

Anja Krnetić

New Elementary School for Novi Sad



Diploma Thesis

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(Diplomarbeit)

New Elementary School for Novi Sad

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von

Anja Krnetić
01528661

Betreuer: San-Hwan Lu
Senior Scientist Dipl.-Ing. Dr.techn.

E253-05 | HB2
Forschungsbereich Hochbau, Konstruktion und Entwerfen
Institut für Architektur und Entwerfen
Technische Universität Wien,
Karlsplatz 13, 1040 Wien, Österreich

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Abstract

EN The city of Novi Sad experienced slow and uneven development until the second half of the 20th century. Following World War II, rapid industrialization during Yugoslav socialism triggered parallel growth in both population and urban expansion. This period saw the construction of new housing blocks, infrastructure, public buildings, and schools to accommodate the growing city's needs. However, economic stagnation and political crisis in the 1990s led to a decline in public and social infrastructure development, with educational facilities such as schools moving far into the background of urban development agendas. While the city's population continues to grow, the lack of educational infrastructure has led to overcrowded schools and suboptimal learning conditions. This diploma thesis proposes a carefully designed school project for the Novo Naselje neighbourhood that follows contemporary architectural standards for educational facilities and embraces new modes of learning through innovative learning landscapes. The project aims to provide both children and the broader community with an engaging educational environment while strengthening neighbourhood connections, addressing the pressing need for modern educational spaces in this growing urban area.

DE Die Stadt Novi Sad entwickelte sich bis zur zweiten Hälfte des 20. Jahrhunderts langsam und ungleichmäßig. Nach dem Zweiten Weltkrieg führte die rasche Industrialisierung während des jugoslawischen Sozialismus zu einem parallelen Wachstum sowohl der Bevölkerung als auch der städtischen Expansion. In dieser Zeit entstanden neue Wohnblöcke, Infrastruktur, öffentliche Gebäude und Schulen, um den Bedürfnissen der wachsenden Stadt gerecht zu werden. Die wirtschaftliche Stagnation und politische Krise in den 1990er Jahren führte jedoch zu einem Rückgang der öffentlichen und sozialen Infrastrukturentwicklung, wobei Bildungseinrichtungen wie Schulen in den städtebaulichen Entwicklungsagenden stark in den Hintergrund rückten. Während die Bevölkerung der Stadt weiterhin wächst, hat der Mangel an Bildungsinfrastruktur zu überfüllten Schulen und suboptimalen Lernbedingungen geführt. Diese Diplomarbeit schlägt ein sorgfältig konzipiertes Schulprojekt für das Novo Naselje-Viertel vor, das zeitgenössischen architektonischen Standards für Bildungseinrichtungen folgt und neue Lernformen durch innovative Lernlandschaften einbezieht. Das Projekt zielt darauf ab, sowohl Kindern als auch der breiteren Gemeinschaft eine inspirierende Bildungsumgebung zu bieten und dabei die nachbarschaftlichen Verbindungen zu stärken, wobei es dem dringenden Bedarf an modernen Bildungsräumen in diesem wachsenden städtischen Gebiet gerecht wird.

Introduction

00

The pressing challenges facing Novi Sad's educational infrastructure, particularly evident in the overcrowded conditions of existing schools, demand innovative architectural solutions that address both immediate spatial needs and long-term pedagogical aspirations. Current facilities operate well beyond their intended capacities, leading to compromised learning environments and fragmented spatial arrangements.

This thesis develops an architectural response through the design of a new elementary school in Novo Naselje. The project synthesizes contemporary pedagogical principles with careful urban integration, establishing fluid connections between learning environments and community spaces. Drawing inspiration from both Yugoslav modernist educational architecture and current international approaches, the design creates dynamic learning landscapes that support diverse teaching methodologies while strengthening neighborhood identity through thoughtful integration of public and educational spaces.



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Novi Sad

Novi Sad, Serbia’s second-largest urban centre, occupies a strategic position within the Pannonian plain in the country’s northern region. As the capital of Vojvodina province, the city extends along the Danube River adjacent to the Fruška Gora mountains, encompassing 129.4 km² with a population of 368,967 inhabitants.¹ Beyond its role as the province’s administrative nucleus, Novi Sad has evolved into a multifaceted metropolitan centre, serving as a crucial hub for cultural, educational, scientific, health, financial, and industrial activities. The city’s significant cultural influence was internationally acknowledged through its designation as the European Capital of Culture in 2022.

Origins and Early Development

The territory of present-day Novi Sad exhibits a profound historical continuity of human settlement, evidenced by numerous archaeological findings spanning from the Neolithic period through the Middle Ages. Archaeological sites at Slana Bara, Jugovicevo, Temerinska petlja, and Klisa reveal sustained patterns of habitation, documenting the area’s enduring significance as a settlement location.² The post-Mohač battle period of 1526 marked a significant demographic transformation, catalyzing the establishment of the first Serbian settlements: Varadinci, Kamendin, Rivica, Sajlovo, and Cenej. Some historical accounts trace the city’s nascent development to a fishing settlement called Bistrica, established in 1528.³

The foundations of modern Novi Sad emerged in 1680 with the liberation of Petrovaradin Fortress from Ottoman control and the subsequent Austrian military establishment of a bridgehead. This strategic development initiated the emergence of new settlements on the Bačka side of the river, culminating in 1748 when Maria Theresa, ruler of the Habsburg dominions, formally elevated Novi Sad to the status of a ‘free royal city’. The subsequent 1754 imperial directive for street paving with bricks represented an early instance of systematic urban infrastructure development. By 1784, the urban population had reached approximately 4,500 inhabitants.

1 “Grad Novi Sad, Južna Bačka, Serbia - Population Statistics, Charts and Map,” City Population, accessed February 17, 2025, https://www.citypopulation.de/en/serbia/admin/ju%C5%BE-na_ba%C4%8Dka/M02472__grad_novi_sad/.

2 Darko Reba, Ulica - element strukture i identiteta [Street - Element of Structure and Identity] (Beograd: Orion art, 2010).

3 Reba, Ulica - element strukture i identiteta.



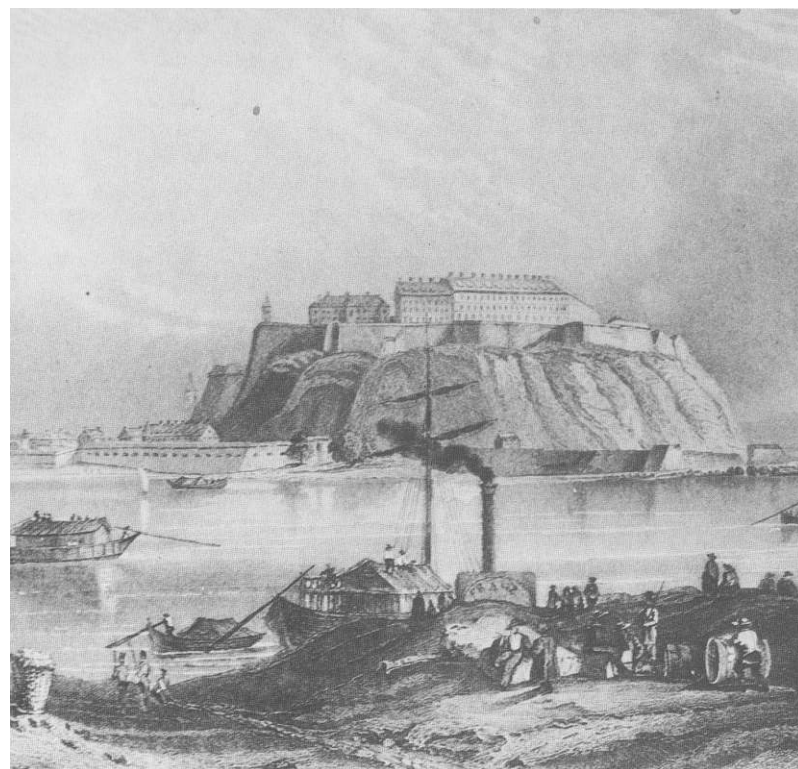


Fig 1.
Petrovaradin fortress after 1830
(from V. H. Bartlett's book)

Administrative Evolution

Despite its elevated administrative status, Novi Sad's initial development proceeded gradually, with limited impact on broader state administration or socio-economic structures during its first century. A transformative shift occurred in the interwar period with the city's designation as the administrative center of the Danube Province. This political elevation catalyzed substantial demographic growth, with the population increasing from 34,334 in 1918 to 63,958 by 1934.⁴

However, the city's urban character remained primarily confined to its core, with peripheral areas retaining rural characteristics manifested in low population density and traditional architecture. This disparity was particularly evident in the limited development of integrated utility and transportation infrastructure. The period was characterized by dispersed industrial zones, predominantly agricultural economic activity, and limited development of communal life and associated public buildings.⁵

4 Šandor Nadj et al., "Novi Sad u prošlosti i sadašnjosti" [Novi Sad in Past and Present], exhibition guidebook (Novi Sad: Budućnost, 1954).

5 Dragana Konstatinović and Miljana Zekanović, Novi Sad: Moderni grad [Novi Sad: Modern City] (Novi Sad: Fakultet tehničkih nauka u Novom Sadu i BAZA-Platforma za prostorne prakse, 2023).

Fig 2.
Name of Mary Church, also
known as the Cathedral, 1894



Modernist Transformation

The city's designation as an administrative center generated considerable civic enthusiasm, marking the beginning of a new developmental era. This transformation was inaugurated by the construction of the Banovina Palace between 1936 and 1940, designed by Dragiša Brašovan, along the Boulevard of Maria Theresa (now called Mihajlo Pupin Boulevard). This development catalyzed the emergence of reinforced concrete construction throughout the city.⁶

A pivotal moment in the city's development occurred in 1937 with the organization of an architectural competition for Novi Sad's masterplan. The competition attracted participation from architectural offices throughout the Yugoslav Kingdom, notably including a team from Le Corbusier's atelier. This initiative produced multiple solutions aligned with contemporary urban development standards, particularly the Athens Charter, encompassing city zoning, industrial clustering, boulevard systems, and modern living standards.⁷



Fig 3.
Banovina Palace (architect
Dragiša Brašovan), 1941

6 Daka Popović, "Prilog urbanističkom i arhitektonskom razvoju grada Novog Sada" [Contribution to the Urban and Architectural Development of Novi Sad], Rad vojvodjanskih muzeja 12-13 (1964).

7 Konkurs za regulaciju Novog Sada iz 1937. godine" [Competition for the Regulation of Novi Sad from 1937], Graditelji Novog Sada (blog), December 13, 2019, <https://graditeljiins.wordpress.com/2019/12/13/konkurs-za-regulaciju-novog-sada-iz-1937-godine/>.

Urban Planning

The architectural solutions emerging from the 1937 competition prioritized the creation of healthier and more economically accessible living spaces, positioning residents at the center of urban development while optimizing both quality of life and economic advancement. This approach sought to integrate Novi Sad into the broader regional context as a significant urban center. A notable advancement in urban planning methodology emerged through architect Juraj Neidhart's proposal for a new city district on the "Kačka Bara" wetlands, demonstrating the transcendence of previous technological limitations and enabling more ambitious urban development strategies.⁸

The aftermath of World War II presented Novi Sad with significant demographic challenges, as the population decreased by nearly half. Although the physical urban fabric remained largely intact, pre-war infrastructural deficiencies persisted. The newly established communist government's mandate for a radical "break with the past" facilitated bold decision-making in urban planning, opening new possibilities for development. The immediate post-war period found Novi Sad with approximately 45,000 inhabitants, of whom only 4% were employed in the industrial sector. The city's designation as a moderately developed industrial center, with projected industrial employment growth of 10-15%, necessitated careful consideration of its persistent agricultural character.

Driven by economic development imperatives, urban planners operated within specific parameters that required the integration of administrative buildings, industrial zones, university campuses, and housing units of specific capacities. The combination of rapid projected growth and centralized governmental capacity for large-scale development presented urban planners with an unprecedented opportunity: the ability to design and implement a comprehensive city master plan within a compressed timeframe.

Industrial Development

The 1950 General Urban Plan, which was the city's first comprehensive urban planning document, positioned industrialization as a fundamental driver of Novi Sad's development, particularly influencing decisions regarding industrial zone placement. The plan established two distinct industrial zones: one adjacent to the Danube-Tisa-Danube Canal, and another in the northeastern sector near the Petrovaradin Fortress. The implementation of this strategic zoning decision, including the relocation of existing industrial facilities, has been retrospectively viewed as highly successful.⁹

Industrial growth substantially exceeded the General Urban Plan's initial projections. By 1974, the city's total surface area had nearly tripled, while industrial zones expanded sixfold, demonstrating the effectiveness of the original zoning strategy in accommodating unexpected growth while maintaining planned urban development patterns.¹⁰

8 Konstatinović and Zekanović, Novi Sad: Moderni grad.

9 DaNS: Časopis za arhitekturu i urbanizam [DaNS: Magazine for Architecture and Urban Planning] 85-86, ed. Slobodan Jović, with Aleksandar Bede, Dragana Konstantinović, and Maja Momirov (Novi Sad: Društvo arhitekata Novog Sada, 2019).

10 Svetlana Vuković, "Prostorne karakteristike planiranja proizvodnje u urbanoj strukturi Novog

Fig 4.
General Urban Plan,
1950

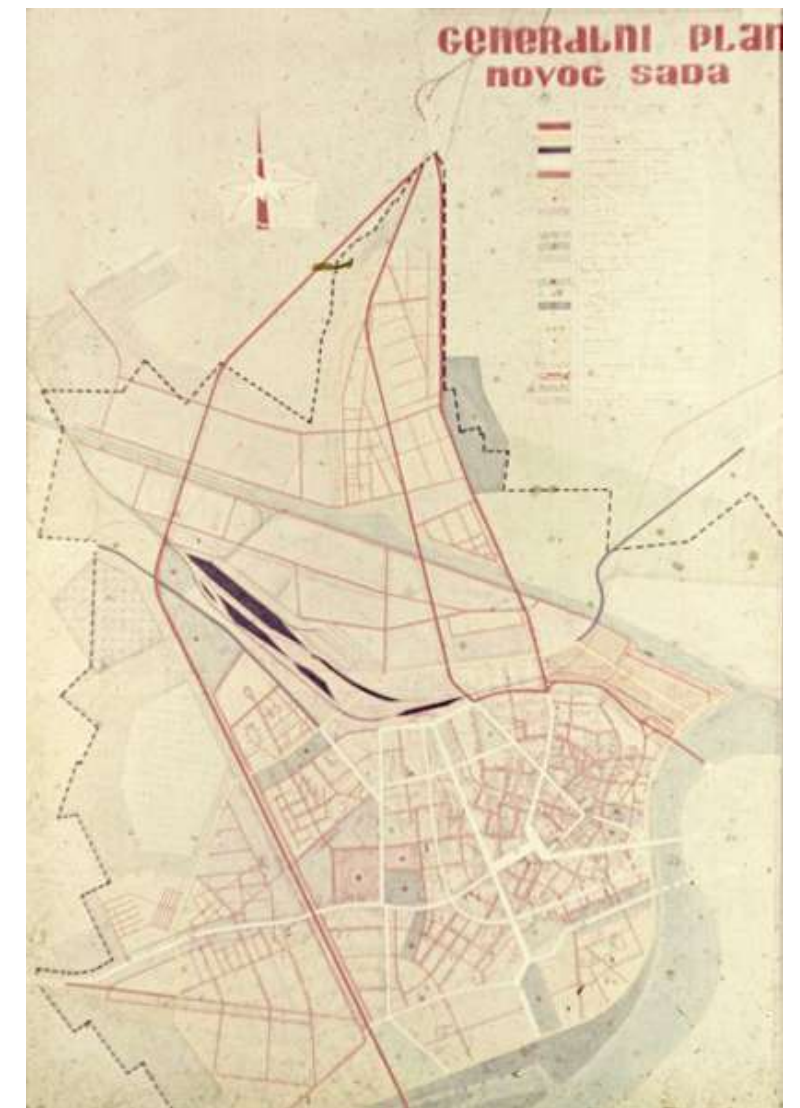
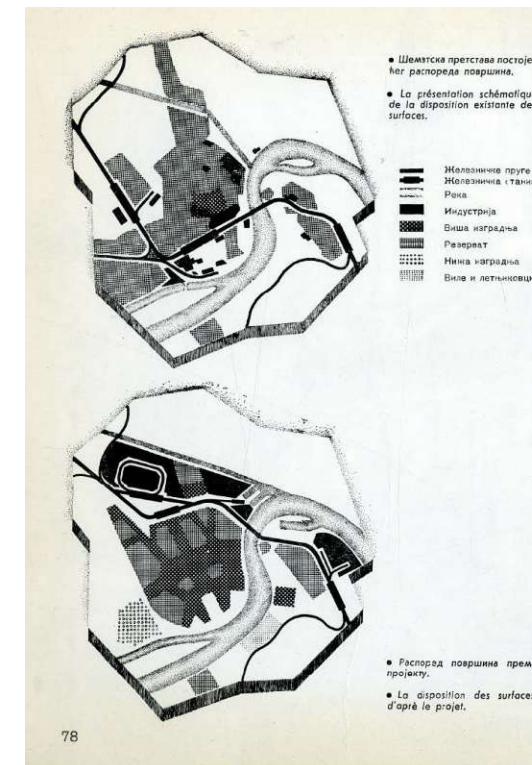


Fig 5.
Proposal for Railway
Transformation

Responding to industrial expansion, city planners undertook significant infrastructural modifications, including the relocation of railway infrastructure from the southern to the northern sector of the city. This reorganization required the construction of a new railway bridge and station, fundamentally altering the city's primary access routes and influencing the alignment of the highway connecting Novi Sad and Belgrade. The spaces formerly occupied by industrial facilities underwent repurposing, facilitating the city's expansion toward the Danube through the development of new residential and public buildings.

Bridging urban transitions, the integration of new and historic city sections was achieved through the construction of the "23. October" Boulevard (now called the Boulevard of Liberation, commemorating Novi Sad's liberation date) and the strategic placement of the SPENS public sports center on the former "Novokabel" factory site.¹¹ While "Novokabel" represented a significant industrial facility of its era, SPENS emerged as one of the city's most important public buildings, maintaining its significance to the present day.

Sada" [Spatial Characteristics of Production Planning in the Urban Structure of Novi Sad], DaNS 3-4 (1982).

11 Aleksandar Bede, "Modernizacijski nizovi: Novi Sad i Vojvodina" [Modernization Sequences: Novi Sad and Vojvodina], Život umjetnosti 96 (2015).

The Boulevard System

The development of Novi Sad's boulevard system represents a crucial element in the city's modernist transformation, with the 1950s General Urban Plan outlining the construction of new boulevards to reshape the urban landscape. This comprehensive approach built upon previous urban planning concepts while incorporating new zoning frameworks. The Mihajlo Pupin Boulevard (formerly Red Army Boulevard) underwent significant extension, attracting new administrative developments along its course. This intervention, while aligned with modernist principles, carried deeper ideological significance within the communist government's agenda of breaking with the past. Furthermore, the boulevard's extension deliberately diverted from the historical center toward new centers of political power, thereby requiring substantial demolition of the existing urban fabric, including the Armenian church.

The Boulevard of Liberation, connecting new residential districts with the historic center, symbolically emphasized the prominence of the working class in urban development. The contrast between new collective housing developments along the boulevard and pre-existing individual private properties physically manifested the ideological transition between eras. The 1950s General Urban Plan envisioned this thoroughfare as a ceremonial boulevard, anchored by the railway station at one end and a stadium at the other. The 1974 plan revision modified its trajectory to cross the river via the Freedom Bridge (Most Slobode). Construction proceeded simultaneously from both northern and southern endpoints, though the planned new city center at their convergence remained unrealized due to the eventual exhaustion of modernization initiatives.¹²



Fig 7.
Removal of the Old Railway
Station, 1970

¹² Konstatinović and Zekanović,
Novi Sad: Moderni grad.



Fig 6.
Construction of 23rd October
Boulevard (now Boulevard of
Liberation)

The third major artery, the Boulevard of Europe, presently the longest boulevard in Novi Sad, was positioned along the former railway infrastructure connecting Novi Sad and Subotica. The boulevard follows the former railway line up to a former turning point, where it was intended to continue towards the Danube and connect with the river via a bridge. However, this final section beyond the former turning point, including the bridge connection, has yet to be realized.¹³



Fig 8.
Comprehensive Urban Development

Legacy and Contemporary Implications

This systematic development of Novi Sad's urban structure through industrial relocation, infrastructure modernization, and the implementation of the boulevard system established the framework for the city's contemporary form. The planning decisions of the post-war period, particularly those outlined in the 1950s General Urban Plan, demonstrated remarkable foresight in accommodating future growth while maintaining coherent urban organization. The successful integration of industrial zones, transportation infrastructure, and residential development created a foundation for sustainable urban expansion, though not all elements of the original vision were fully realized.

The transformation of Novi Sad from a peripheral Habsburg city to a major regional center reflects the complex interplay of political, economic, and social forces in shaping urban development. The successive phases of planning and implementation, from the initial establishment of the free royal city through the socialist period's comprehensive planning initiatives, demonstrate the evolution of urban planning approaches and their lasting impact on the city's spatial organization. This historical development provides crucial context for understanding contemporary urban challenges and opportunities, particularly as the city continues to adapt to changing socio-economic conditions while maintaining its architectural and cultural heritage.

¹³ Konstatinović and Zekanović, Novi Sad: Moderni grad.

Overview Map

OLD RAILWAY

NEW RAILWAY

Boulevard of Europe

Boulevard of Liberation

02
Mihailo Pupin
Boulevard

03

01

Railway Station

01

Design

Imre Farkaš

Year

1964

Location

Bulevar Jaše Tomića 4,
Novi Sad

Program

Railway Station

The Novi Sad Railway Station represents a significant modernist transportation hub, distinguished by its monumental column-free central hall and distinctive sawtooth roof structure, embodying the postwar modernization of Yugoslavia's railway infrastructure.



Fig 9.
Sawtooth Roof Structure

The Novi Sad Railway Station, completed in 1964, embodies a pivotal architectural achievement in Yugoslav modernist design. Following a 1960 competition where no awards were given, architect Imre Farkaš from the "Arhitekt" design bureau developed the project through program revisions. Its defining element is the central hall spanning 22x50 meters without intermediate supports, an unprecedented spatial configuration for Yugoslavia at the time.

