner-city residential blocks, and forms a courtyard-well enclosed by the surrounding annexes. Courtyards of this type usually serve a circulation function, providing access to residential units and commercial premises.

Currently, the courtyard covers an area of 283.8 m^2 (the total plot area is 1171 m^2) and is fully paved with concrete. There are no biologically active surfaces or greenery. The courtyard is mainly used by residents as a parking area and includes a designated space for waste storage. The area has low functional and aesthetic value, and the impervious concrete surface contributes to the urban heat island effect.

Figure 2 Courtyard at Traugutta 8 in Łódź - views

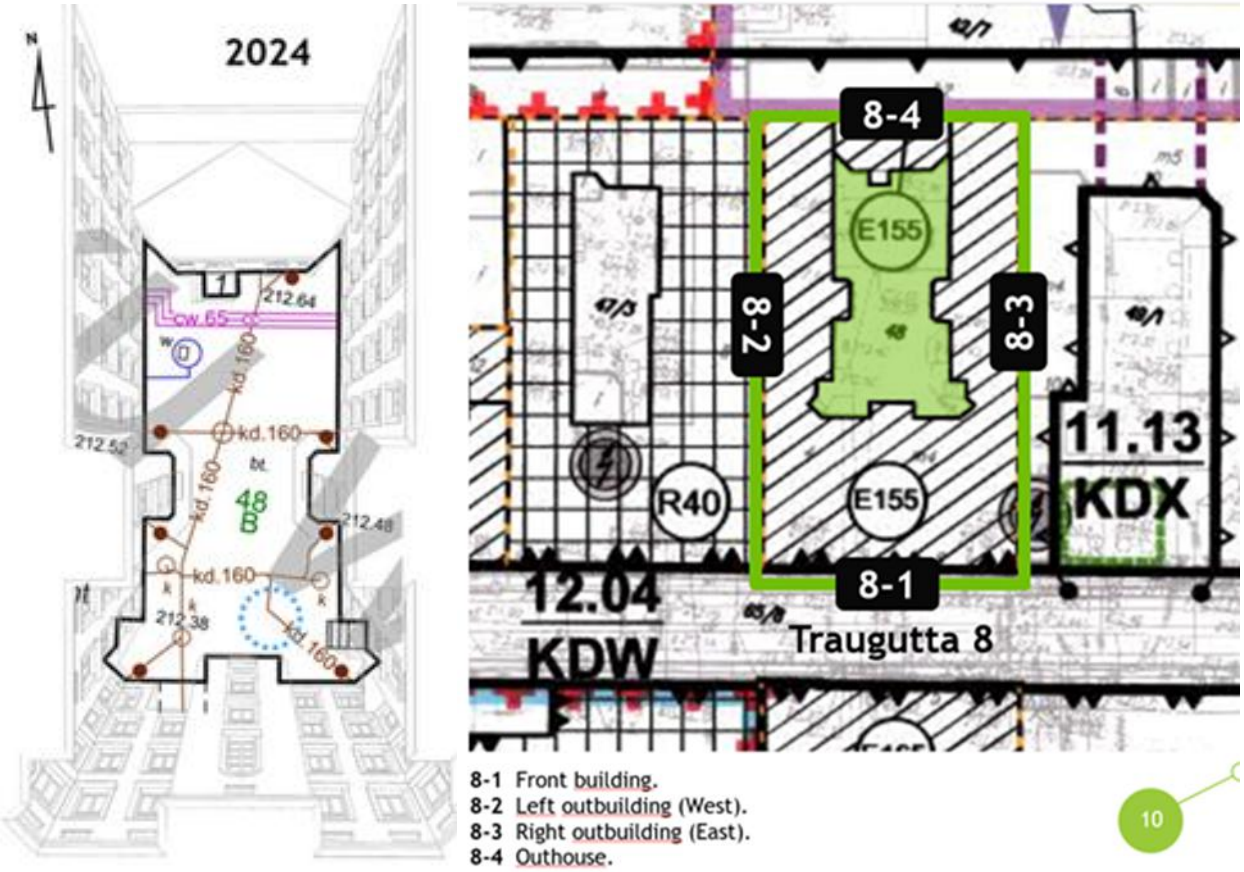

Figure 3 Courtyard at Traugutta 8 in Łódź - top view - parameters

The revitalization project aims to implement interventions at the functional, environmental, heritage, and social levels, transforming the fully paved courtyard into a green, sustainable, and resident-friendly public space, while preserving and emphasizing its historical character.

As part of pre-design works, a room for municipal waste storage will be established in the utility annex, allowing for better organization of functional areas and separating the recreational zone. In addition, the gateway passage and annex plinths will be cleaned and repainted, with all necessary technical repairs and plaster protections completed.

The project will create a functional, welcoming space for residents while maintaining the main circulation routes, introducing rest areas, new plantings, and nature-based solutions (NBS). Special attention is given to increasing green areas and rainwater retention through the installation of stormwater retention tanks connected to building downspouts. This

approach improves the microclimate, reduces heat accumulation, and increases the courtyard's resilience to climate change.

The transformation is guided by four core principles.

1. Water as an Asset: Harvesting Rain, Slowing Runoff

The transformation embracing climate adaptation by implementiation of sustainable rainwater management.

In the face of accelerating climate change, the approach to the role of water in urban ecosystems requires thoughtful transformations, including better utilization of existing infrastructure. Until now, rainwater from the courtyard at Traugutta 8 was directly discharged into the sewage system. Thanks to the changes introduced by the project, it has become possible to effectively utilize this water.

At the heart of this approach lies the need to create a self-sustaining mini-ecosystem based on effective rainwater collection and storage. The planned solutions will restore ecological balance by breaking up the concrete surfaces of the courtyard, introducing thoughtfully designed and diverse plantings, and creating a friendly space for residents, animals, and insects.

These actions are part of a broader urban vision within the city's spatial policy, in which water will play an active and significant role in restoring biodiversity and supporting water infiltration into the soil.

