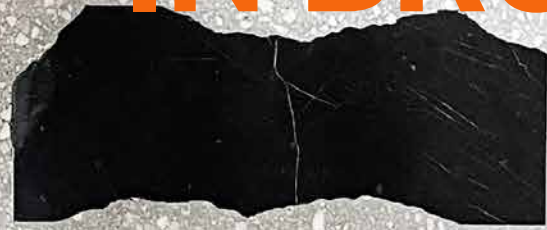
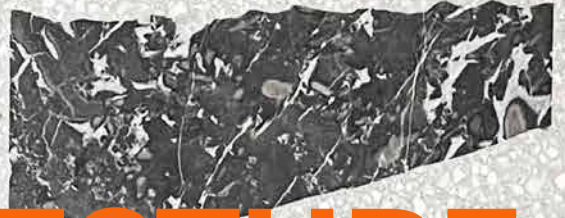


from linear to circular

THE ARCHITECTURE OF REUSE IN BRUSSELS



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from linear to circular

THE ARCHITECTURE OF REUSE IN BRUSSELS

BOUWMEESTERMAITREARCHITECTE

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INTRODUCTION

Kristiaan BORRET

THE GOOD OLD DAYS?

In 1555, Cardinal Archbishop de Granvelle had an elegant city palace built in the heart of Brussels. Over the centuries, the building accommodated various owners and purposes and was subject to successive renovations. In 1931, the city ordered its demolition to construct the train tunnel connecting Brussels North Station with the South Station. A photo taken during the demolition of the palace shows how the removed building materials were sorted to be reused. Was this an early form of sustainability before the term existed in its current understanding? Looking closely, you will also see a small sign with "façade à vendre" written on it. How intriguing! The facade sections of the Palais Granvelle were subsequently purchased for the new town hall of Woluwe-Saint-Pierre (which ultimately did not happen). They were then used for a colonnade in a Brussels cemetery and sold to various private individuals.

In other words, sometimes the past was more "progressive." This historical anecdote shows that what we call "circular construction" today is not an entirely new concept; it is a good habit that we gradually lost. Globalisation and mass production instigated by industrialisation have made us accustomed to building with new and cheap materials every time, but there are other traditions in our building culture. With pressing climate issues in mind, we can draw lessons from past reuse practices today.

In Brussels, much is owed to the pioneers of reuse: the Rotor collective. Founded in 2005, their influence is undeniable, not only in terms of the aesthetic recalibration through which we learned to see the beauty of wear and tear in industrially produced materials but also for the ecological awareness of the CO₂ reduction inherent in reusing building materials. In addition, Rotor DC has pushed boundaries on an operational level. How do you set up a logistics chain that connects supply and demand? How do you disassemble and clean without damage? How do you adapt public procurement to allow for material reuse?



↑ Demolition of the Palais Granvelle

FROM PIONEERING TO MAINSTREAM

As city architect of Brussels Capital Region, Bouwmeester Maître Architecte (BMA) has been able to reap the benefits of Rotor's pioneering work and the ripple effect it had on the larger building ecosystem of Brussels. For several years, grants and awards have been going towards reuse, and we've been able to launch design competitions with motivated clients. It became clear that Brussels was ready for the next shift towards reuse.

In 2017, BMA organised a public debate in a vacant office building. In a nod to punk music, we called the initiative "Should I Stay or Should I Go?": How to deal appropriately with the transformation of the vast building stock of the Brussels office economy from the 1960s to 1990s. It's great that the fancy materials from those buildings are saved and given a second life, but that is just the tip of the iceberg regarding impact. In terms of CO₂ reduction, preserving the concrete structure of the buildings is much more critical. Compared to other cities, Brussels frequently demolished office buildings once they became outdated and replaced them with new ones to meet the latest standards, expectations, and fashions of office users. It became clear that this would be the primary challenge: the reuse of buildings, even more so than the reuse of materials.

Therefore, from 2020 onwards, we have advocated preserving the building or its main structure in new projects through BMA's various tools. The mindset of public authorities, developers, and architects also appears to be shifting, and the increase in office vacancies, especially after COVID-19, only made the issue more current. The reuse of structures and materials is now evolving fully from pioneering to mainstream practice in Brussels, and that was our objective.

The ultimate objective of this mainstreaming strategy would be to embed circular construction in urban planning legislation so that it would apply generally to all projects in Brussels. A fundamental reform of the Brussels Building Code, including a proposal to impose the reuse of buildings as a basic principle, has been underway since 2021. The current standard practice will, therefore, be reversed in future regulations. Whereas previously, it was possible to apply for a permit for demolition without justification, from now on, preservation of existing buildings will be the rule, and, in the case of demolition, it will be necessary to prove that there is no other option. This requirement is not dogmatic, and various criteria will be considered. But when approved – hopefully in 2024 – this reversal in standard practices will mark an innovative breakthrough in architecture regulations in the Brussels Building Code.

NOT LESS ARCHITECTURE

What is certain is that there are many ways to build circularly. The projects we have chosen for this publication testify to this. They are just a sample of a much wider range of current projects in Brussels that deliberately aim at reuse. Many of them still need to be built, given that the paradigm shift on reuse is still relatively young compared with typical time frames in urban development.

A circular approach need not restrict the designer's creativity, as the architectural diversity of these projects shows. What changes is the designer's attitude. Those

who want to establish the same recognisable signature everywhere cannot cope with an ever-changing contextual approach in which they must work with what is "as found". We would argue that it's good that we are finally ridding ourselves of "iconic architecture"! Reuse in architecture requires at least as much ingenuity from a design team as new construction and relies more than ever on intense collaboration between the architect and technical expertise. A changing attitude on the part of the architect must go hand in hand with adopting other working methods in the professional field: a new format for the design process of an architectural project, a regulatory framework more adapted to the possibility of reuse, organising around the process of dismantling, interim storage and reliable supply, the creation of databases and monitoring of buildings and their materials, the formation of new skills in the construction sector. A paradigm cannot change without adjusting practices in the workplace.

THE TIME IS NOW

Circular construction is needed to reduce the construction industry's high CO₂ emissions. Systematically replacing existing buildings with high-performance new buildings is not a solution because the required demolition ignores the CO₂ embedded in an existing building and the CO₂ associated with producing and supplying new materials. New premium buildings may earn every possible sustainability label, but these are mainly about low operational energy consumption that will only deliver CO₂ reductions over a future time spanning decades. Because emissions are cumulative and we only have a limited time to reduce them, CO₂ reductions now have more value than CO₂ reductions in the future. We need strategies that reduce CO₂ emissions in the coming years, not decades from now. Reuse does just that. The time is now.

A PHOTOGRAPHIC ESSAY

by **Corentin HAUBRUGE**

In Brussels, a new wave of adaptive reuse projects has breathed life into once-forgotten office buildings, transforming them into housing. Two series of six photographs draw attention to the architecture of these post-modern structures — anonymous, even banal to some, yet strangely captivating — unveiling their hidden value: the preservation of embodied carbon within their materials and sparing the planet the cost of their demolition.





