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RECOMMENDATIONS

BOOKLET / DESIGN STUDIOS
PORTO

UAH! Unconventional Affordable Housing!

Booklet / Design studios

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POLITECNICO MILANO 1863 DIPARTIMENTO DI ARCHITETTURA E STUDI URBANI

UNIVERSITÀ DEGLI STUDI DI TRIESTE

UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO

Politecnico di Bari

1. The project's framework

The profound socio-demographic transformations that have taken place in Europe over the past decades have led to major changes in household composition and what is typically referred to as the family. As a consequence, the ideal equivalence between "family" and "housing typology", as promoted by the Modern Movement, collapsed highlighting the increasing distance existing between housing demand and housing supply. The above-mentioned transformations have resulted mainly in an increase in the number of households of single people, divorced couples with children, single parents and the elderly, as well as in the spread of the phenomenon of cohabitation among different population groups in search of affordable housing solutions. At the same time, changes in the labour market, namely a significant rise in temporary employment and delocalization, have forced people to organise their lives between more than one dwelling and led to the emergence of new lifestyles, such as couples living apart together in long-distance relationships. In addition, worsening employment and economic conditions have reduced housing affordability, increased precarious and informal housing conditions and set constraints on access to housing, even for middle-income groups and people whose housing demands appear to be increasingly changeable across their life trajectories.

While unconventional* and affordable housing practices can take many shapes and emerge from a diversity of household situations, the lack of an adequate offer by social and public housing policies reflects the inadequacies, dissatisfaction with or inaccessibility of conventional housing offers. A key hypothesis underlying the research is therefore that unconventional solutions can be strategies to cope with such inadequacies and a lack of affordability, better responding to changing or intensifying demands. The intersection between the two levels, affordability and unconventionality, has yet to be explored in-depth and can provide valuable insights for a reflection on existing housing (design).

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The project's framework

The Research Project of National Relevance "UAH! Unconventional Affordable Housing" – guided by Politecnico di Milano with Università degli Studi di Trieste, Politecnico di Bari and Università di Bari – aims at identifying and analysing existing affordable and unconventional housing solutions, investigating practices, projects and policies - thus, gaining an understanding of the wide range of housing phenomena considered unconventional and affordable in Europe; analyse these housing solutions and evaluate their qualities, innovative features, shortcomings and criticalities; and at developing architectural design experiments & proposals (in each of the research units' geographical contexts) at the intersection of policy and design, in order to explore the feasibility of innovative solutions within a given context.

Within the scope of the Dissertation Course of the FAUP's Integrated Master's Degree (MIArq), as well as FAUP's participation in the UAH! Unconventional Affordable Housing Design Studios Network, 16 students enrolled in the 4th and 5th years of MIArq are challenged to propose the transformation of Porto's Silo Auto into a non-conventional, affordable housing unit.

The design marathon will take place from 22–24 April 2025, supported by FAUP lecturers Diogo Aguiar, Cristina Guedes, Joana Restivo, Margarida Quintã, Pedro Baía, and Raquel Dias, as well as Eliseu Gonçalves, Raquel Paulino and Rui J. G. Ramos, who will contribute to the discussion of topics and proposals.

***By "unconventional" we mean above all: the non-equivalence between the idea(s) of family and the type of housing; the presence - among households - of different (social and cultural) profiles and different age populations.**

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2. The site: Porto

Situated on Portugal's Atlantic coast, Porto is the nation's second-largest city, home to approximately 250,000 residents within 41.42 km². It anchors a metropolitan region of 17 municipalities, with a combined population of roughly 1.75 million across 2,040 km². This places it as the second most populous NUTS III region in Portugal, after Lisbon, and the 13th largest urban agglomeration in the European Union. The intervention site is in the former parish of Cedofeita**, which has a population of around 22,100 people living in an area of 2.66 km² according to 2011 data. Following the 2013 administrative reform that brought together the parishes of** Sé**,** São Nicolau**,** Vitória**,** Miragaia **and** Santo Ildefonso**,** Cedofeita **is now part of the union of central parishes. This corresponds to the enlarged "historic centre", with around 37,500 inhabitants in approximately 5.43 km².**

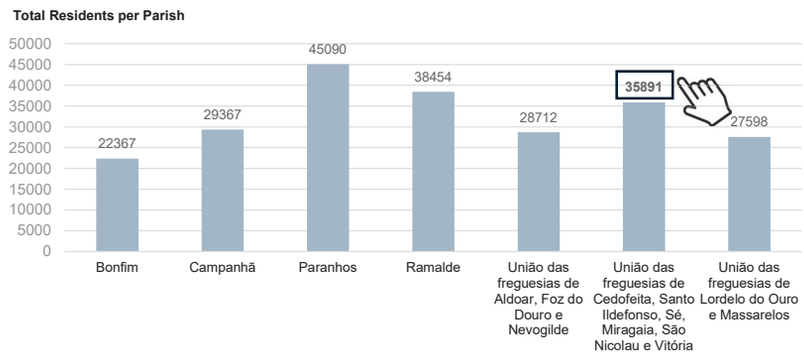
Historically, Porto was a city shaped by the negotiation between ecclesiastical powers and the bourgeoisie, traditionally at odds with the nobility—though not with the monarchy. Both the nobility and the clergy settled in magnificent manor houses on the outskirts of the city for production and recreation, most of which were built or improved in the Baroque period. Porto was the site of the first republican uprising in 1891, before the Republic was established in 1910. It had been boosted economically by the old seaport on the River Douro, which has the largest river basin on the peninsula (around 79,000 km²). Porto experienced accelerated urban and economic growth from the 18th century onwards, following the introduction of quality control measures for Port Wine production on the steep slopes to the east up the Douro River. Like many other cities, Porto experienced significant growth due to industrialisation, albeit archaic, which led to a critical shortage of adequate housing for workers throughout the 19th and 20th centuries. This issue was only partially overcome by the democratic revolution of 25 April 1974, which ended the installed dictatorial regime. In democratic Portugal in the second half of the 1970s, the architect Nuno Portas, the Secretary of State for Housing and Urbanism, promoted several state housing programmes. These included the SAAL programme (Serviço Ambulatório de Apoio Local, or Ambulatory

The site:
Porto

Statistics

Residents (No.)

35891



Residents 65+ (%)

27,33

Proportion of the resident population aged 65 or over	(%)
Porto	**25,97**
Bonfim	28,30
Campanhã	27,22
Paranhos	25,48
Ramalde	23,64
Union of the Parishes of Aldoar, Foz do Douro and Nevogilde	26,30
Union of the Parishes of Cedofeita, Santo Ildefonso, Sé, Miragaia, São Nicolau and Vitória	**27,33**
Union of the Parishes of Lordelo do Ouro and Massarelos	24,65

Average Household Size (No.)