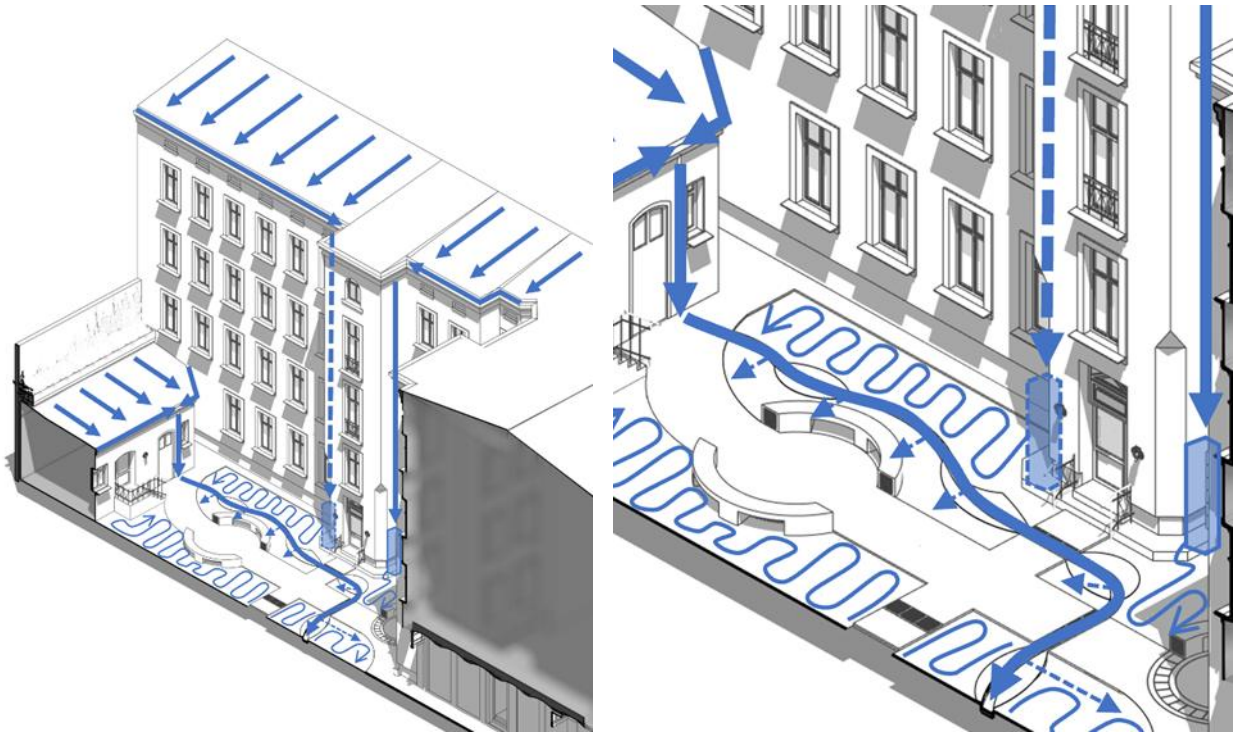

Figure 4 Water catching scheme

The project envisions the creation of a system of above-ground rainwater tanks, strategically located near four of the building's downspouts. This simple yet effective solution is designed to collect and store rainwater, ensuring that excess precipitation is managed in a sustainable manner. Moreover, rainwater from the utility building roof will be directed into a partially exposed, specially designed shallow stone channel running through the courtyard, adding both functional and aesthetic value to the space.

An analysis of the courtyard's hydrological performance was conducted throughout the average year by calculating monthly precipitation averages as well as modeling extreme conditions, such as torrential rain. Based on these findings, a basic model of annual rainfall amounts was prepared. Taking into account the potential volume of collected rainwater, as well as the technical limitations of the site, the most suitable solution was determined to be the installation of above-ground rainwater tanks. These tanks will be directly connected to the downspouts, allowing for efficient collection in line with their storage capacity, without requiring modifications to the existing underground drainage system.

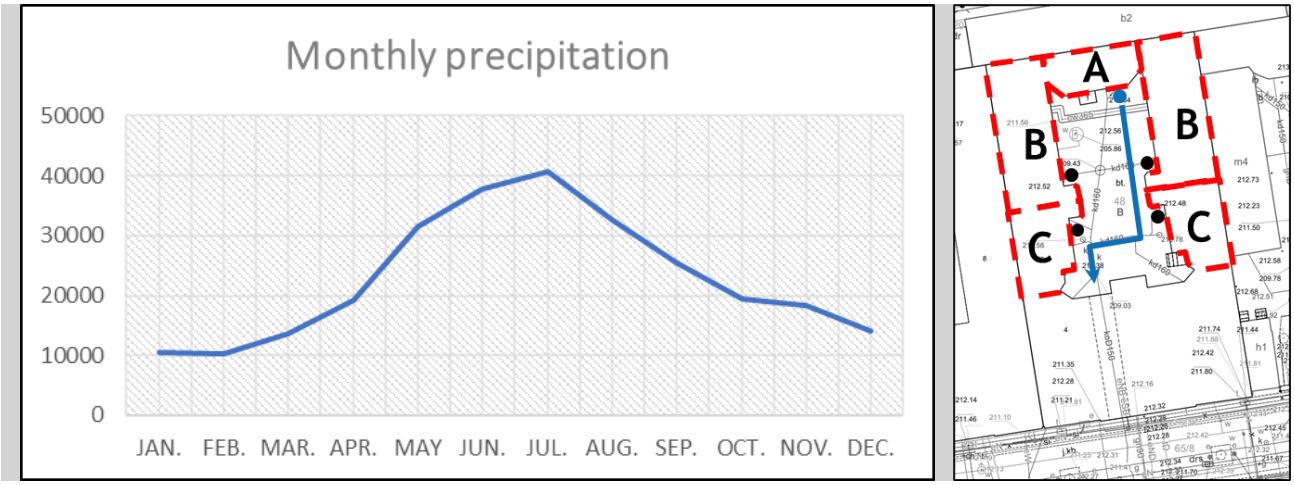

Figure 5 Monthly precipitation for roof sections A, B, and C

Based on an analysis of the tenement roof structure, the operation of the current drainage system, and the natural slope of the terrain, it was decided to collect rainwater from five specific points. Water from the perpendicular annexes (sections B, and C) will be directed into the above-ground storage tanks, while runoff from the transverse annex (sections A) will flow into the designed channel running across the courtyard. This division of collection points ensures optimal use of the existing drainage geometry and maximizes the efficiency of the system.

At roof section B, two downspout points will be equipped with two tanks each, providing a total of four tanks. At roof section C, two downspout points will each be fitted with one tank, providing two additional tanks. Altogether, the system will comprise six above-ground retention tanks, each with a capacity of approximately 650 liters.This distribution ensures balanced water collection from all major roof areas. Collected water will be reused for irrigation purposes through a gravity-fed or low-pressure distribution system, while any overflow will be safely diverted to the stormwater drainage system.

The project envisions the creation of an open water channel to distribute rainwater from roof section A (the transverse annex). The channel will serve both retention and decorative functions, slowing down water runoff and allowing for partial infiltration into the soil. Its bed and edges will be filled with gravel to enhance the resemblance to a natural stream. Any excess water not retained within the system will ultimately be discharged into the stormwater drainage network.