The architectural complex comprises four functional zones: an administrative section managing railway traffic operations, a monumental central hall with passenger services, areas dedicated to restaurant and cargo facilities, and technical support spaces. The design optimizes circulation through an 8-meter-wide underpass with dual staircases, enabling rapid passenger movement between platforms and the station square.

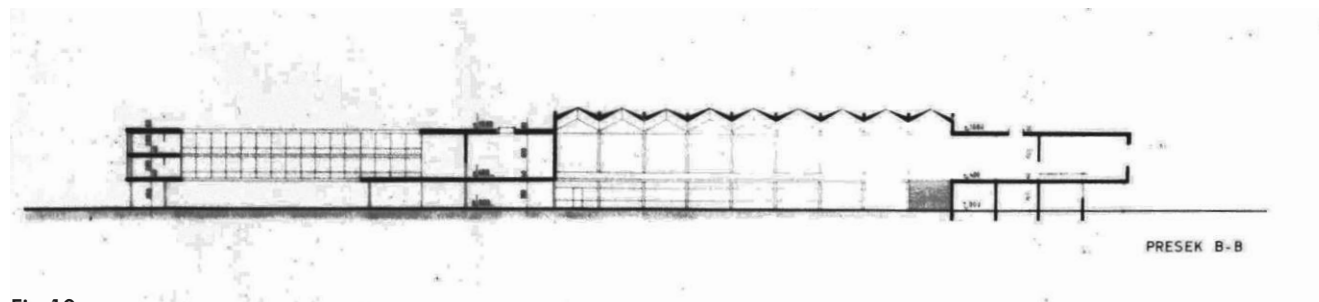


Fig 10.
Section through the Hall

Fig 11.
Southern Glass Facade



The station incorporates both modernist principles and contextual references through its architectural expression. The sawtooth roof structure, composed of polyhedric concrete plates, creates a distinctive silhouette, while public spaces include two assembly halls and an artistic intervention – an 8x20 meter ceramic relief mural by Ljubiša Petrović on the main hall's western wall, added in 1965.

Embodying the international modernist style, the station incorporates localized architectural references. The sawtooth roof structure suggests traditional Vojvodinian architectural motifs, while the southern glass facade creates dynamic visual connections between platform infrastructure and the urban boulevard.

Structural System

The structure employs a reinforced concrete skeletal system, with its central hall spanning 22x50 meters without intermediate supports, representing Yugoslavia's largest column-free space at the time. The sawtooth roof consists of polyhedric rectangular concrete plates, calculated by Draško Berisavljević. The exterior features Venčac marble cladding, while the interior incorporates sixteen different marble varieties. The building is founded on individual footings.



Fig 12.
Concrete Structure

BAZAR

02

The Stoteks Department Store, recognized internationally through MoMA's "Toward a Concrete Utopia" exhibition, represents a distinctive late modernist commercial building characterized by its dynamic facade articulation and innovative structural solution at a prominent urban intersection.

Design
Milan Mihelić
Year
1971
Location
Bulevar Mihajla Pupina
1, Novi Sad
Program
Department Store



Fig 13.
Three-story Volume facing the
Mihajlo Pupin Boulevard

The Stoteks Department Store (Bazar) represents another significant achievement in Yugoslav late modernist architecture. Completed in 1972 following architect Milan Mihelić's winning competition entry of 1968, the building articulates a crucial transition point between historical and modernist urban fabric in Novi Sad's developing center.

The structure's response to its triangular-trapezoidal site manifests through distinct volumetric elements: a lower two-story volume mediates the historical context, while the boulevard-facing section rises to three levels beneath a pa-



Fig 14.
South Facade Elevation

Fig 15.

Solid-Void Composition



vilion-crowned roof terrace. At street level, reinforced concrete columns support expansive glazing, establishing a continuous public arcade through a cantilevered canopy system.

The facade's composition orchestrates a precise interplay between solid and void, with white marble surfaces alternating with rhythmic glazed openings. This articulation creates a dynamic envelope that responds to both the historical street pattern and modernist boulevard while resolving the corner condition through a sculptural gesture that marks this significant urban intersection.

Structural System

The structural system features reinforced concrete columns with detailed joints supporting longitudinal concrete C-beams and transverse steel I-beams spanning 20 meters. This arrangement facilitates open interior planning, allowing for maximum functional adaptability. The upper floors are characterized by horizontal rhythmic alternations, with white marble-clad facade surfaces interrupted by glass openings ("gills") and segmented stone waves that express dynamic and dispersed rhythm.



Fig 16.
Public Pedestrian Arcade

SPENS

03

The Public Sports Center “Vojvodina” (SPENS) stands as a landmark of late Yugoslav modernism, exemplifying the era’s multifunctional public architecture through its expansive 85,000m² complex that integrates comprehensive sports facilities with cultural and commercial programs.



Fig 17.
North Entrance Platform

The Public Sports Center “Vojvodina” represents a significant achievement in Yugoslav late modernist design. Designed by Sarajevo architect Živorad Janković with collaborators, it stands as one of Yugoslavia’s defining megastructures, following similar developments in Sarajevo, Split, and Priština.

The 85,000m² complex integrates diverse functions within a unified spatial composition: competition-scale sports halls, specialized training facilities, and recreational zones. The main hall accommodates both international sporting

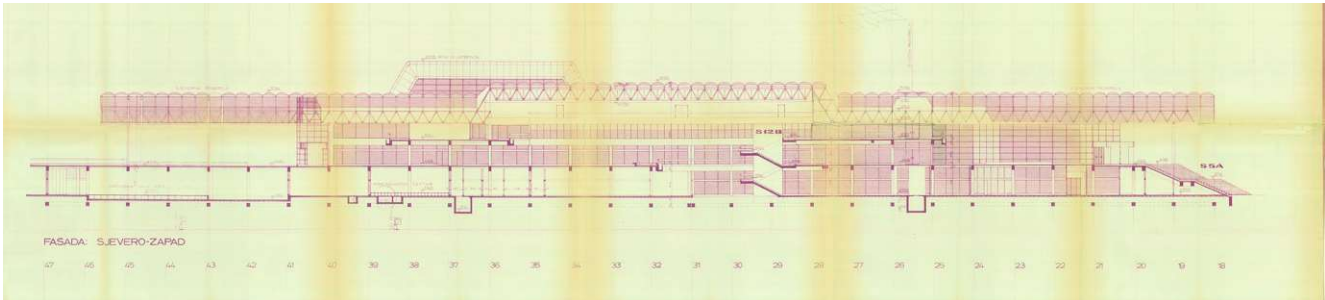
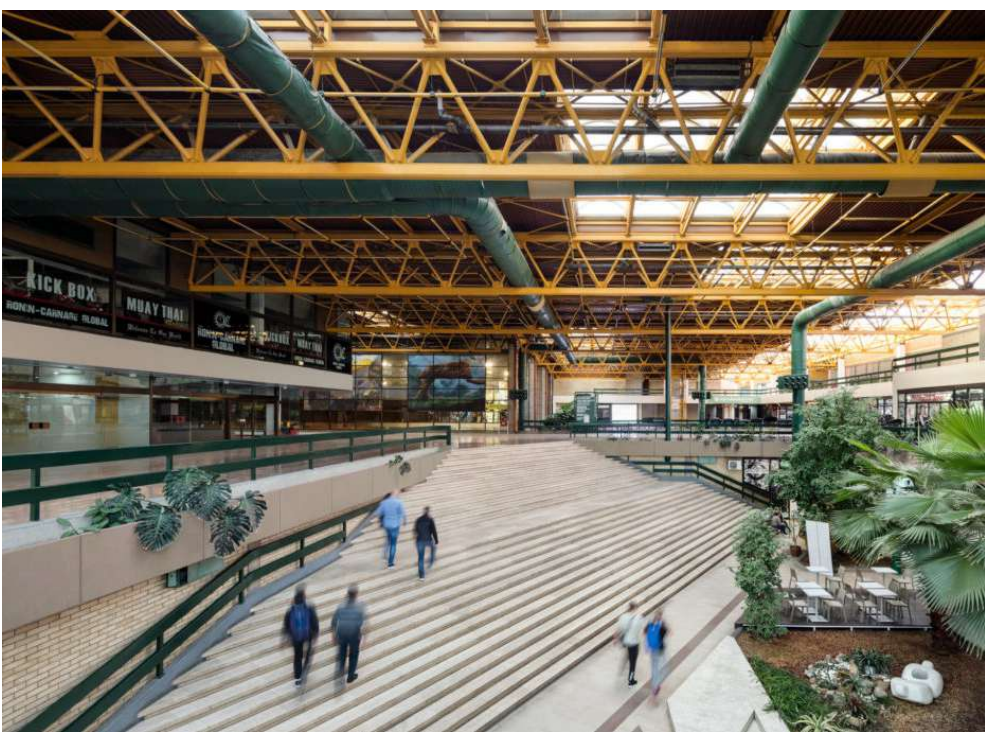


Fig 18.
Section

Design
Živorad Janković, Branko Bulić, Duško Bogunović
Year
1981
Location
Sutjeska 2, Novi Sad
Program
Sports Center

Fig 19.
Interior Public Space



events and large public gatherings, while dedicated spaces house facilities for combat sports, ice skating, swimming, and other athletic activities. The public program extends through a congress center, gallery spaces, and an amphitheater.

The spatial organization establishes continuous visual connections through transparent internal corridors, transforming circulation spaces into active zones of public engagement. This arrangement allows visitors to experience multiple simultaneous activities throughout their journey through the building. The complex extends its public character into the urban realm through a carefully orchestrated system of platforms, terraces, and approaches.

Structural System

The complex employs a modular structural system that enabled phased construction and future expansion. The architectural expression is characterized by exposed technical elements and visible structural components in the interior spaces, directly referencing Centre Pompidou’s design approach. A light, translucent roof system moderates the building’s external monumentality, while the integration of terraces and platforms creates seamless transitions between interior programs and the surrounding urban context.



Fig 20.
Hovering Roof Structure



Novo Naselje (Bistrica)

NEW RAILWAY
OLD RAILWAY

NOVO NASELJE

CITY CENTER



Fig 21.
Development of the Novo
Naselje neighborhood

Urban Neighborhood

The urban neighborhood of Bistrica, commonly known as Novo Naselje, represents a significant example of post-war urban development in Novi Sad. The district's heterogeneous character stems from its phased development over different periods, resulting in distinct sub-neighborhoods with varying architectural and urban characteristics. This predominantly residential district is characterized by multi-story housing as its primary typology, complemented by integrated commercial spaces and public amenities, including educational, recreational, and healthcare facilities. The area also encompasses the Zapadna Privredna Zona (West Economic Zone), which is currently undergoing revision of its land use and zoning plans.

The neighborhood's evolution since World War II marks a gradual transformation from peripheral territory to one of the city's most densely populated urban areas. Initial development commenced in the 1950s with the construction of single-story houses accommodating workers from nearby industrial facilities, notably "Novkabel" and "Jugolat."¹ The area's subsequent expansion introduced multi-story housing developments and commercial zones, earning it the designation "Satelit" due to its initial physical separation from the urban core. This early phase of development included the establishment of the district's first educational institution, Miloš Crnjanski Elementary School (formerly Boris Kidrič), in 1962.

While Novi Sad's 1950 General Urban Plan initially envisioned the city's expansion along the Danube's right bank, a revised plan in 1963 identified significant development potential in the area north of Satelit. This recognition led architect and urban planner Rodoljub Radosavljević to develop a detailed urban plan for Novo Naselje in 1975-1976. The neighborhood's contemporary form began taking shape in 1977 with the construction of multi-story buildings along Bate Brkić Street and high-rise developments along Bulevar Jovan Dučić, incorporating lessons learned from the development of Liman, an urban area along the Danube River.

¹ "Satelit: Radničko naselje modernog imena" [Satelit: Workers' Settlement with a Modern Name], Dnevnik, March 5, 2023, <https://www.dnevnik.rs/lat/novi-sad/satelit-radnicko-nasele-modernog-imena-05-03-2023>.

Social Housing Architecture

The residential areas, conceived through the lens of modern architecture and socialist ideals, materialized as collective housing blocks featuring semi-open layouts. These configurations incorporated expansive green spaces between buildings, promoting healthy microclimates and communal activities. The development of Liman served as a prototype, fully embodying the modernist principles characteristic of the Yugoslav regime's approach to urban planning.

A distinguishing characteristic of these developments was the implementation of standardized floor plans incorporating multiple apartment configurations, from one-bedroom to three-bedroom units, with standardized bathrooms.² This standardization was facilitated through the IMS Žeželj skeletal system, enabling efficient spatial organization. The emphasis on typification, standardization, and prefabrication proved instrumental in addressing the housing crisis precipitated by mass rural-urban migration. However, this large-scale housing development necessitated parallel infrastructure development, including educational and healthcare facilities, along with transportation networks.

Development and Infrastructure

The neighborhood's architectural evolution continued through the 1980s, exemplified by the construction of significant public facilities. Between 1978 and 1980, architect Albert Josipović designed a new school facility in a central location, positioned between housing blocks and high-rise buildings. Upon its completion in 1980, Prva Vojvođanska Brigada School emerged as the city's largest educational institution. The development of social infrastructure continued with architect Slavko Odavić's design for the Novo Naselje-Bistrica healthcare center (1986), which drew upon his previous experience with similar facilities in Liman.³

As mass construction persisted through the 1980s and 1990s, the neighborhood's expansion gradually incorporated the former Satelit area into Novo Naselje. This successive development initially featured modernist architectural expressions, with later phases introducing postmodernist elements characterized by curved forms, decorative details, and vibrant color schemes. Construction activity significantly decreased from the 2000s onward, a consequence of the economic crisis triggered by the events of the 1990s, including Yugoslavia's dissolution and the NATO bombing. This period saw minimal new construction and limited infrastructure modifications.

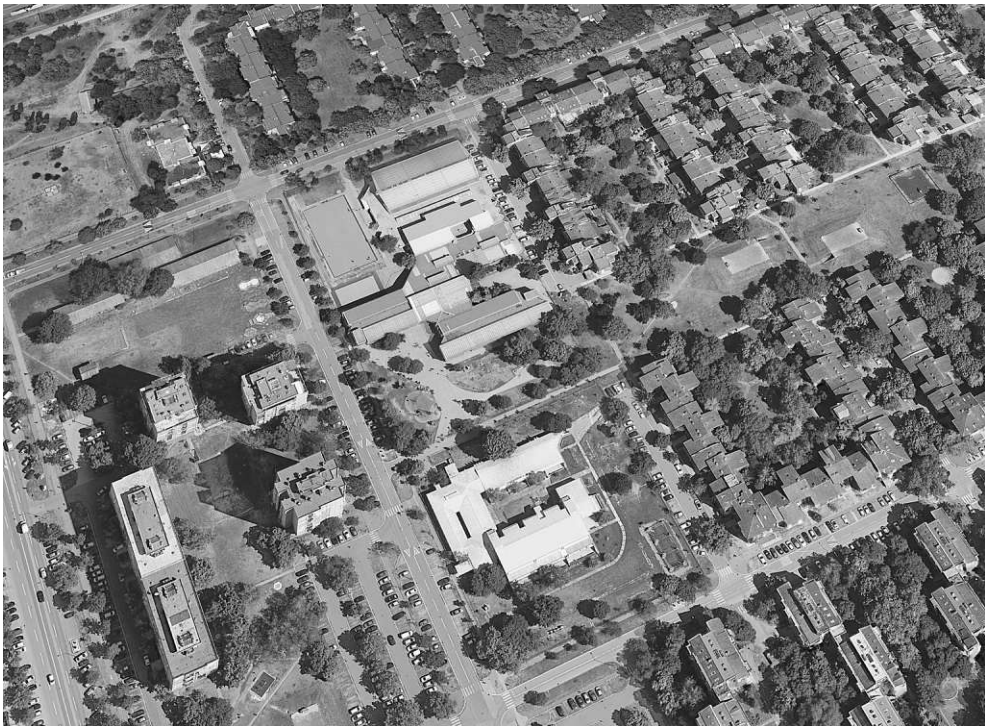
The general instability of the newly formed state led to a reduction in its role across multiple sectors, particularly in housing development, where private investors assumed the primary role in residential construction. The General Urban Plan of Novi Sad for 2030 now provides a strategic framework for future development, delineating construction areas and undeveloped land in Bistrica. This plan emphasizes the harmonious integration of new buildings within the existing urban fabric while preserving spatial characteristics and environmental quality.

² "Novo naselje" [New Settlement], DOCOMOMO Serbia, accessed February 17, 2025, <https://www.docomomo-serbia.org/atlas/novo-naselje/>.

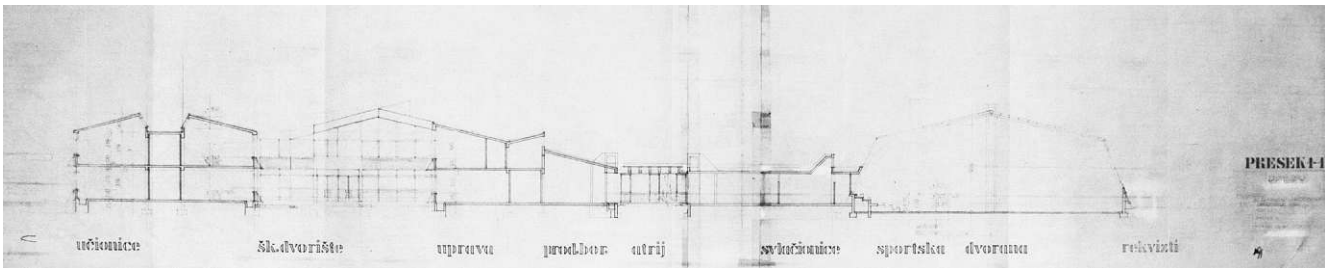
³ Slavko Odavić, "Tabakovićeva nagrada za arhitekturu" [Tabaković Award for Architecture], exhibition catalogue (Novi Sad: DaNS, 2004).

Prva Vojvođanska Brigada School

The Prva Vojvođanska Brigada Elementary School represents a significant achievement in Yugoslav educational architecture, distinguished by its efficient spatial organization, innovative hall system, and sophisticated integration of natural lighting through a carefully articulated section design.



The Prva Vojvođanska Brigada Elementary School, designed by architect Albert Josipović and completed in 1980, stands as one of Novi Sad’s largest educational facilities. The 7,100m² complex integrates teaching spaces with a 1,500m² sports hall, establishing a new standard for school design in Vojvodina. The building’s flexible spatial organization has proven adaptable to increasing capacity demands over time. The project’s innovative approach to natural lighting and multifunctional spaces influenced subsequent educational facilities in the region, including Josipović’s later schools Jožef Atila and Žarko Zrenjanin.



Design
Albert Josipović
Year
1980
Location
Seljačkih buna 51a,
Novi Sad
Program
Elementary School

Fig 22.
Aerial View of a School and
Its Surroundings

Fig 23.
Section through the School
and Sports Hall

Fig 24.
Old Photo with
Neighborhood High-Rises



The school occupies a central position within the established Novo Naselje district, ensuring optimal accessibility within the neighborhood. The building’s orientation along the southeast-northwest axis optimizes natural lighting, with main classrooms facing southeast. Multiple access points are distributed around the perimeter, with the main entrance oriented toward Seljačkih Buna Street. The freestanding structure maintains a considered relationship with its surroundings, including the adjacent Vendi kindergarten, while its scale distinguishes it within the residential context.

Fig 25.
School’s Main Entrance



Fig 26.
Facade and
Shading Elements





Fig 27.
Main Staircase Connecting
Two School Levels

The double-height entrance hall serves as the building's central multifunctional space, incorporating permanent exhibition elements and performance areas. The design features a staircase with an integrated amphitheater configuration, enabling various gathering and cultural activities. This central space connects directly to the sports facilities while maintaining capacity for independent operation. The hall's spatial organization emphasizes visual connectivity between levels, creating a dynamic core that serves both circulation and social functions



Fig 28.
Arts Classroom with Sloped
Roof Features

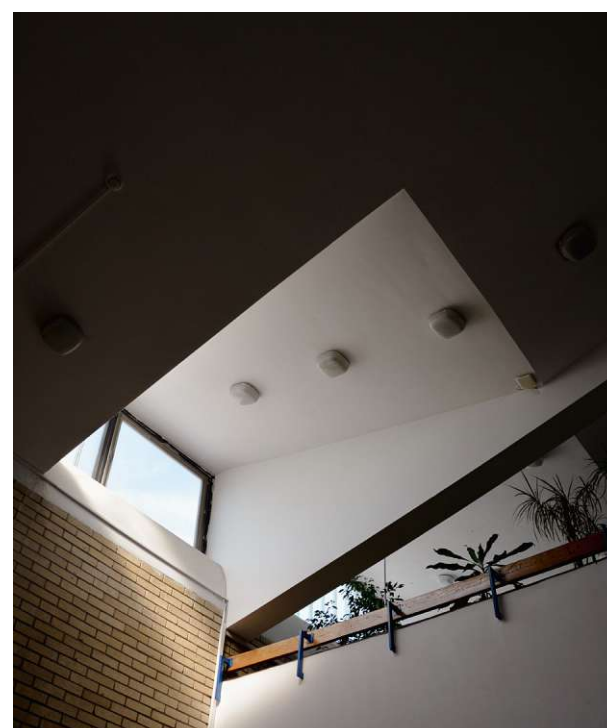


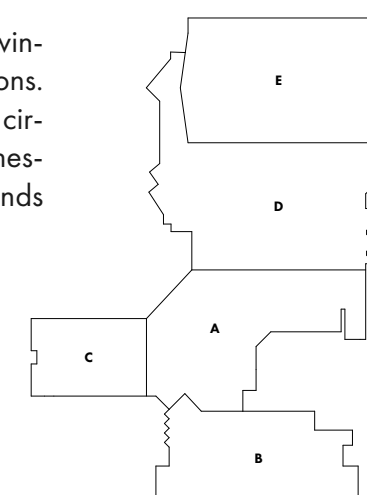
Fig 29.
Sloped Roofs for Natural Light

The building comprises five segments: Section A (first floor) features the main hall with the First Vojvodina Brigade exhibition, staircase and stage; Section B (first floor) contains classrooms; Section C (first floor) accommodates specialized teaching cabinets; Section D (originally single-story, later extended) includes spaces around an atrium, with kitchen, dining area, and dental facility; and Section E houses the sports hall.