Croissant





Souverain



Twin House



Val d'Or



Chip



Croissant



Everegreen



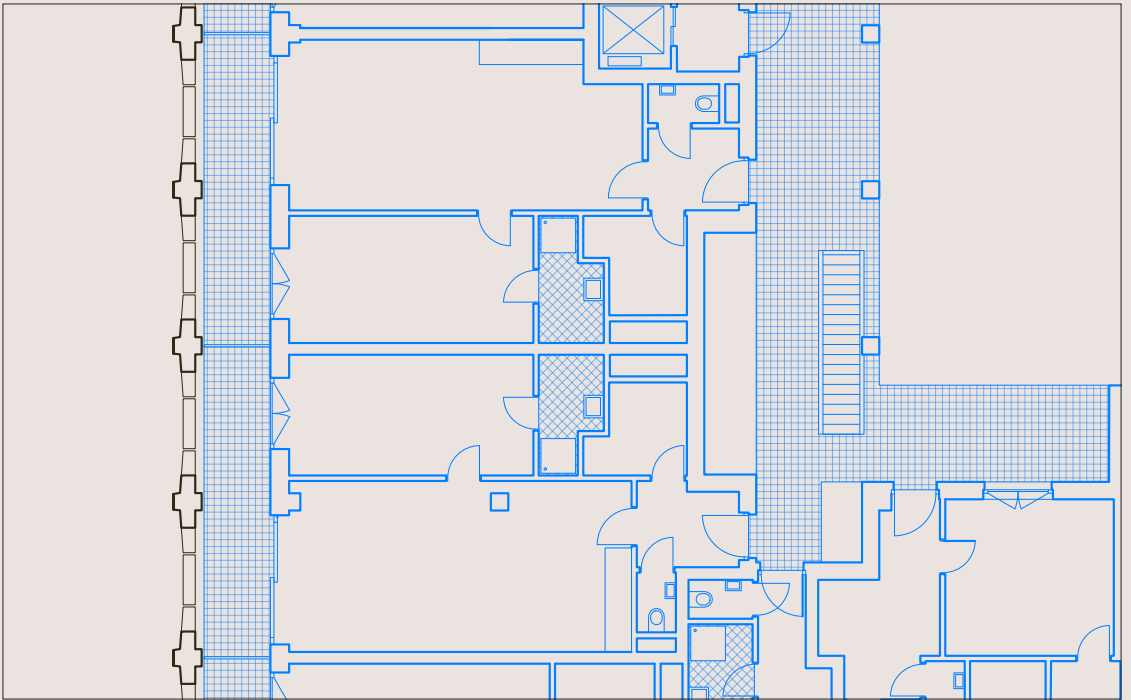
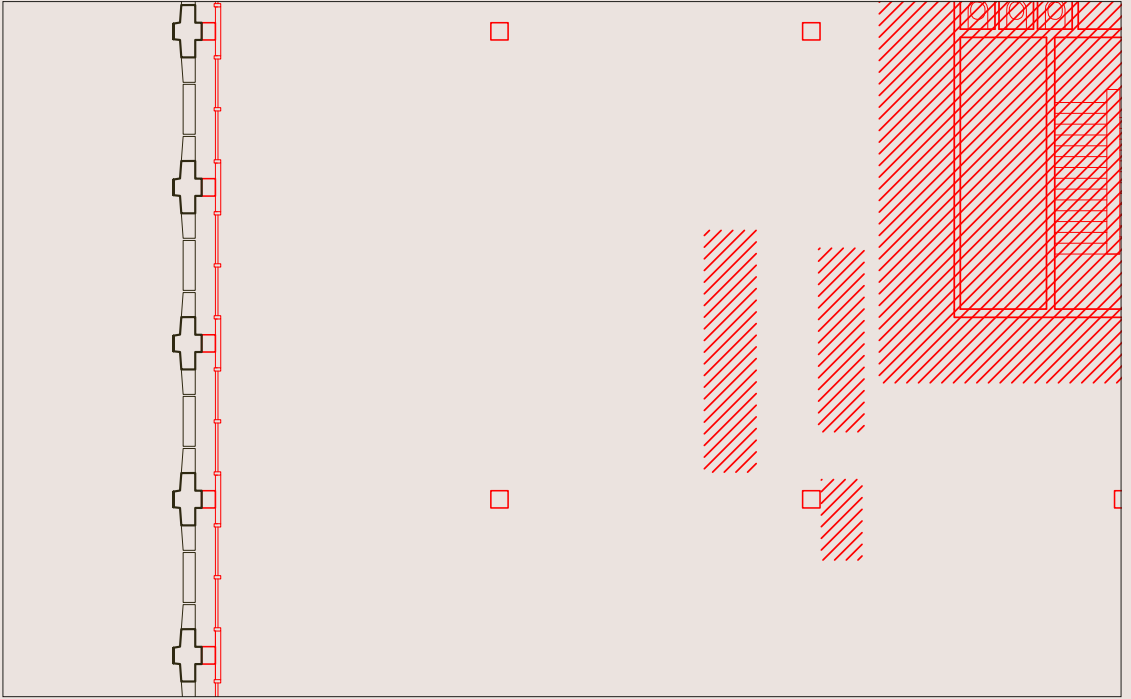
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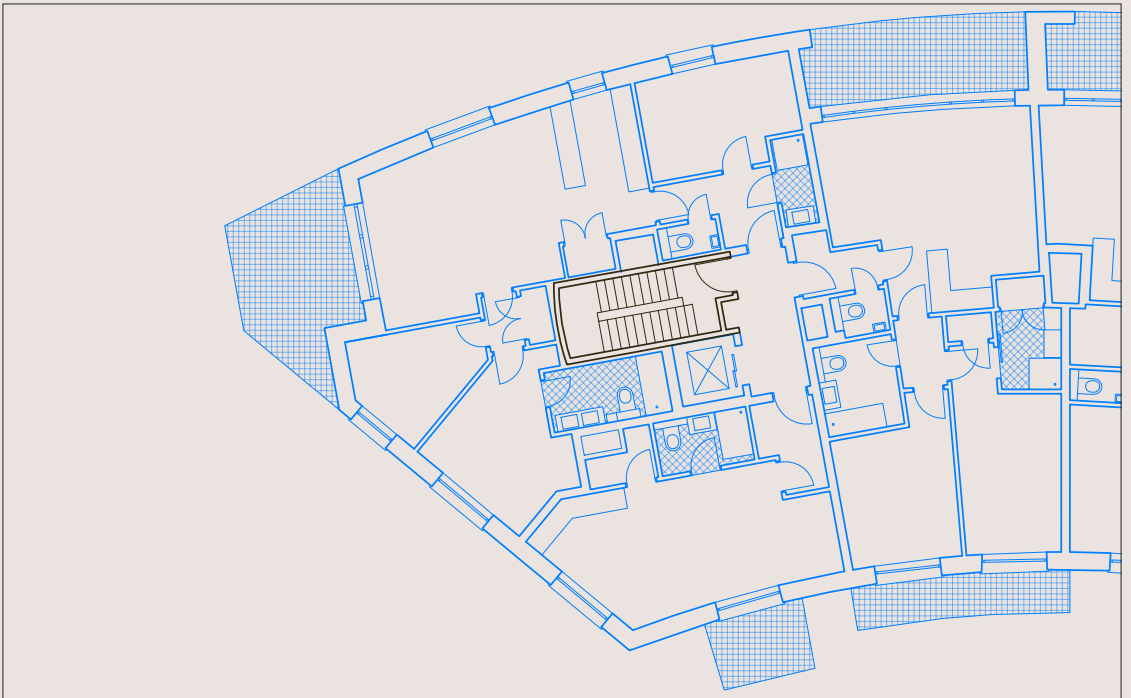
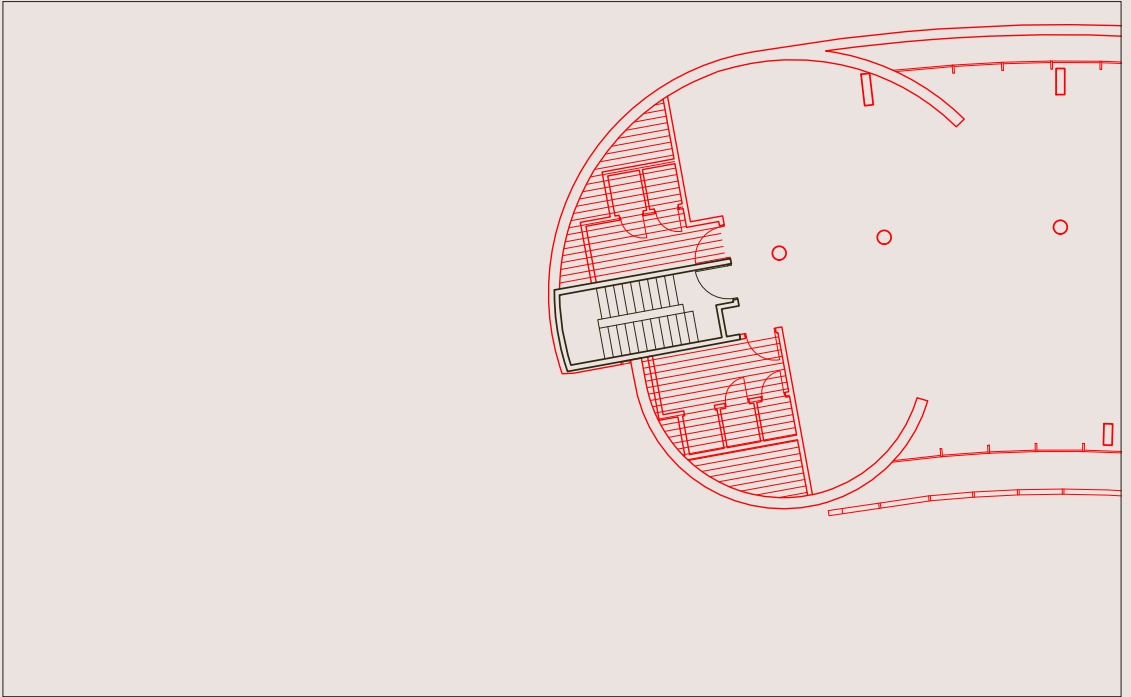
Twin House



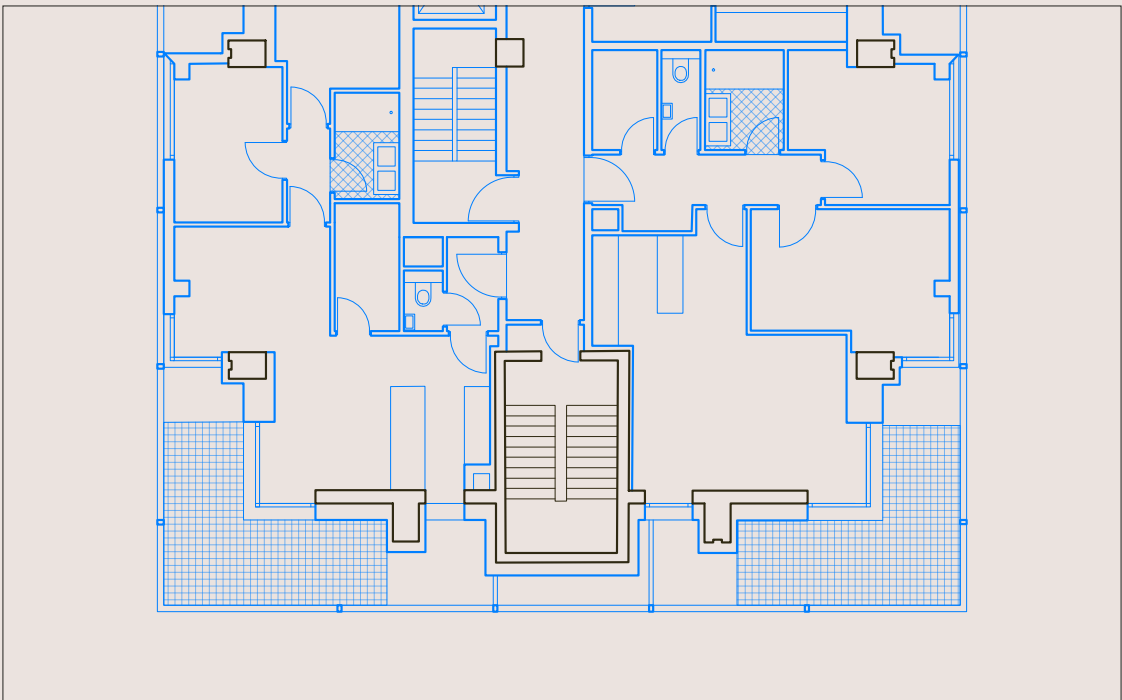
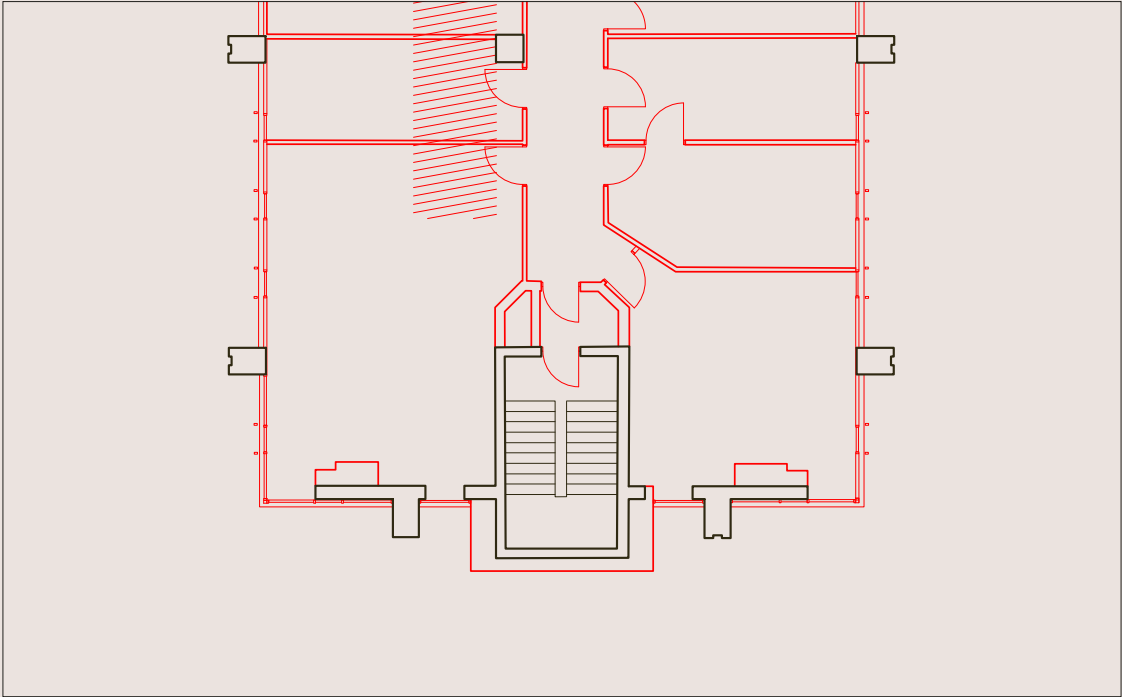
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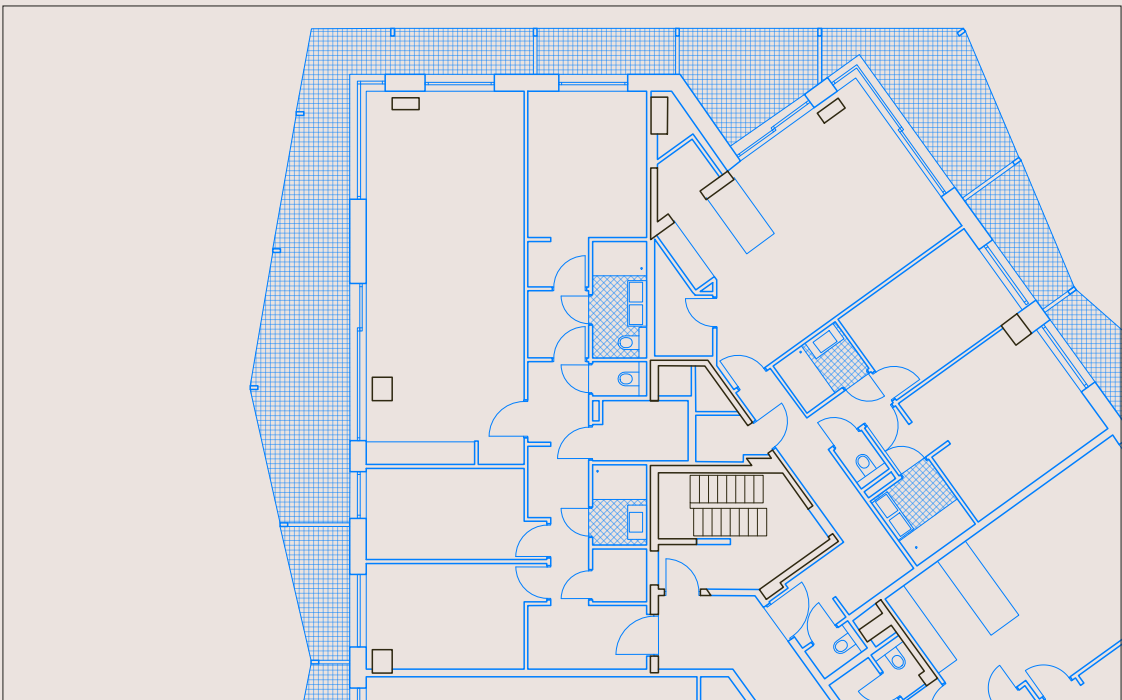
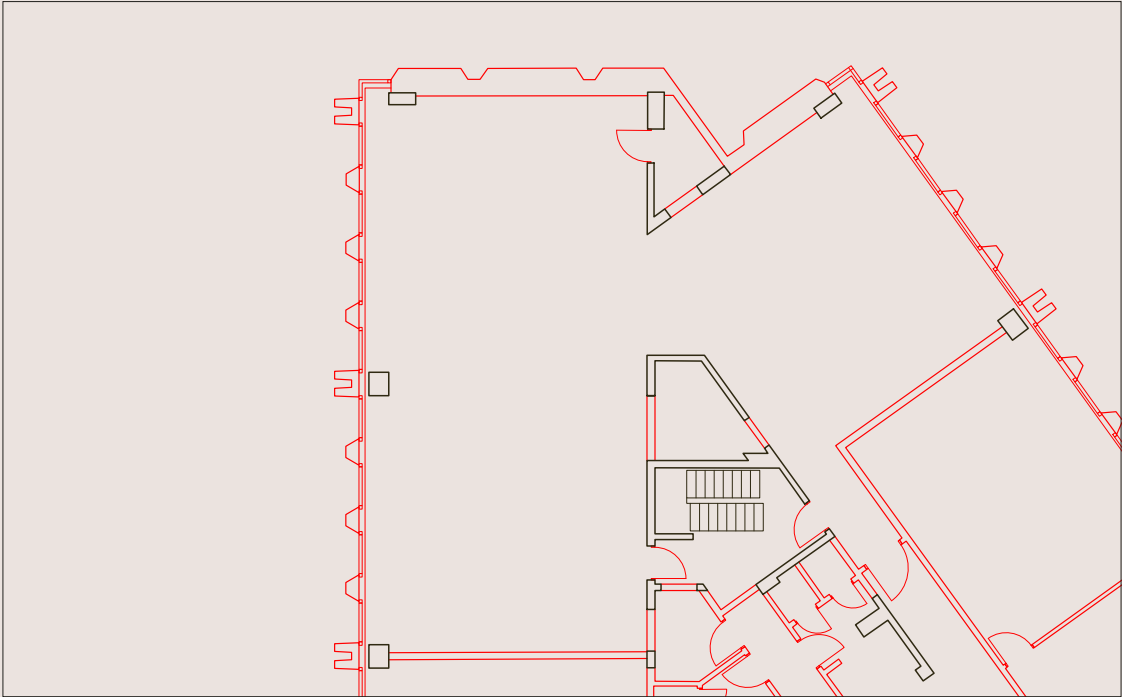