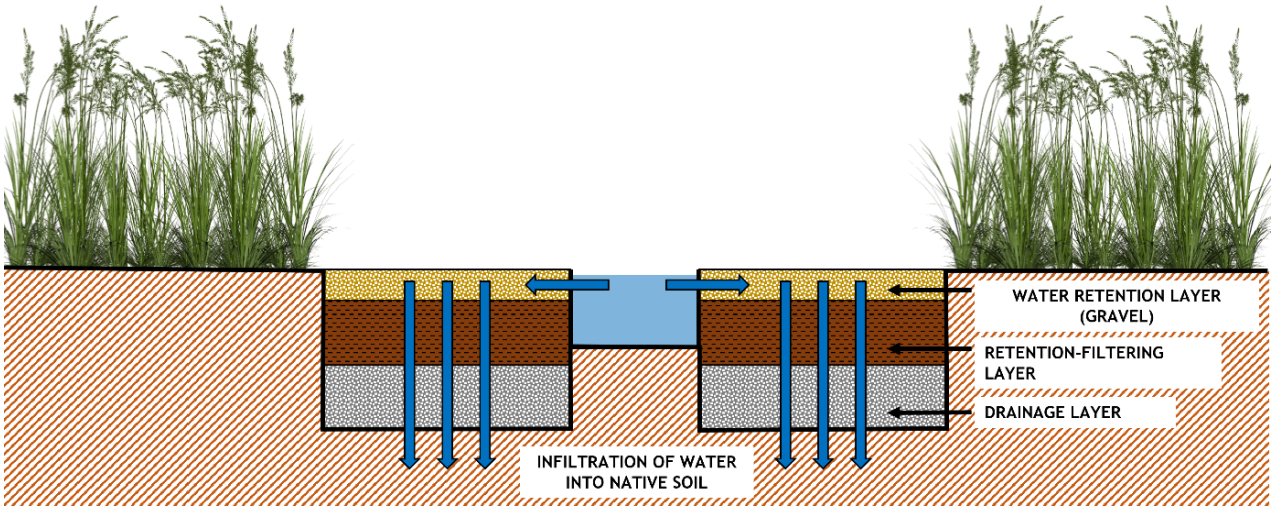

Figure 6 Water infiltration scheme

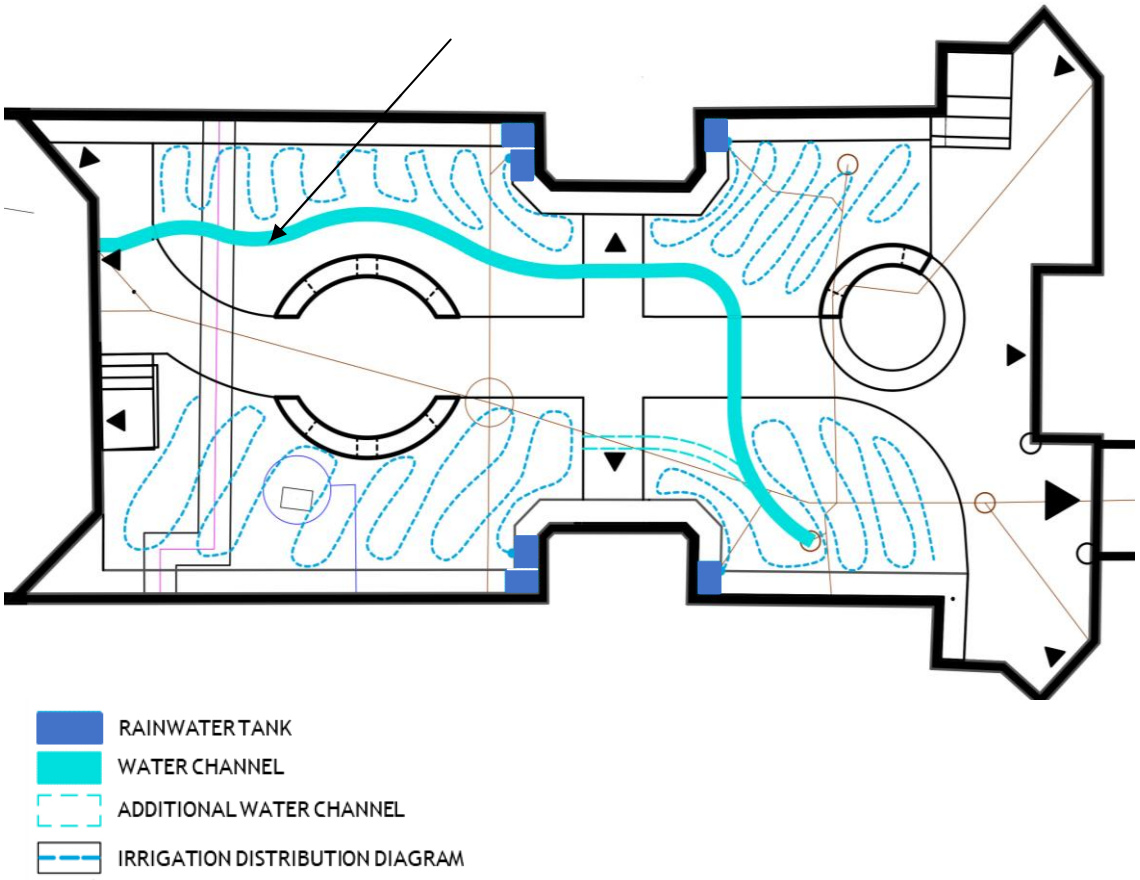

Figure 7 Water catching and infiltration scheme

Figure 8 Water tank and artificial chanel in the courtyard

Due to currently unknown geological characteristics of the courtyard's subsurface layers, it is anticipated that adjustments to the upper ground level may be required. The planned plantings are characterized by relatively shallow root systems, which necessitate the replacement of 30–50 cm of soil currently located beneath the pavement. This intervention will ensure healthy vegetation growth while improving the courtyard's water retention and infiltration capacity.

2. Green Infrastructure: Enhancing Ecology and Everyday Comfort

The introduction of climate-resilient plantings implemented using the rainwater management system

The blue-green infrastructure implemented in the project has not only an aesthetic gesture but also constitutes an essential element of the strategy to transform the courtyard into a climate-responsive space, oriented towards the needs of people. Carefully selected plantings and permeable materials work effectively in harmony with the rainwater management approach, strengthening both ecological resilience and everyday usability.

One of the analyzed climatic aspects was sunlight exposure. The courtyard has no issue with excessive direct sunlight, as there is no location that receives more than two hours of continuous sun per day. Therefore, the design focuses instead on optimizing shade-tolerant greenery, ensuring that planting thrives despite limited solar access.