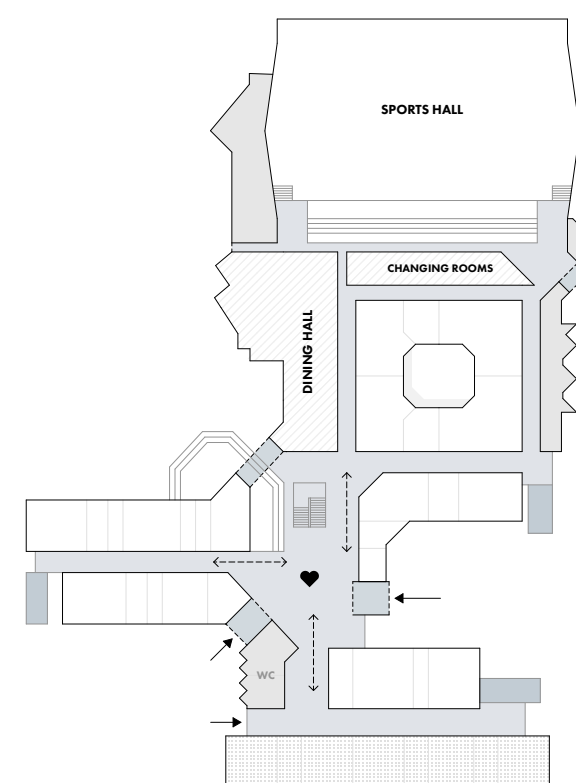
Faculty offices, administration, and teachers' lounge are located in Section A's first floor. The design features eighteen specialized classrooms, a library with reading room, four daycare spaces (later subdivided by the school into smaller units to accommodate increasing student numbers), and outdoor sports facilities including basketball, football, and volleyball courts.

The structure employs a reinforced concrete skeletal system with grid dimensions of 8.40 x 7.40m and 8.40 x 3.60m, optimizing classroom and corridor configurations. The sports hall's 29.15-meter span is achieved through three-hinged laminated wooden arches spaced at 4.94m intervals.

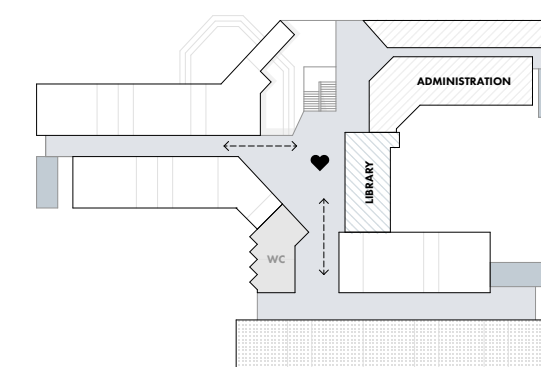
The building's envelope combines exposed and fluted concrete, with window openings following a systematic rhythm corresponding to interior functions. Larger glazed areas serve classrooms while more modulated openings mark circulation spaces. The facade design emphasizes horizontal lines through its fenestration pattern, particularly in classroom areas where continuous window bands reinforce the building's linear composition.



Ground Floor



1. Floor



Conclusion

The sustained population growth in Novi Sad, coupled with the increasing demand for educational facilities and the necessity to alleviate pressure on existing schools, underscores the critical need for new educational infrastructure in this district. This necessity is particularly acute given that no new schools have been constructed in the area for several decades, despite significant urban expansion. The neighborhood's well-developed existing infrastructure and available land parcels position it as an ideal location for educational facility development.

Field research at Prva Vojvođanska Brigada School, including interviews with faculty and staff, reveals the pressing nature of this situation. The school, despite recent structural modifications and expansions, operates significantly beyond its intended capacity, currently accommodating 1,750 students in facilities originally designed for 900 students. This overcrowding has necessitated substantial internal reorganization, including the conversion of all-day school spaces, where four classrooms were subdivided to create eight smaller units. This adaptation, while addressing immediate capacity needs, has resulted in compromised spatial quality and educational conditions.

The evident strain on existing educational infrastructure, manifested through overcrowded facilities and compromised spatial arrangements, demands immediate attention. This situation presents an opportunity to implement contemporary educational architecture principles while addressing urgent community needs.

Interview with Albert Josipović

“Architecture is a very interesting profession. At least it was. It can be extremely creative.”

The **Prva Vojvođanska Brigada school** stands as one of the last significant educational facilities built in Novi Sad of its era, and today serves an ever-growing student population far beyond its initial capacity. As a pivotal reference point for this diploma thesis, understanding its architectural conception became crucial to the research.

The investigation into the school’s development presented unique challenges. Despite the generous assistance from faculty members at the Novi Sad Faculty of Technology who shared their available resources, the scholarly discourse surrounding the school proved limited. The facility received minimal coverage in architectural publications of its time, and subsequent academic research addressing its design principles and implementation remained notably scarce. Further investigative process led to a significant breakthrough: the identification of the school’s architect, Albert Josipović, residing in Kotisina, a small village near Makarska on the Croatian coast.

This discovery led to an extensive interview with Josipović in August 2023, yielding insights that extend far beyond the specific school project. The conversation encompasses his remarkable journey through the architectural landscape of Europe, his philosophical approach to educational architecture, and his firsthand experience with the evolution of architectural practice from socialist Yugoslavia to contemporary times.



Biography

Albert Josipović, born in 1942 in Makarska, Croatia, began his architectural journey at the technical school in Split before completing his studies at Belgrade’s Faculty of Architecture in 1966. After working as an architect in Regensburg, Germany (1967-1974), he joined Novi Sad’s Institute for Physical Culture (1974-1982), where he designed several significant educational facilities that shaped the city’s institutional landscape. Beyond architecture, Josipović established himself as an accomplished jazz musician and author, currently residing in Kotisina near Makarska, where he continues his creative pursuits through writing and architectural practice.

Q&A

Date: 18.08.2023
Location: Makarska,
Croatia

You knew you wanted to be an architect from a very young age. How did that journey begin?

I knew I wanted to be an architect when I was just a child. I can’t explain exactly why, but the conviction was there early on. After finishing elementary school, I went to see the municipality president and said, “Barba Lovre, I want to be an architect, I need a scholarship.” He looked at my grades and told me to tell my father I had received a 7,000-dinar scholarship. That’s how I started at the technical school in Split. The school was excellent - all our professors had studied either in Prague or Vienna, and it’s where I learned the fundamentals of drawing and design.

During summers, I worked with a well-known architect, Olga Pavlinović. She taught me freehand drawing, how to understand dimensions and proportions. I was like a sponge, absorbing everything because architecture fascinated me. Later, when it was time for university, I went back to the municipality and they supported my studies again, which brought me to Belgrade.

How did your professional journey begin before completing your studies?

I actually started my architectural career in Germany, before even finishing my diploma. I went to Regensburg where I was playing in a jazz band. When the band broke up, I suddenly had my afternoons free and decided to look for work. One day, I went into the city and approached a police officer, asking him where I might find architectural work. After hearing I was from Yugoslavia, specifically Dalmatia and Makarska, he became quite friendly - he had been there himself. He ended up giving me a business card of an architect and 20 Deutsche Marks for transportation, since I admitted I had no money for the bus fare. That’s how I found my first architectural job in Germany.

Your diploma defence at Belgrade’s Faculty of Architecture became quite dramatic. Could you tell us about that experience?

I chose to design a school for my diploma project because I felt most comfortable with that typology. I implemented shed lighting for the classrooms, following Professor Baylon’s principles from his book on school buildings. During my defence, Professor Damjanović, under whom I had been one of the best students, claimed my design wasn’t any good. This put me in a difficult position - I responded by saying I wasn’t sure what to think of my four years of education if I had to question whether Professor Damjanović or Professor Baylon knew what they were talking about.

This caused quite a scandal, and the defence was suspended. Professor Tomić later called me to his office and presented two options: either redo the project since I had been “insolent,” or accept a grade of seven. I told him I had a job waiting in Germany and didn’t care about the grade - I just needed the diploma.

What do you think about architectural education today?

Today’s post-capitalist society wants everything fast, including education. Schools aren’t built to nurture development but to quickly produce people who will work for profit. As for art and architecture, what’s considered art today is also subject to capital. Almost anything can be sold as art now.

Your work in Germany significantly shaped your career. How was that experience?

What's interesting is that in all my years working as an architect in Germany, particularly in the first 10-11 years, no one ever asked to see my diploma. Their approach was always, "Here's your workspace, show us what you can do." What mattered wasn't the diploma but your capabilities. I even lost my diploma at one point - I only needed to translate it years later when I started my own practice and had to submit it to the Bavarian Ministry of Culture.

Your path to Novi Sad was quite unexpected. How did that come about?

It was completely by chance. After military service, when I was 33, I had a job waiting in Köln. I was walking down the boulevard in Belgrade, standing in front of the faculty, when my study colleague Vojislav Kujundzic, who had become a professor of wooden constructions, came out. He told me they needed someone like me in Novi Sad. I remembered my friend Sava Subotin, an architect who had taught me to play blues guitar, was there. I went to see Sava, who encouraged me to try it out. The next day, I had an interview at the Institute for Physical Culture, an institute responsible for sports facilities and education infrastructure in Novi Sad.

You later designed several significant schools in Novi Sad, including the Prva vojvođanska brigada School. Tell us about this pivotal project and your approach to educational architecture.

That school emerged because I wasn't constrained by any program except the basic educational requirements. I conceptualized everything myself, including special spaces for younger children from first to fourth grade - that wasn't even in the original program. When I defended this project before the committee, and it exceeded the required square footage, they were initially silent after my explanation, then said, "We'll build this."

The central hall was designed so you could breathe when you enter - it doesn't press down on you, it's completely open. I introduced elements that weren't common in schools then - the connection between indoor and outdoor spaces, the separate entrances for different functions. The sports section had its own entrance, so when sports teams arrived, they had their path through the changing rooms. School children entered from another side, near the dining area and kitchen.

Even the schoolyard was conceived as a meeting place where children would not only play but exchange experiences. It was directly connected to the central part, making it practically one space. Many educators didn't even understand how to use all the spaces properly.

You were once offered a chance to work with Walter Gropius. Why did you decline?

My friend Alex Cvijanović, who worked with Gropius, once offered me a position with their firm. At the time, Gropius was still alive and for me, he represented the highest level of architecture. However, I declined. Years later, Cvijanović and I met again, and he told me it was probably for the best - they would have sent me all over the world, separating me from my family. I might have become globally known, but at the cost of my private life.

Interestingly, years later, I received a book about Gropius from a friend in Hamburg that changed my perspective. It revealed that Gropius never actually completed architectural studies and couldn't draw. He was skilled at utilizing others' abilities and was an excellent speaker. This was quite disillusioning for me, as Gropius had been like a god in my eyes.

What are your thoughts on contemporary architecture and its challenges?

A good architect never allows the structural engineer to solve problems - the architect should solve everything. The engineer should only prove that it's stable and nothing more. Even with dimensioning, the architect must be extremely careful because the engineer might destroy the basic concept.

Today's post-capitalist society only wants profit in the fastest possible way. That's why even schools aren't as important anymore - they exist merely to produce people who will work toward generating more profit. They won't refuse funds to build new schools, but they'll try to make them as cheap as possible to achieve their results with minimal investment.

The space for creativity has become relatively narrow. You're constrained by the investor's program, new construction technologies, and material limitations. Every firm has their own solutions for facades and forming, and you're influenced by that if you want to use their materials. In high-tech architecture, where everything is done with steel and similar constructions, the material dictates how you'll resolve the visual design of the buildings.

You're also an accomplished jazz musician. How do music and architecture relate in your life?

Architecture always came first. Music was something on the side. I wasn't formally trained but was talented and played with some of the best. I recorded five CDs, and I'm essentially satisfied with how far I got without formal education. I used to play at Hotel Kaštelet in Tučepi - a villa I had renovated from the Grubišić family's summer house into a hotel, for which I received an award for the best restored Baroque building in the Balkans.

In recent years, you've turned to writing. What motivated this shift?

I began writing after my wife Sonja passed away. I would wander around Europe, often staying in Berlin, keeping small notebooks where I'd record daily events, sketch churches, write down thoughts and poems. That's when I discovered I could write. My first book was titled "Gdje je nestala Sonja" ("Where Did Sonja Go?") because I was grappling with questions about who we are and why we're here. I wrote about her battle with cancer and included many anecdotes from our life together to explain who she was. I've also written a children's book, and my latest book, "Laži, prevare i druge obmane" ("Lies, Deceptions and Other Deceits"), will be released this summer. It includes my perspective on contemporary issues and features two main characters - a father and son, both architects - discussing modern architectural challenges like shopping centers and urban development.

After such a long career, what are your thoughts on the architectural profession?

It's a very interesting profession. At least it was. It can be extremely creative. You've chosen this path, keep going forward. The path is arduous.

Educational Framework

Education represents a complex, continuous process of learning and personal development, encompassing knowledge acquisition through diverse methodologies and environments. As a lifelong endeavor essential to human, social, and economic advancement, education transcends age boundaries and serves both individual and collective interests, establishing itself as a fundamental human right. The contemporary form of education, while varying across national contexts, has evolved gradually through historical development, resulting in the establishment of diverse institutions including kindergartens, schools, and universities, each employing distinct educational approaches while adhering to common foundational principles.

The Universal Declaration of Human Rights (1948) establishes education as a universal right, mandating free access to elementary and fundamental education, with elementary education designated as compulsory.¹ This framework ensures that general education equips individuals for active participation in society's social, cultural, and economic domains. Following World War II, Yugoslavia, along with other European nations, underwent UNESCO-guided school reform in 1949, resulting in the establishment of a unified eight-grade primary school system.² This structural framework continues to influence educational organization in most successor states of the former Yugoslavia.



Fig 30.
Learning Space,
Photo: Hufton+Crow

¹ UN General Assembly, "Universal Declaration of Human Rights" (Paris: United Nations, December 10, 1948).

² Aleksandra Ilić Rajković and Sanja Petrović Todosijević, eds., *Bez škole šta bi mi?! Oglеди iz istorije obrazovanja u Srbiji i Jugoslaviji od 19. veka do danas [What Would I Be Without School?! Essays on the History of Education in Serbia and Yugoslavia from the 19th Century to Today]* (Belgrade: Institute for Recent History of Serbia and Institute for Pedagogy and Andragogy, Faculty of Philosophy, University of Belgrade, [2022]).

Current Educational System Structure

The contemporary educational system mandates eight years of elementary education, organized into two distinct levels within a unified structure, each spanning four years. The transition from first to second level marks a shift from classroom-based to subject-based instruction, while maintaining consistent class structures. The first level, encompassing grades one through four, employs a classroom teaching model where a single teacher delivers the majority of program content to students aged 6½ to 10½ years. This arrangement, typically accommodating approximately 30 students per class, enables teachers to create meaningful learning environments within designated classroom spaces.

The second level, covering grades five through eight, transitions to subject-specific instruction while maintaining consistent peer groups within the same facility. This phase requires students to move between specialized classrooms, with different subject teachers delivering instruction grouped by educational fields such as natural sciences, social sciences, and languages. Upon completing the eighth grade, students pursue secondary education pathways based on academic achievement and examination results, choosing between four-year general secondary education in grammar schools or vocational programs.

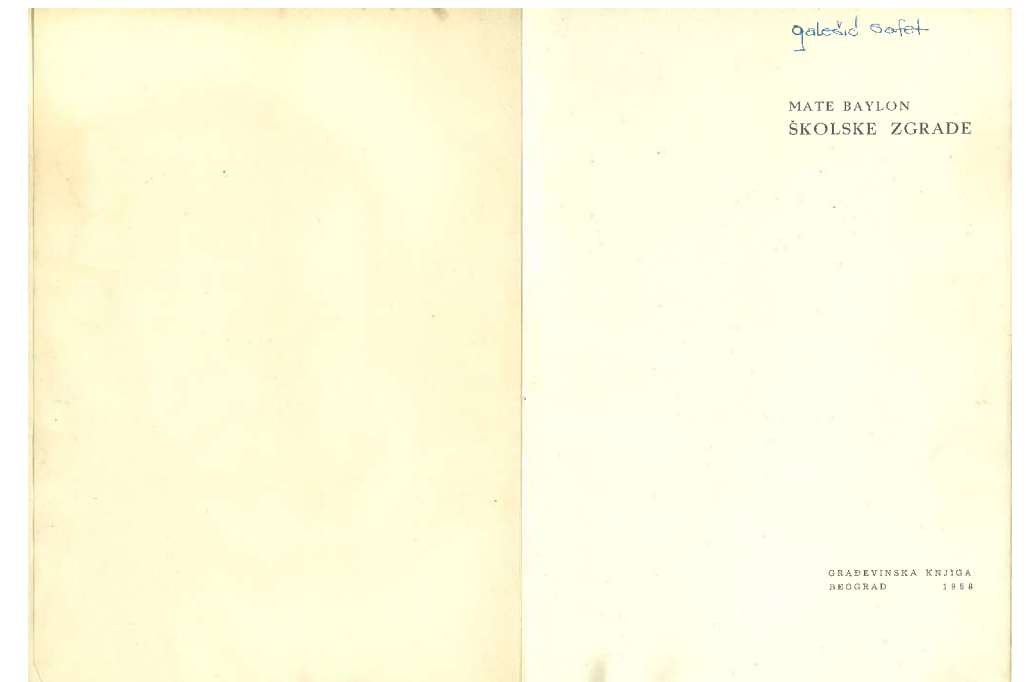


Fig 31.
Literature: Mate Baylon, *Školske Zgrade* (School Buildings) as the cornerstone of my research

School Building Typologies

The development of school architecture reflects the evolution of pedagogical theories and changing conceptions of teaching and learning through corresponding spatial structures. School buildings have undergone significant transformations in their structural organization, layout, and interior arrangement over past centuries. This evolution traces a path from traditional corridor-and-classroom configurations prevalent in the late 19th century to open school models emerging in the 20th century, leading to contemporary approaches in school construction and renovation that address modern educational requirements.³

The profound influence of spatial environment on learning processes positions school buildings as pedagogical tools in themselves.⁴ While the relationships between spaces and their positioning within overall building structures exhibit considerable diversity, distinct typological classifications emerge. These classifications, however, must be approached with flexibility, acknowledging the dynamic nature of educational needs and architectural responses. Several key typological approaches have emerged through this evolutionary process, each offering distinct advantages and challenges in supporting educational objectives.

The Corridor School

The corridor school typology represents a fundamental approach to educational architecture, with the corridor serving as the primary organizational element facilitating horizontal circulation and connecting various spaces into a coherent system. In its most basic configuration, classrooms are arranged linearly along one side of the corridor, enabling optimal natural light orientation while allowing illumination to penetrate the circulation space from the opposite side. Alternative arrangements position classrooms on both sides of the corridor, increasing spatial efficiency through functional grouping but consequently limiting direct natural light access.

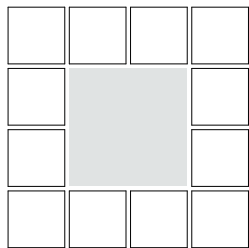
This basic organizational principle has evolved into more sophisticated configurations such as L, H, or U-shaped layouts, each offering distinct advantages in spatial organization, circulation patterns, and natural light distribution.⁵ Beyond their primary circulation function, corridors in these schemes can serve multiple purposes, functioning as break-out areas, social interaction spaces, and informal learning environments. The success of these secondary functions largely depends on the corridor's design parameters, particularly width and natural light access.



The Hall School

The hall school typology represents an evolution in educational architecture where the central hall emerges as a distinct organizational element that transcends mere circulation. Unlike the corridor school's linear organization, the hall serves as a central gathering space around which functional units are arranged, emphasizing communal interaction over simple circulation. This central space may be conceived as either a single-story volume or a multi-story atrium, often incorporating vertical circulation elements that create visual and spatial connections between different levels.

The arrangement of classrooms around the hall presents unique challenges and opportunities for natural lighting, which can be addressed through overhead illumination or, in taller configurations, through strategic side openings. Freeing one side of the hall from adjacent programs can significantly improve the central space's natural lighting while creating opportunities for visual connections to the exterior.⁶



3 Kerstin Sailer, "Corridors, Classrooms, Classification – The impact of school layout on pedagogy and social behaviours," in *Designing for the future of schooling*, ed. Harry Daniels et al. (London: Routledge, 2018).

4 Patrick Bjurström, "The space of the school as a changing educational tool," in *Educational Dimensions of School Buildings*, ed. Jan Bengtsson (Frankfurt am Main: Peter Lang Verlag, 2011).

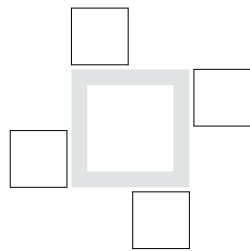
5 Thomas Jocher and Sigrid Loch, *Raumpilot Grundlagen [Space Pilot Fundamentals]*, ed. Wüstenrot Stiftung (Stuttgart: Karl Krämer Verlag, 2012).

6 Mate Baylon, *Školske zgrade [School Buildings]* (Belgrade: Građevinska knjiga, 1958).

The Pavilion School

The pavilion school typology emerged from a desire to optimize natural ventilation and classroom illumination while establishing stronger connections between learning spaces and the natural environment. This approach has led to the development of smaller organizational units, typically arranged as wings or clusters, connected through various means including enclosed corridors, open verandas, or external pathways. The underlying philosophy emphasizes direct relationships between classrooms and nature, encouraging outdoor teaching when the weather permits.⁷

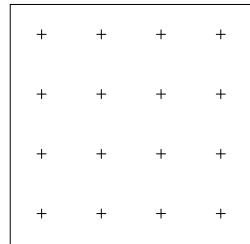
This approach has influenced the creation of intimate courtyards between classrooms, providing each teaching space with its own dedicated outdoor area. While this arrangement creates highly desirable learning environments with strong connections to nature, it requires substantial land area to accommodate its distributed layout. The success of pavilion schools often depends on the careful integration of building clusters with landscape design and the effective management of circulation between units.