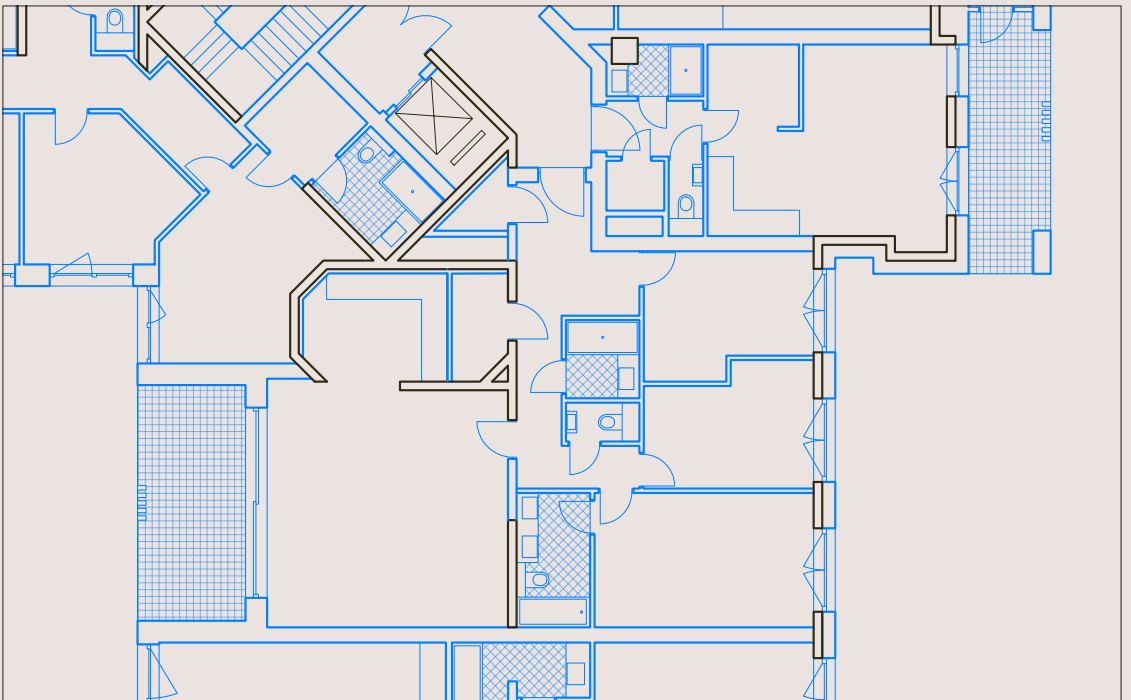
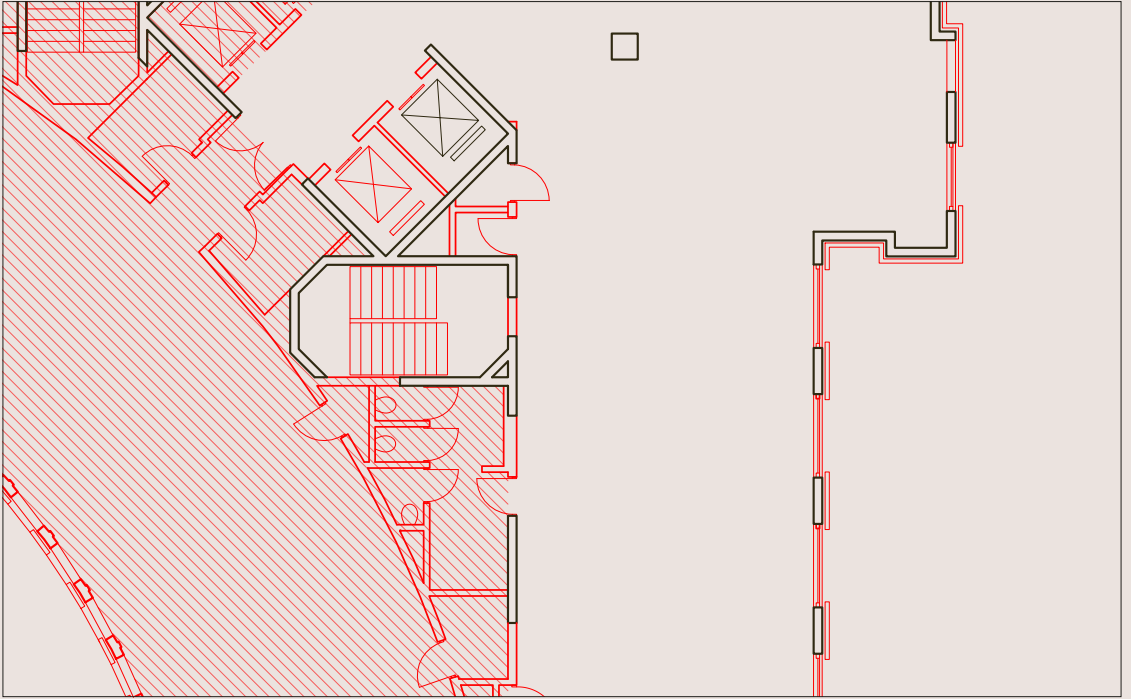
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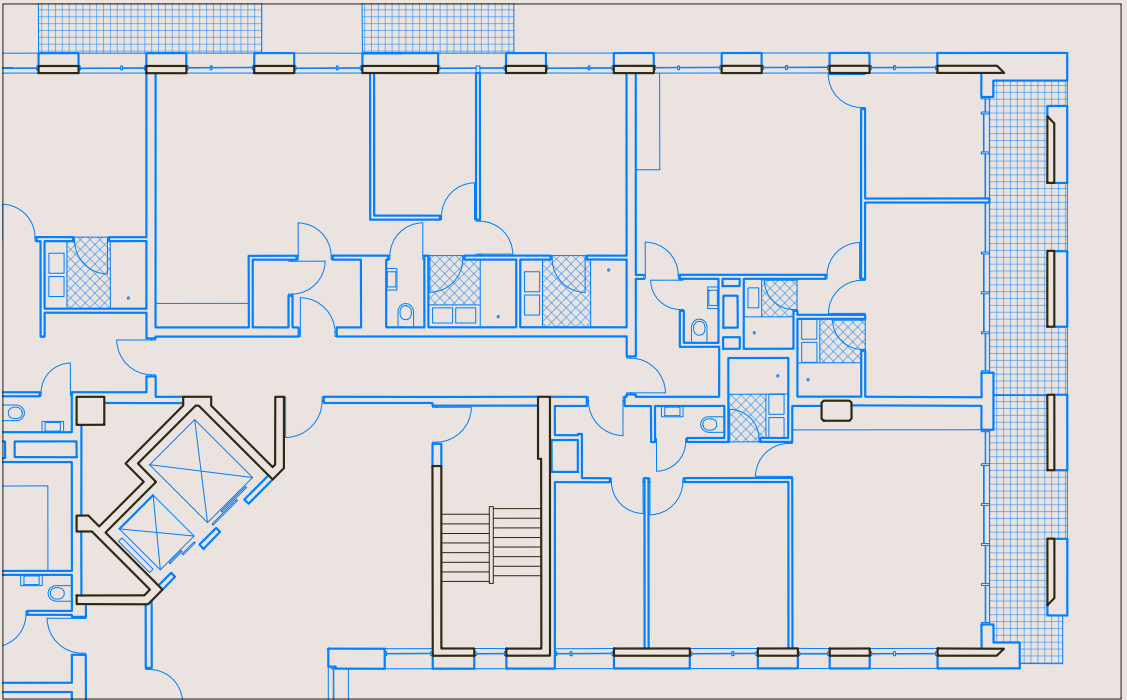
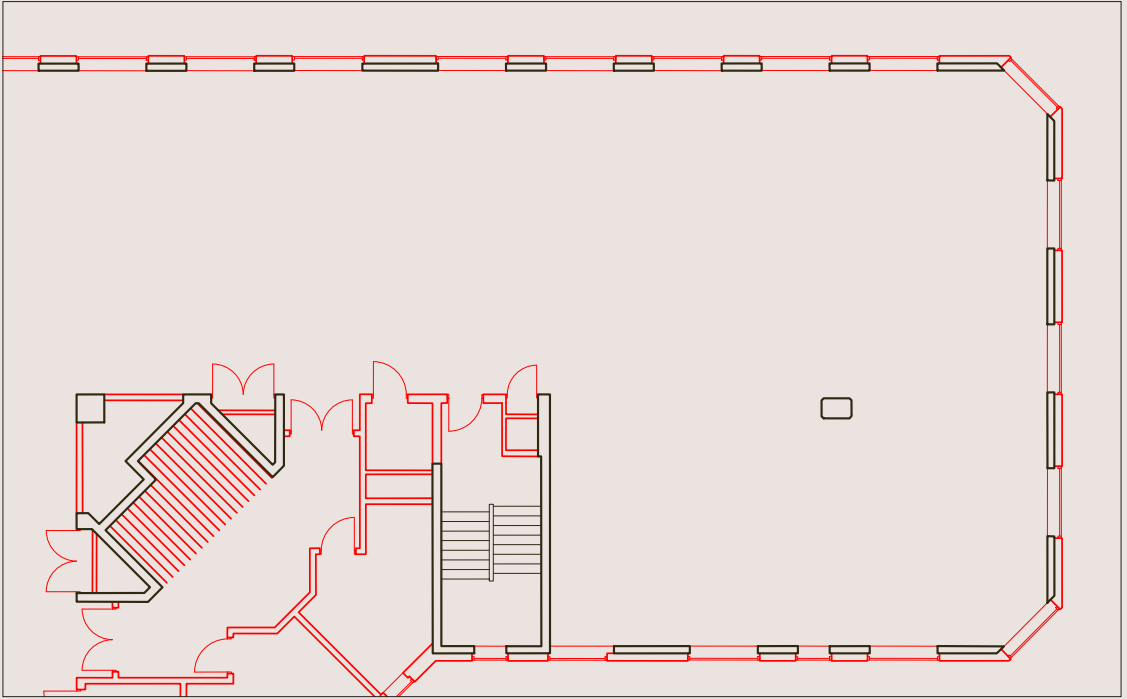
Croissant