1,99

Average size of private households	(No.)
Porto	**2,23**
Bonfim	2,06
Campanhã	2,33
Paranhos	2,16
Ramalde	2,36
Union of the Parishes of Aldoar, Foz do Douro and Nevogilde	2,44
Union of the Parishes of Cedofeita, Santo Ildefonso, Sé, Miragaia, São Nicolau and Vitória	**1,99**
Union of the Parishes of Lordelo do Ouro and Massarelos	2,35

Type of Family (No.)

Geographical location	Single person	Nuclear without children	Nuclear with children	Others	Private households consisting of a single-parent family nucleus	Father with at least one child under 25 years old	Father with child(ren), the youngest being 25 or older	Mother with at least one child under 25 years old	Mother with child(ren), the youngest being 25 or older
Porto	102214	22566	24090	2115	14560	945	930	7018	5667
Bonfim	10876	2467	2146	156	1377	93	96	625	563
Campanhã	12583	2872	2932	409	2210	119	155	1082	854
Paranhos	20840	4492	4510	433	3006	196	191	1457	1162
Ramalde	16325	3506	4630	366	2486	165	146	1229	946
Union of the Parishes of Aldoar, Foz do Douro and Nevogilde	11755	2672	3638	232	1668	154	93	807	614
Union of the Parishes of Cedofeita, Santo Ildefonso, Sé, Miragaia, São Nicolau and Vitória	**18099**	4046	3055	244	2054	118	147	928	861
Union of the Parishes of Lordelo do Ouro and Massarelos	11736	2511	3179	275	1759	100	102	890	667

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Local Support Service), which covered the São Victor neighbourhood designed by architect Álvaro Siza Vieira and the Leal neighbourhood [BL] designed by architect Sergio Fernandez, situated in the vicinity of the Silo Auto site.

Porto's current municipal boundaries were delineated by the Circunvalação Road, established for customs purposes at the end of the 19th century. They came to include an extensive peri-urban area comprising rural centres to the north-west, north, and north-east of the second medieval wall. This area was located along the main regional communication routes. The first urbanisation project of a structured nature outside the city walls took place in the second half of the 18th century, during the Almadine Enlightenment period, as part of the extensive reorganization of the capital that had an impact throughout the country following the 1755 earthquake and the actions of the Marquis of Pombal. The opening of Almada Street up to the new Infantry Barracks [Q] in Campo de Santo Ovídio, in front of the Lapa Church, will soon have repercussions for the new Boavista axis [BV] to the north-northwest. From this elevated position, there is a wide view of the Atlantic. Initially developed as military infrastructure, this axis will be the main driver of urban growth until the end of the 20th century, when the city transitioned from a commercial to a service-based economy, increasingly oriented toward tourism in the final decades of the century. This surge created unsustainable demand and triggered major social challenges regarding the availability of affordable housing, particularly for students, young adults, and young couples.

Over the past three decades, numerous national programmes—often supported by European funding—have played a crucial role in improving the urban landscape, including the Polis programme and the urban requalification changes initiated by Porto's designation as European Capital of Culture in 2001 and followed by the implementation of the light rail system. The riverside and seafront promenades, together with

those of the neighbouring cities of Matosinhos and Vila Nova de Gaia, form a high-quality urban and landscape continuum that is widely exploited for tourism purposes. This has been particularly evident since the installation of significant facilities such as several marinas and the recent Cruise Terminal.

The downtown: intervention plans
To the east of Lapa Hill, with a slight valley in between, rises Monte do Bairro Alto, or High Neighbourhood Hill. Formerly a quarry, this area now hosts the Silo Auto [SA] on its southeastern slope. At its base runs Bonjardim Street [Bj], oriented south to north, and flanked by Almada Street [Alm] to the west and Santa Catarina Street [StC] (formerly Bela da Princesa) to the east. The opening of several streets, including Gonçalo Cristóvão Street [GC], in an east-west direction and perpendicular to the aforementioned streets in the second half of the 19th century, resulted from the subdivision and urbanisation of the old Gonçalo Cristóvão Manor House and its extensive grounds. This created an urban matrix of notable geometric clarity, which nonetheless had to adapt to an irregular and rocky topography. These large blocks are based on the morphological principle of street-front perimeter occupation, with the characteristic narrow, long Porto plot, three to four storeys high, and with a workshop or shop on the ground floor. The completion of the opening of Sá da Bandeira Street [SB] to the north, up to its junction with Gonçalo Cristóvão Street, led to several urban projects in the 1930s and 1940s that featured the development of new housing models, also known as "income buildings". This morphology has progressively come to characterise the surroundings of the former quarry now occupied by the Silo Auto, coexisting with the inherited 19th-century urban fabric. This is especially evident after the opening of Gonçalo Cristóvão Viaduct in the 1960s, which overcame the open valley between Monte do Bairro Alto and Campo de Santo Ovídio [StOV]. This coexistence can be observed in Largo do Bonjardim to the west, for example.

The site:
Porto

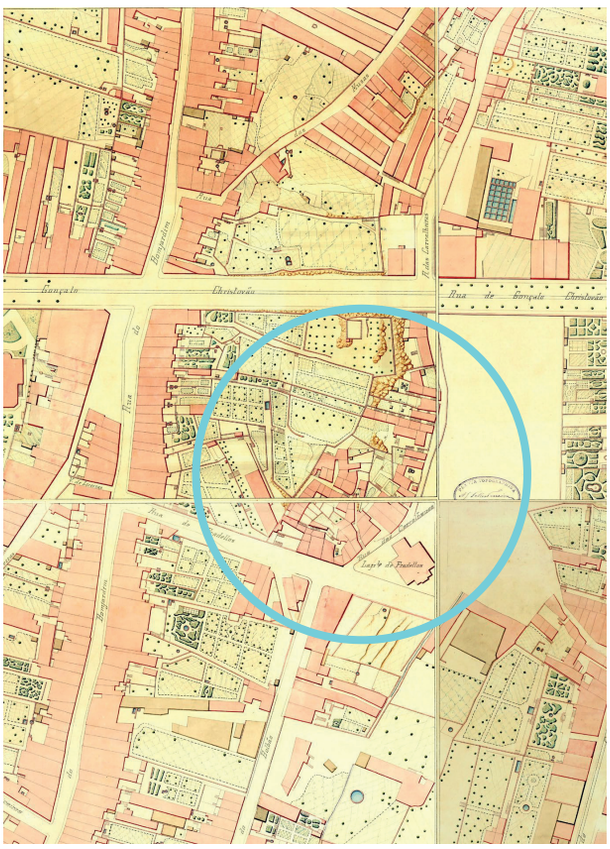
(i)