The Open Plan School

In contrast to the pavilion school's distributed organization, the open plan school concept eliminates traditional spatial divisions between learning groups. This radical approach organizes educational activities within a shared environment under a unified roof, typically employing a compact form that relies primarily on artificial lighting and mechanical ventilation systems rather than natural environmental conditions. The architectural expression of open plan schools is characterized by the absence of permanent partition walls and traditional corridors, creating a continuous learning landscape that facilitates interaction between teachers and students across different learning settings.⁸

While this arrangement offers maximum flexibility for various activities and group configurations, it presents challenges in acoustic control and environmental comfort. The heavy reliance on artificial lighting and ventilation systems can impact user comfort and operational costs, requiring careful consideration in design and implementation. Despite these challenges, the open plan school concept continues to influence contemporary educational architecture, particularly in its emphasis on flexibility and interconnected learning spaces.



Conclusion

The analysis of school building typologies reveals a rich architectural evolution responding to changing pedagogical approaches and societal needs. These established models - from corridor schools to open plan configurations - provide a comprehensive framework for understanding the relationship between educational philosophy and architectural form. Rather than serving as rigid templates, they offer a basis for combining elements and incorporating new ideas, allowing for synthesis and adaptation to contemporary requirements.

As Novo Naselje continues its urban development and faces increasing educational infrastructure demands, these typological insights offer crucial guidance for creating learning environments that respond to both local context and contemporary pedagogical needs. The framework's flexibility accommodates emerging educational methodologies while addressing specific site conditions and cultural contexts, ultimately serving as a foundation for developing schools that advance both educational excellence and community cohesion.

⁷ Baylon, Školske zgrade.

⁸ Franz Hammerer and Katharina Rosenberger, eds., RaumBildung 5: Transitionen in Bildungsbauten [Space Education 5: Transitions in Educational Buildings] (Vienna, 2019).

Educational Campus Sonnwendviertel 01

The Sonnwendviertel Education Campus (2014) utilizes a cluster-based organization that integrates kindergarten, primary, and secondary education. The design creates fluid transitions between educational spaces while emphasizing shared learning areas and communal interaction.



Photographs: Hertha Hurnaus

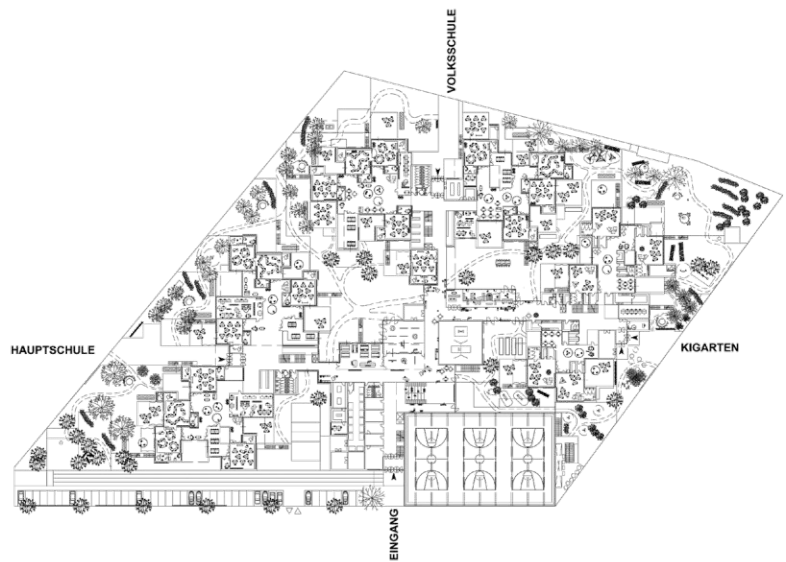
Design
PPAG architects
Year
2014
Location
Wien, Austria
Program
Educational Campus



The campus organizes learning spaces into distinct clusters, each comprising four classrooms, a project room, and a teachers' area arranged around a flexible "marketplace" space. The spatial configuration avoids stacking classrooms directly above one another, instead creating covered outdoor areas beneath upper-level rooms and terraces above ground-floor spaces.

Each learning space features a distinct "nest" - an elevated alcove that can be separated by a pivoting board. The three two-story educational wings are connected by shared facilities including a triple sports hall, multi-purpose room, and library, fostering interaction between different age groups throughout the campus.

Fig 32.
Ground Floor



Wilkes Elementary School

02 **Design**
Mahlum Architects
Year
2012
Location
Bainbridge Island, US
Program
Elementary School

Wilkes Elementary School features a series of low-profile bar forms extending from the hillside. The design creates protected exterior courtyards between building volumes while emphasizing connections between learning spaces and landscape.



Carved into the hillside, Wilkes Elementary School creates a seamless relationship between built form and natural environment. The school's organization comprises parallel bars extending from the slope, each housing learning clusters organized around shared spaces. This configuration creates sheltered courtyards while optimizing natural daylight and views.

The design provides direct connections to play areas and learning gardens, allowing varied scales of interaction between students, educators, and their environment. Interior and exterior learning spaces integrate fluidly, acknowledging the district's priority of bringing light and landscape into the learning environment.

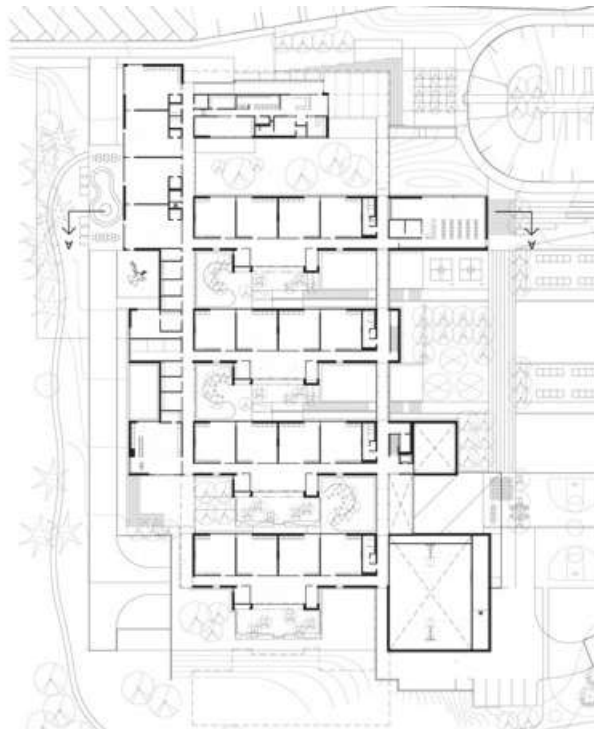


Fig 33.
Main Level



Photographs: Jeremy Bittermann

Uto Elementary School

03

Design
Coelacanth CAI
Year
2011
Location
Uto, Japan
Program
Elementary School

The Uto Elementary School reimagines educational architecture through its distinctive L-shaped wall system and indoor-outdoor integration. The design dissolves traditional classroom boundaries while creating adaptable learning environments supported by natural ventilation and lighting strategies.

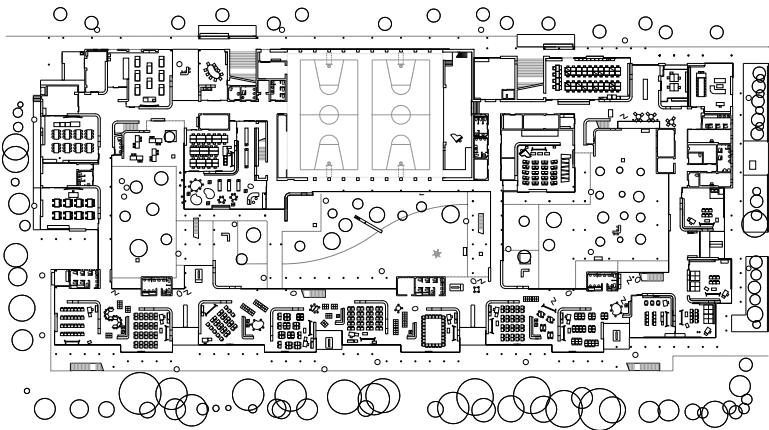


This complete reconstruction project by Kazuhiro Kojima and Kazuko Akamatsu replaces a fifty-year-old school facility with an innovative spatial concept for over 800 students. The design employs L-shaped wall elements to define learning spaces without fully enclosing them, creating fluid transitions between classrooms and common areas.

The building's envelope features ceiling-height folding doors that enable complete opening to the exterior, while projecting roof planes provide solar protection. Learning spaces are organized around planted courtyards, with the structural solution of flat slabs supported by L-walls generating expansive, flexible spaces for diverse teaching approaches.



Fig 34.
Ground Floor



Photographs: Sadao Hotta

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Design Criteria

03

Building Site

The proposed building site occupies a strategic position bordered by two prominent thoroughfares: Radomira Rase Radujkova Street to the northwest and Boulevard of Europe to the northeast, the latter marking the neighborhood's eastern boundary. The site's western edge interfaces with an established residential area, while its southern boundary adjoins the former marshalling yard, Stara Ranzirna Stanica. The recently established Novi Park (2021) lies northwest of the site, providing substantial green space within the urban environment and offering diverse recreational opportunities. Concurrent development plans along Boulevard of Europe, occupying former railway corridors, anticipate new residential construction.

The adjacent former marshalling yard, currently inactive, represents a significant development opportunity within the urban fabric. While various proposals suggest its transformation into a cultural hub incorporating museums and galleries, or alternatively its conversion into green space connected to Novi Park, the expanding residential population in surrounding areas and the necessity for additional educational infrastructure support the site's potential development as an educational campus, incorporating both kindergarten and school facility.



Fig 35.
Old Aerial Image of
the Marshalling Yard



Topographical and Transportation Infrastructure

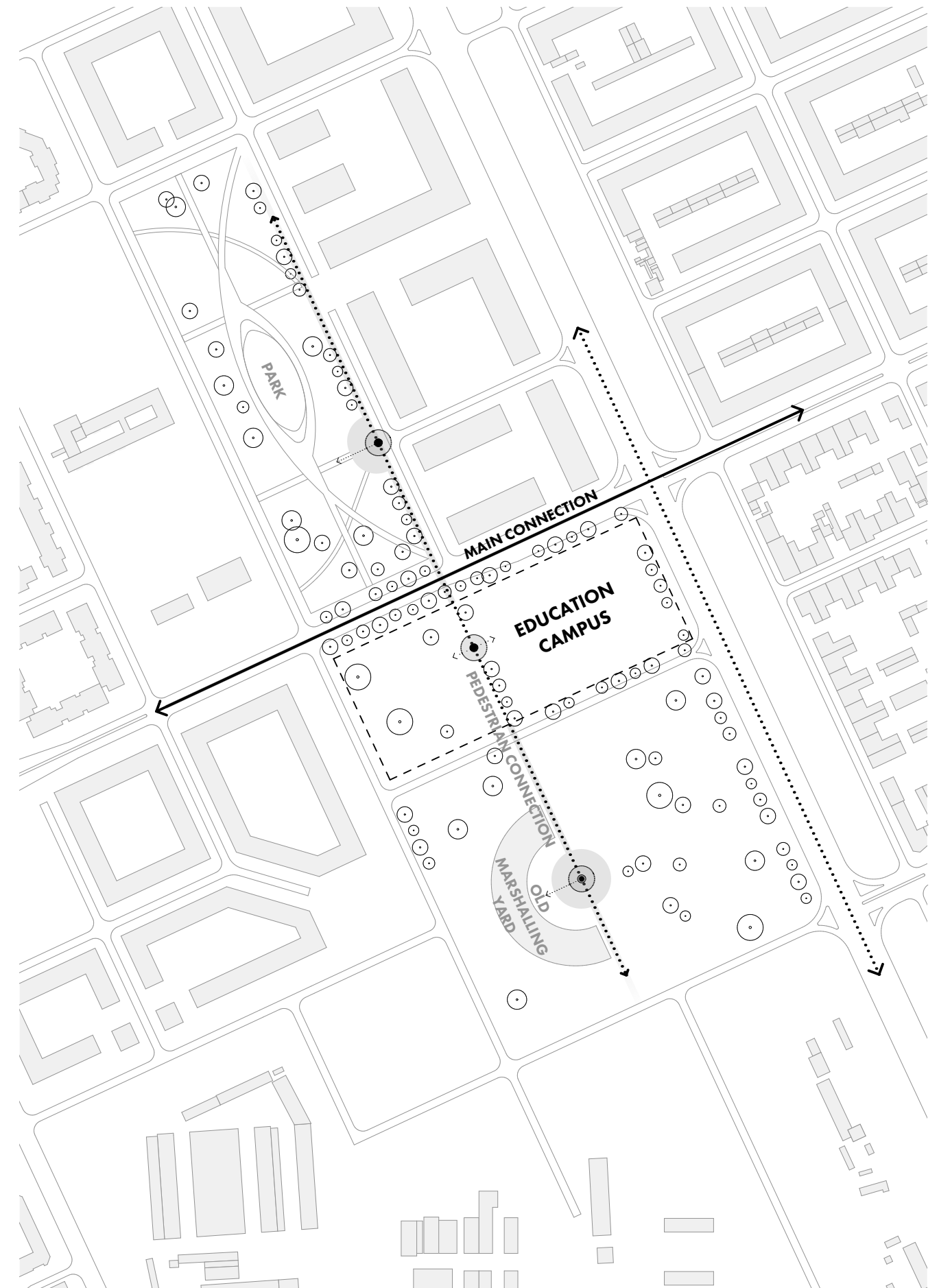
The site's topography reflects Novi Sad's characteristic flat terrain, a defining feature that, in conjunction with the city's network of broad boulevards and linear street profiles, contributes to its distinctive urban identity. This level terrain, complemented by extensive cycling infrastructure, has fostered an extensive cycling culture. While individual transportation remains the predominant mode of travel, the public transportation system has evolved through several phases, transitioning from historical tram service to its current bus-based network.

The Boulevard of Europe stands as Novi Sad's longest boulevard and a principal traffic artery. Its comprehensive cross-sectional profile incorporates three traffic lanes in each direction, divided by a central green strip, complemented by angled parking spaces, dedicated bicycle infrastructure, peripheral green zones, and expansive pedestrian walkways. Radomira Raša Radujkova Street, extending from the Jovana Dučić Boulevard, features a modified profile with two traffic lanes in each direction, while maintaining comparable provisions for green spaces and non-motorized mobility. The 2022 removal of railway crossings from tracks connecting the new railway station to the old marshalling yard has further improved circulation patterns.

Public Spaces

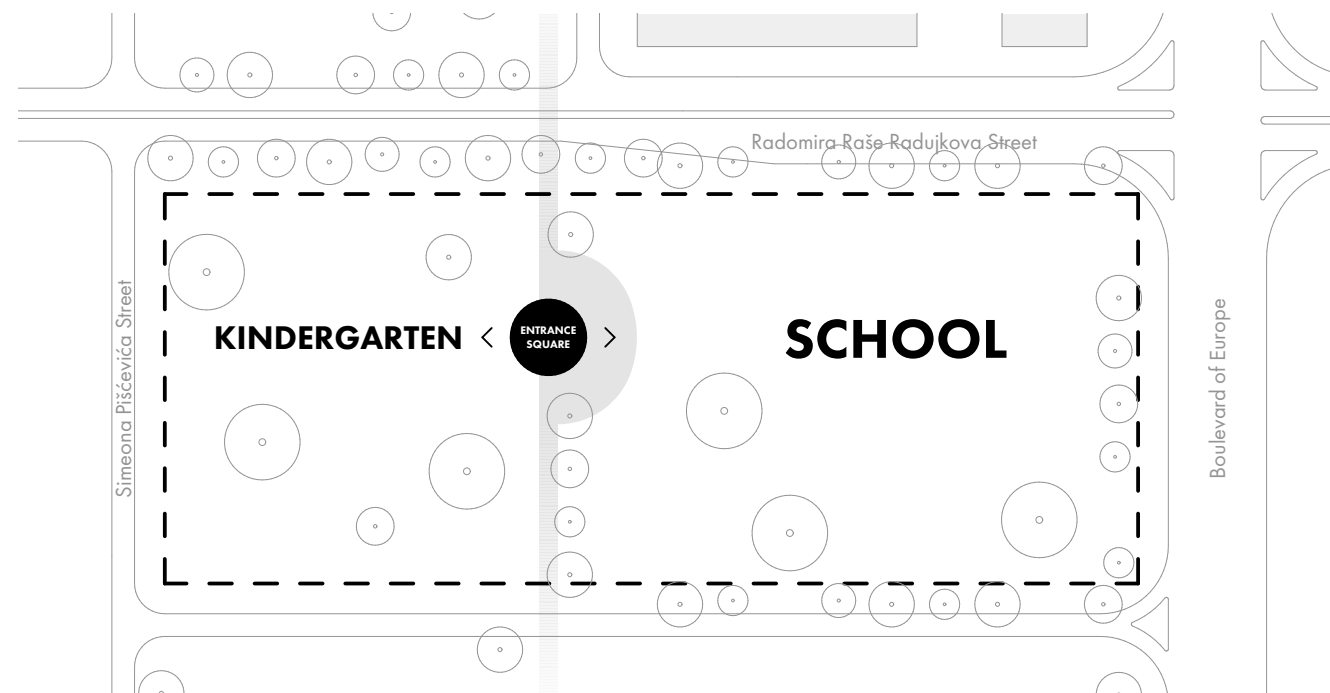
Novo Naselje distinguishes itself among city districts through its abundant green infrastructure, characterized by tree-lined streets, integrated block-level green spaces, and formal parks. The recently established Novi Park, adjacent to the building site, creates a significant public space within the immediate context, offering diverse amenities including pedestrian pathways, seating areas, water features, children's play areas, and outdoor fitness facilities. The currently undeveloped land south of the site, naturally revegetated, presents opportunities for future development as organized public green space. Meanwhile, the Boulevard of Europe represents an evolving public realm, incorporating tree-lined avenues, cycling infrastructure, and integrated recreational facilities.

The strategic positioning of educational facilities adjacent to existing green spaces offers multiple advantages: it provides students with a healthy environmental context, enables the utilization of green spaces as extended learning environments, and creates pleasant pedestrian approaches to the school through landscaped areas featuring various points of interest. This relationship between educational facility and public space operates reciprocally, as the school can enhance neighborhood vitality by making its facilities available for public use, thereby functioning as both an educational institution and a community focal point that strengthens neighborhood identity and social cohesion.



Positioning

The design requirements call for an elementary school that responds to its urban context through clear volumetric organization. The primary building volume is to be oriented along Radomira Raša Radujkova Street, with concentrated massing in the northeastern sector creating expansive southern spaces for sport and recreational activities. Site planning requires the southwestern portion to be reserved for future kindergarten development, establishing an integrated educational campus to strengthen the neighborhood's institutional character. Essential to the design is a public pathway between these facilities, developing into a school promenade to enhance site connectivity and pedestrian movement. The architectural arrangement establishes clear institutional presence while optimizing circulation patterns and creating protected outdoor spaces. Critical to the positioning is efficient separation between public and private zones while maintaining visual connections to the surrounding urban context.



Circulation

The access system requires a clear hierarchy of entry points, each serving distinct functions within the overall circulation strategy. Primary design parameters specify a generously scaled public square as main entrance area, facilitating access to both the school building and planned kindergarten facility. This transitional space, extending from the public pathway, functions both as circulation infrastructure and social nucleus. The architectural arrangement creates intuitive wayfinding while effectively managing peak pedestrian flows and providing spaces for community gathering. Design requirements include independent barrier-free entry to sports facilities for community use outside academic hours, as well as separate service access for kitchen deliveries and maintenance functions. The circulation system necessitates clear separation between pedestrian and operational traffic patterns.

Building Program

Number of Classes

36

Students

960

Faculty Members

100

Net Floor Area

8 000 m²

The educational facility accommodates 1,200 students across 40 classes with approximately 100 faculty members, encompassing a net floor area of 8,000 square meters. Program organization comprises two distinct educational levels, each containing 20 classes, with spatial arrangements reflecting different pedagogical approaches.

Level I spatial organization is based on a cluster system, where classroom spaces form primary learning zones. These clusters integrate open learning landscapes as extended educational environments. The spatial configuration enables flexible arrangements for group work, individualized instruction, and cooperative learning formats, while providing areas for recreational activities within the learning environment.

Level II organization follows a departmental system arranged by academic disciplines, reflecting students' increased autonomy and movement between specialized instruction spaces. The design incorporates classrooms as spatial anchors for student groups, providing dedicated areas for social interaction and independent learning. These spaces establish stable reference points within the departmental organization while supporting both individual and group activities.

The entrance area incorporates a flexible public zone connecting to additional functional units, forming an assembly hall for larger educational events and community gatherings. This central zone encompasses essential facilities including dining spaces, school library, multi-purpose rooms and additional support spaces.

The administrative area requires central placement within the building, ensuring straightforward and user-friendly access for teachers, students, and parents. The faculty area requires central positioning in the school building to optimize circulation routes. This area includes working spaces and an open social area with zones for communication.

The sports facility comprises a three-unit sports hall with subdivision capability. The design requires independent barrier-free access for community use outside school hours, with the capability to separate the sports area from the main school building while maintaining operational efficiency and security.

Design Proposal

04

The school design synthesizes contemporary pedagogical requirements with innovative spatial organization, establishing a dynamic learning environment that emphasizes connectivity, flexibility, and community engagement. The architectural concept prioritizes the interplay between built form and open space, allowing exterior spaces to flow seamlessly into interior environments and vice versa, creating a fluid spatial experience that supports diverse learning activities.