Twin House



SECO



GAINING BY MAINTAINING

Ben DIRICKX

In December 2020, BMA organised a competition to renovate the SECO building in the heart of the European quarter of Brussels. The specificity of the winning project lies in its radical structural intervention. The new lobby and underground conference space are conceived as one enormous load-bearing structure that carries the floor plates of the building. This allows for removing the oversized and irregular columns and the central core on every floor plate. The resulting spatial flexibility and natural light gains are considerable. This ambitious intervention also allows the ground floor to become more open and transparent, resulting in a double-height "city room," further establishing an improved relationship between the public realm and the building. An architecturally subtle but structurally crucial element is the crown, which gives a new finish to the building. Together with the ground floor "city room" and the underground conference room, it programmatically reinforces the mixed-use character of the building, further assuring the long-term resilience of this 1960s symbol of modernist architecture.

HOW DID WE GET TO THIS POINT?

Whether to demolish and rebuild or to renovate and reuse a building is a multilayered question that needs a multidisciplinary response. Often, the focus lies too much on the obvious environmental gains, which should be the main ambition when we aim to preserve a building. Conversely, the focus may lie solely on the financial gains, where the response is usually demolition and rebuilding. But the arguments for and against preservation can be built from urbanistic, technical, architectural, historical, environmental, financial and spatial points of view.

The difficulty lies in finding the right balance between all these aspects to come to a well-considered decision that results in a qualitative project that creates added value in the long run.

The decision to maintain the SECO building in the heart of the European quarter has been an exemplary process, and most of these aspects have been substantially evaluated with a highly qualitative and resilient project as a result.

A TINY BIT OF HISTORY

The service economy boomed in the 1960s. The SECO building is a direct result of this economic transformation. It was one of the many office buildings taking over the predominantly residential character of the European Quarter at that time.

Built between 1964 and 1968 by the architect Jean Verschuere, the building is a symbol of a then predominant rational modernist architecture with as main aspects an open plan with columns and floorplates in reinforced concrete, geometric repetitive prefabricated elements, a relatively sterile and hard open space... The striking S-shape between Rue Arlon and Rue Trier is not readily perceivable from the street level but is clearly a contextual anomaly when looking at aerial photos.

TOWARDS A NEXT LIFE?

In May 2020, BMA, together with an array of Brussels administrations, will be invited by the developers AG Real Estate and BPI, who acquired the SECO building in 2019, for a site visit, initiating a new chapter for this site in the European Quarter.

During the visit, the impressive volumetry of the existing building is striking. With its 12 floors, the building pops out of the surrounding building heights. Once inside, one can notice the significant size and irregular position of the columns, the fairly low ceiling heights and the limited amount of light that penetrates the heart of the building.

At that time, no clear decision had been made on whether to keep or demolish the building. In a dim corner of an empty floorplate, the developers presented to the public authorities their analysis highlighting the various challenges with the existing building: floor-to-floor heights limited to 2,95 m, building depth of 18 m, limited natural light, lack of thermal rupture between the load-bearing facade and the floorplates...

In that same presentation, several scenarios show the potential of the site if the building were demolished. Other scenarios question the feasibility of reconvertng the building into housing, and lastly, another scenario updates the building into offices complying with today's minimum comfort requirements. A comparative sheet at the end of the presentation shows the developers' non-surprising preference for the demolish-and-reconstruction scenario.

However, the multi-scenario analysis demonstrated that the developers disagreed on whether to keep or demolish the building. The conclusion to demolish seemed a mere reflection of what was seen as "the normal" up until then.

SEIZING THE OPPORTUNITY

With a newly established consciousness that we cannot take for granted demolition and reconstruction as the preferable scenario, this absence of consensus formed an opportunity par excellence to open the debate to a broader panel of experts. Several disciplines have put their arguments on the table, resulting in a more well-considered decision:

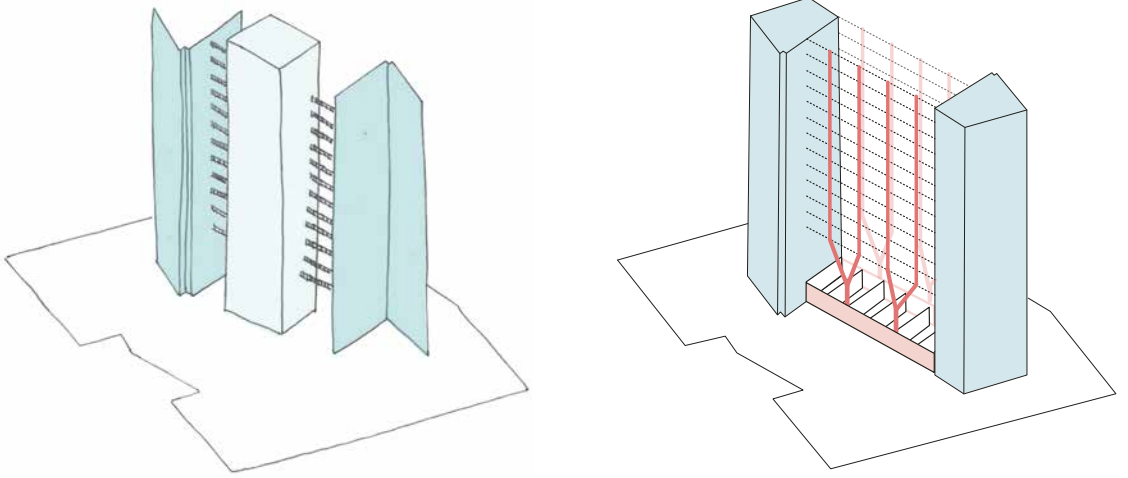
> Technical: Bureau Bouwtechniek conducted an in-depth technical study of the building, concluding that converting it into offices compliant with modern-day requirements is technically feasible. Intelligent interventions can, in fact, solve the current thermal insulation problems, increase the capture of natural

light, and maximise the net floor-to-ceiling height. Bureau Bouwtechniek continues to form part of the team to this day, ensuring continuity in the technical feasibility of the project.

- > Historical: From the beginning, the Heritage Department insisted on the building's reversion and produced an analysis of its heritage value. A newly established interest in the European Quarter and its architectural heritage of tertiary economic activities further argues for preserving this symbolic building.
- > Urbanistic: Even though the building forms an anomaly within its urban context, it is now considered a landmark highlighting the typical urban landscape of the European Quarter. The proven feasibility of opening up the ground floor allows for a better connection between Rue Arlon and Rue Trève, a vital ambition of the public authorities.
- > Financial: The scenarios where the existing building is demolished and replaced by a new development show a considerably lower m² that can be constructed within the current urban regulations. This aspect has undoubtedly played an essential role in this project, convincing the developers to preserve the existing building.

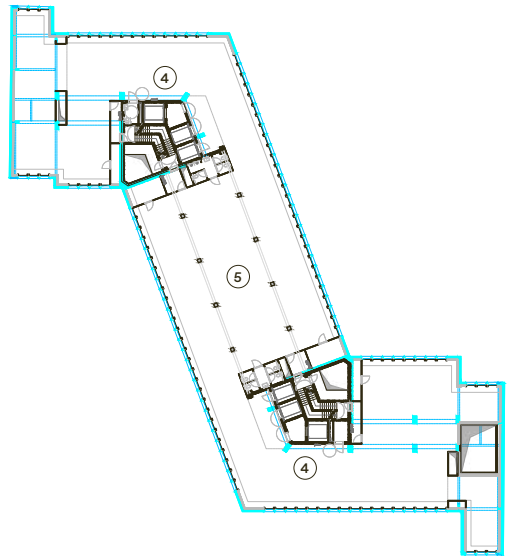
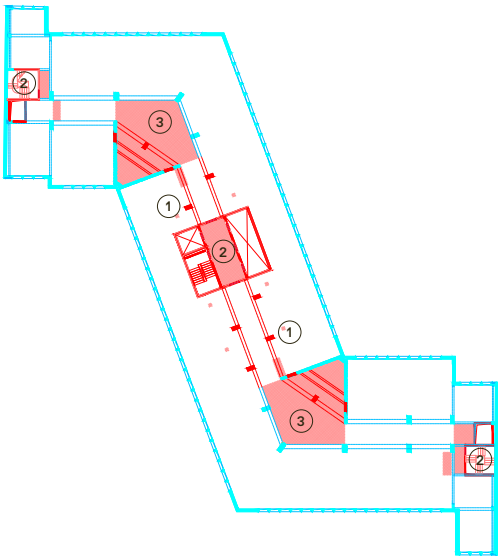
YES, WE MAINTAIN!

Following multiple exchanges, a consensus was reached among the involved actors on how to maintain the building. BMA, AG Real Estate, and BPI launched an ambitious architectural competition entailing a crucial technical component. Because of their sensible yet radical approach, the architects of TRANS, together with CES, Daidalos Peutz, Captif, and Util, won the competition. Their approach, which combined respect for heritage, technical ingenuity, structural radicality, programmatic flexibility, and urban reintegration, was undoubtedly the most integral and intelligent approach to transforming the SECO building into a future-proof one. In fact, with the integral quality of their project, they managed to fully argue in favour of preserving this symbolic building insofar as it is now unthinkable that demolition was ever an option.

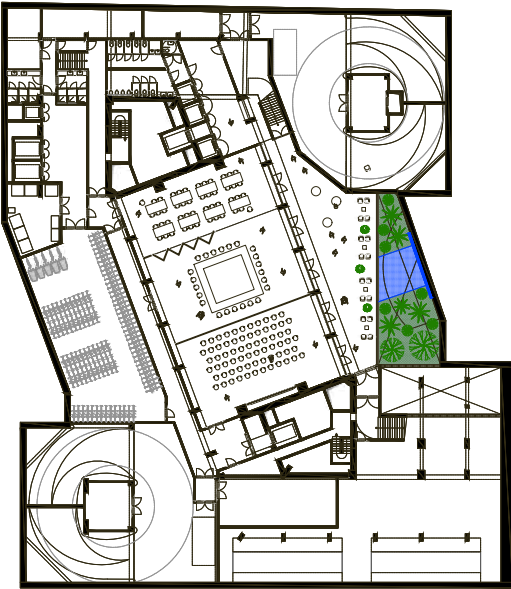


↑ Existing structure and proposed structural intervention allowing an open and adaptable space layout





↑ Typical floorplan - (1) Removing oversized structure (2) Removing vertical circulation (3) Clearing the 'diamonds' (4) Creating new vertical circulation (5) Creating new structure



↑ Underground floor plan - conference centre





Transformation of a 1970s brutalist office building in the heart of the European district. While retaining its original office function, the building is enhanced with a conference centre, a double-height entrance hall, and new office amenities on two new top floors. Through the architect's innovative solutions, developed in close collaboration with a team of structural and MEP engineers, the building, initially slated for demolition, will be preserved and revitalised.