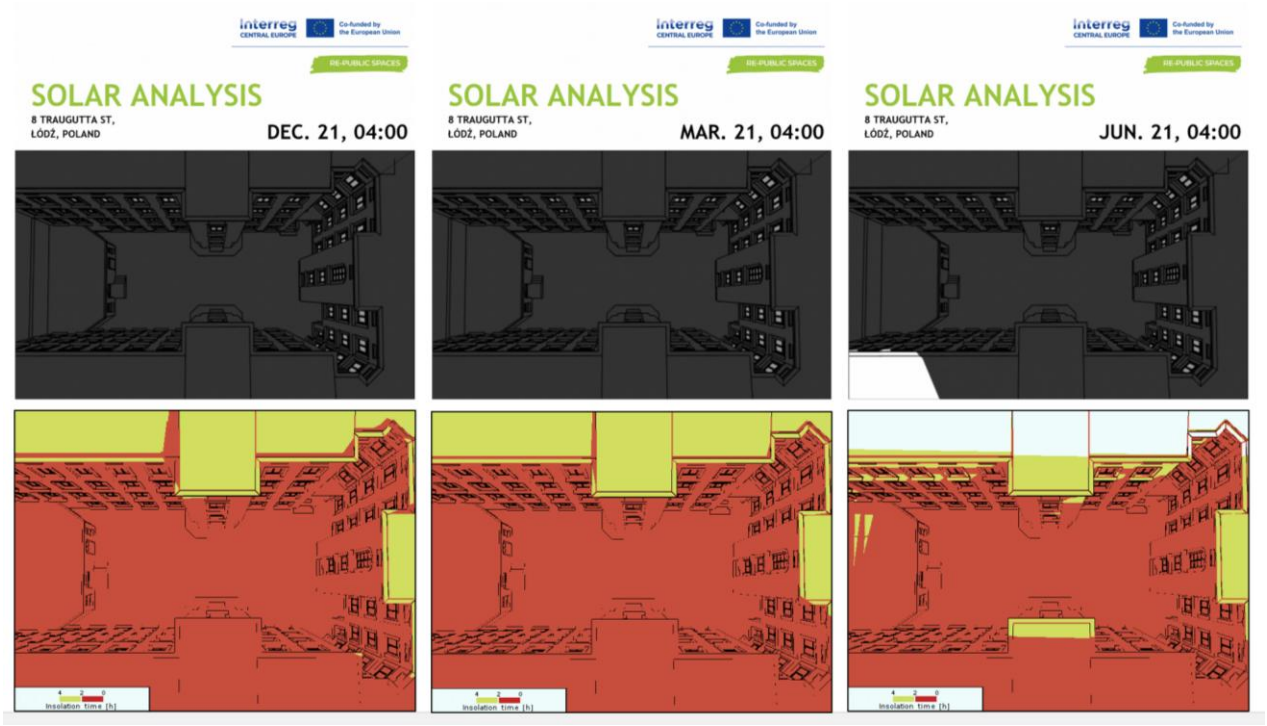

Figure 9 Solar analysis of the courtyard

As for the urban heat island effect, the project introduces a set of complementary measures. These include the installation of above-ground water tanks, the creation of an open water channel that both visually and physically cools the space, and the use of shade-tolerant greenery to strengthen vegetation cover and regulate temperature. Together, these interventions mitigate heat accumulation in the courtyard while enhancing comfort for its users.

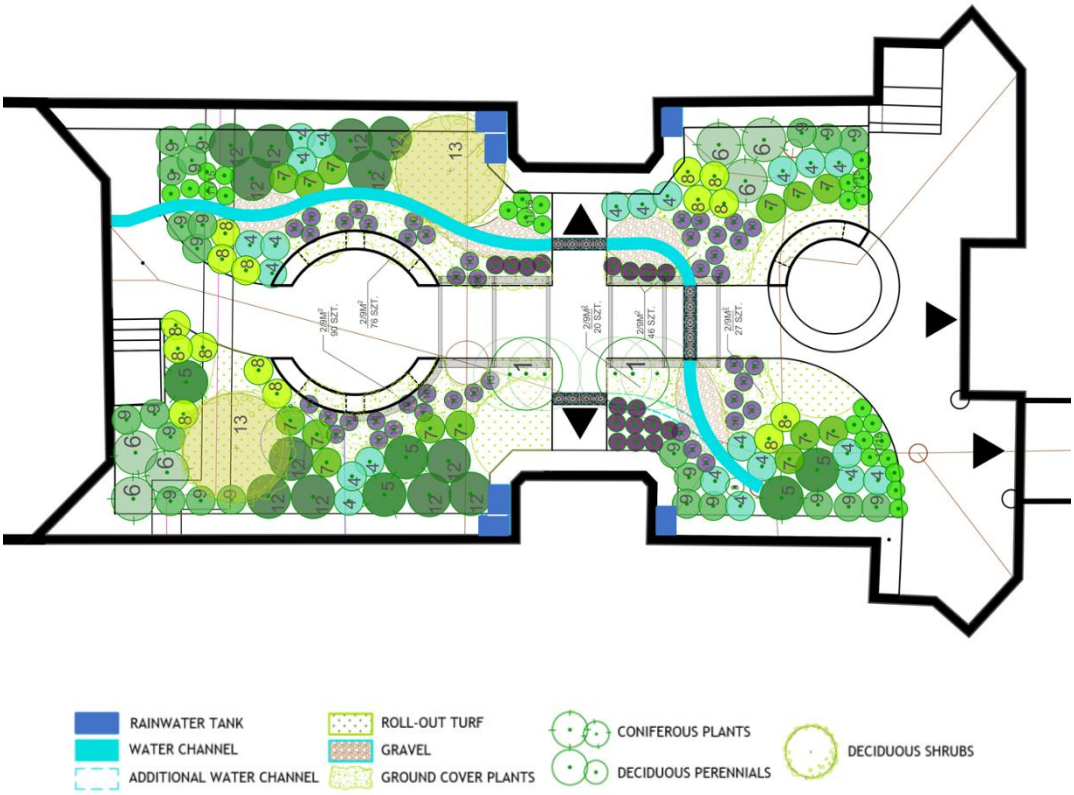

Figure 10 Enhancment of biodiversity - greenery

Figure 11 View of the courtyard

The plant species included in the project have been selected based on their adaptability to the conditions in the courtyard. The chosen plantings tolerate shade and are low-maintenance. The composition, dominated by shades of white, purple, and blue, has been designed with flowering plants that bloom from early spring to late autumn, giving the courtyard a consistent and elegant character. Evergreen species serve as the structural anchor of the planting scheme, offering year-round form and greenery, while dynamic understory layers introduce movement, variety, and depth.

These living systems are supported by practical ecological measures: bark mulch and natural groundcovers help regulate soil moisture and suppress weeds, and a specifically selected soil mix in selected areas enhances infiltration and water retention—ensuring the landscape remains resilient in the face of increasing climatic extremes.

This green infrastructure also plays a pivotal role in supporting biodiversity. Flowering species provide nectar for pollinators such as bees and butterflies, while dense, layered vegetation offers habitat and refuge for small urban wildlife. In addition, the thoughtfully designed space accommodates the needs of tenants' pets, providing areas where animals can safely explore and interact with nature.

In this way, the courtyard contributes to a broader ecological network within the city.

Figure 12 View of the courtyard

3. Contemporary Courtyard with Historic Roots

Revitalization with respect for historical heritage

Figure 13 View of the courtyard - top view

The revitalization of the courtyard at Traugutta 8 is not just about updating infrastructure; it's about creating a meaningful dialogue between the past and the present, where modern functionality and historical integrity coexist seamlessly. Considering the conservation protection measures applicable to the area, the project complies with legal requirements regarding the preservation of historical values. At the same time, it incorporates thoughtful contemporary solutions that enhance the functionality, accessibility, and overall value of the space.

One of the reference to the past is marking within the courtyard space the location of the former well. Its position is emphasized with a distinctive paving pattern.

To support comfort and social interaction, a new set of urban furniture — including benches, planters, waste bins, pergolas, railings, and bicycle racks — has been carefully selected in a minimalist, cohesive style. Made from robust materials and thoughtfully arranged, these elements create a welcoming atmosphere while maintaining respect for the 19th-century context.

Figure 14 Compilation of historical plans, current and proposed conditions, with the location of the former well commemorated in the pavement as indicated in the design

A significant improvement in the courtyard's layout, and thus its aesthetic and historical value, will be achieved through the removal of waste containers that previously occupied a considerable amount of space. These will be moved to a designated room in the utility building (the transverse annex) located in the northern part of the site.

4. Social Value and Participatory Design

The transformation of Traugutta 8 courtyard is a collective act of placemaking shaped by the voices, needs, and aspirations of the very people who call this space home. At the heart of this revitalization lies a deep commitment to participatory design, recognizing residents not as passive users but as co-creators of their environment.