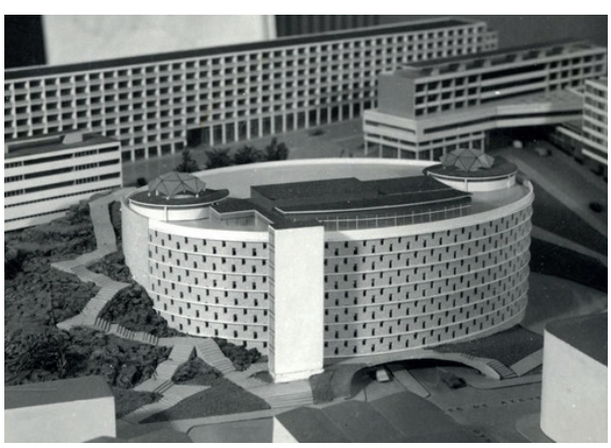
The site:
Porto

The Silo Auto and Infrastructural Urbanism
As a result of the road-building boom of the 1960s and the subsequent need for car parks, Silo Auto is at the heart of the city's northern expansion, comprising a network of civic and infrastructural facilities. (i) São Bento Railway Station, designed by the architect José Marques da Silva and connecting to the main south-north interregional line. (ii) The main City Square with the City Hall, redesigned in the first half of the 20th century with the establishment of a new economic and financial centre, resulting from the growth of the old city centre, which developed from near the river up to the rocky plateau above the Douro Valley. (iii) To the east of the current City Hall stands the Post Office Palace, most likely designed by the architect Carlos Ramos and built in the early 1950s; it now houses municipal services open to citizens, known as the Porto Citizens' Office. (iv) To the north is the neoclassical complex of the Church and Hospital of the Ordem Terceira da Santíssima Trindade. (v) The old Trindade Railway Station, dating from the 1930s, was an extension of the one at Boavista and served a regional railway line dating from the 1880s; linking to Póvoa de Varzim, some 35 km to the north-northwest, the importance of this railway stems from both the Enlightenment first and then the Liberal era, aiming the organisation and infrastructure of the territory, as well as the growing phenomenon of therapeutic and leisure bathing. (vi) As part of the conversion of this railway line into a surface metro at the beginning of the 21st century, Trindade Station became the main hub for public and ecological mobility in the city; this urban intervention, coordinated by the architect Eduardo Souto de Moura, greatly improved the quality of public spaces in the city centre and surrounding areas. (vii) The nineteenth-century Bolhão Market has undergone three significant architectural interventions, the most recent with a refurbishment by architect Nuno Valentim, reconciling the market's status as a city market with its current context of mass tourism. Finally, to the north of the Silo Auto is the Marquês de Pombal Square [MqP], a nineteenth-century redefinition of the old Largo da Aguardente, where the streets of Bonjardim and Santa Catarina meet.
The Chapel of Fradelos [cpF], to the south-east of the Silo Auto, is a fragment of a bygone era. It was

The site:
Porto

Urban transformations





1892 | 1958
1890 | 1960

1892. Topographical Plan of the City of Porto, on a scale of 1:500, surveyed under the direction of Telles Ferreira; squares 275, 276, 296, 297. Arquivo Municipal do Porto, Porto Municipal Archives.
AMP, D-CDT/A4-51(275)

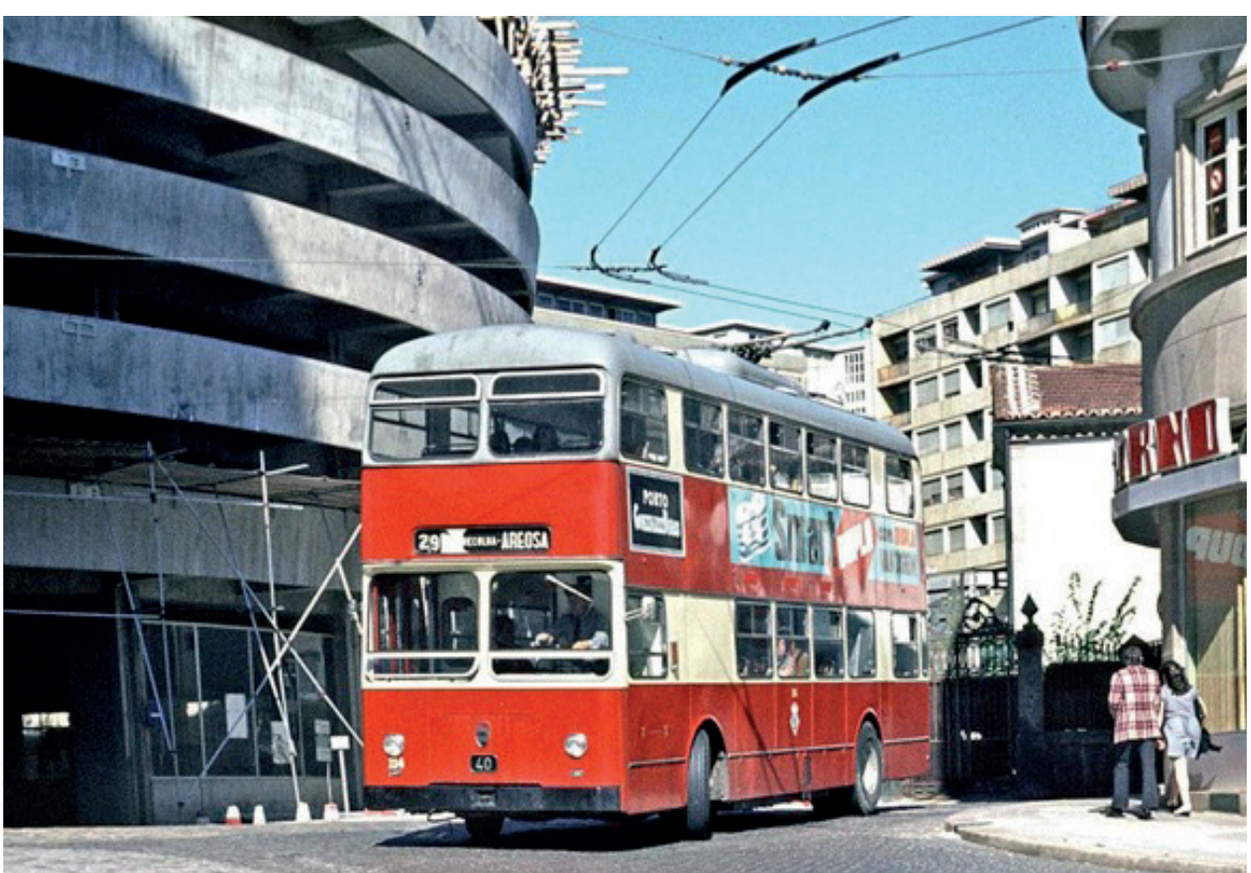
1890. A city hall meeting approved the project to relocate the Chapel of ***Fradelos***, regularise the small square on the edge and extend ***Fradelos*** Street to ***Santa Catarina*** Street.
AMP, D-CDT/A4-584