Site

Aarlenstraat 53 / Trierstraat 84
1000 Brussel

Year

2020 > Ongoing

Client

AG Real Estate + BPI

Architect

ATAMA

Team

Bureau Bouwtechniek

(execution architect)

UTIL (structural engineering)

CES (MEP engineering)

Daidalos Peutz

(acoustical engineering)

ORO (landscape architecture)



PROGRAMME AND BUILDING ALLIANCES

Lorène MORENVAL

Building owners must be motivated to undertake renovations to transform the quality of existing buildings in the city. At the same time, public authorities play a crucial role in making these projects possible. They can act as a link between a programme and a real estate opportunity. The aim is to find the perfect alliance between the programme's needs and the existing building's characteristics. Two examples illustrate this approach: In Molenbeek, transforming a former art deco brewery into a secondary school (Egied Van Broeckhoven School project) reveals the successful alliance between a building and a specific programme. This adaptive reuse of the building reveals its spatial qualities while highlighting the qualities of its architecture and opening it up to the neighbourhood. In the same way, the conversion of the gendarmerie barracks into social housing (Général Jacques project, 60 social housing units on the Usquare site) takes advantage of the architectural features of the existing buildings and, through architectural acupuncture, intertwines new typologies as an extension of the initial occupation. This process involves tailoring the programme and project timetable.

EGIED VAN BROECKHOVEN SCHOOL

The story of the Egied Van Broeckhoven school is one of opportunity. It all began with the wishes of the non-profit organisation Ignatius Scholen in Beweging to open a secondary school for people from the working and middle classes, particularly those with a migrant background. Targeting the Molenbeek municipality, the essence of the project from the outset was to forge links with the neighbourhood. In 2014, Joris Tiebout, chairman of the non-profit association, embarked on a tedious search for a plot of land, which took almost four years.

At the same time, a project to build housing on the former Vandenheuvel brewery site was referred to a quality board. Although not listed, the former brewery boasts some interesting architectural features, with the art deco facade housing a beautiful concrete structure with a long span and generous volumes. This broad span could not be used for housing, so the developer proposed partially demolishing this industrial heritage.

Following the unfavourable recommendation from the regional authorities, the BMA informed the non-profit association that the building was available for a programme capable of exploiting the existing potential and adapting these broad spans. And so the alliance between the non-profit association and the Vandenheuvel building began. However, the brewery was falling into disrepair, and the land was polluted, making a reconversion particularly complex. The non-profit association negotiated with the owner to pay for the clean-up, enabling the school to be set up at the same time as refurbishing the building for its next life. The project's ambitions were refined with the help of a programming agency, which defined the scope required to implement such a programme.

The non-profit association organised a competition for the conversion as part of a Design and Build contract, including in the specifications the desire to open up the building to the neighbourhood and conserve as much of the existing structure as possible. The Alheembouw — BAM PPP PGGM & B2AI consortium won the contract. In particular, the project proposes to locate the sports hall open to residents on the ground floor in the corner, in direct contact with the street, providing a visual link and

a buffer with the educational programmes. The project rooms will be on top floors, taking advantage of the building's long spans.

The Egied Van Broeckhoven school opened its doors in September 2023 for the first secondary classes and will open one new class per year, with completion scheduled for around 2028.

GÉNÉRAL JACQUES

The Général Jacques project, the conversion of a military barracks into social housing, is part of the SLRB's (Société du Logement de Région Bruxelles-Capitale) general strategy to significantly increase the stock of social housing. Against a housing crisis in Brussels, the SLRB delivered almost 2.000 homes between 2019 and 2024, and many projects are underway. This diversity of projects allows flexibility in terms of the typologies present in each project, which can be adapted to the qualities and potential specific to each context.

The barracks building, dating from 1950, has intrinsic qualities of habitability, with a slim corridor composed of double-oriented flats. It once housed the gendarmes' barracks and was transferred to the land registry. In 2018, it was acquired by the SLRB, which was interested in the location, price and cost of the work. While the SLRB seized the opportunity of this land, a study of the financial profitability of the project was carried out beforehand, with the choice of a light, one-off renovation scenario that would not affect the structures. *"We based our studies on this scenario from the outset. Our responsibility is to ensure an operation that does not put the SISP (Société Immobilière de Service Public) into debt and that even allows it to make a profit after a certain number of years, with the support of regional subsidies,"* explains Guillaume Sokal and Déborah Tramontada, who are responsible for this project within the SLRB.

The SLRB's approach began by paying close attention to what already existed. The typology grids and general programming requirements have been set aside to adapt the building. *"Here, the choice was made to demolish as little as possible and to use the building as a mine."* Although the building no longer complies with energy standards and some rooms are now too small to be considered bedrooms, the owner retained as much of the original features as possible, right down to the Bulex kitchens and floor coverings.

This choice of light renovation costs the same as a demolition-reconstruction strategy. While savings are made on the cost of materials, this is offset by the price of the labour required to carry out the painstaking work of reuse. However, if the cost is equivalent, the result is a detailed treatment *"that goes beyond the standard qualities generally found in social housing. Here, we have built-in kitchens with parquet flooring... It's a step up in quality thanks to renovation and reuse"*.

Achieving this reuse goal required a longer time frame before putting the units on the market. The SLRB has carried out an asbestos inventory and, for the first time, a reuse inventory. In addition, a plan was drawn up to study the possibilities and needs of typologies.

This additional work was part of a paradigm shift. Instead of a visible, interventionist architectural operation, the SLRB aimed for an intelligent renovation: one-off interventions on the building to renovate it and refurbish the flats, achieve good energy performance and integrate outdoor spaces. Several user requirements have been formulated, such as the need for access for people with reduced mobility, the inclusion of a cycle parking area, the provision of a common room, and the need to improve urban integration, particularly by improving the treatment of the inner courtyard. The technical strategy was also important, with thermal insulation and the integration of technical installations to be defined.

In this competition, where the primary criterion was attention to circularity, the choice fell on the bid from the architectural duo Karbon-Label, who proposed the least amount of extra material. The integration of the loggias towards the interior, taking advantage of the existing slab, is of particular note. *"This project raises the question of architectural quality. Does it mean looking for the perfect project in terms of its architectural expression? In this project, it's expressed more in the technical solutions, which are much less visible, perhaps more humble."*

While renovations occur regularly for the SLRB, particularly in the heritage department, pushing the boundaries of attention at a non-listed site is a position that is becoming increasingly important. However, Guillaume Sokal notes that the assignment always evolves according to the state of the existing building: in some cases, more extensive work, including modifications to the facade, is unavoidable. In any case, the Général Jacques project is: *"one of the most attractive housing projects to be let."*

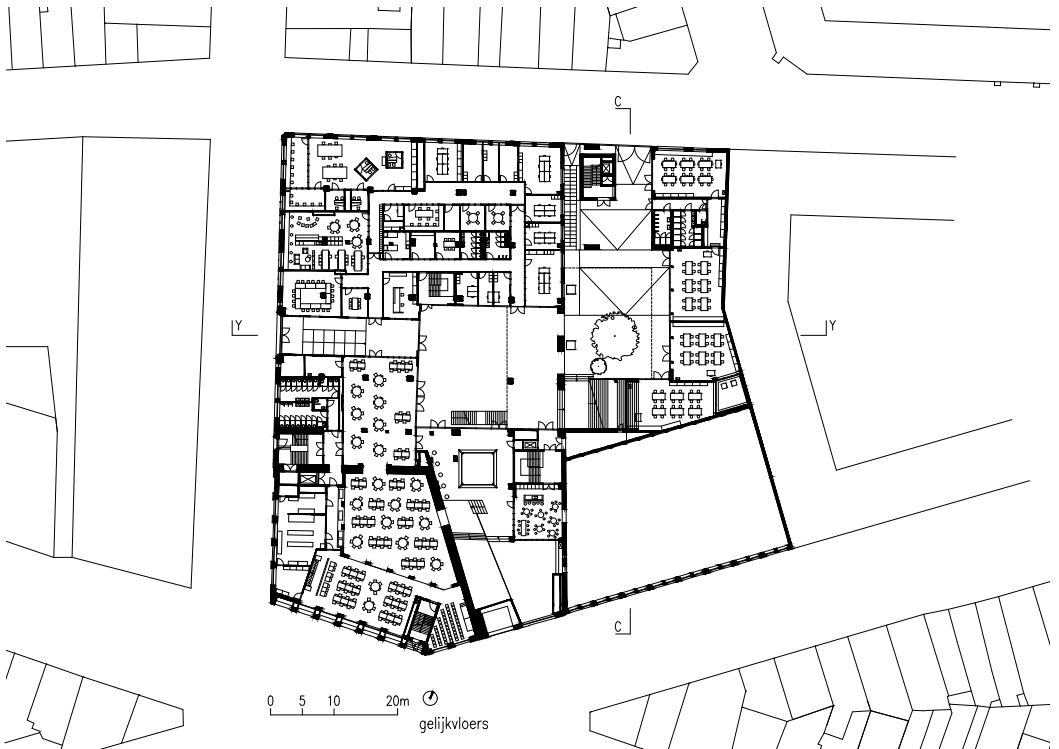
CONCLUSION

These two projects embody the great leverage project owners and the authorities that support them have in reconversion programmes. One essential observation is that not all programmes adapt naturally to an existing building. Finding the right opportunity is crucial, one that combines the programme's needs and the building's characteristics. To facilitate this alliance, the appropriate players need to be mobilised. Public authorities, project owners and developers must be able to work closely together. BMA, the Facilities Task Force, and other similar entities can be vital in identifying buildings and carrying out successful transformation projects.

Flexibility in project programming and timing is essential when integrating them into existing buildings. Although the rules and standards are sometimes too rigid, and reuse often requires extra time in the preparatory phases, this approach offers long-term benefits such as unexpected architectural quality, preservation of heritage, savings on materials, and the project's social impact.