From the earliest stages, tenants were actively engaged in shaping the vision for the courtyard. Through consultations, conversations, and surveys, their insights directly informed key design decisions — from the placement of benches and bike stands to the routing of walkways and the organization of green areas. This inclusive process ensured

that the space would reflect not only aesthetic and ecological goals but also the rhythms of daily life of the community it serves.

In giving residents a true stake in the design process, the project has strengthened social ties and empowered a shared sense of stewardship. The courtyard has the potential to become more than just a shared space. It can serve as an example of building and renewing social bonds on a neighborhood scale.

Figure 15 Public consultation in Łódź

B. Summary

The revitalization of the courtyard at Traugutta 8 is a model of how thoughtful design can address contemporary ecological and urban challenges while honoring historical context. The project implements solutions increasing a resilience to accelerating climate change, while respecting historical heritage. Water is treated as a valuable resource through the implementation of thoughtful rainwater management systems. The blue-green infrastructure enhances biodiversity, creating a friendly microclimate for people, animals, and insects. At the same time, the courtyard's layout has been reorganized to improve everyday functionality and foster social interaction.

Developed in close cooperation with tenants, the transformation reflects collective values and everyday needs. It is not just a renovation—it is a reinvestment in the shared life, memory, and future resilience of the urban courtyard.

Figure 16 View of the courtyard

The concept was developed on the basis of a Joint Methodology on Climate Change Adaptation of Courtyards in Historic Cities, which provided a structured framework for integrating historical preservation, ecological resilience, and social functionality. The methodology identified key criteria, including: solar radiation, temperature factors, nature-based solutions (NBS) (focusing on sustainable water management), as well as inclusivity and accessibility, and conservation.

The presented concept is consistent with this methodology, resulting in a project that successfully balances technical, cultural, and environmental priorities.