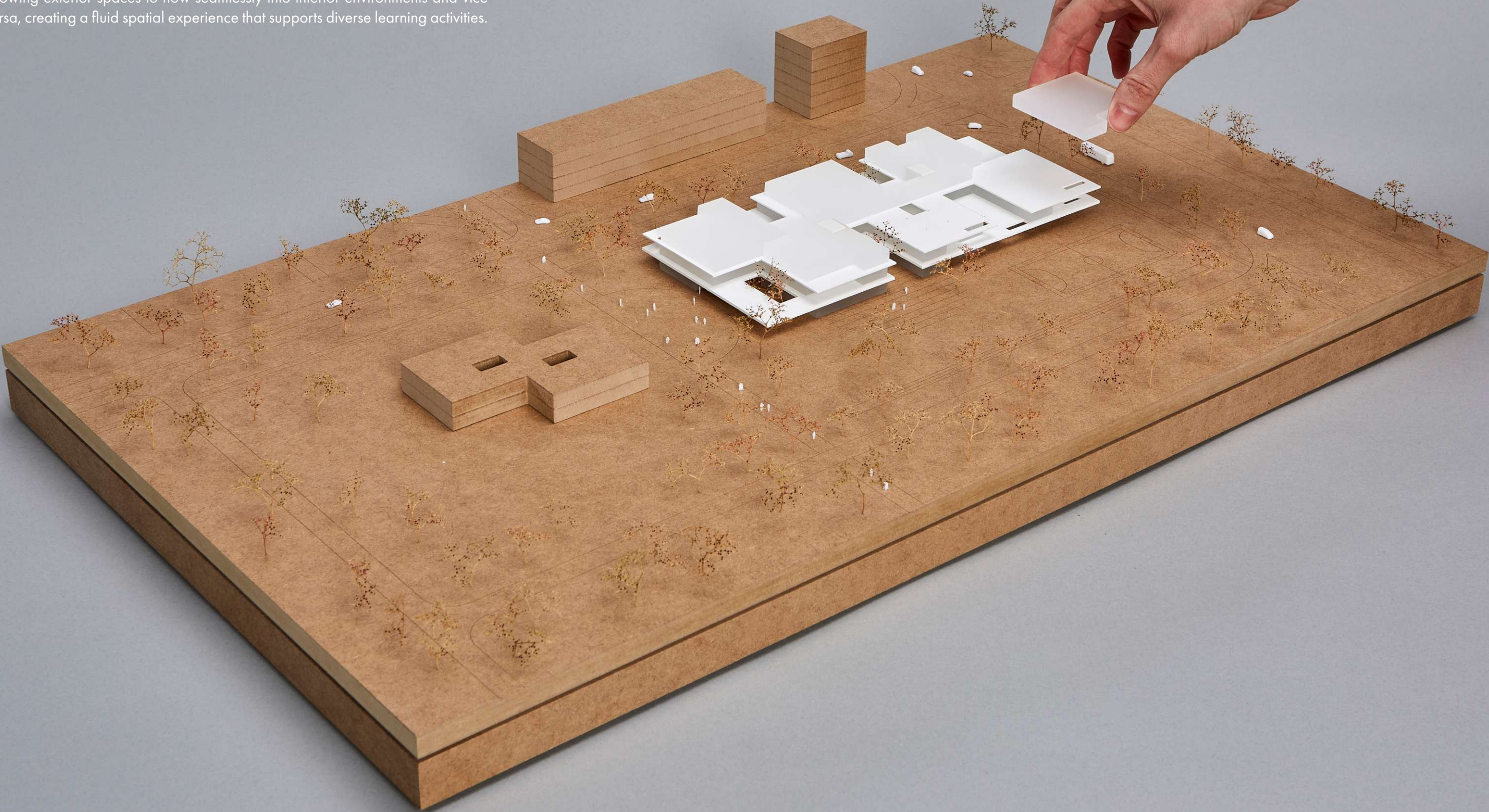


Figure - Ground Plan



Scale 1:5 000

Urban Integration and Site Organization

The project extends the existing orthogonal urban fabric while anticipating future development to the north, positioning an elongated building volume along Radomira Rase Radujkova Street. This strategic massing concentrates the built form in the northeast portion of the site, liberating the southern area for recreational spaces and sports activities. The design reserves the southwestern area for a future kindergarten, establishing the foundation for an integrated educational campus. A public promenade between the school and planned kindergarten creates a shared outdoor space that encourages interaction between the two educational institutions while fostering a sense of community through active pedestrian movement and informal gathering spaces.

Architectural Articulation

The building mass is deliberately articulated across three above-ground levels, creating a layered composition with a terraced structure, forming accessible outdoor spaces. This careful scaling of architectural elements achieves two primary objectives: it establishes an appropriate relationship with the surrounding urban context and creates dynamic spatial connections between different levels of the school. The arrangement produces interconnected courtyards at various elevations, offering differentiated outdoor spaces that foster both vertical and horizontal visual connections across multiple levels, promoting interaction and awareness between educational activities.

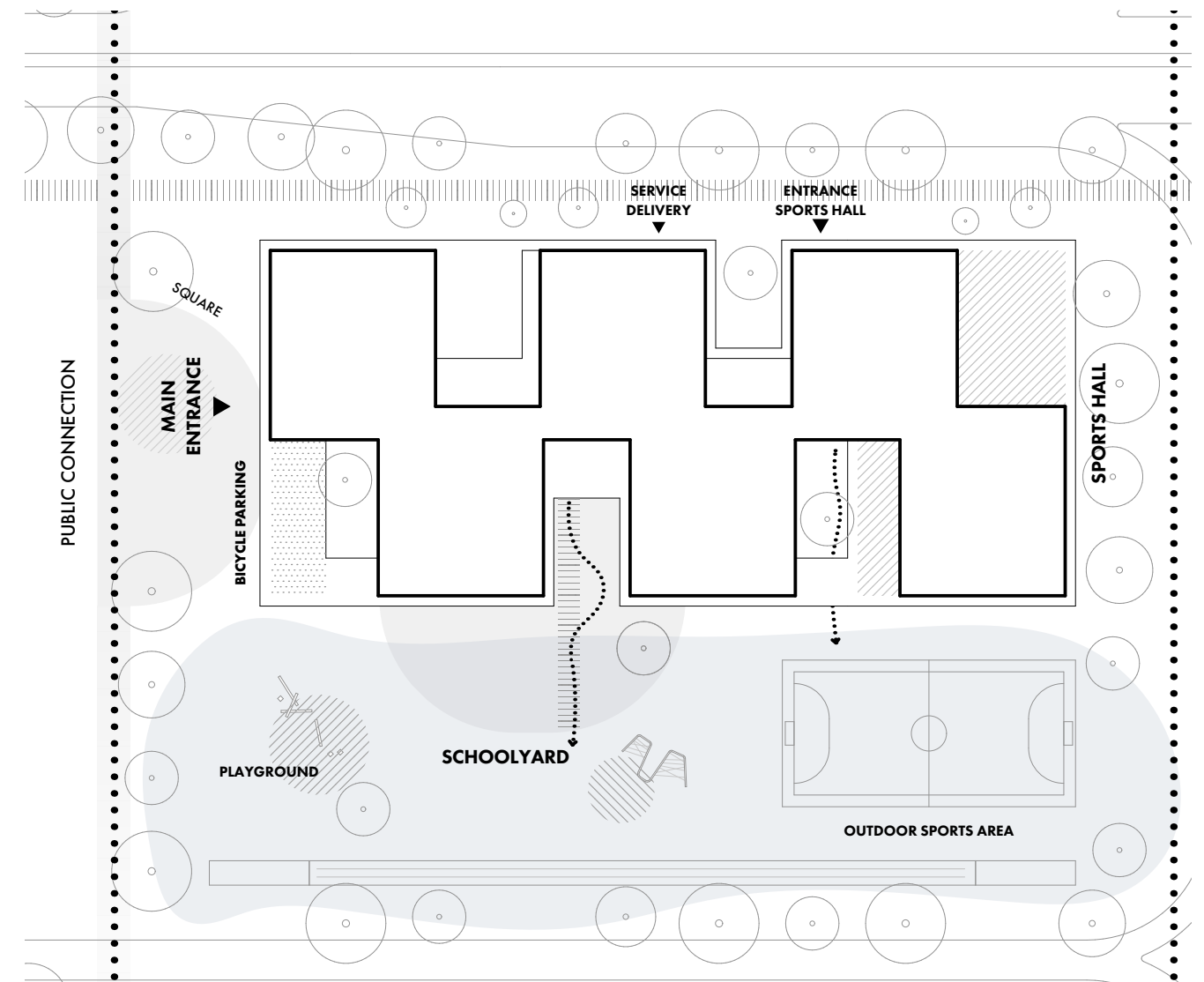
The half-sunken sports hall is spatially integrated within the overall building composition. Its double-height configuration creates additional spectator areas and merges naturally with the rest of the building's areas, reinforcing its role as an integral part of the school's daily activities.

Accessibility

The main entrance is accessed through a western square that provides direct access to the school. This area incorporates covered parking for bicycles and scooters. The base zone of the building is set back, reinforcing the sheltered character of the square while providing weather protection. This creates a clear address for the school, guiding students from the square directly into the entrance hall.

A secondary entrance along Radomira Raša Radujkova Street provides independent barrier-free access to the sports hall for community use outside school hours. Service access, including kitchen deliveries, is also positioned along this street, ensuring efficient separation of pedestrian and operational circulation.

The southern facade is articulated with strategic entry points that establish direct connections between interior spaces and exterior recreational zones, facilitating fluid movement between the building and outdoor sports activities while optimizing circulation patterns within the overall site organization.



Open Space Organization

The open space concept establishes a harmonious relationship between architecture and green spaces, combining functional requirements with design and ecological qualities to create a vibrant and versatile outdoor environment. The site is organized into three distinct zones: the entrance square, the schoolyard, and the outdoor sports areas.

The entrance square serves as a representative threshold while functioning as a space for gathering and social interaction, mediating between the school and public realm. The building provides multiple pathways to the schoolyard, which interweaves with the building's form and offers green spaces for movement and recreation.

The outdoor sports area is strategically positioned to establish a direct connection with the sports hall, enabling multifunctional use during and outside school hours. This arrangement extends recreational opportunities to the broader neighborhood while maintaining clear spatial relationships with the school's primary functions.

Site Plan



Main Entrance

Radomira Raše Radujkova Street

Boulevard of Liberation

Schoolyard

Outdoor Sports Area

Playground

Scale 1:1000

Functional Organization

The building’s organization responds to the requirements of all-day educational facilities, offering differentiated daily routines with flexibility in spatial movement and individual, needs-based selection of various learning and recreational settings. This approach creates valuable potential for both learning and leisure activities, informing the decision to make a significant portion of these areas accessible throughout the day.

Ground Floor

The main entry leads into the central corridor and connects to the adjacent hall, providing efficient circulation throughout the building. A double-height entrance hall forms the heart of the building, featuring an integrated seating stair that creates opportunities for gathering and informal interaction. The multi-purpose room and music room can be opened to the hall, enabling assemblies and school events. The positioning of common areas at the ground level creates a clear spatial separation between public functions and the private learning zones above while simultaneously creating an animated meeting point for all users.

The ground floor accommodates central facilities including a cloakroom directly accessible from both interior and exterior, optimizing student flow during arrival and departure times. The after-school care spaces are strategically positioned on this level, enabling flexible use throughout the day. This arrangement allows students to participate in after-school programs individually according to their needs, independent of their class groupings.

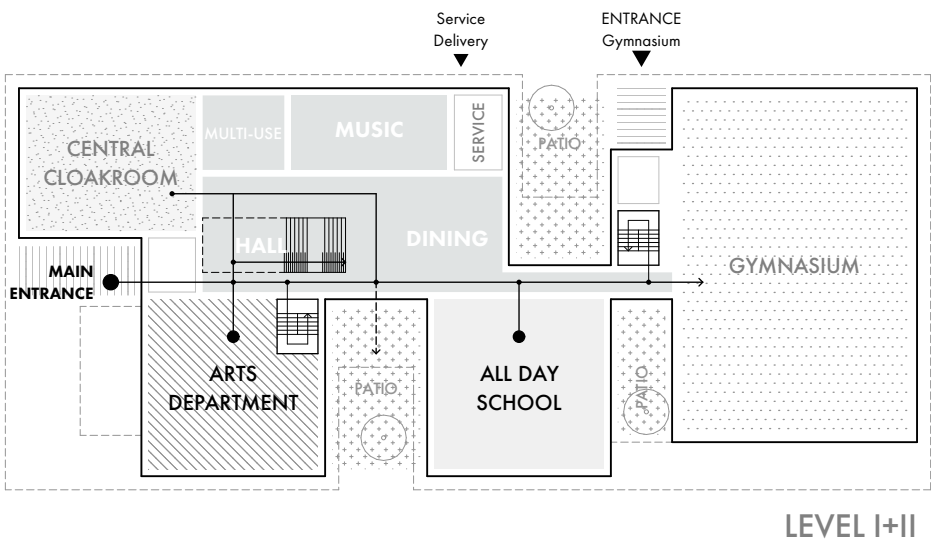
In the context of all-day education, food service plays a crucial role. The dining facility is positioned in proximity to the after-school care areas and features direct access to a covered outdoor area. Its location enables multiple use patterns to avoid unused spaces during the day.

The art department is also located on this floor, accommodating practical work and experimentation in various fields (painting, printmaking, design, performance). This location is optimal for the visual arts’ role in school design, theater, and music productions, while the direct connection to outdoor spaces provides additional value.

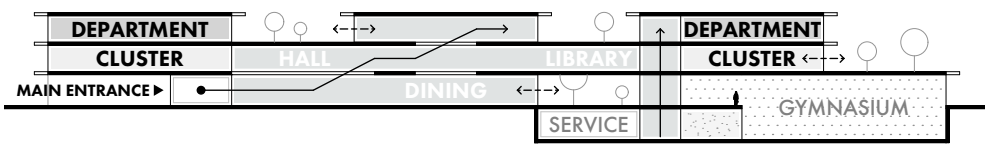
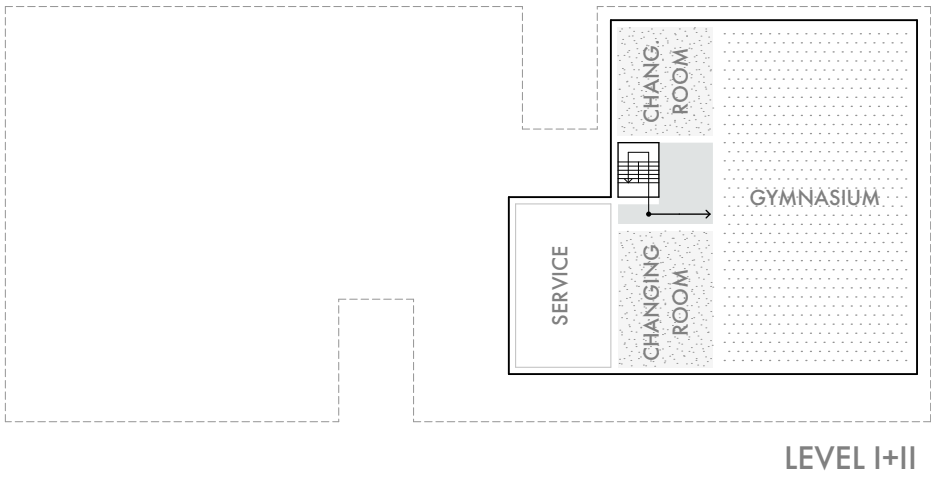
Lower Ground Floor

The vertical circulation core provides direct access between the sports hall in the lower ground floor and the outdoor sports areas. The changing rooms are positioned adjacent to the hall on the same level, creating an efficient circulation sequence. The careful integration of the sports hall in the lower ground floor maintains convenient connection to the school without requiring extended passages.

0.



-1.



Circulation

The generous entrance hall is organized around a central main stair with integrated seating steps, leading to the first floor along the roof terrace above the base level. This arrangement generates a sequence of naturally illuminated spaces characterized by high spatial quality. At the first floor, users can either access this level or continue via a smaller staircase to the second floor. Two additional circulation cores are positioned along the main corridor, serving as efficient connections to individual clusters and departments.

The internal circulation paths function beyond mere movement, as their generous articulation creates valuable opportunities for daily school activities and informal gathering. The differentiation of spatial sequences through patios and vertical voids creates dynamic visual experiences throughout. The main corridor’s relationship to its branching wings organized as clusters on the first floor and departments on the second enables intuitive wayfinding, with the educational program oriented along this primary circulation route.

1. Floor

The library is situated on the first floor, accessed as a natural continuation of the entrance hall and main stair sequence, occupying a cantilevered volume that offers views to the surrounding greenery, enhancing the learning environment. The administration area consolidates faculty and teaching staff spaces in a central zone on the first floor, enabling optimal access for teachers to departments distributed across floors while remaining easily accessible to parents.

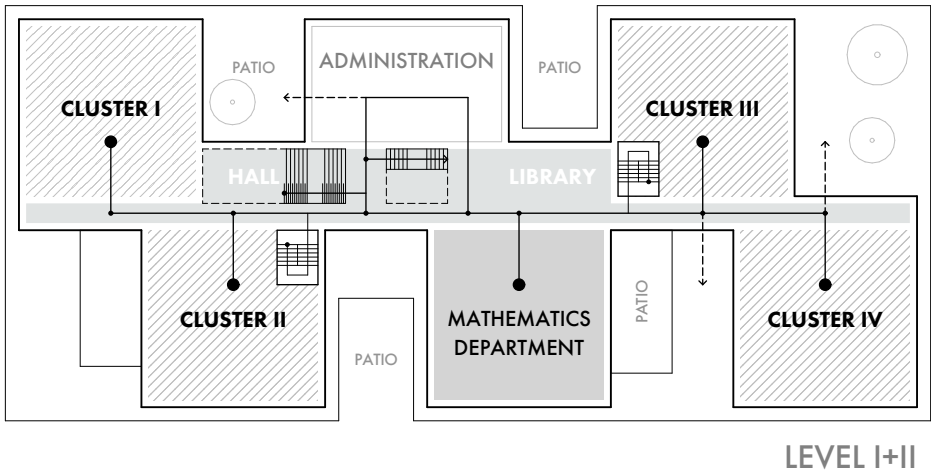
Special teaching spaces for mathematics and computer science are organized into a department positioned in the central wing, enabling their use for final examinations. This arrangement exemplifies the broader spatial-pedagogical concept that articulates the building complex into distinct programmatic zones through clustering. Clusters group a specific number of class units into spatial associations, strengthening cross-class cooperation while creating comprehensible units.

The Level I clusters are placed at each end of the first floor, where pairs of clusters function as schools within the school. Each pair shares circulation and service cores, enabling independent operation while minimizing travel distances for younger students.

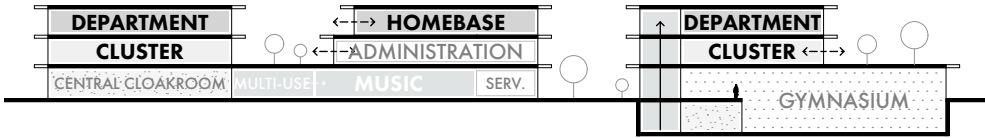
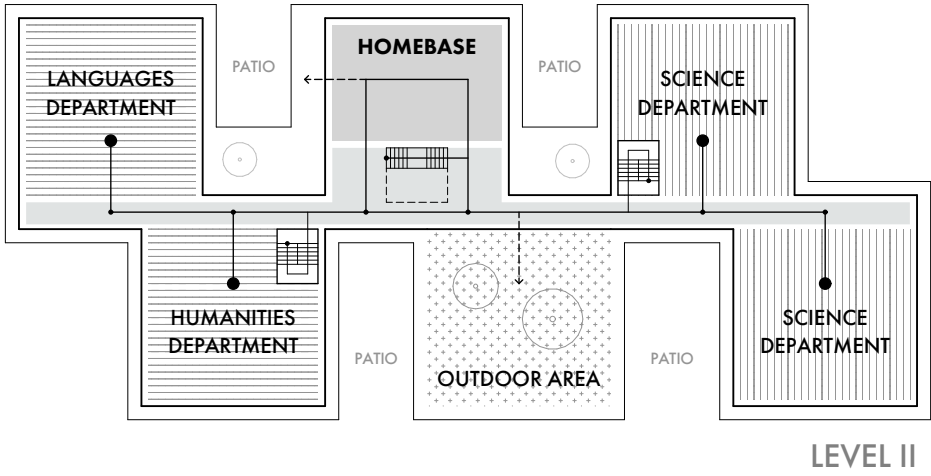
2. Floor

The second floor exclusively houses Level II spaces. Alongside subject-grouped teaching spaces organized in departments, Homebases serve as social meeting points for learning, working, recreation, and leisure activities, providing identity-forming spaces for these students. The large roof terrace on the second floor serves as an additional break area, connecting directly to the ground floor recreation areas via external stairs.

1.

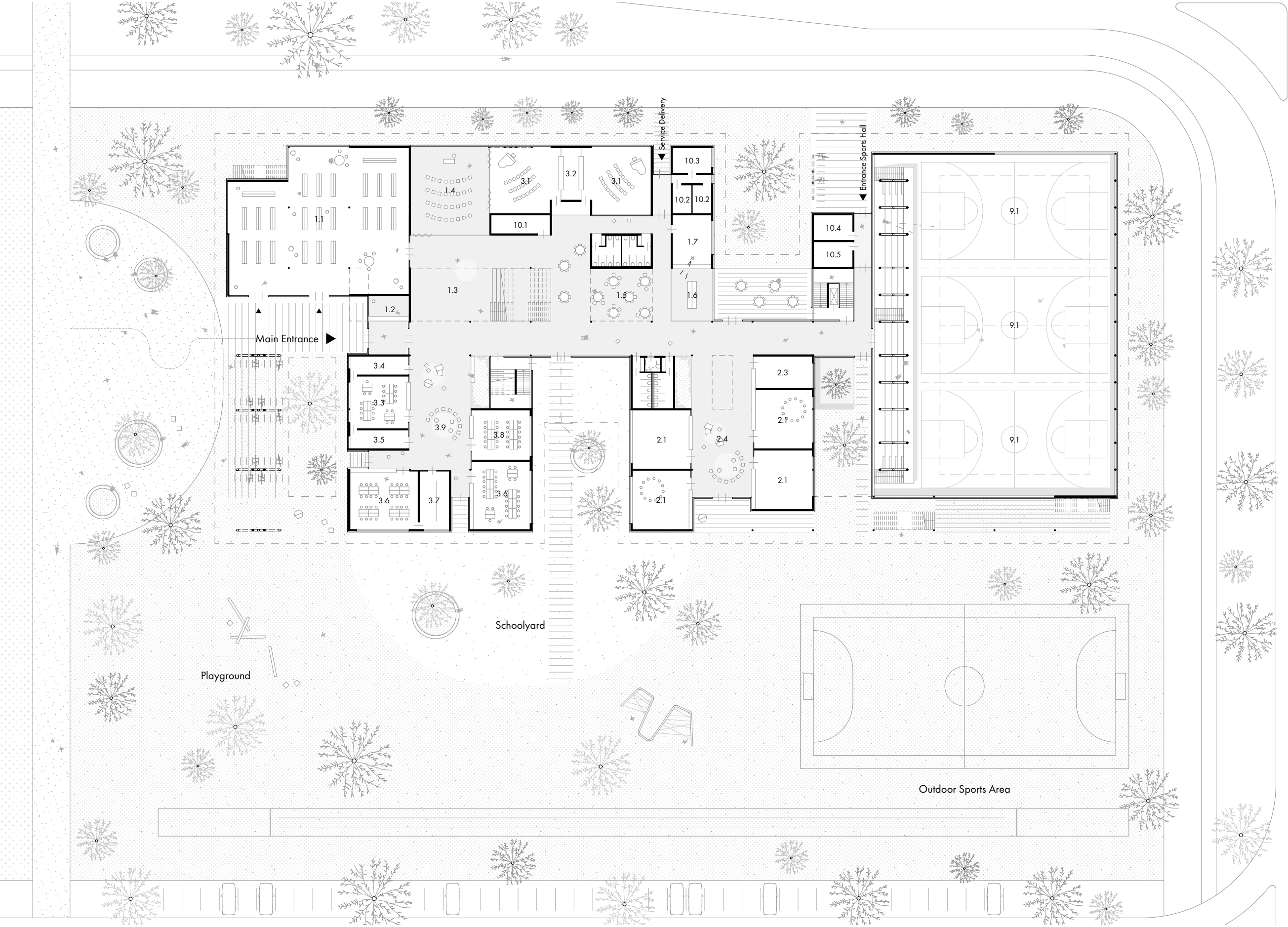


2.