EGIED VAN BROECKHOVEN SCHOOL

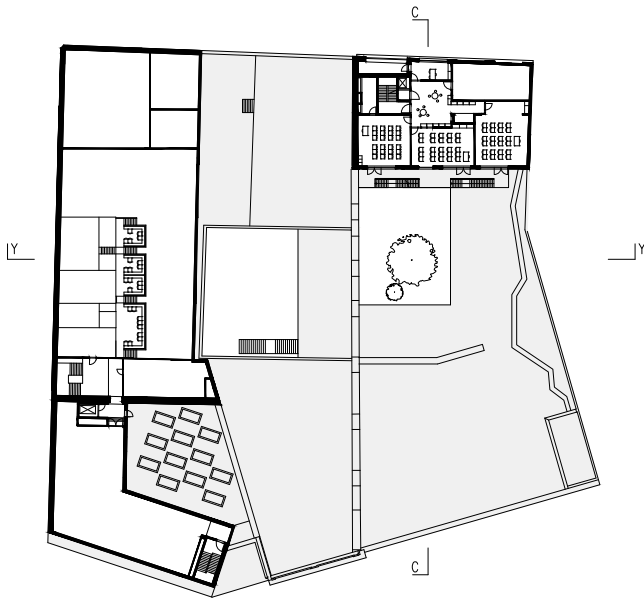




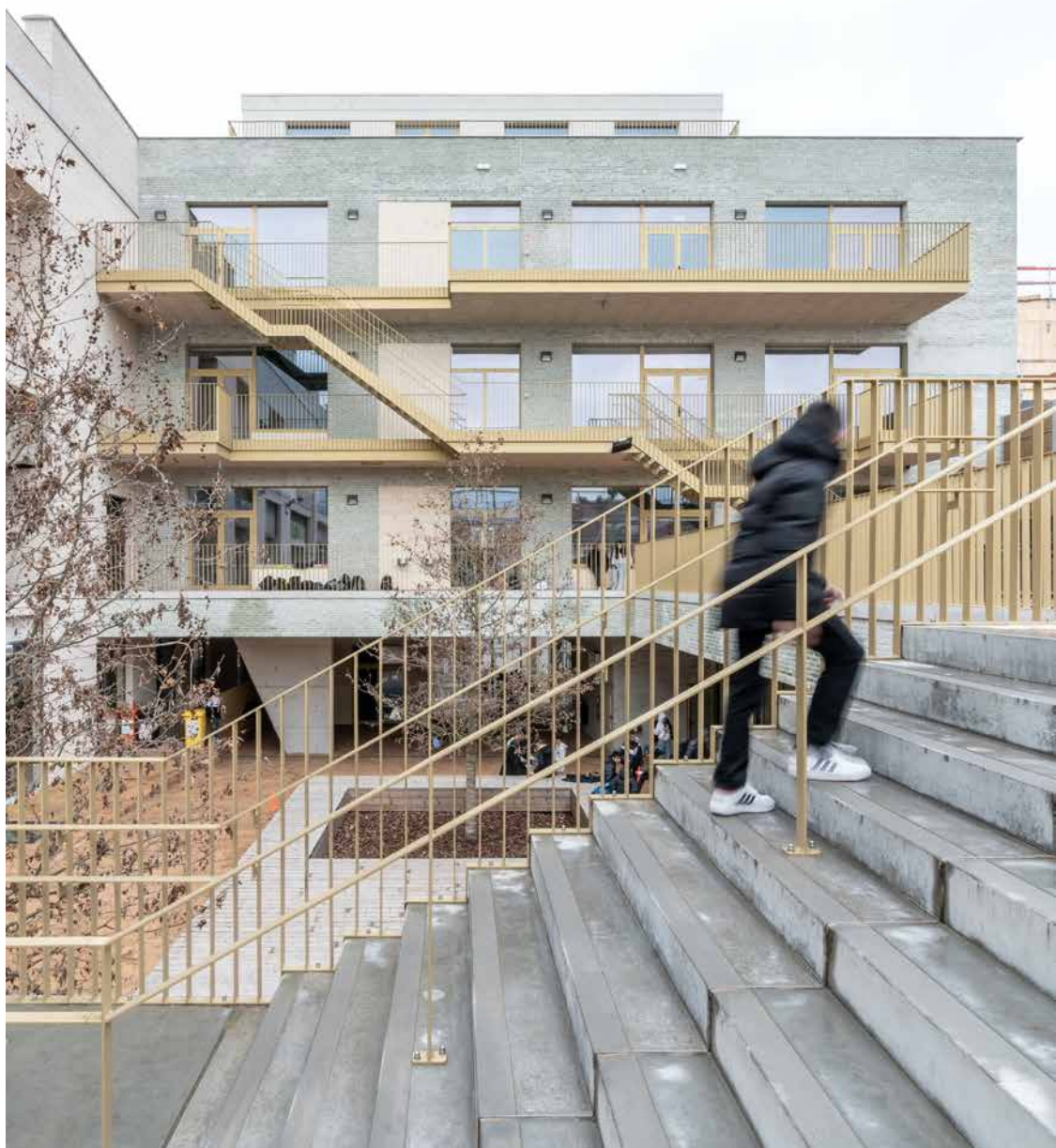
↑ Ground floor plan



↑ Cross section through the transformed brewery structures and the new additions



↑ Floor plan +3





Transformation of a former brewery in Molenbeek into a school. Initially prospected unsuccessfully as a residential development in a city in search of densification, the brewery's generous spaces proved more suitable for a different type of programme, leading to its adaptation into an educational facility.

Site

Pierre van Humbekstraat 5
1080 Sint-Jans-Molenbeek

Year

2017 > 2024

Client

vzw Ignatius Scholen in Beweging

Architect

B2Ai architects

Team

B2Ai interior design (interior design)
Stefaan Thiers (landscape architecture)
VK architects & engineers
(structural and MEP engineering)

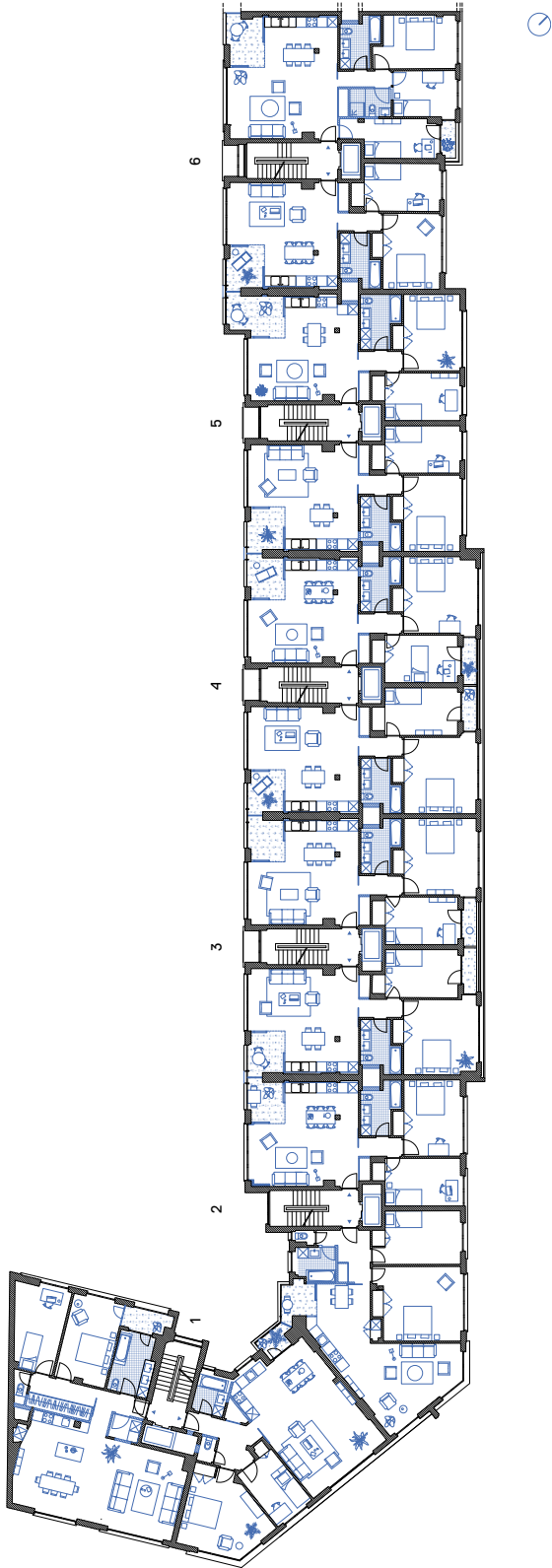
GÉNÉRAL JACQUES

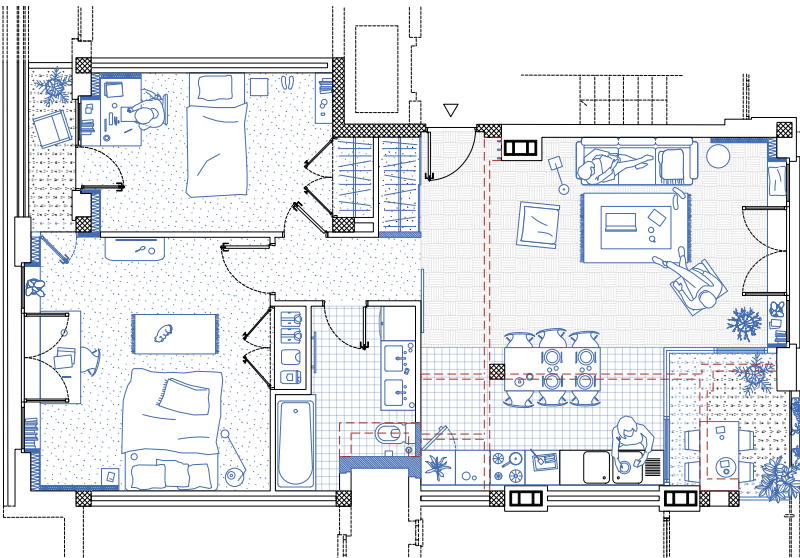






↑ Preservation of, among other things, the aluminum windows, closets, radiators, floor finishings, kitchen furniture





↑ Apartment typology



↑ Subtle additions to the existing architecture: 12 cm of cork is added to the facade walls, a new strip for the windowsill and a lime/plaster/sand render protects the insulation and ensures perfect air tightness





Transformation of former Federal Police staff flats into social housing. Focusing on 61 units, the project preserves the original building typology and incorporates principles of material reuse. A thoughtful and restrained approach to renovation highlights the building's original qualities.

Site

Boulevard Général Jacques 202
1050 Ixelles

Year

2020 > Ongoing

Client

SLRB-BGHM + BinHôme

Architect

Karbon' architecture et urbanisme
+ Label architecture

Team

Ney & Partners WOW
(structural engineering)
MKEngineering (MEP engineering)
Retrival (reuse and recycle)
Carbonifère (landscape architecture)

KANAL



AS FOUND

Mark TUFF

When we find something, sometimes it's because we're looking for it: the house keys, a quote we've read somewhere in a book, a tin of paint we used to decorate a wall. Our efforts pay off, and we are rewarded by finding something we knew was there, somewhere.

At other times we find something unexpected, something that surprises us: coins down the back of the sofa, a wildflower growing in the garden, a hidden place in the city with a certain magical atmosphere. These chance finds have a serendipitous quality and transform our lives for the better.

Some of the things we find are banal — useful in our daily life but unexciting. Items without emotion that simply ensure our lives can carry on. But other things we find are more than that. We speak of these "finds" as treasures — not only unexpected but enriching.

When we first visited the Citroën garage in Brussels, we found many things: some predictable, some unexpected, some banal, others precious. We found equipment, fixings, finishes, marks of use and traces of history, all of which contributed to the atmosphere of the place. We always knew we were adding another chapter to the garage's many lives and that the powerful qualities the spaces and fabric held were too precious to throw away or ignore.

Yet using the "as found" involves not simply blindly accepting everything. It requires discernment and selection — thinking about what gives a place its character by looking carefully. We found that how elements are strapped to the columns brings a vibrant quality to the structure; observing the way the paint has been applied up to a certain height around the spaces gives surfaces a sense of being "handmade"; plotting the fields of colour, markings, pathways and tire marks charts the uses and histories bound up in the concrete floor and lends the building a spatial quality that transcends its current function and material presence.

LEARNING FROM KANAL BRUT

Jitse VAN DEN BERG

The opening of KANAL BRUT shortly after our project won the international competition for the transformation of the Citroën garage was a Big Bang moment. It revealed a structure that had fallen into hibernation as a critical new public building for Brussels. The experience surpassed even our wildest dreams as KANAL reinvented itself as a new public space in the centre of Brussels.

Curated with well-chosen art pieces from the modern art collection of the Centre Pompidou, KANAL BRUT brought art into interesting dialogue with the garage "as found". The scenography — at times playful, never banal — was revealing and liberating in its informality and directness: the sight of children playing freely between precious art pieces made from metal seemed curiously apt in the Tôlerie, the car body workshop. The manufacturing process's traces and lingering smells made the exhibition a much richer experience than the familiar display of art pieces in isolation within white space.

It reinforced our joint trust in the existing building and inspired changes to the competition scheme to keep even more of the original structure. For instance, we used the ramps as the main access to the public areas on the first floor, leaving the entire Carwash area open — a large-scale space available for temporary use.