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Appendix 6: View 3d

Appendix 7: View 3d

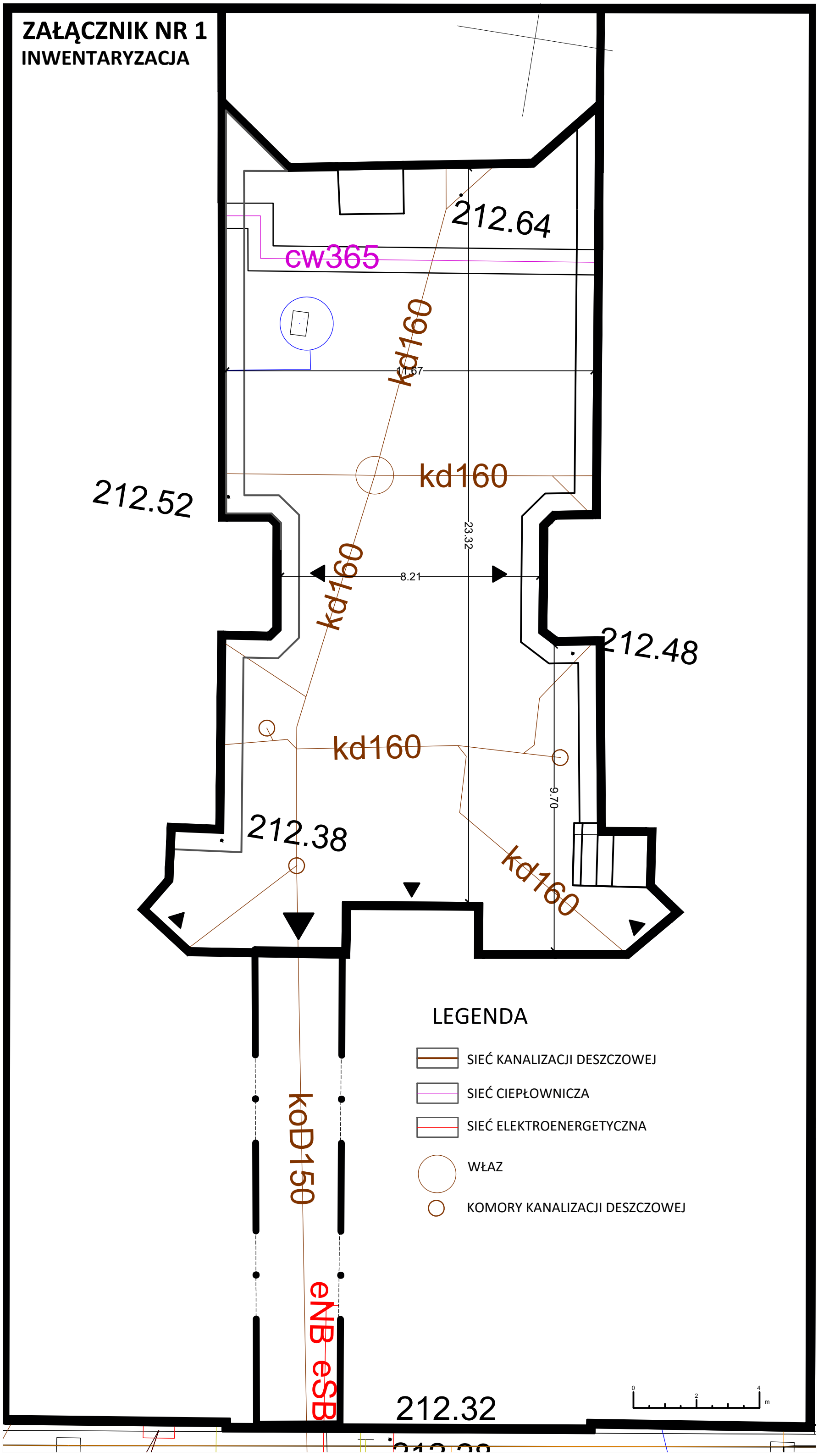
Appendix 8: View 3d

Appendix 9: View 3d

Appendix 10: Archival materials

Appendix 11: Archival materials

ZAŁĄCZNIK NR 1
INWENTARYZACJA



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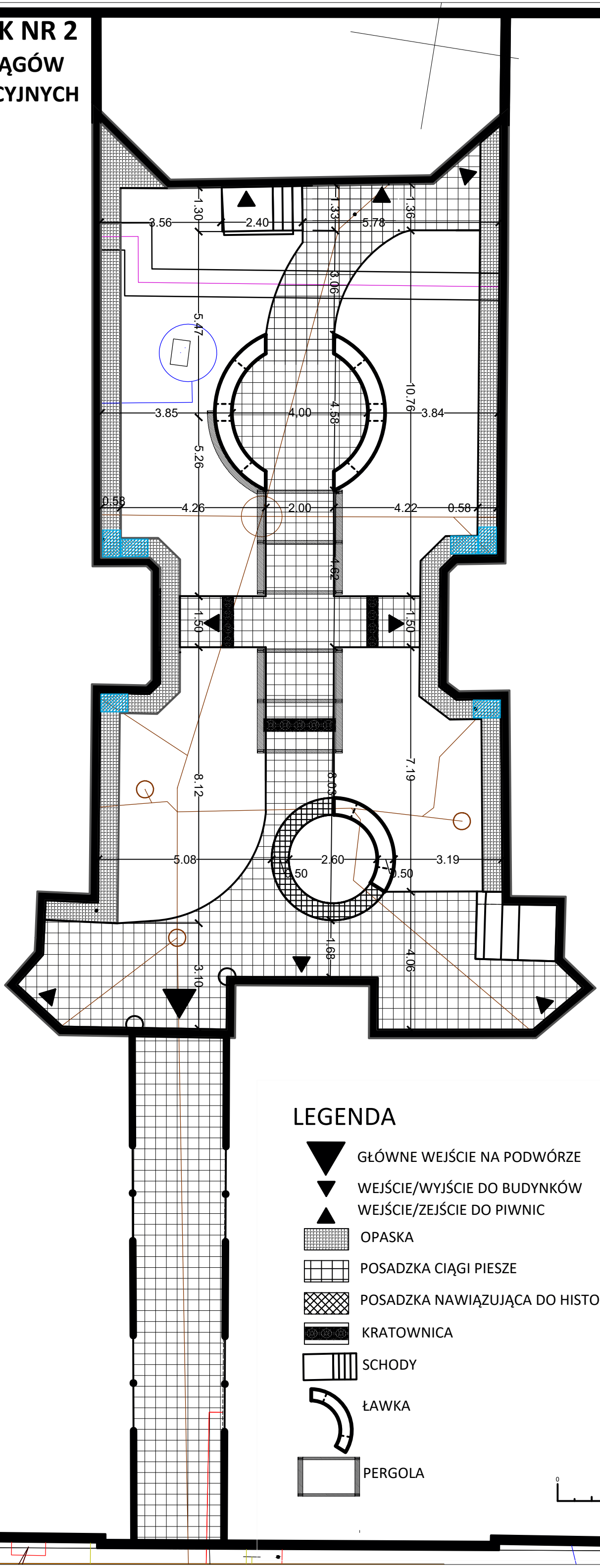

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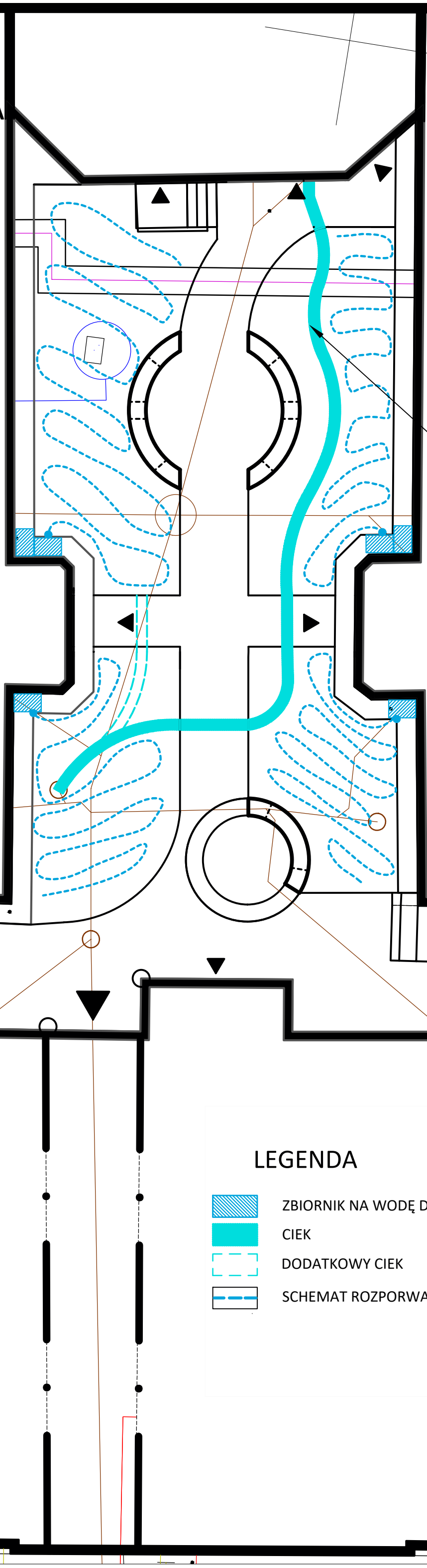

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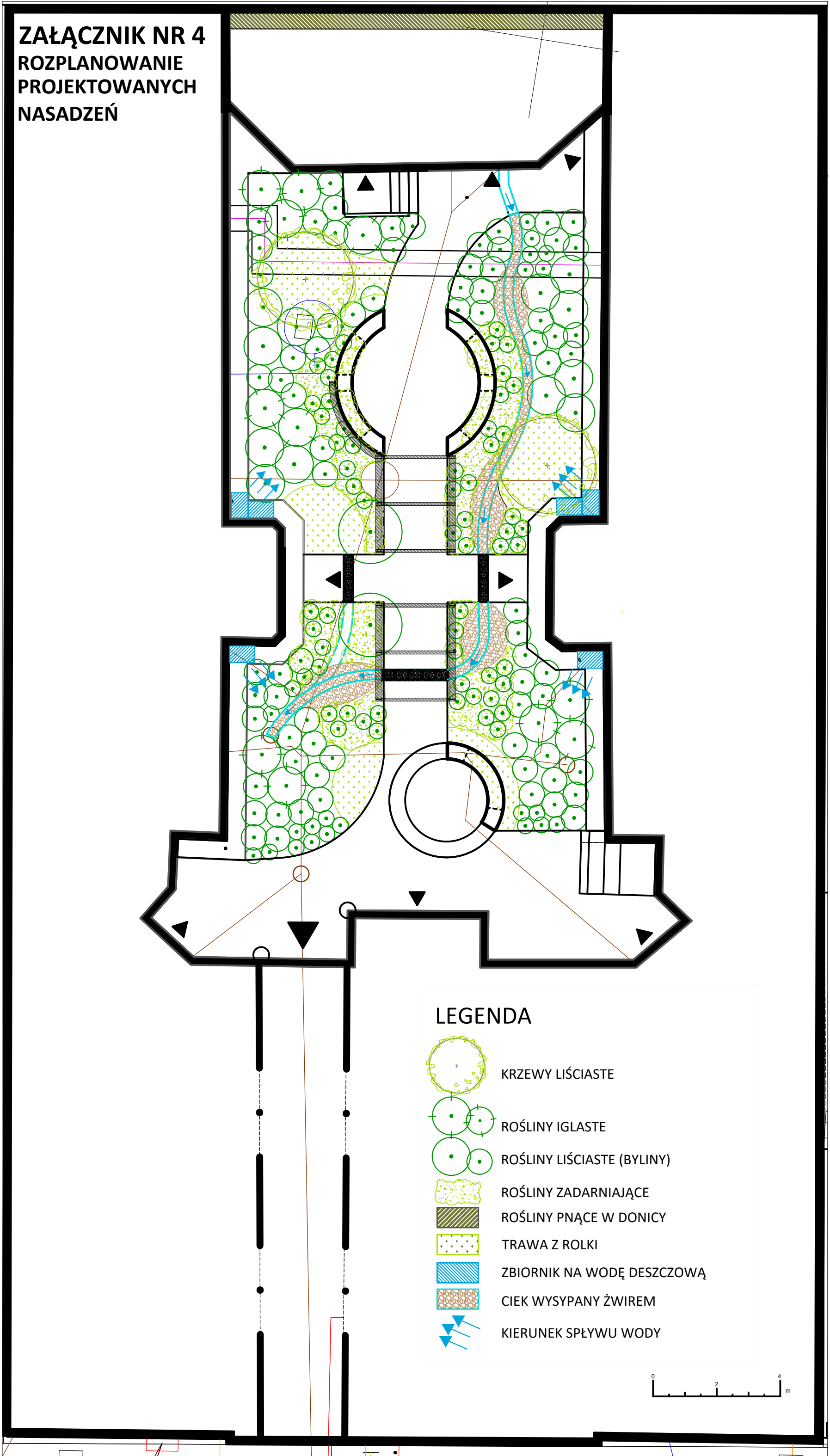
ROZPLANOWANIE PROJEKTOWANYCH NASADZEŃ