1958. City of Porto, photoplan 14.
AMP, D-PIN/c-26(14)

1960. Model of the first version for the Silo Auto car park, between the streets of ***Gonçalo Cristóvão*** (above) and ***Sá da Bandeira*** (right).
AMP, F-NP/CMP/7/336

The site:
Porto

Porto 1960-80, changing cityscape



The site:
Porto

1986 | 1985 | 1965 1973

1986. ***Gonçalo Cristóvão*** Street, view from west to east.
AMP, F-C/CMP/10/60(1)

1985. Repair of the centre divider on ***Gonçalo Cristóvão*** Street, near the Jornal de Notícias tower.
AMP, F-P/CMP/9/75

1965. Garden next to Fradelos Chapel, on ***Sá da Bandeira*** Street when connecting with ***Gonçalo Cristóvão*** Street beneath a new building.
AMP, F-NP/CMP/7/691

1973 circa. Resumption of works at Silo Auto. ***Porto Desaparecido*** (disappeared), unidentified author.

even repositioned at the end of the 19th century to accommodate urban transformations, prefiguring the transformations that would reshape the area. Curiously, the Silo Auto will align itself with the chapel's longitudinal axis, thus anchoring it in the history of the place.

The urban landscape around Silo Auto underwent significant transformation in the 1960s, following the city's renovation and tertiary development plan launched by the architect and urban planner Robert Auzelle in the 1962 Porto City Master Plan, which foresaw the integration of new service and equipment facilities. Designed by architects Alberto Pessoa and João Abel Manta between 1961 and 1964, the construction of the Silo Auto was suspended for a few years, at long last completed in the mid-1970s. The nearby tower, Hotel D. Henrique [dH], which was inaugurated in 1973, also stands out. Designed by architects Carlos de Almeida, José Carlos Loureiro and Luís Pádua Ramos, the project was the winner of a 1965 competition for the construction of an office building and commercial spaces and was converted into a hotel during construction. Designed by architect Márcio Freitas in 1965 and completed in 1970, the Jornal de Notícias [JN] tower is also emblematic of the city. This is due to the dialogue it establishes with previous buildings, as well as its status as the former headquarters of an important regional and national newspaper. It is currently being converted into a luxury hotel by the Oporto Office for Design and Architecture (OODA).

Silo Auto has provoked, and continues to provoke, a great deal of controversy regarding its reception by the local population. Opinions range from those advocating its immediate demolition, to those who, captivated by its location and formal potential, envision multiple adaptive reuse scenarios.
In 2013, architects Cristina Guedes and Francisco Vieira de Campos, of the practice menos é mais ("less is more"), and geographer Álvaro Domingues, accepted the challenge set by journalist Valdemar Cruz of the Expresso newspaper to reinvent the Silo with a view to its future in 2053, by proposing the Silo as a multifunctional social laboratory, conceived

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as a "Swiss Army knife" of urban uses, integrating cultural, social, and infrastructural functions. In July 2015, Silo Auto hosted the first ARCHI Summit in Portugal. The following year, it became the subject of design explorations by Studio Christ & Gantenbein, in collaboration with architect Margarida Quintã, at Porto Academy 2016.

Silo Auto, a Brutalist Structure

Silo Auto is a striking building in the urban landscape of the city of Porto. Its layout, drawn as a perfect circle, stands out clearly in aerial images of Porto, alongside the circle of the Palácio de Cristal or, on a larger scale, the circle of Estádio do Dragão.

Silo Auto also makes an impact through its concrete materiality, and is considered one of Porto's ten iconic brutalist works of the 20th century, according to the editors of Porto Brutalista.[1] This selection was based on the strong plastic expression displayed by the texture of its reinforced concrete structure.

From the outside, each floor of Silo Auto is defined by a vertical sequence of continuous horizontal concrete bands, which serve as guardrails around the building's perimeter. This vertical rhythm of curved horizontal bands is punctuated by the horizontal sequence of radial columns, unfinished and recessed from the façade. From the inside, these columns, along with the guardrails and ceiling, frame cinematic panoramas of the city's silhouette.[2]

The concrete grid of Silo Auto projects a powerful presence within Porto's urban setting, with its structure proudly exposed, devoid of any cladding. Its raw materiality and construction, combined with the radial layout of parked cars, highlight its operational character as a functionalist machine within the city's dynamic mobility system.

Porto features a significant collection of automobile silos — some informal, in warehouses or garages, and others purpose-built, such as the Garagem do

1 Magda Seifert, Pedro Baía (eds.), *Porto Brutalista*, Porto: Circo de Ideias, 2019.

2 Silo Auto, Docomomo Ibérico — https://docomomoiberico.com/pt-pt/edificios/silo-auto/

The site:
Porto

The Silo Auto and the City

The site:
Porto

Ground Floor and First Floor

Comércio do Porto (1930–32) by Rogério de Azevedo, or the Garagem Passos Manuel (1930–38) by Mário Abreu. In addition to these historical garages from the 1930s, today the city offers parking facilities with varied spatial arrangements, such as those at Praça dos Poveiros, the Santa Catarina shopping centre, Matosinhos waterfront, Castelo do Queijo, or Praça do Infante.
The design of Silo Auto (1961–64) is by architects Alberto Pessoa and João Abel Manta.[3] The same duo is also responsible for the building of the Coimbra Academic Association (1958–59) and for the housing complex on Avenida Infante Santo in Lisbon (1955-59) — together with Hernâni Gandra. Alberto Pessoa also co-authored the headquarters and museum of the Calouste Gulbenkian Foundation in Lisbon (1959–69) with Ruy Jervis d'Athouguia and Pedro Cid.
Despite the roughness of its exterior appearance, Silo Auto was designed with care and precision, paying close attention to vehicular circulation in entrances and exits, ascents and descents, through autonomous circular access routes housed in a cylindrical core, as well as the radial parking layout.
Those who use Silo Auto recognize the architects' sensitivity in designing this concrete structure — responding not only to the program's functionalist needs, but also adding other values that enhance its relationship with the city and the way the building is experienced.