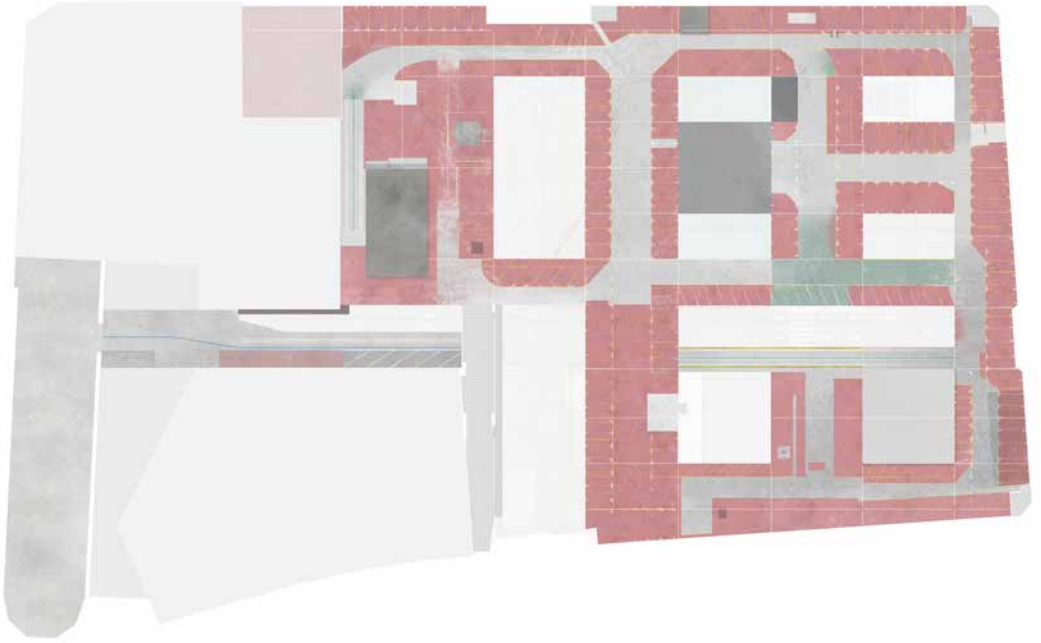
Another radically optimistic move, the public Promenade, was also strengthened as a looping path across the ramps to the first floor through a sequence of open curated spaces stretching along the perimeter of the garage — an invitation to all visitors, with or without a ticket, to explore the Nave and the vast expanse of the first floor.

The extended and independent use of the Showroom, initiated by our proposal to keep KANAL open during the construction phase, is an exciting development for BRUT. The Showroom, with 20-metre-high letters boldly painted on the facade, is an important public space in itself. Directly accessible from the street, it opens towards the centre of Brussels. It will do so even more in the near future when its grand windows lift vertically along Place Sainctelette.

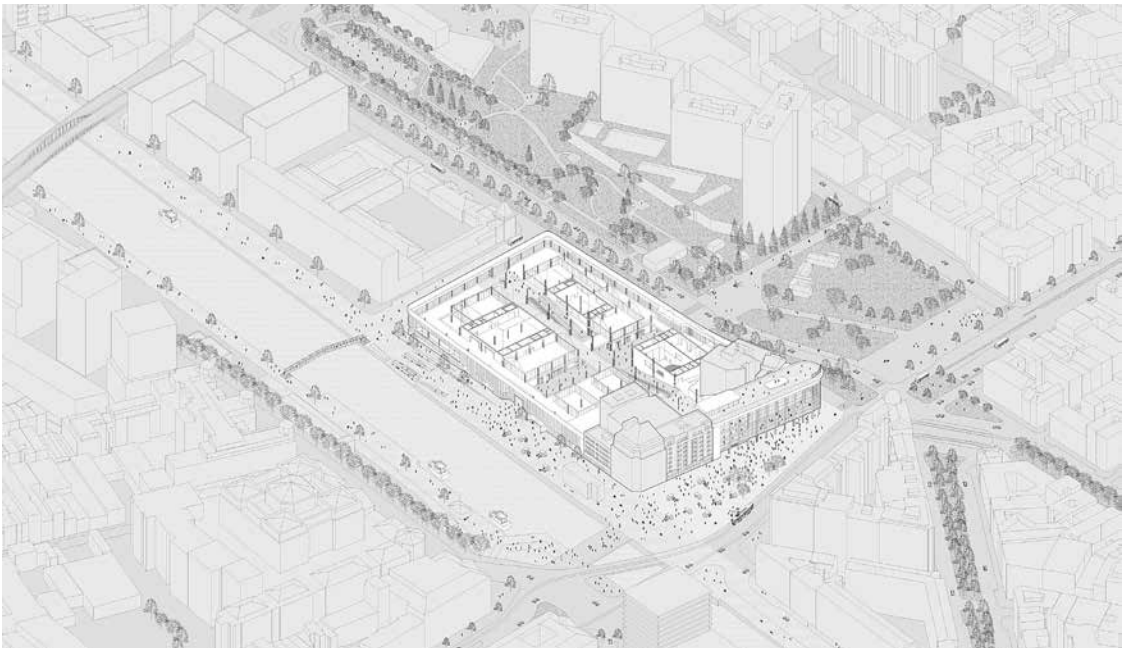


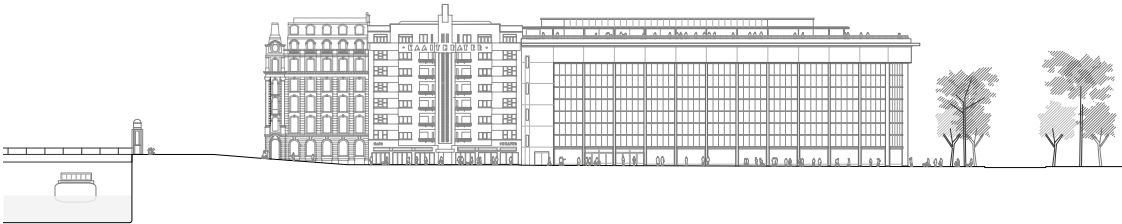
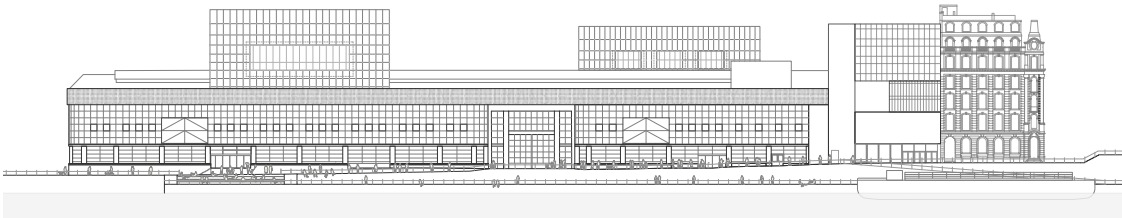
↑ Images from the temporary museum KANAL BRUT

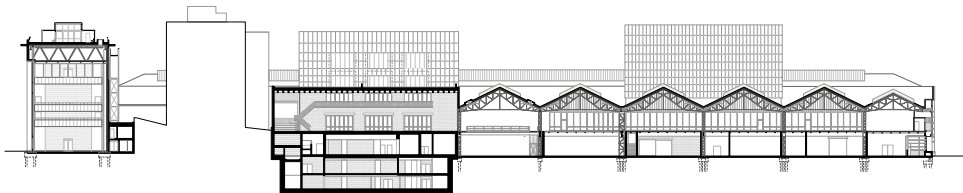
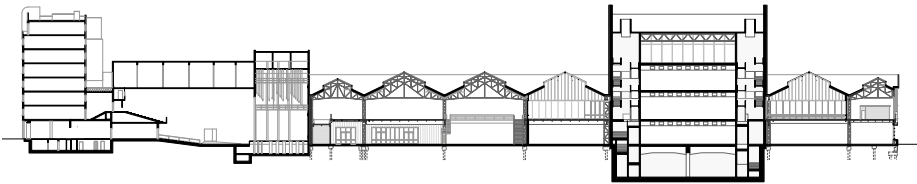




↑ Among the many things found at KANAL were the floor paintings adding up to the powerful qualities of the spaces









Transformation of the iconic Citroën garage along the Brussels canal into a 35.000 m² cultural hub, with a museum for modern and contemporary art, an architecture centre, as well as public and multipurpose spaces. The project takes place in the heart of a rapidly regenerating urban district, positioning the site as a key driver of cultural and urban revitalisation.

Site

Willebroekkaai 6,
1000 Brussel

Year

2017 > ongoing

Client

Fondation KANAL Stichting

Architect

Atelier KANAL (NoAarchitecten
+ EM2N + Sergison Bates Architects)

Team

**Arviso / Buro Happold /
Cartlidge Levene / Egeon /
ELD / FESG / Gevelinzicht
Greish / Kahle / iArt /
Up&Cie**

USQUARE



A CIRCULAR TRANSFORMATION AT THE NEIGHBOURHOOD LEVEL

Frederik SERROEN

Usquare.brussels is the conversion of the former Ixelles/Elsene gendarmerie barracks into an open, mixed, and multifunctional district, welcoming university facilities, student, and family housing. The site of 4 ha is a unique enclave in the city close to the university campuses of ULB and VUB in Etterbeek, and it is also located at a major public transport hub. The former barracks are iconic buildings of the early 20th century with a total floor surface of over 56.000 m². In recent years, they have become empty due to the relocation of the Federal Police. The Brussels Planning Agency (Perspective) adopted a new regulatory framework for the site's future transformation. The universities and the Urban Development Cooperation (SAU/MSI) are jointly responsible for the real estate operations and project coordination.

The redevelopment process started in 2018 with an architectural competition for the transformation of six historical buildings facing Boulevard Général Jacques and the former horse riding hall at the centre of the site. Sustainability is a common thread for the site's transformation. The winning design of the architecture competition by EVR, BC architects, Callebaut, and VK Engineering generously opens up to its surrounding environment. In doing so, it formulates an appropriate response to the challenges in terms of visibility and integration of the project into the existing urban fabric without losing sight of the enclosed character of the site. Based on a detailed analysis of the on-site elements, the renovation project seeks to enhance the qualities of the existing heritage. The project embodies a thoroughly circular approach and serves as a model for later construction phases on the site. Dismantling several neighbouring buildings provides the project with "waste streams" that can be converted into repurposed raw materials. For example, bricks and glazing are being

reused, and other raw materials are recycled and used as flooring. New building materials, such as (acoustic) clay plasters, and hempcrete, are bio-based. By considering the site as a quarry, the project dramatically reduces the inflow and outflow of building materials, thus reducing CO₂ emissions. BC architects organised several building workshops on site, allowing students and young professionals to become familiar with these new circular renovation techniques.

Parallel to the first architectural competition, a call for proposals was launched for the temporary use of the site. Pali Pali's proposition was chosen and started in 2019 under the name See U. The installation of various temporary activities helped to (re)discover the qualities of the as-found architecture. From See U came the insight that the future of the buildings along the central courtyard (fab labs, student accommodation, and the food hall) were essential to bringing the square to life. The temporary use of the site allowed us to experiment and prefigure a desired future of the site. It helped test and fine-tune the programme and can be considered a real-time feasibility study. The transitory use of the barracks site by See U is one of the first of its kind in the Brussels region, and through its open-ended approach, helped establish new ties between the site's occupants and residents.

The SAU/MSI drew inspiration from the first phase's circular approach to strengthen the ambitions for the following architectural competitions. This was also in line with the group's views around French landscape designer Anyoji Beltrando, who won the competition for the public space at the end of 2019. The winning team mainly proposes a working methodology and a structured and flexible vision for redeveloping the 21.000 m² of public space. The methodology is developed around three axes:

frugality as a guarantee of sustainability, experimentation and sublimation of what is already on site, and co-design and flexibility as a principle for managing the site. The temporary use will remain active during the different development phases and will be given a central place within the final project. The group fully embraces the concept of circularity. They reclaim as much of the existing cobblestones as possible but make the space greener by processing it differently.

Another vital element in the redevelopment process was the desire to ensure the project's sustainability and the integration of the circular economy at the neighbourhood level. Of the 26 buildings on the site, 18 will be preserved and renovated, and two will be raised in height. In contrast, just three will be demolished and rebuilt, and four demolished without being rebuilt to ensure plenty of high-quality public space, including creating an open-air public garden. Supported by Rotor, the SAU/MSI, therefore, defined a site-level circular strategy. By doing so, the SAU/MSI have set ambitious objectives to showcase the site's architectural heritage and circular construction based on the reuse of materials. In November 2022, the SAU/MSI initiated work to overhaul all utilities (water, gas, electricity, telecoms, sewers) to create an underground heating system. After some geothermal test drilling, it was decided to connect the converted buildings to a heating system supplied by renewable geothermal energy.