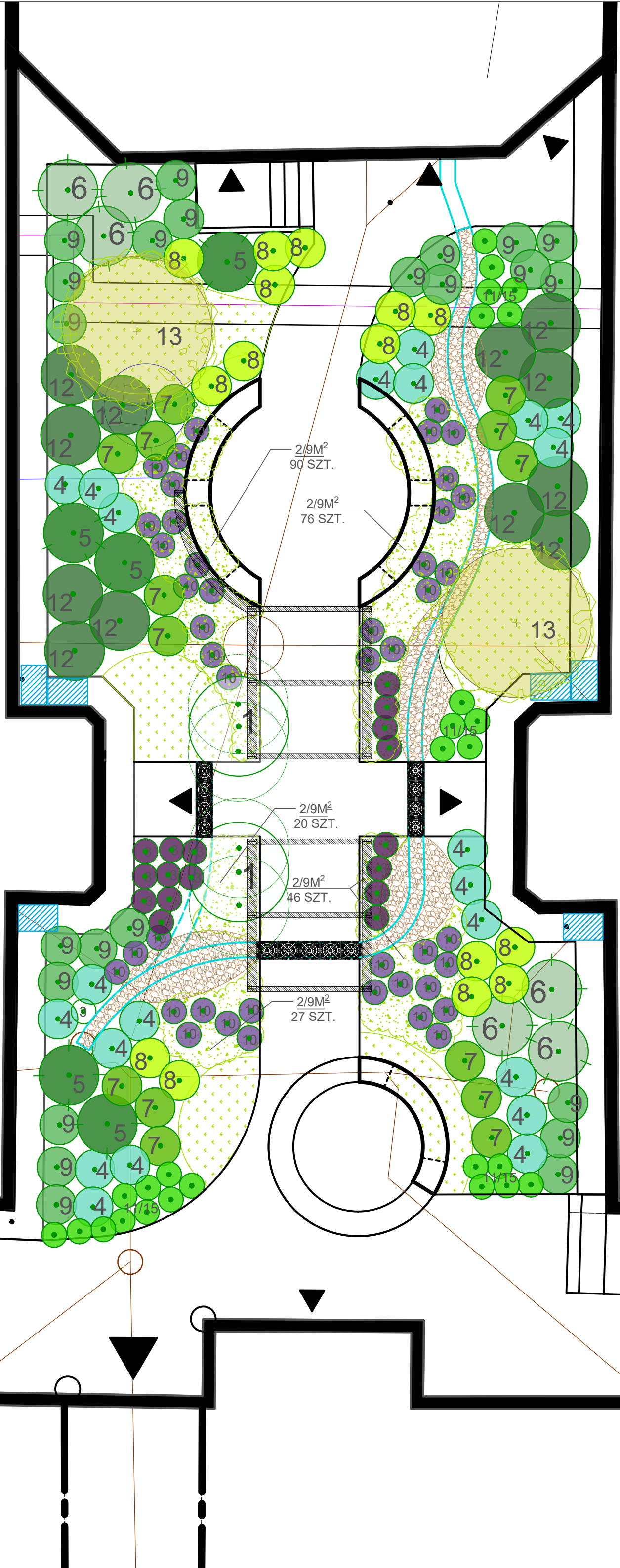


ZAŁĄCZNIK NR 4 a

DOBÓR GATUNKOWY

TABELA

lp.	NAZWA POLSKA	NAZWA ŁACIŃSKA	ODMIANA
1.	HORTENSJA PNĄCA	HYDRANGEA ANOMALA PETIOLARIS	BROOKSIDE LITTLELEAF / TAKE A CHANGE / MIRRANDA
2.	BARWINEK POSPOLITY	VINCA MAJOR	BRAK
3.	LIRIOPE SZAFIRKOWE	LIRIOPE MUSCARI	INGWERSEN
4.	FUNKIA	HOSTA	WISHING WELL / ELEGANS /BIG DADDY
5.	CIS POSPOLITY	TAXUS BUCCATA	REPANDENS
6.	CIS POŚREDNI	TAXUS MEDIA	HICKSII
7.	FUNKIA	HOSTA	MINUTEMAN/ WOLVERINE/
8.	FUNKIA	HOSTA	VENETIAN BLUE / PATRIOT /
9.	PAPROTIK ZBROJNY / WIETLICA SAMICZA	POLYSTCHUM MANITUM / ATHYRIUM FILIX-FEMINA	BRAK
10.	KOSACIEC SYBERYJSKI	IRYS SIBIRICA	PODSTAWOWA
11.	ZAWILEC JAPOŃSKI	ANEMONE HUPEHENSIS	HONORINE JOBERT
12.	PLUSKWICA GRONIASTA RODGERSJA KASZTANOWOCOLISTNA	CIMICIFUGA RECEMOSA RODGERSIA AESCULIFOLIA	BRAK BRAK
13.	MAGNOLIA	MAGNOLIA	PLENA/STELLATA
14.	WINOROŚL PACHNĄCA	VITIS RIPARIA	BRAK
15.	BRUNERA WIELKOLISTNA	BRUNERRA MACROPHYLLA	BRAK
16.	BLUSZCZ POSPOLITY	HEDERA HELIX	BRAK