Construction system
This project is based on a cylindrical form, wherein the selection and positioning of the structural supports suggest a deliberate intention to optimise spatial efficiency while simultaneously reducing the volumetric impact. The aim was to generate the least possible visual intrusion into the urban landscape.
From a structural perspective, the system is organised around a vertical central core, composed of two concentric walls—each 50 cm thick—between which

3 Ana Vaz Milheiro, "João Abel Manta, a reluctant modern (architect)", *Jornal Arquitectos*, n.244, pp.102-107.

two continuous helical ramps unfold. Along the perimeter of the façade, triangular-section columns are placed at intervals of 8.10 metres, each approximately 2.00 × 0.70 metres in dimension.
These vertical elements support a grid of beams spanning up to 15 metres, with variable depths ranging from 0.80 to 1.00 metres. Upon this grid rest ceramic PATIAL slabs—an early type of lightweight flooring system—chosen specifically to reduce the overall structural weight. Within the central core, the floors are carried by a system of crisscrossing beams forming coffered caissons, topped with solid reinforced concrete slabs of 10 cm in thickness. Owing to the relatively long spans and constrained ceiling heights, the beams are heavily reinforced to accommodate structural demands.

Notably, substantial technical and structural alterations were made in response to evolving programme requirements throughout the design process. The uppermost volume of the building — originally intended to house an ice rink and a restaurant on the eighth and ninth floors — was conceived as a lightweight metal structure. This configuration was later replaced by a ring-shaped reinforced concrete superstructure, leaving the central circle open to the sky and transformed into a garden. Around this “circular crown,” a restaurant, nightclub, bar, and commercial spaces were distributed. Today, the building features an aluminium shallow conical roof coated in microcement, and its upper levels are no longer in active use.

This construction system—at once simple and rapidly executable—epitomises the material and formal tendencies of its time. Its architectural language is characterised by clarity, formal simplicity, and the expressive use of exposed reinforced concrete, clearly intended to reveal the tectonic logic of the structure. As noted in a contemporary description: “The general structure of this building is made of concrete, consisting of columns, walls, beams, and slabs, forming

Relationship with the Exterior

an ensemble of great formal purity from which one intends to extract the greatest aesthetic benefit by leaving its essential elements exposed."[4]

Simultaneously, the structural form reveals a profound functional rationalism, as evidenced in the project documentation. The adoption of the cylindrical geometry is explicitly justified: "We opted for the cylinder of revolution, since the circular plan offered us appreciable functional and structural advantages, and the cylinder of revolution is the geometric solid (excluding the sphere) that has the least surface area for a given volume, thus resulting, in our case and as desired, in a reduced presence of the enormous building."[5]

Additional functional considerations include the

4 Alberto Pessoa e João Abel Manta Arquitetos, Memória Descritiva de 1961, pg.2

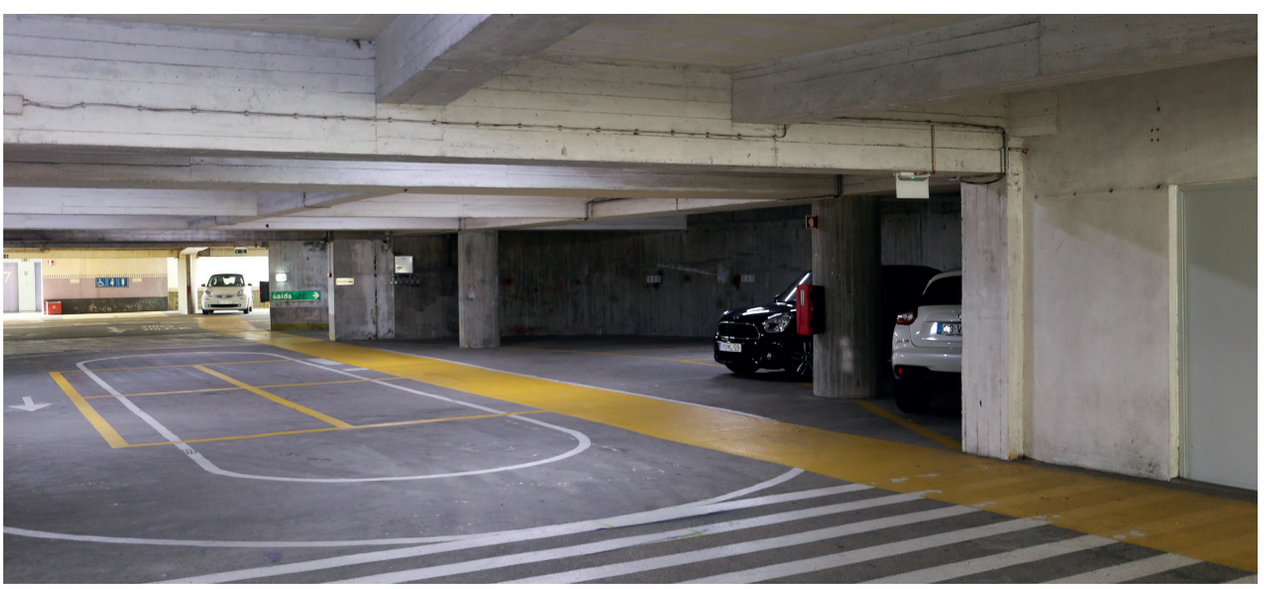
5 Alberto Pessoa e João Abel Manta Arquitetos, Memória Descritiva de 1961, pg.2

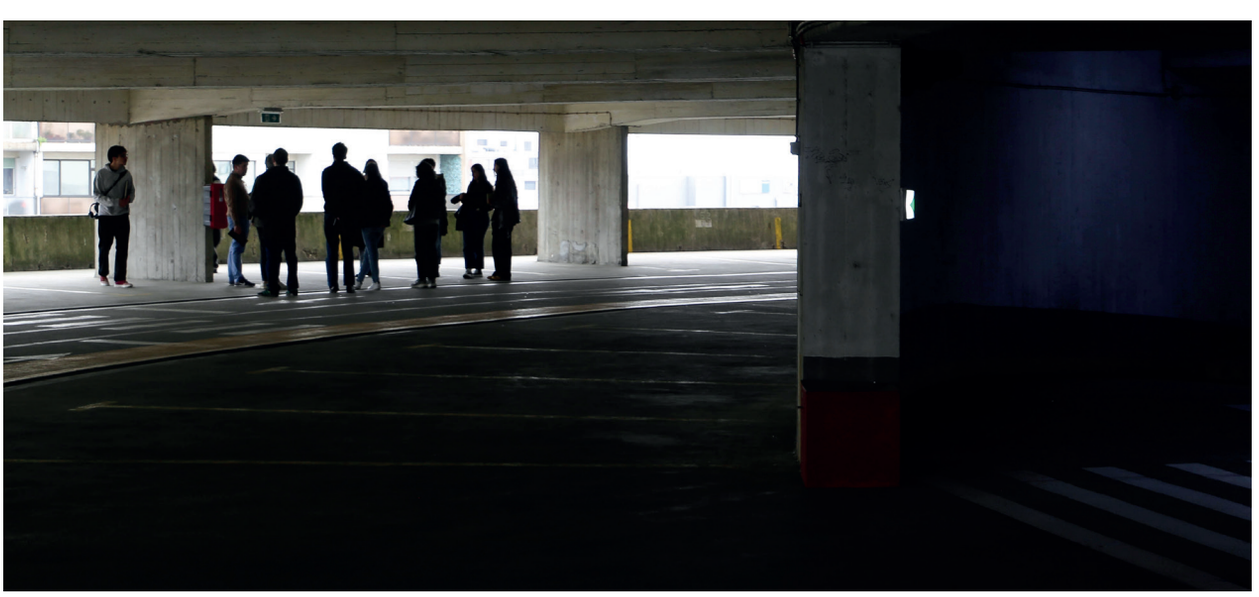
incorporation of helical ramps, evidencing an early and innovative concern for fluid vehicular circulation—anticipating later developments in urban mobility—and the strategic use of reinforced concrete, selected for its durability and resilience under conditions of intensive and future wear.
Ultimately, the spatial flexibility afforded by this construction and structural system has enabled the building's reinterpretation over time, as evidenced by its occasional reuse for artistic and cultural events[6]. This adaptability underscores the project's latent capacity for urban regeneration and its continued relevance within contemporary architectural discourse. As one source evocatively summarises: "Among all shapes, the circle is the only simple, uniform, equal, strong, and spacious form."