Floor Plans

Ground Floor



Floor Plans

- 1

General Area

1.1

Central Cloakroom

450 m²

1.2

Custodian Lodge

15 m²

1.3

Assembly Hall

200 m²

1.4

Multipurpose Room

120 m²

1.5

Dining Zone

130 m²

1.6

School Cafeteria

40 m²

1.7

Serving Kitchen

40 m²

2

Level I - Theory Clusters

2.1

Classroom

65 m²

2.2

Group Room

30 m²

2.3

Team Room

30 m²

2.4

Open Learning Zone

3

Arts Department

3.1

Music Education

90 m²

3.2

Music Collection

20 m²

3.3

Technical Crafts

60 m²

3.4

Collection Room

20 m²

3.5

Machine Room

20 m²

3.6

Visual Arts

75 m²

3.7

Visual Arts Collection

20 m²

3.8

Creative Space

55 m²

3.9

Department Learning Zone

4

Mathematics and Computer Science Department

4.1

Computer Science

80 m²

4.2

Mathematics Classr.

65 m²

4.3

Mathematics Collection

30 m²

4.4

Server Room

30 m²

4.5

Department Learning Zone

5

Administration

5.1

Secretary's Office

25 m²

5.2

Principal's Office

20 m²

5.3

Administration Office

15 m²

5.4

Archive

10 m²

5.5

School Medical Room

20 m²

5.6

Social Area

40 m²

5.7

Central Preparation Room

135 m²

5.8

Cloakroom

30 m²

5.9

Copy Room

10 m²

5.10

Staff and Student Representatives

25 m²

1. Floor

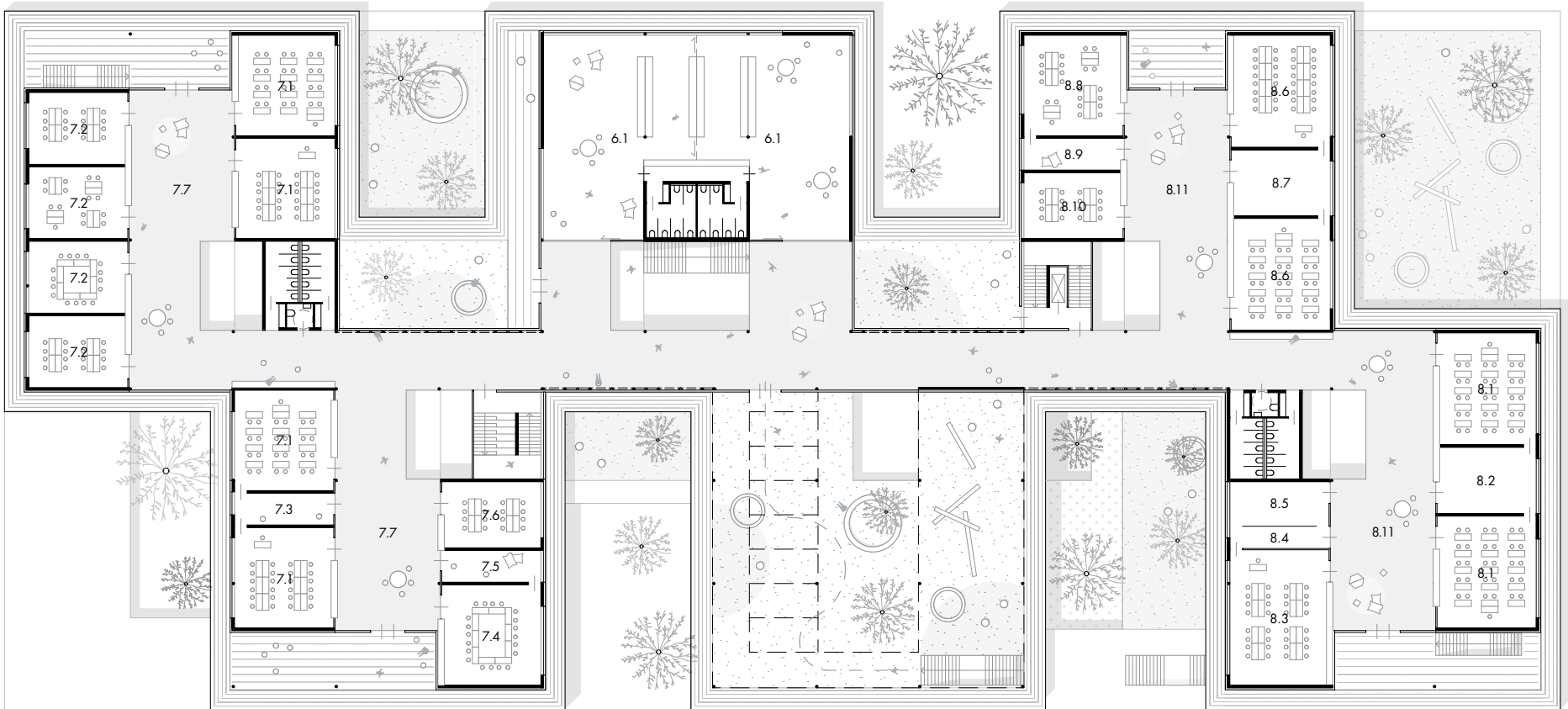


Scale 1:500

Floor Plans

2. Floor

6	Level II - Homebases	
6.1	Homebase	180 m ²
7	Languages and Humanities Department	
7.1	Large Language Classr.	65 m ²
7.2	Small Language Classr.	45 m ²
7.3	Collection Room	20 m ²
7.4	History Classroom	65 m ²
7.5	Collection Room	20 m ²
7.6	Religion	45 m ²
7.7	Department Learning Zone	
8	Science Department	
8.1	Physics Classroom	75 m ²
8.2	Physics Collection	45 m ²
8.3	Chemistry Classroom	90 m ²
8.4	Chemistry Collection	15 m ²
8.5	Chemistry Teacher Preparation	30 m ²
8.6	Biology Classroom	75 m ²
8.7	Biology Collection	45 m ²
8.8	Geography	65 m ²
8.9	Collection Room	20 m ²
8.10	Civic Education	45 m ²
8.11	Department Learning Zone	
9	Sport	
9.1	Gymnasium	405 m ²
9.2	Equipment Rooms	60 m ²
9.3	Locker Rooms with Washrooms	40 m ²
9.4	Teacher Changing Rooms	15 m ²
10	Service Area	
10.1	Storage	20 m ²
10.2	Service Staff Changing Rooms	10m ²
10.3	Service Staff Room	20 m ²
10.4	Waste Room	20 m ²
10.5	Cleaning Equipment Room	20 m ²
10.6	Furniture Storage	45 m ²
10.7	Archive	45 m ²
10.8	Technical Room	180 m ²

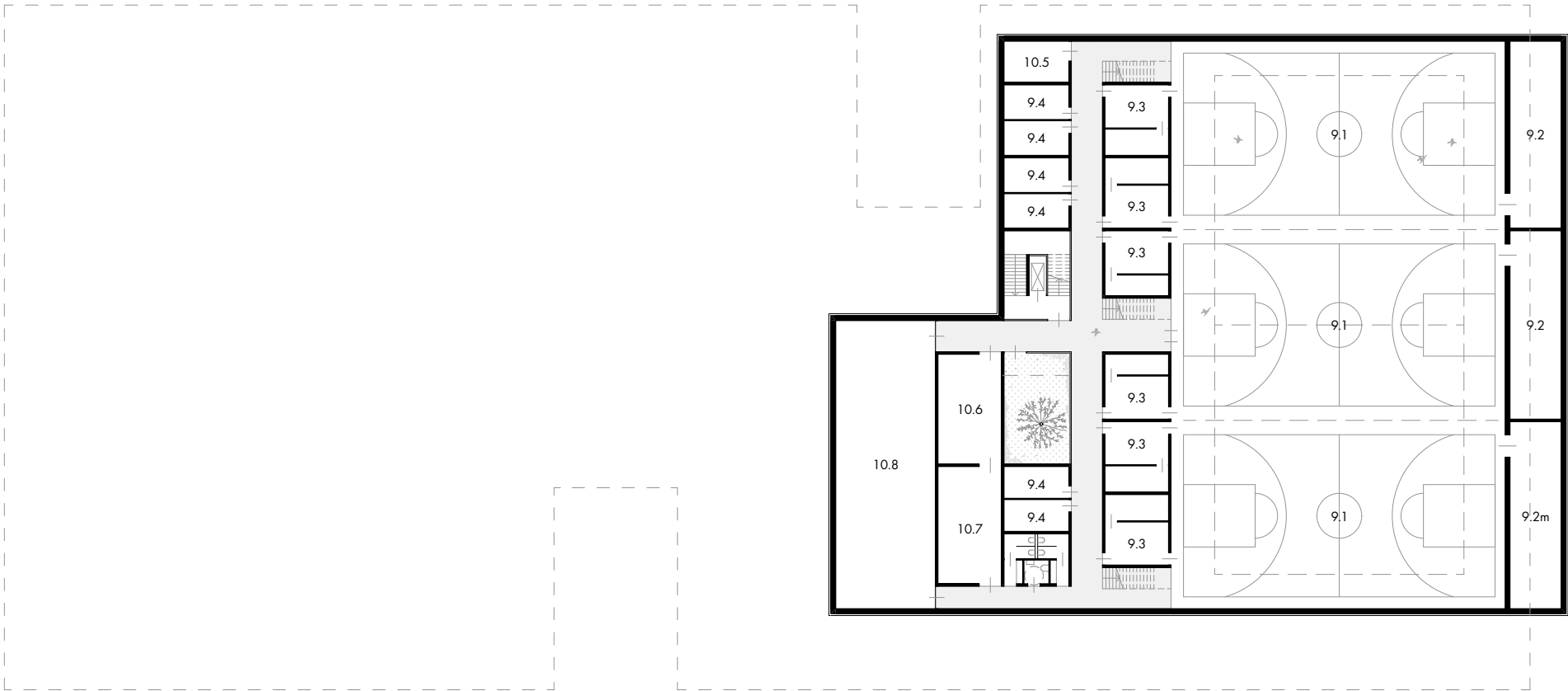


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Floor Plans

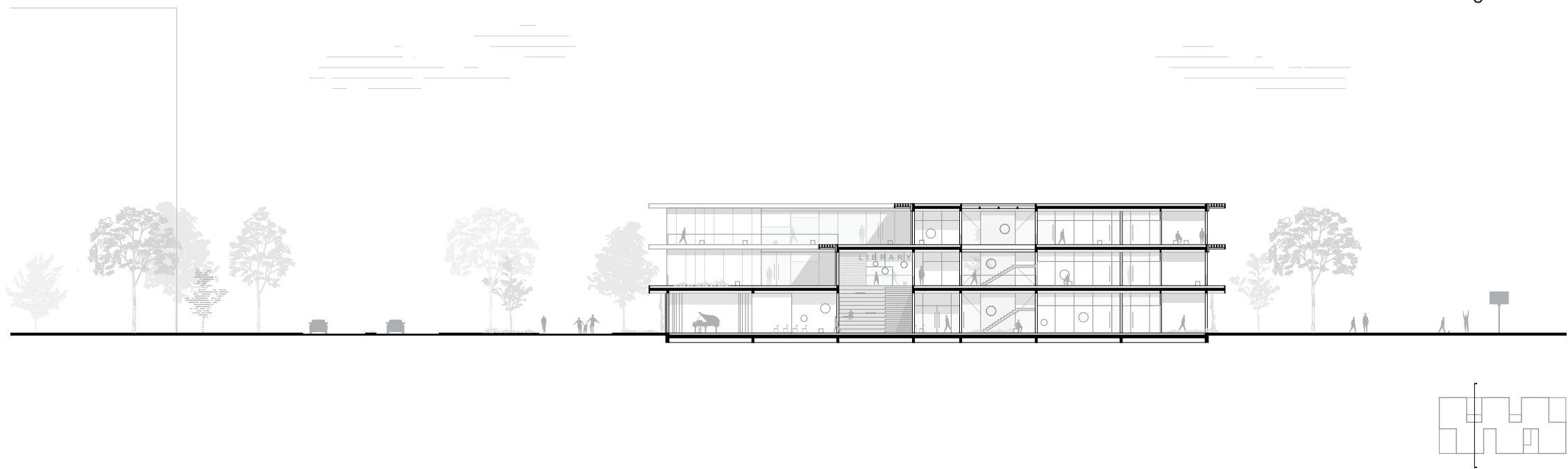
Lower Ground Floor



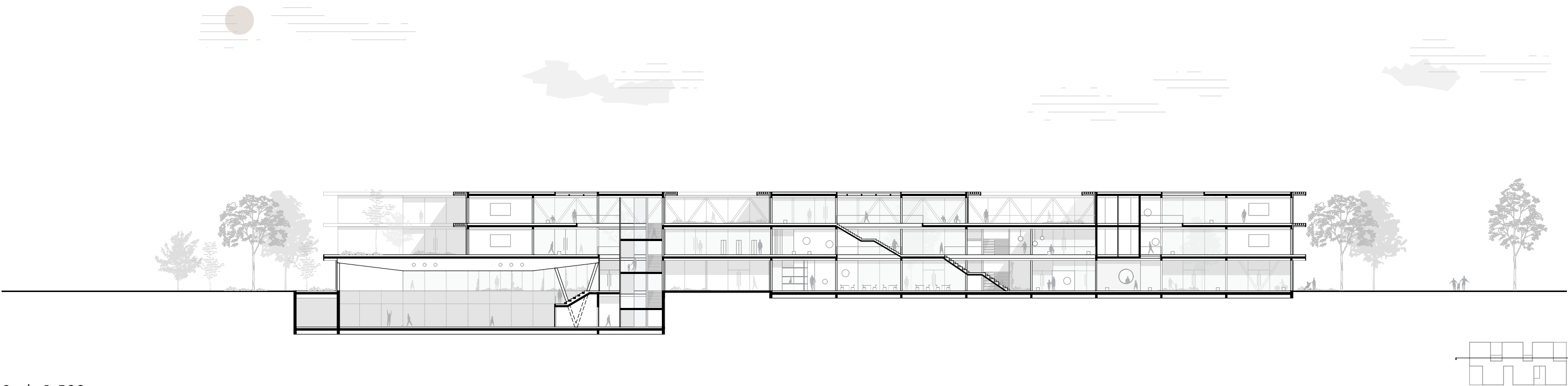
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Sections

Cross Section
through the Hall



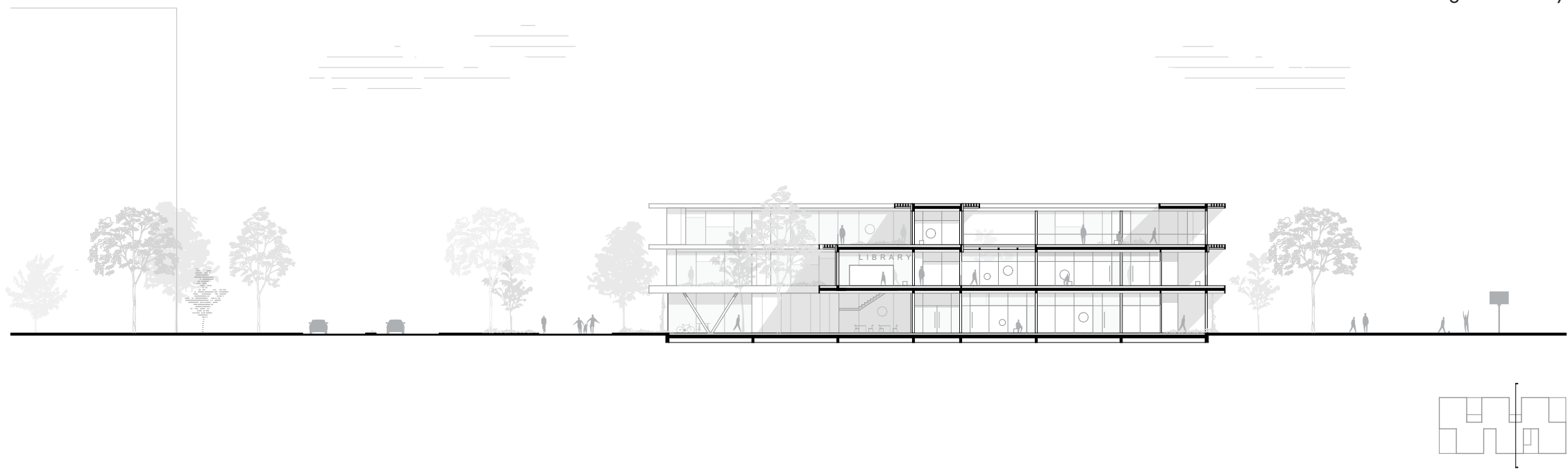
Longitudinal Section
through the Hall



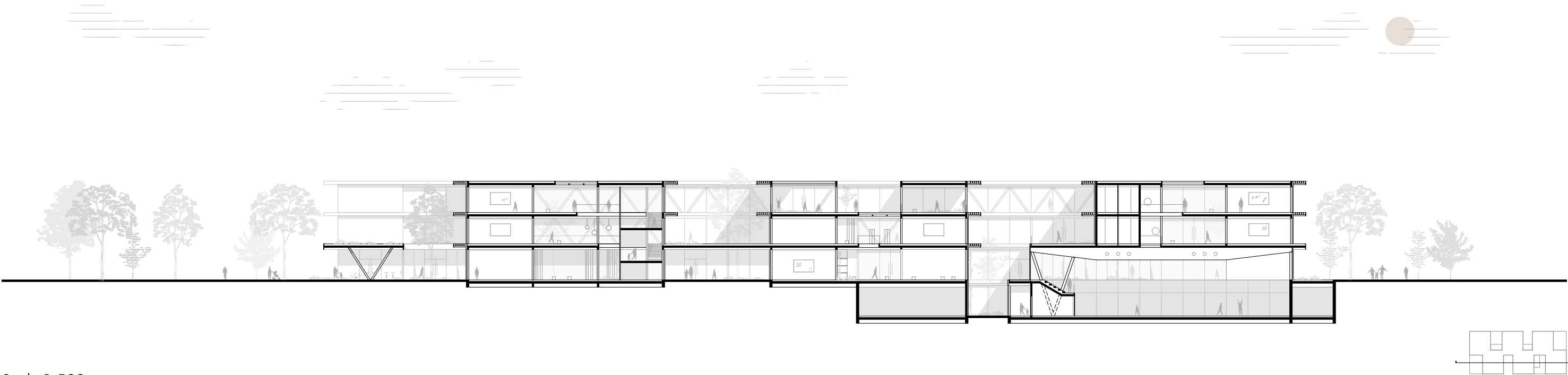
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Sections