BLOOMING TABLE

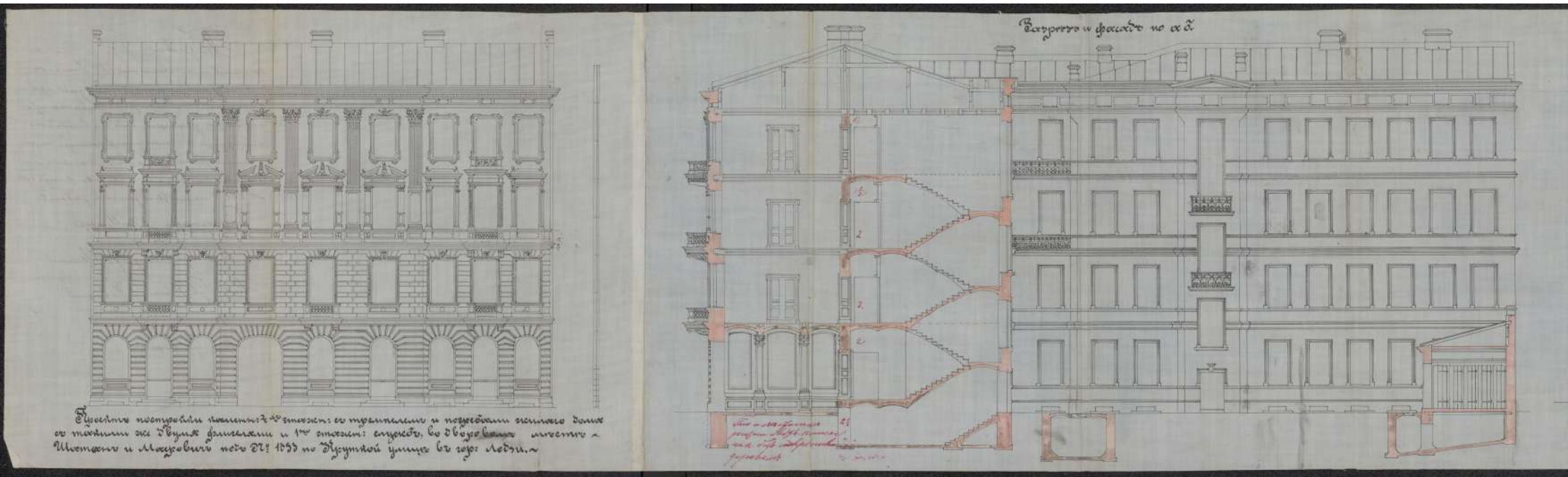
lp.	PHOTO	POLISH NAME	LATIN NAME	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
1.		CLIMBING HYDRANGEA	HYDRANGEA ANOMALA PETIOLARIS											
2.		VINCA MAJOR	VINCA MAJOR											
3.		LILYTURF / BLUE LILYTURF	LIRIOPE MUSCARI											
4.		HOSTA	HOSTA											
5.		COMMON YEW	TAXUS BUCCATA											
6.		HYBRID YEW / INTERMEDIATE YEW	TAXUS MEDIA											

7.		HOSTA	HOSTA											
8.		HOSTA	HOSTA											
9.		CRESTED WOOD FERN / LADY FERN	POLYSTCHUM MANITUM / ATHYRIUM FILIX-FEMINA											
10.		SIBERIAN IRIS	IRYS SIBIRICA											
11.		JAPANESE ANEMONE	ANEMONE HUPEHENSIS											
12.		ACTAEA RACEMOSA	CIMICIFUGA RECEMOSA											
		RODGERSIA WITH HORSE CHESTNUT-LIKE LEAVES	RODGERSIA AESCULIFOLIA											

13.		MAGNOLIA	MAGNOLIA												
14.		RIVERBANK GRAPE	VITIS RIPARIA												
15.		LARGE-LEAVED BRUNNERA	BRUNERRA MACROPHYLLA												
16.		COMMON IVY / ENGLISH IVY	HEDERA HELIX												
				FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	
						BLOOMING			**GROWING SEASON**			**WINTER PERIOD**			

lp.	PHOTO	POLISH NAME	LATIN NAME	ODMIANA	H MAX	W MAX	COMMENTS	FLOWER BED NR 1	FLOWER BED NR 2	FLOWER BED NR 3	FLOWER BED NR 4	PCS.
1.		CLIMBING HYDRANGEA	HYDRANGEA ANOMALA PETIOLARIS	Brookside Littleleaf / TAKE A CHANGE / MIRRANDA	3-5 m	2-3 m	BLOOMS WHITE FROM JULY TO AUGUST (VII–VIII)	3		3		**6**
2.		VINCA MAJOR	VINCA MAJOR	BRAK	0.3 - 0.4 m	DENSE, COMPACT CLUMPS; SPREADS BY RHIZOMES.	GROUND COVER PLANT, BLOOMS VIOLET FROM APRIL TO MAY	90	76	47	46	**259**
3.		LILYTURF / BLUE LILYTURF	LIRIOPE MUSCARI	Ingwersen	0.3 - 0.5 m	0.5 m	BLOOMS VIOLET FROM AUGUST TO SEPTEMBER		4	9	4	**17**
4.		HOSTA	HOSTA	Wishing Well / ELEGANS /BIG DADDY	0.5 - 0.6 m	0.7 - 0.8 m	LARGE-LEAVED VARIETY, BLOOMS WHITE; BELL-SHAPED INFLORESCENCES PERSIST FROM JULY TO AUGUST	3	6	7	6	**22**
5.		COMMON YEW	TAXUS BUCCATA	REPANDENS	0.5 - 1 m	1 - 1.5 m	EVERGREEN CREEPING SHRUB	3		2		**5**
6.		HYBRID YEW / INTERMEDIATE YEW	TAXUS MEDIA	HICKSII	1-2 m	3 m	EVERGREEN COLUMNAR SHRUB	3			3	**6**
7.		HOSTA	HOSTA	MINUTEMAN/ WOLVERINE/	0.3 m	0.6 m	BLOOMS LAVENDER FROM JULY TO AUGUST, HIGHLY RESILIENT	5	3	3	3	**14**
8.		HOSTA	HOSTA	VENETIAN BLUE / PATRIOT /	0.35 m / 0.4 m	0.8 - 0.9 m / 0.7 - 08 m	BLOOMS WHITE FROM JUNE TO JULY	6	3	2	4	**15**
9.		CRESTED WOOD FERN / LADY FERN	POLYSTCHUM MANITUM / ATHYRIUM FILIX-FEMINA	BRAK	0.5 - 0.8 m	0.7 m	EVERGREEN CRESTED WOOD FERN	6	7	7	3	**23**
10.		SIBERIAN IRIS	IRYS SIBIRICA		0.5 - 1 m	0.6 m	BLOOMS VIOLET IN JUNE AND JULY	13	12	9	10	**44**

11.		JAPANESE ANEMONE	ANEMONE HUPEHENSIS	HONORINE JOBERT	BEFORE FLOWERING: 0.3–0.45 M, DURING FLOWERING: 1.2 M	0.6 - 0.9 m	BLOOMS WHITE FROM AUGUST TO SEPTEMBER		5	5	5	**15**
12.		ACTAEA RACEMOSA	CIMICIFUGA RECEMOSA		1.5-2 m	0.6-0.9	BLOOMS WHITE	6	6			**12**
		RODGERSIA WITH HORSE CHESTNUT-LIKE LEAVES	RODGERSIA AESCULIFOLIA	BRAK	0.7-1.2 m	0.9-1.2 m	BLOOMS WHITE FROM JUNE TO AUGUST					
13.		MAGNOLIA	MAGNOLIA	PLENA/STELLATA	5-6 m	3-4 m	BLOOMS WHITE	1	1			**2**
14.		RIVERBANK GRAPE	VITIS RIPARIA				LEAVES TURN BURGUNDY IN AUTUMN AND EMIT A PLEASANT FRAGRANCE					**15**
15.		LARGE-LEAVED BRUNNERA	BRUNERRA MACROPHYLLA				PERENNIAL, BLOOMS BLUE IN EARLY SPRING; ALSO ORNAMENTAL FOR ITS LARGE LEAVES		5	5	5	**15**
16.		COMMON IVY / ENGLISH IVY	HEDERA HELIX				EVERGREEN CLIMBING PLANT					**15**
								139	**128**	**99**	**89**	**455**



Archiwum Państwowe w Łodzi