6 In recent years, the Silo Auto has occasionally been reactivated as a venue for cultural programming, including flea markets (Flea Market Porto, 2019–2021), collective art exhibitions (Galeria Vertical, 2018), and artistic festivals (Baluarte, 2024). These temporary uses reflect the building's adaptability and its potential for urban regeneration beyond its original function as a parking structure.

The site:
Porto

Typical Floors





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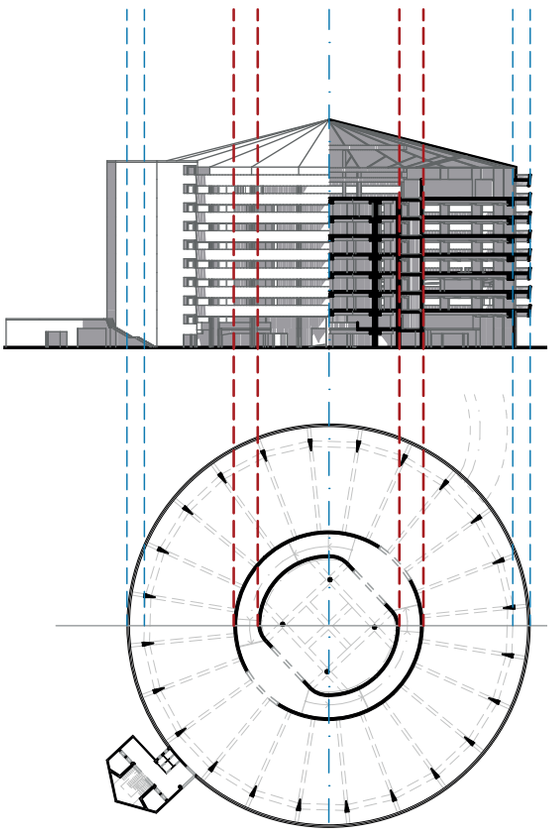
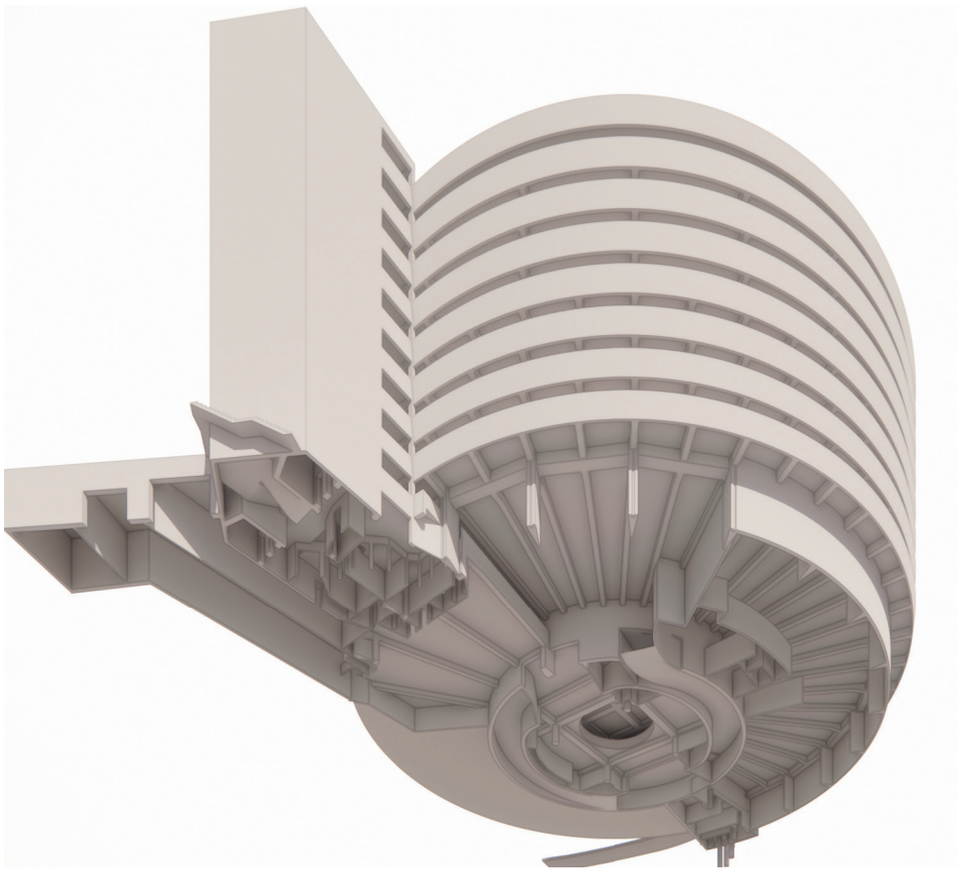
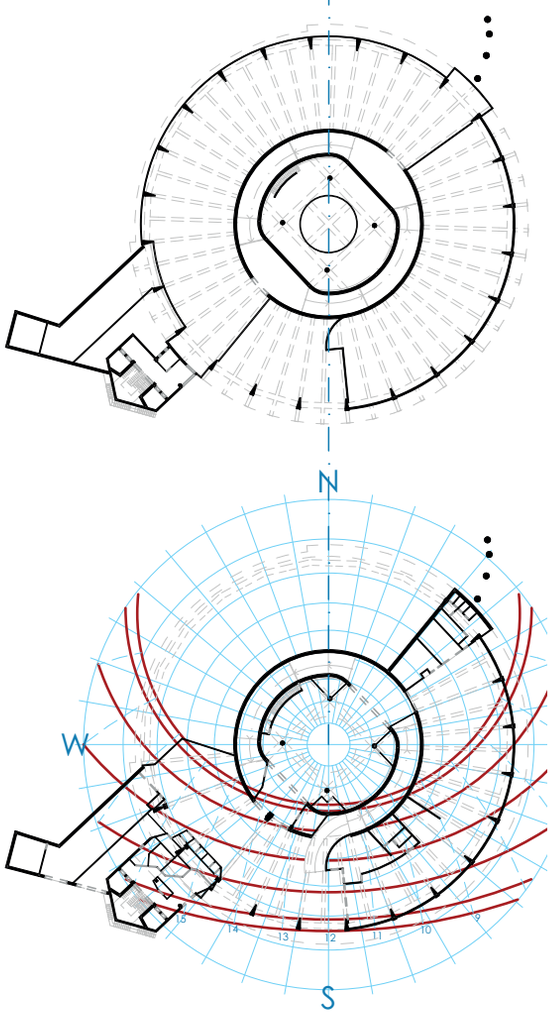