Cross Section
through the Library



Longitudinal Section
through the Main Entrance

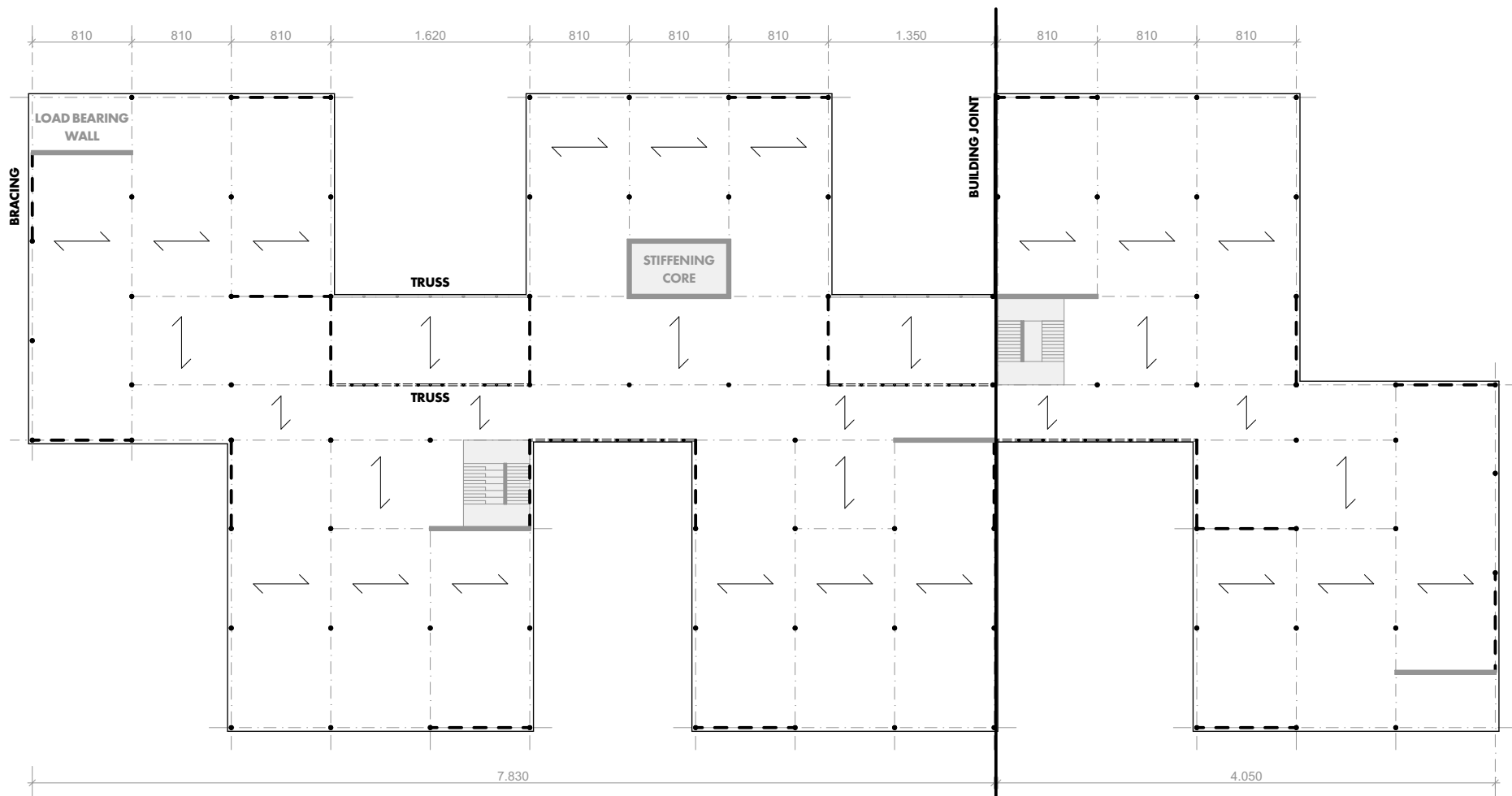
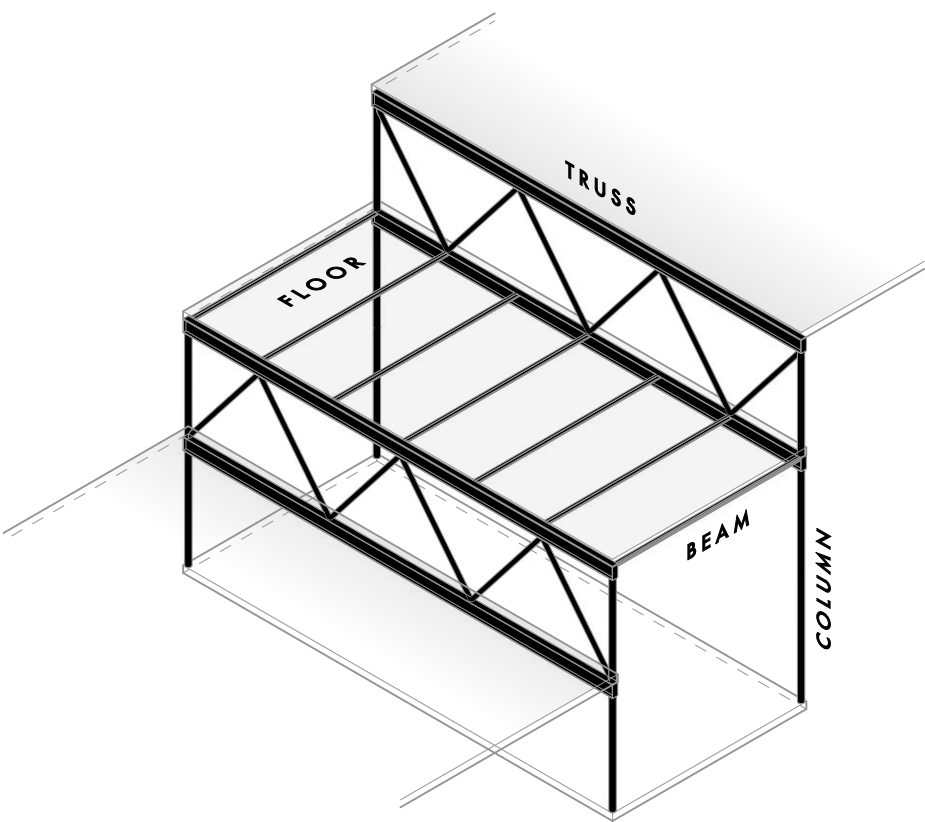


Scale 1:500

Structural Concept

Hybrid Structure

The structural concept responds to contemporary and future pedagogical requirements through a robust and flexible spatial framework. The design emphasizes adaptability, enabling future modifications, expansions, and potential deconstruction while facilitating material reuse. A hybrid construction approach combines steel and concrete elements, with a primary system of slender steel skeleton framework integrated with reinforced concrete shear walls and cores. Slender steel columns and beams enable open, unobstructed floor spaces, imparting a sense of lightness to the structure. The use of steel allows for larger spans between supporting elements, while prefabrication techniques reduce on-site construction time and enhance quality control measures.



Truss System

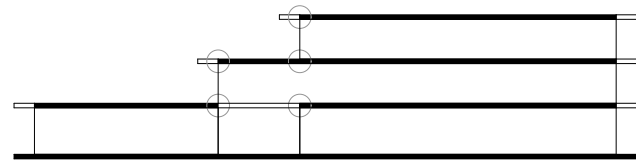
The building employs story-high trusses in areas requiring larger spans, notably the 16.2-meter school hall and 13.5-meter cantilevered library. These trusses, integrated within the facade plane, follow the structural principle of slender, widely-spanned construction. The staggered arrangement supports two floor levels simultaneously, with top and bottom chords supporting respective floors, connected by longitudinal linking beams for load distribution and stability. The trusses maintain consistent height and configuration throughout, promoting modular construction while creating unobstructed spaces essential for the school hall and library functions.



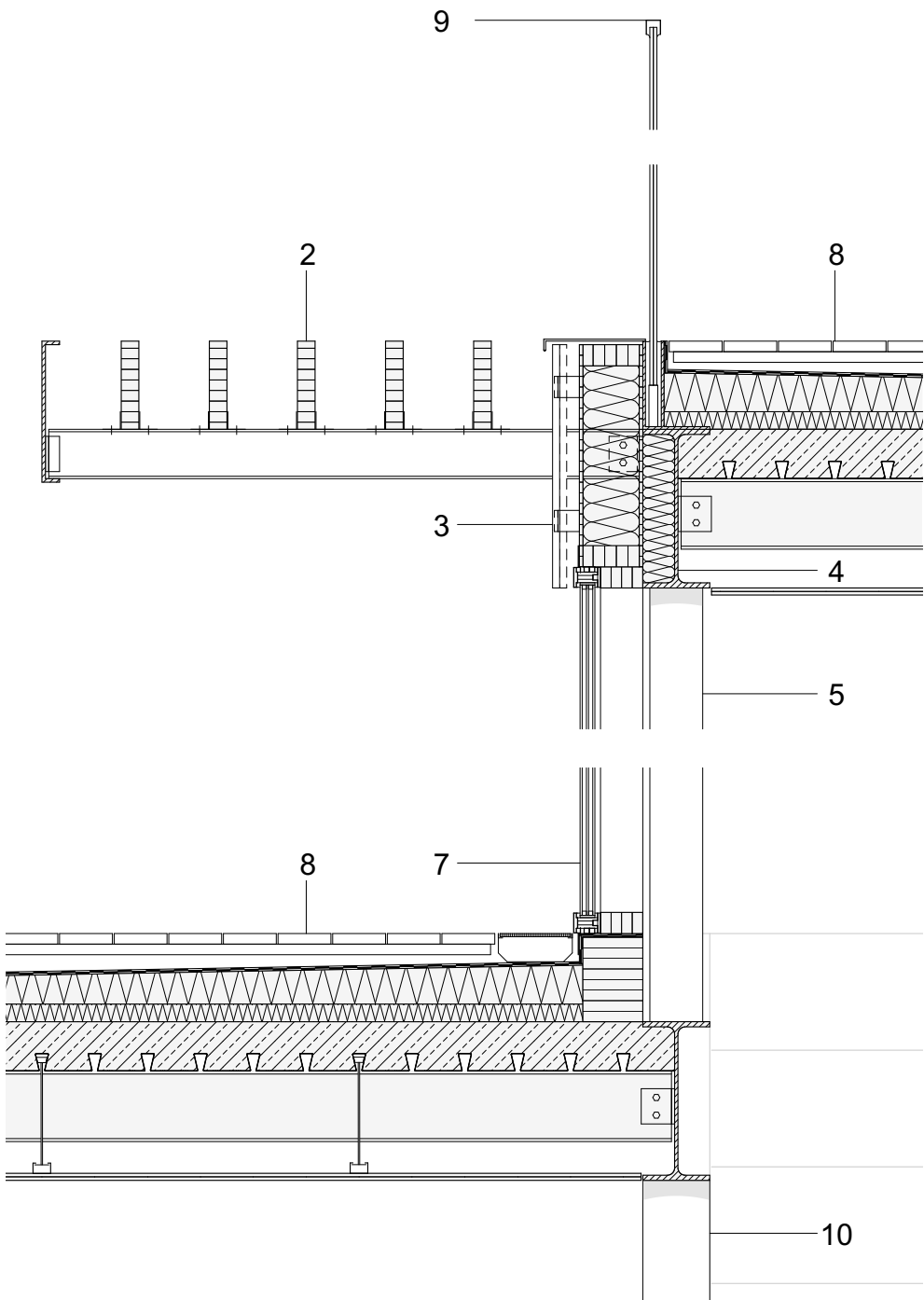
Lateral Stability

Lateral stability is achieved through strategically positioned reinforced concrete shear walls and cores resisting longitudinal loads, while cross-bracing elements provide stability in the transverse direction. These elements transfer horizontal forces efficiently while being carefully integrated to preserve the openness of educational spaces. Between the primary beams, smaller-dimensioned secondary beams support composite steel-concrete floor slabs. This floor system combines the advantages of both materials, optimizing structural depth and span capabilities. The incorporation of prefabricated components enhances construction precision and efficiency, contributing to the overall spatial and structural performance without compromising the architectural vision.

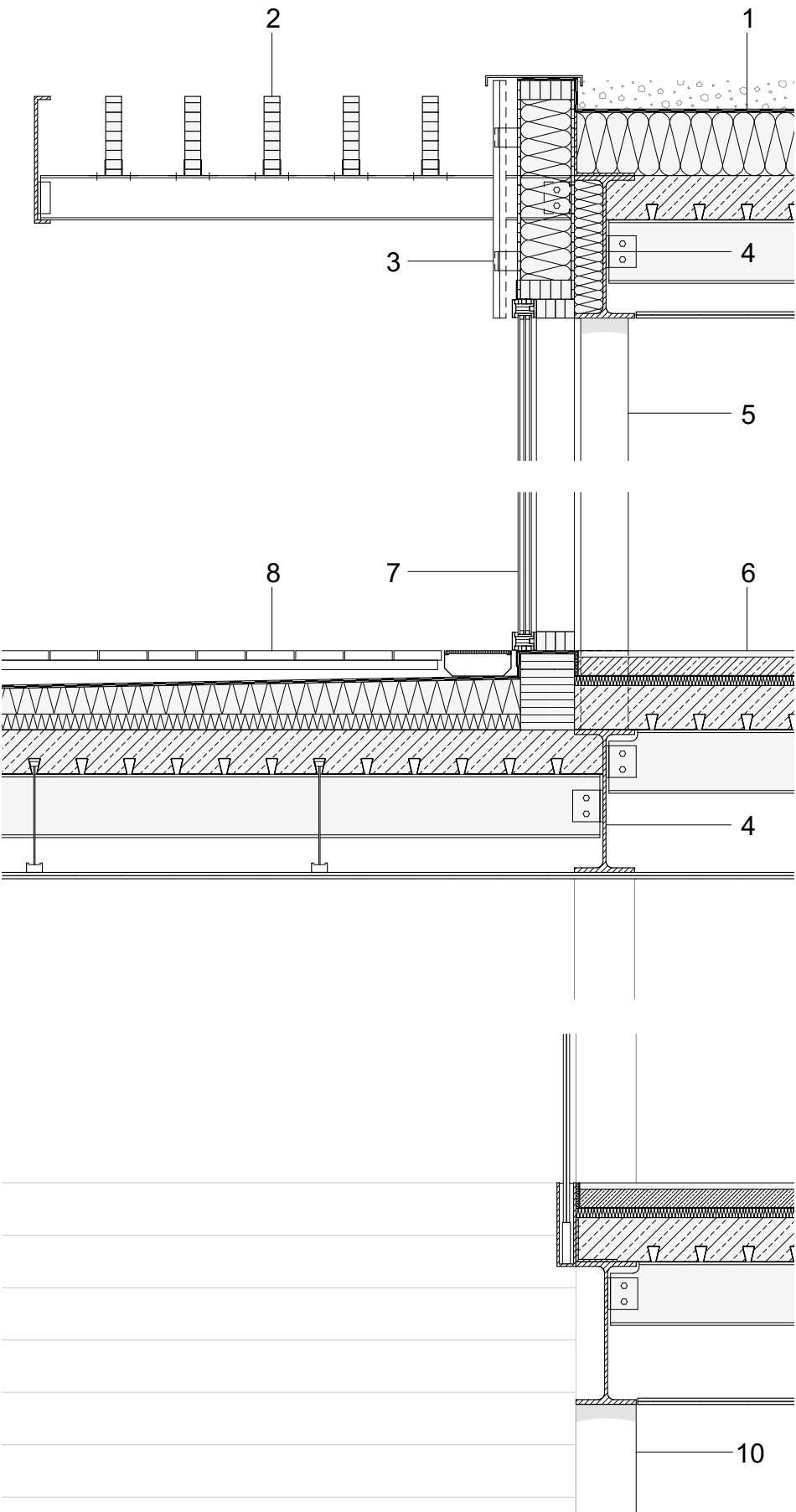
Facade Section



- 1 roof structure
 - gravel 50 mm
 - two-layer seal
 - sloped mineral wool
 - thermal insulation 200 mm
 - steel-concrete composite slab 140 mm
 - supported by IPE 200 steel beam
 - service cavity 250 mm
 - acoustic panel 20 mm
- 2 sun protection 250/50 mm
 - timber slats
 - supported by IPE 140 steel beam
- 3 timber panel construction
 - aluminium standing seam cladding 1 mm
 - mounting system
 - back ventilation 40 mm
 - diffusion open facade membrane
 - MDF board 16 mm
 - solid structural timber (KVH) 140/60 mm
 - with mw thermal insulation fill
 - OSB board 15 mm
- 4 truss chord 450/190 mm
 - IPE 450 steel beam



Scale 1:20



- 5 truss web
 - round steel tube Ø 150 mm
- 6 floor construction
 - flooring 20 mm
 - screed 60 mm
 - separation layer
 - impact sound insulation 30 mm
 - steel-concrete composite slab 140 mm
 - supported by IPE 200 steel beam
 - service cavity 250 mm
 - acoustic panel 20 mm
- 7 transom and mullion facade
 - timber profile 140/60 mm
 - aluminium cover
 - triple glazing
- 8 roof terrace construction
 - timber decking 30 mm
 - with substructure
 - two-layer seal
 - sloped insulation 160 mm
 - steel-concrete composite slab 140 mm
 - supported by IPE 200 steel beam
 - service cavity 250 mm
 - acoustic panel 20 mm
- 9 laminated safety glass railing 20 mm
- 10 column
 - round steel tube Ø 190 mm

Materialization

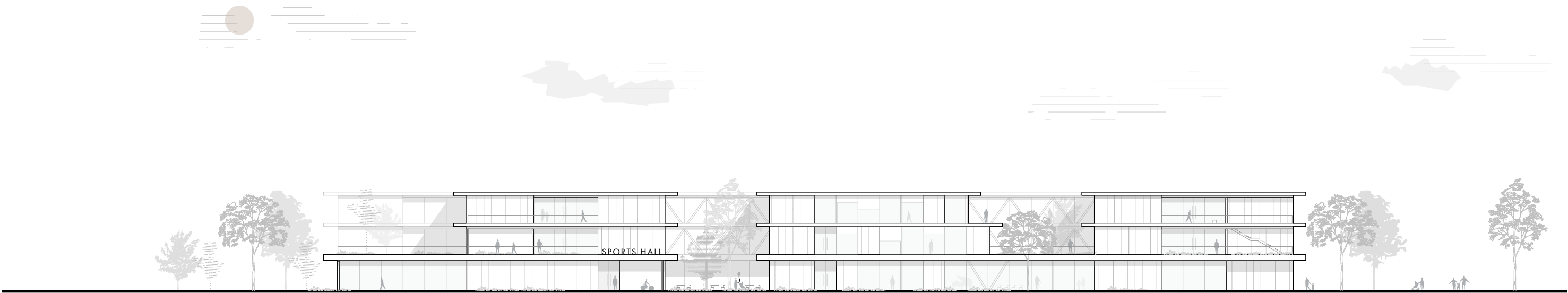
The building’s structural concept manifests through a clear articulation of its slender, wide-span design elements. Both interior and exterior spaces express the construction logic transparently, with truss beams visible through strategic glazing that emphasizes the lightweight nature of the structural system. The white-coated steel elements maintain a minimal aesthetic, reinforcing the overall sense of structural lightness while clearly expressing the building’s tectonic logic.

The facade organization follows a distinct horizontal rhythm that articulates the building’s volumetric composition. Seemingly floating floor slabs create visual lightness, while actually functioning as horizontal sun-shading elements separate from the structural floor plates. This dual functionality contributes to both environmental performance and architectural expression. At ground level, integrated landscape elements provide privacy screening, while upper floors utilize the projecting horizontal elements for both sun protection and visual screening.

Interior spaces feature wooden wall surfaces and finishes that introduce warmth and tactile quality to the learning environment. This material strategy facilitates a fluid transition between exterior and interior spaces, with natural elements and greenery from the outside flowing inward. The transparent building envelope enables this dialogue between inside and outside, creating a harmonious relationship between built form and natural context.

Elevations

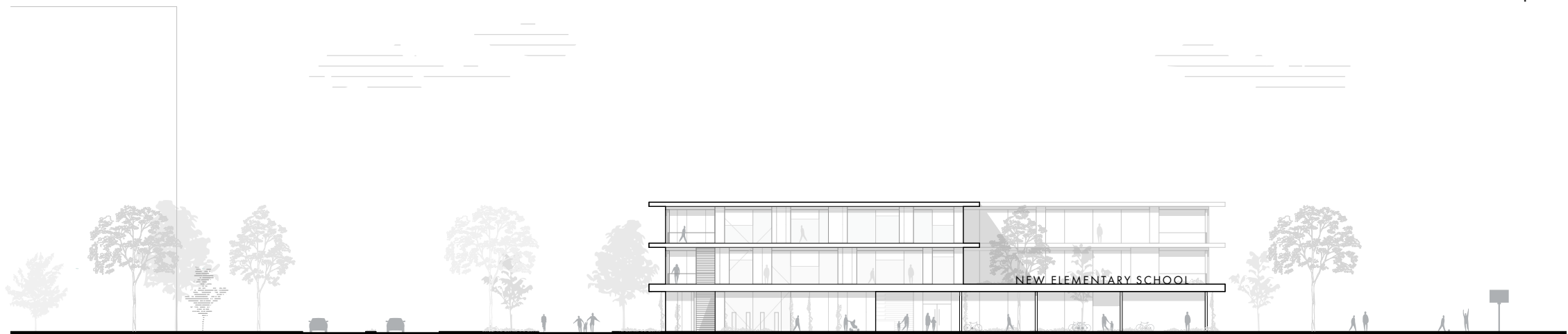
Northwest Elevation
from the Radomira Raše Radujkova Street



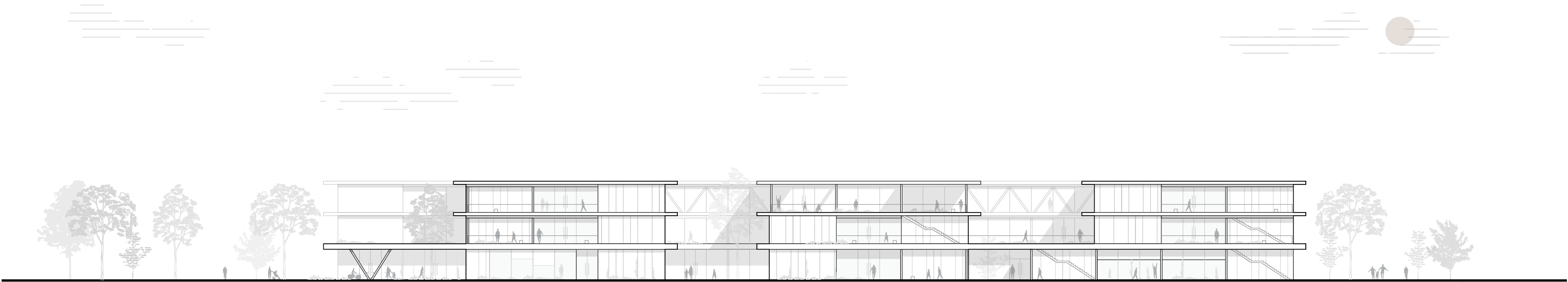
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Elevations