Silo Auto: Spatial and Architectural Overview

General Data:
Diameter: 66.5 m
Approximate height: 38,5 m
Access Points:
Ground floor access: south side, via Guedes de Azevedo Street, allowing vehicle entry and exit
Fourth floor access: north side, via a bridge connection to Gonçalo Cristóvão Street
Topography & Setting:
The structure is embedded in an old quarry
The site is obstructed up to the 5th floor on the northwest side due to terrain constraints
Formal Composition:
The design consists of a cylindrical body intersecting with a prismatic core, intermediated by two helical ramps, one going up and the other going down. Structured in 24 segments with radial pillars and porticos, comprises 48 beams (one intermediate beam per wedge), spanning up to the 4th floor
Interior Characteristics:
Ceiling height: 2,90
Vertical core (southwest): circulation shafts including stairs, 4 elevators, and restrooms

3. Stakeholders' perspectives

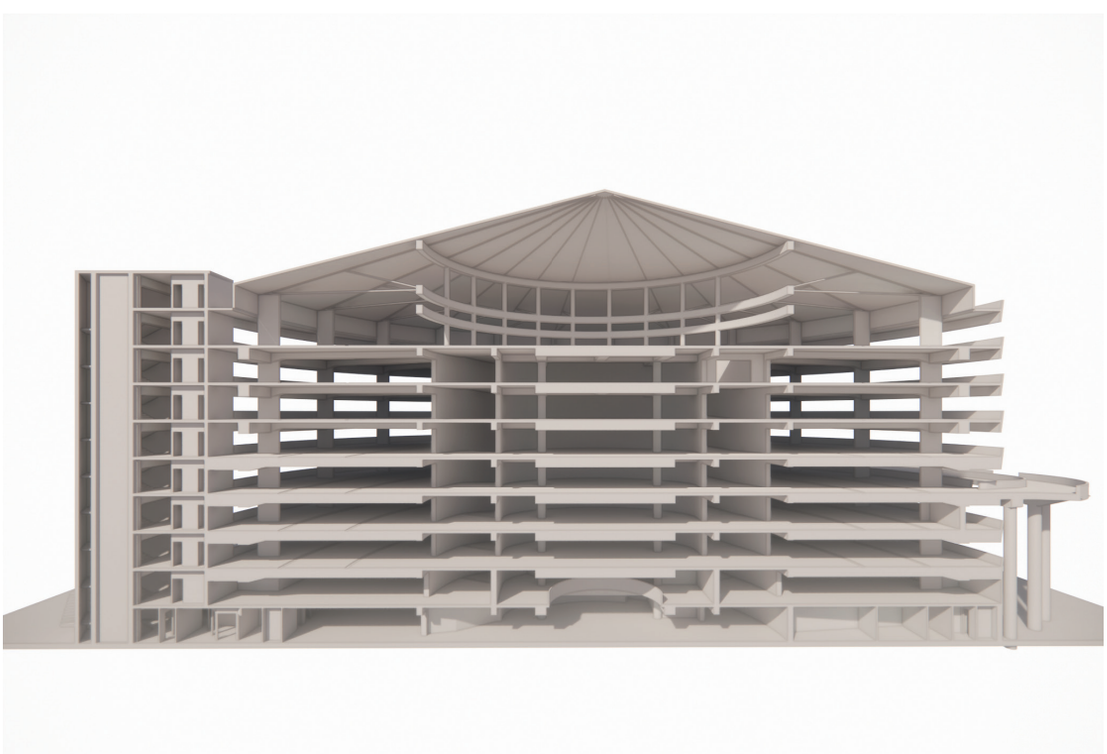
Ongoing public programmes / state subsidised housing[7]
Portugal has several public housing programmes and initiatives to support access to housing, focusing on low-income families, urban rehabilitation, and new housing solutions, with the goal of improving both access to housing and the quality of the housing stock in the country.

1st Right Program (Programa 1.º Direito): Supports families in housing need, aiming to create 59,000 homes by 2030, funded by the Recovery and Resilience Plan (PRR) and the State Budget.
Public Housing Stock at Affordable Costs: Rehabilitation of state-owned properties to be rented at affordable prices.
National Pool for Urgent and Temporary Accommodation (BNAUT): Support for housing emergencies (due to exceptional or unforeseen events or situations of imminent risk).
Porta 65 – Youth: Rental support for young people between the ages of 18 and 35.
Porta 65+: Support for single-parent households or families with income losses.
Rent to Sublet Program (PAS): The Institute for Housing and Urban Rehabilitation (IHRU) rents properties at affordable prices to sublet to low-income families.
IFRRU 2030: Focused on promoting affordable housing supply, improving energy efficiency in buildings, and revitalizing urban centres.
Cooperative and Collaborative Housing: Encourages innovative models of sustainable housing.

Private promotion
Private housing development in Portugal faces several challenges that make increasing the affordable housing supply difficult. One of the main obstacles is high construction costs, driven by rising prices for materials, labour and energy costs. The shortage of qualified workers in the sector is also problematic. Additionally, private developers are discouraged by

7 Source: Housing Portal – Portal da Habitação

the complex urban licensing processes, and rigid legal requirements make the processes long and unpredictable. Also, cost-controlled housing projects offer low-profit margins, making attracting private investment to this market segment difficult. The lack of available urban land, especially in Lisbon and Porto, is also a limiting factor, making housing development even more expensive.
Nevertheless, new housing models are emerging that aim to respond to the property crisis with more accessible, sustainable and innovative solutions. These include housing cooperatives, with collaborative management and controlled prices, and industrialised construction, such as modular and 3D-printed houses, which decrease costs and construction time. Passive and bioclimatic houses, with low energy consumption, and reduced size houses, which allow a more compact and ecological lifestyle, are also gaining notoriety. Also, co-living attracts young people and digital nomads with shared spaces that can be adapted to remote working.