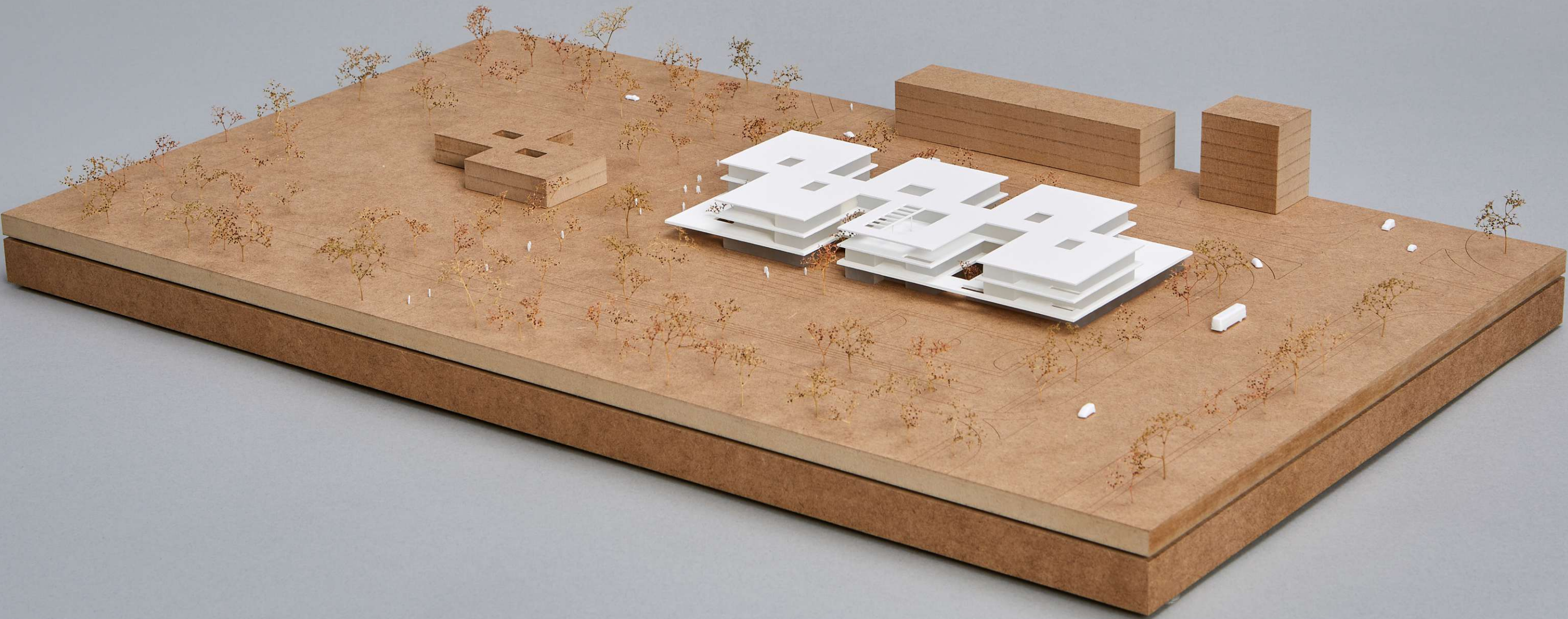
Southwest Elevation
from the Public Square

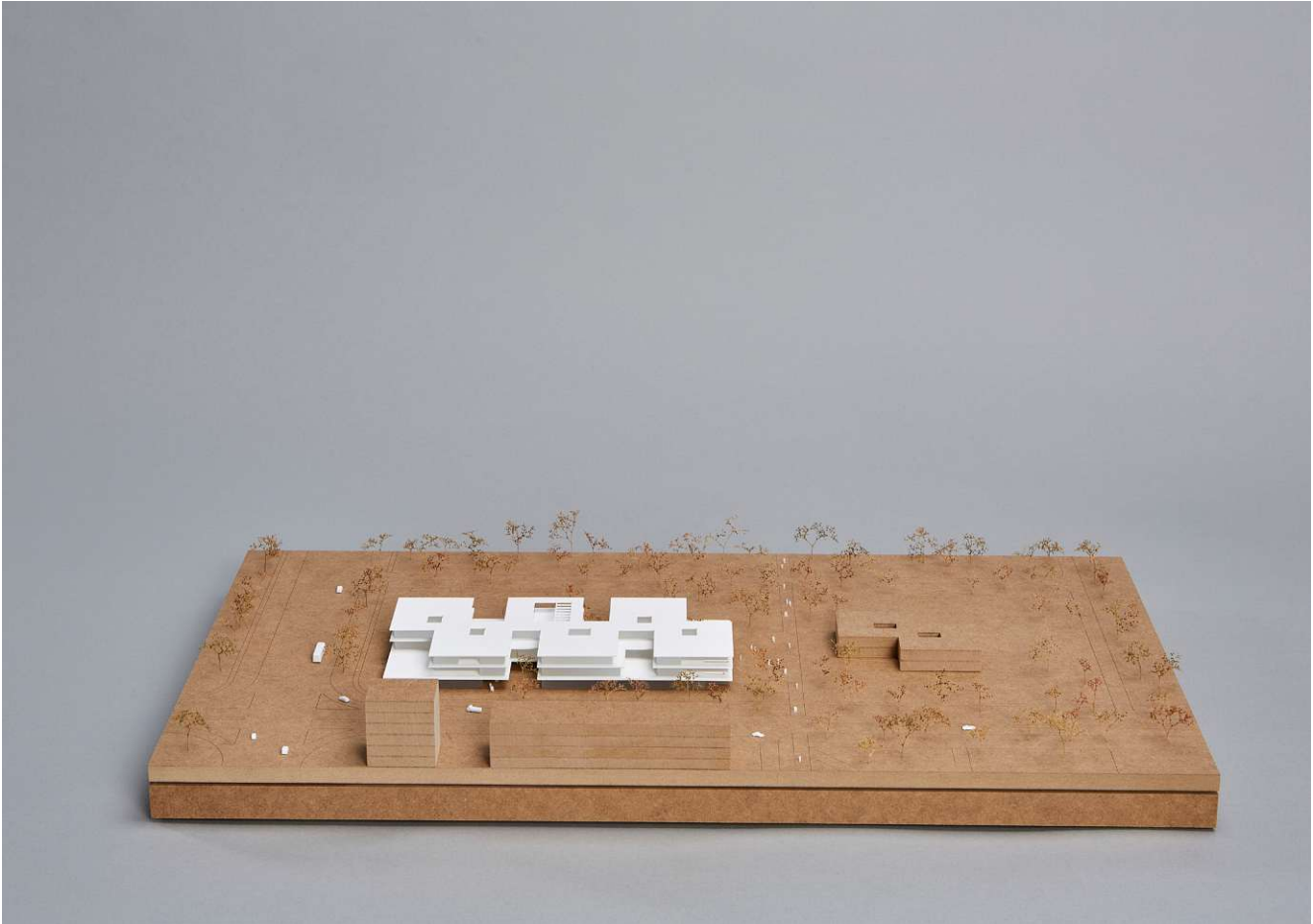


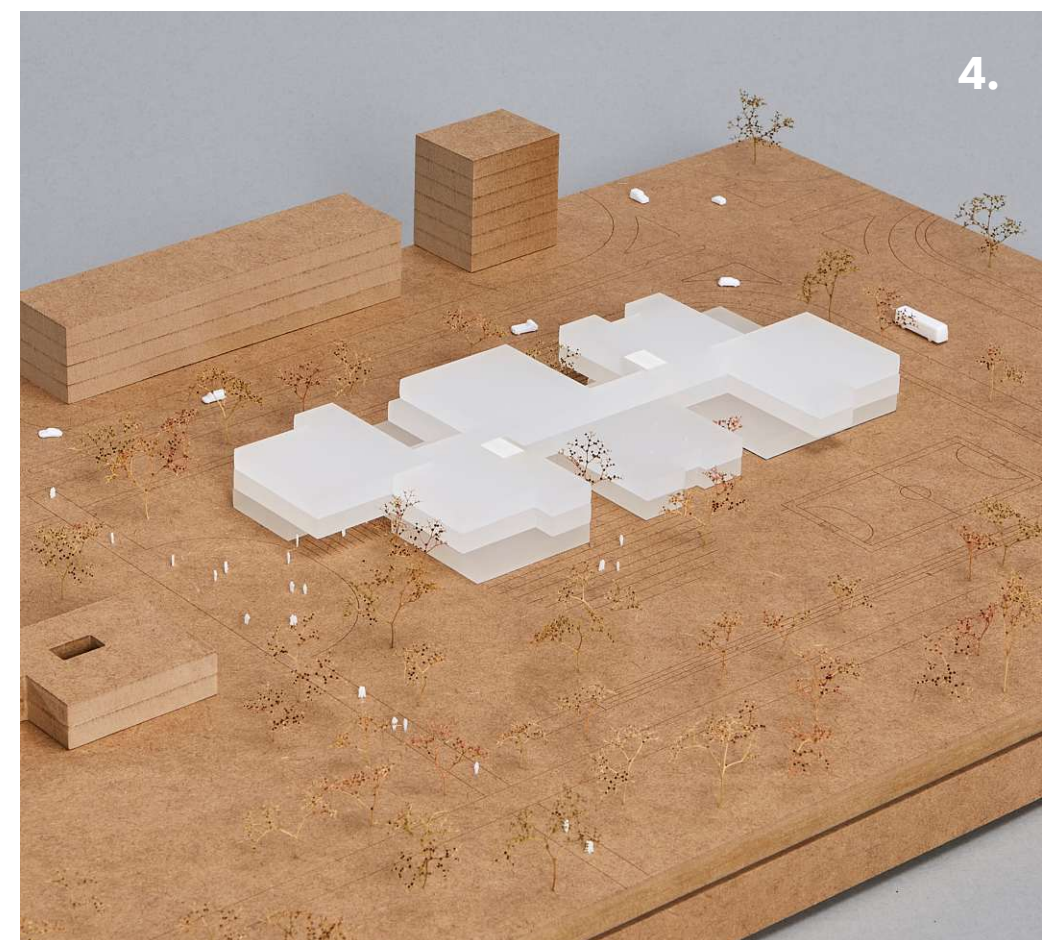
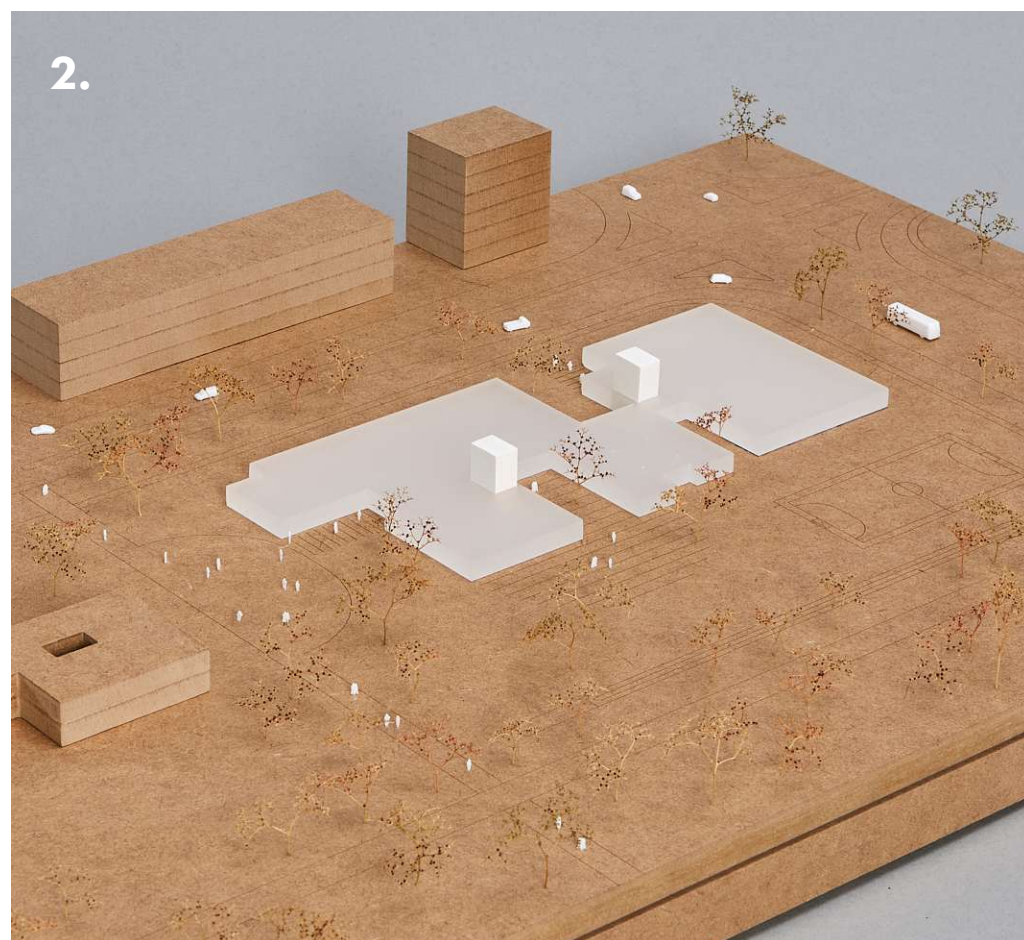
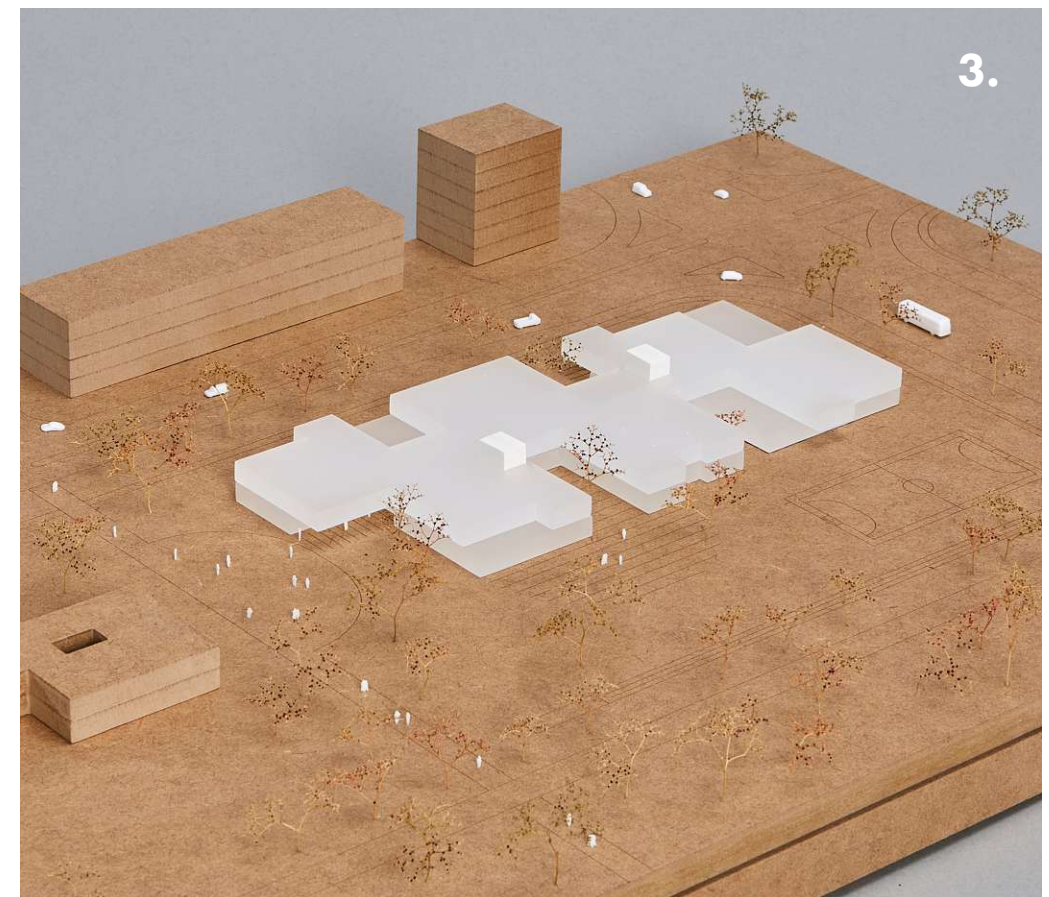
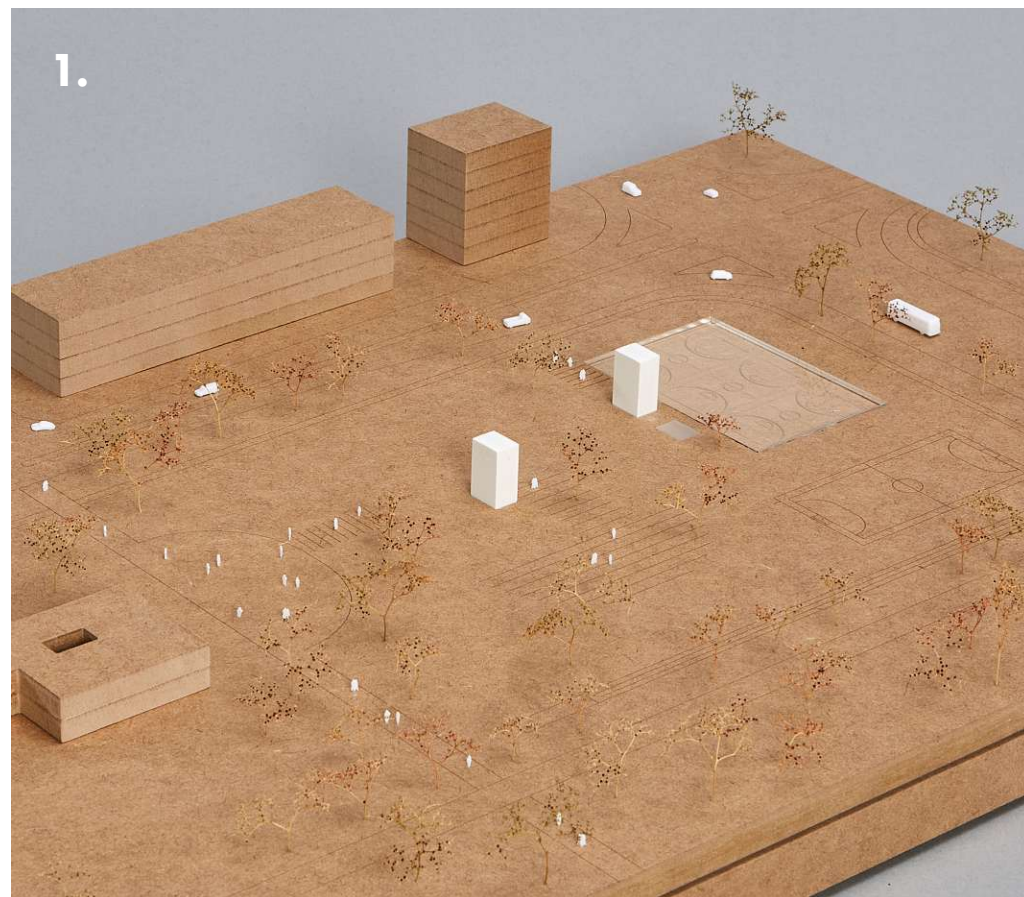
Southeast Elevation
from the Schoolyard



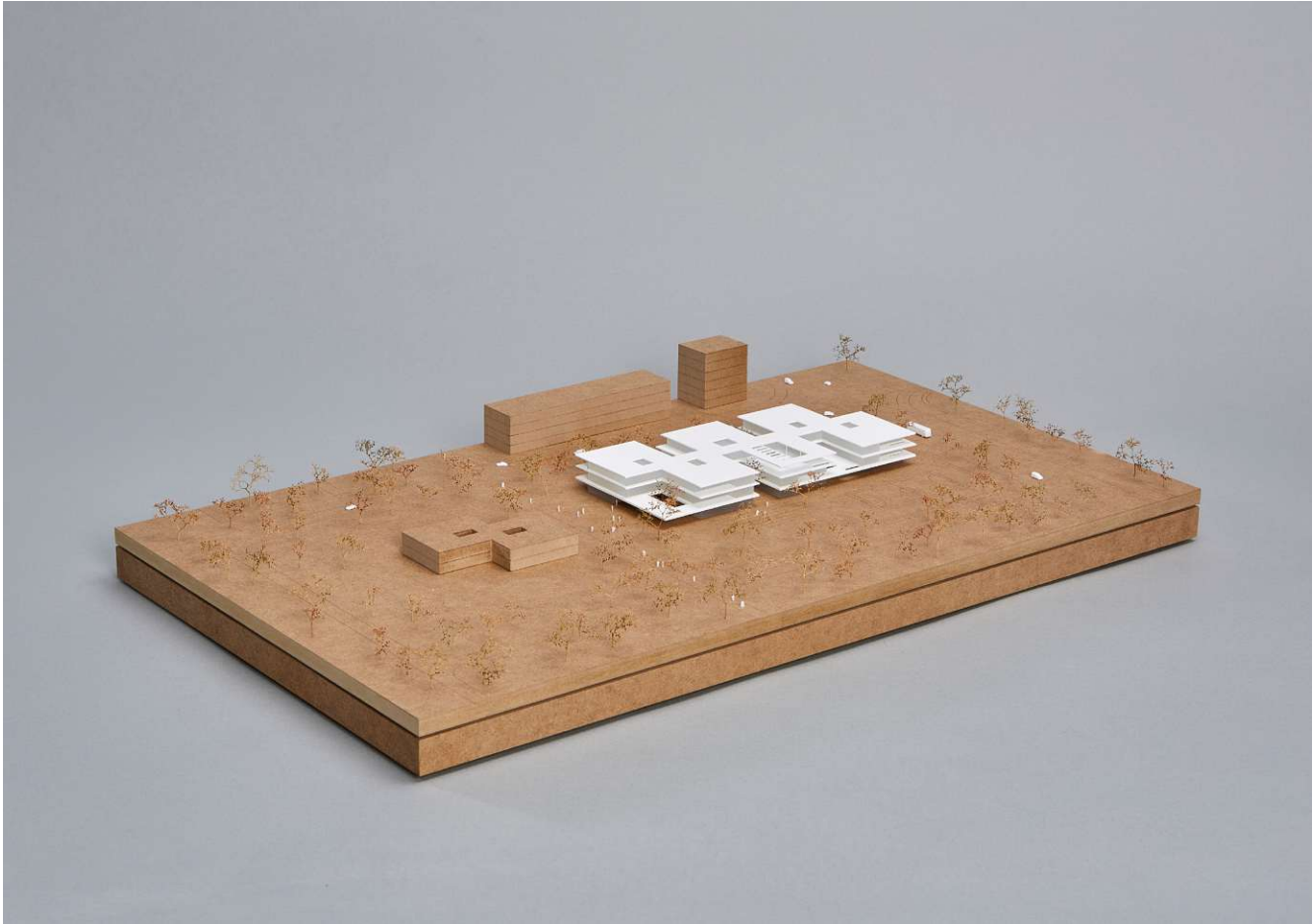
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Model



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Fig. 2. Name of Mary Church, also known as the Cathedral, 1894, Stare fotografije Novog Sada [Facebook page]

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Interview:

Josipović, Albert (architect). Interview by Anja Krnetić and Amar Kulenović
Personal interview. Makarska, Croatia August 18, 2023.

Model photographs: Gregor Titze

Unless otherwise noted, all photographs, drawings, and diagrams are by the author.