4. Design/Unpacking Methodology

Contemporary housing challenges

The 2021 Special Report on Climate Change and Health by the World Health Organisation highlights the impact of the environmental crisis on populations, emphasising the role of social organisation in determining responses and vulnerability levels. Urban areas are particularly affected by climate change, with a focus on reducing risks for vulnerable groups through transformative adaptation. The reciprocal relationship between inhabitants and the built environment is crucial, revealing spaces of segregation that amplify social inequalities and health issues, especially among vulnerable groups like the elderly. Addressing the challenges posed by climate change and ageing populations in cities requires a holistic approach to urban design, considering accessibility, mobility, and environmental factors. Transformative adaptation and resilient urban design strategies are essential for improving the quality of life in cities while combatting spatial segregation and promoting social inclusivity. Emphasising the reuse and transformation of existing urban spaces is crucial for sustainable urban planning and design that prioritises the well-being of inhabitants and minimises extreme climate events. From the outset of the architectural project, an increased capacity of domestic spaces must be considered, namely the ability to accommodate the inhabitants' ageing process, changes in lifestyle and shifting needs. This perspective moves beyond merely complying with accessibility standards for bathrooms, kitchens, and circulation areas, which architects often treat as mere regulatory impositions rather than as generative design constraints.

Towards Transformative Design Frameworks

The following five dimensions—building programme, structural systems, access strategies, housing typologies, and transitional spaces—are critical to rethinking housing for adaptability and inclusivity. Facing the abovementioned range of complex challenges, architectural discourse needs to critically interrogate the limitations of conventional housing

models, particularly concerning five key areas: i) building programmes, ii) structural flexibility (supports and infill), iii) access systems, iv) housing typologies, and v) transitional spaces (outdoor-indoor). Each dimension reveals the tension between inherited design conventions and the need for more adaptable, inclusive, and responsive residential environments. Contemporary housing design must move beyond rigid, traditional models to address the diverse needs of modern households. This includes flexible building programmes that support various living arrangements, mixed-use spaces, and adaptable structures that separate permanent supports from modifiable infill. Access systems should be designed not only for function but also to encourage social interaction and inclusivity. Conventional housing typologies are being replaced by hybrid forms that blend density with community. At the same time, transitional spaces—like balconies and shared corridors—are being reconceived for their social and environmental potential. Overall, housing should be adaptable, inclusive, and resilient in supporting diverse modes of inhabitation.

Typological Innovations and Spatial Strategies

These principles were further explored through a design workshop that tested adaptive methodologies against specific architectural typologies and real-world constraints.

One of the workshop's core objectives was to reimagine the architectural typology of the parking garage as a site for contemporary housing transformation. Through global references and case studies, participants explored examples rooted in cooperative, adaptive and inventive design strategies.

Multistory car parks were reimagined as potential sites for hybrid housing models. The 1111 Lincoln Road car park (Herzog & de Meuron, Miami Beach, 2010) blurs the line between infrastructure and public space, while the Student Residence and Reversible Car Park (Bruther and Baukunst, Plateau de Saclay, 2020) explores modularity and dual-functionality. These projects inspired participants to view parking

structures as adaptable urban assets, ripe for transformation into vertical communities.
In examining cooperative and multigenerational housing, we focused on La Borda (Lacol, Barcelona, 2018), a pioneering cooperative housing project that prioritizes affordability, democratic governance, and sustainability. Developed by its future residents, La Borda reduces construction costs through timber structure, communal spaces, and shared decision-making—demonstrating how architectural design and social structures can support inclusive, intergenerational living.
Adaptive reuse emerged as a powerful strategy for affordability and environmental responsibility. The Gemini Residence (MVRDV, Copenhagen, 2005)—a conversion of former seed silos into waterfront housing—exemplifies how industrial structures can gain new life. Equally compelling is SESC Pompeia (Lina Bo Bardi, São Paulo, 1986), which transformed a former factory into a vibrant cultural and social complex, showcasing how reuse can foster community while preserving architectural memory.
The exploration of circular plans emerged as a final yet conceptually rich trajectory within the workshop discourse. From historical rotundas such as the Pantheon (Ancient Rome, c. 126 AD) to contemporary examples like Vortex Student Housing (DGM Architects, Lausanne, 2020), circular forms were studied for their spatial efficiency, social centrality, and symbolic power. These geometries offered inspiration for alternative housing models that challenge hierarchical layouts and encourage shared, democratic space.
The circular plan also evokes the Panopticon, which was originally designed to optimise the relationship between function and structural system. This feature could be useful when rethinking how space can be adapted for housing purposes, as it rebalances the significance and power of the centre. Due to its distributive and infrastructural nature, this core space is a vital element for passive strategies that ensure a comfortable environment using low-technology solutions. For instance, it can exploit the formal

and technical effects of a thermal chimney, towards ecological architecture.
These architectural references empowered participants to rethink housing as a platform for community, ecology, adaptability and innovation.

Collectively, these explorations underscore the need for housing models that transcend functionalism, embracing spatial flexibility, historical continuity, and social solidarity as foundations for a new urban ecology.

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5. References

UAH! collects references, projects, readings, exhibitions in order to frame the broad background of the research topic. Here is a selection that we consider relevant to approach the topic. Some of these are the product of the Polimi research group.

Click on the title to access the pdf (if available) or the research's website.

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The Architecture of Collaborative Housing:
Exploring Uncommon Typologies and Alternative Processes
Speaker: Sara Brysch (Co-Lab Research, TU Delft)
Moderators: Rui J. G. Ramos (FAUP), António Carvalho (UAH!/POLIMI)

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References

>PROJECTS AND PRACTICES

La Borda / Lacol
Barcelona/ES

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Zürich/CH

Kalkbreite Cooperative [ARPA project] / Müller Sigrist AG
Zürich/CH

Gemini Residence / MVRDV
Copenhagen/DK

SESC Pompeia / Lina Bo Bardi
São Paulo/BR

Vortex Student Housing / DGM Architects
Lausanne/CH

9th Avenue Parkade + Innovation Centre / Kasian Architecture, 5468796 Architecture
Calgary/CA

ICTA-ICP Research Centre / HARQUITECTES
Cerdanyola del Vallès, Barcelona/ES

GREENH@USE – 140 Social Housing in 22@ BCN / Peris+Toral
Barcelona/ES

San Riemo Apartment Complex / SUMMACUMFEMMER + Büro Juliane Greb
Munich/DE

COM O APOIO

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Porto.

UNCONVENTIONAL AFFORDABLE HOUSING explores the new possibilities of contemporary living at the intersection of affordability and unconventionality, starting from a reflection on existing housing projects, practices and policies.

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