The site's transformation continued with the realisation of new family housing, which the Brussels government had decided to be all public, around the edge of the former barracks. The first housing project, Clos de Mariés, started with an architecture competition in 2019. The winning design of Atelier Kempe Thill and Kaderstudio aims to return the Clos des Mariés to its original residential function as part of the broader reconversion of Usquare by housing 33 social housing units. The architectural interventions preserve 86 % of the existing building while providing housing adapted to contemporary needs. The planned renovation respects the sheltered character of the Clos, an intimate space in the heart of the city, and adds a secret garden full of plants. The plan was designed using a reasonably simple grid to make the spaces modular and reversible. For example, spaces under the roof can be transformed into additional bedrooms, and duplexes can be divided into two separate dwellings. In terms of circularity, the team works with innovative and reusable materials. For example, the terraces are

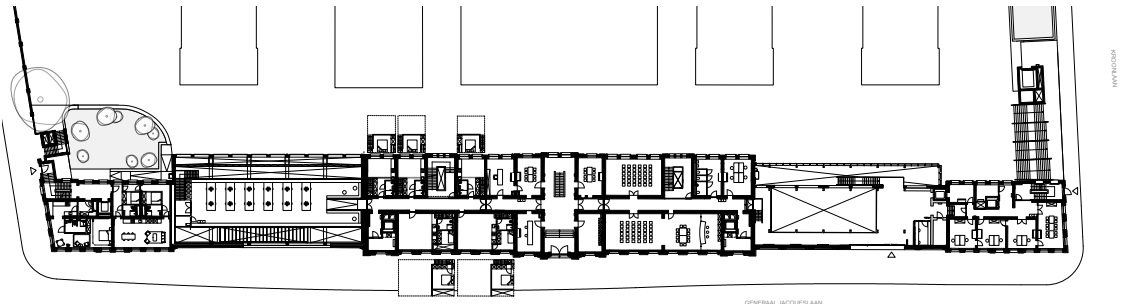
constructed from reused and reusable steel. The internal walls can be easily removed again thanks to ingenious assembly techniques. The insulation is biodegradable. Thus, the team demonstrates its ambition regarding sustainability and responsible energy use.

Today, the reconversion project of the former barracks is halfway through. The pace of the transformation is relatively slow, and there is still a margin for improvement. The regulatory framework, for example, has to allow more flexibility to keep up with the evolving views around building preservation. On the other hand, this "slow urbanism" has pushed the circular ambitions and set the tone for the upcoming projects. Without any doubt, the realisation of future projects such as the student residences, the new family housing, the public amenities, and the transformation of the existing fablab will follow the circular standard showcased in the reconversion works so far. Moreover, if someone looks at the first plans in 2016 for transforming the barracks into an international university neighbourhood, they can clearly see that a more radical approach towards reuse and as-found architecture has been put into practice. In less than ten years, a shift from a merely heritage approach towards an innovative circular economy vision has become common sense.

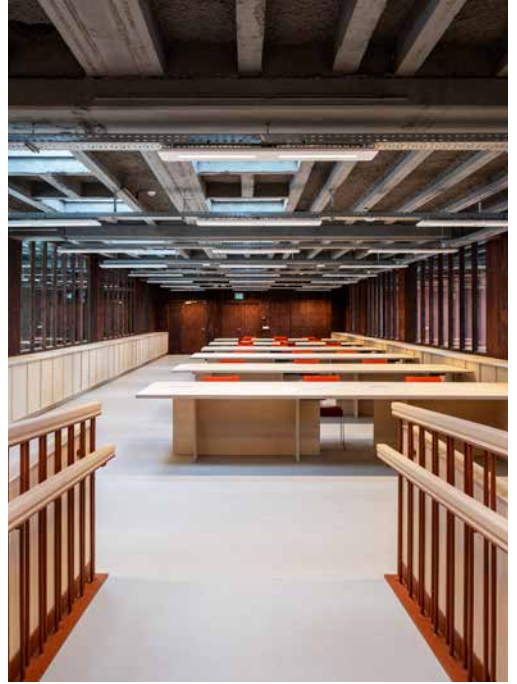


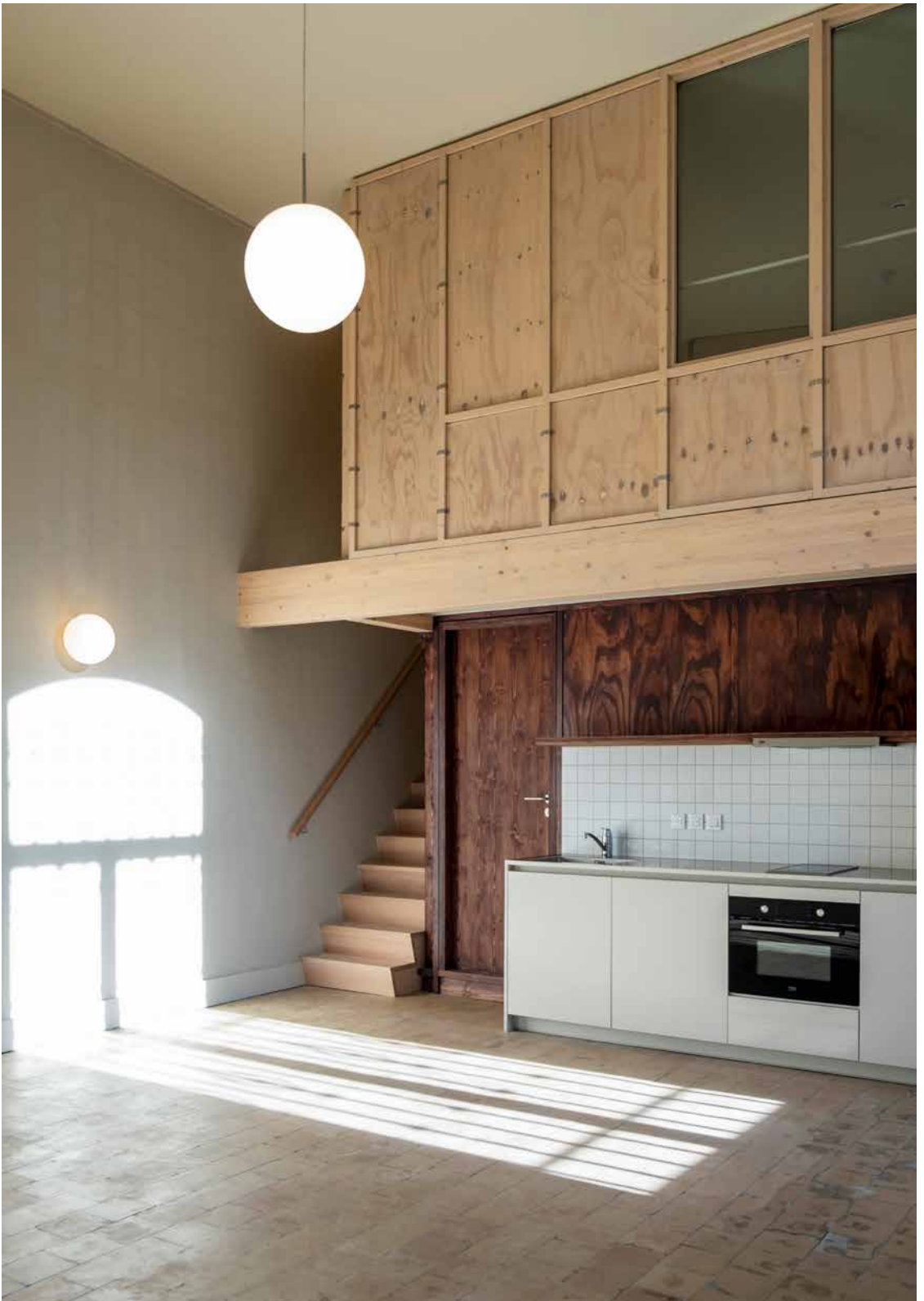
↑ Temporary use plan set up by Pali Pali and master plan for the public spaces by Anyoji Beltrando - the installation of temporary activities on the Usquare site helped to (re)discover the qualities of the as-found architecture and allowed to experiment and prefigure a desired future of the site.





↑ Plan and cross-sections of the ABC-buildings realised by EVR architecten, BC architecten, and Callebaut architecten









↑ Clos des Mariés project by Atelier Kemp Thill and Kaderstudio



↑ Public space design by Anyoji Beltrando

Transformation of the former Ixelles-Elsene barracks, evolving into an international university campus and a lively new city district, with sustainability as guiding principle throughout the development. In its initial phases, the site was partially opened through a temporary occupation project that helped shape the future district. Usquare now includes a first completed project (the conversion of the ABC Buildings featuring university research departments and accommodation facilities for international residents), while the Clos des Mariés social housing project and the public space project are still in design phase. Upcoming projects, such as a centre for persons with autism and student housing, are set to further enrich the area. The redevelopment integrates a robust commitment to circular economy principles.

Site

Rue Fritz Toussaint
 Rue Juliette Wytsman
 Boulevard Général Jacques
 Avenue de la Couronne
 1050 Ixelles

Year

2017 > ongoing

Client

SAU-MSI + VUB + ULB + SLRB-BGHM

Architect

Pali Pali (temporary use)
EVR architecten + BC architects + Callebaut architecten (ABC buildings)
Atelier Kempe Thill + Kaderstudio (Clos des Mariés)
Anyoji Beltrando (public spaces)

Team

VK Engineering (ABC buildings)
Latitude (Clos des Mariés)
Olivier Graeven (Clos des Mariés)

KARREVELD



DEVELOPING AN ARCHITECTURAL LANGUAGE FROM WHAT IS ALREADY THERE

**Interview by Lorène MORENVAL
with Benoît VANDENBULCKE
and Harold FALLON**

Karreveld Primary School is the result of the redevelopment and extension of the pharmaceutical company Takeda's former factory and office buildings in Brussels. The conversion of this building was carried out in two phases, which gave rise to two competitions. AgwA won both: the conversion of the first wing and the construction of the second wing.

As an architect, how does one live side-by-side with heritage and the forces at play? How can one take on-site reuse even further? How can we make transformation through reuse into a desirable future? These are the questions tackled by Harold Fallon and Benoît Vandenbulcke, partners at AgwA.

LIVING SIDE-BY-SIDE WITH OUR HERITAGE

What is your view of the Takeda context? Interventions like the wooden staircase or the canopy are minimal signs of the conversion. Was it a conscious decision to intervene as little as possible?

Benoît: When we participated in the competition for phase 1, there was an urgent need for the school to open in September. It was December, and the budget was 850.000 €. Our approach was not to say, "We're going to do a circular project," but "How are we going to make it work?". We studied the partitions and realised that everything could be completely dismantled. We said to ourselves: it's all here. It was a godsend. Then, there were requests for a canopy and a second staircase. There

was no significant attempt to blend in with the building; it was really in a spirit of simplicity.

Harold: Whether it was for the staircase or the canopy, you can imagine the people who had to do the nailing and screwing. Our architectural design contrasts this highly controlled, polished concrete skeleton of the original building. We were interested in changing the image of the building as a very corporate office so that suddenly you could feel that a different kind of life was taking over the building.

What is impressive about the conversion is that you created a new identity from tertiary elements with a strong connotation. The new extension also plays with these codes. What was your approach to these two operations?

H: All these tools designed to create smooth surfaces and absorb differences suddenly become a fragmented system, a raw aesthetic in motion. You break the symbolism, and it's confusing to read. It's the ingredients of the office, but it's not the office. That said, it's not the aesthetic of a school either. When you walk around, you think: this is a bit of a strange place.

B: There are two operations: refurbishing the existing building and constructing a new one. The same approach was used in both parts of the existing structure. As the second part of the existing building is slightly wider, the corridors created are wider. Pupils can sit down there at tables. In terms of space, it's interesting. A corridor becomes a space that you can actually use.

Then, the question was: How do you add the new building programme? Two sports halls, many classes, and a large refectory were needed. The challenge was not to detract from the existing building.

H: This playing with codes continued in the second phase of the operation. A spatial and graphic staircase was created at the junction of the two buildings to serve the entire school. Once again, a one-off intervention in the entrance hall transformed the building into a real school with generous circulation.

Has working from what already exists enabled you to create a richer architecture?

H: Having this history, these as-found materials provided us with a catalogue specific to the site. There's a certain pleasure in using these constraints and not inventing everything. Similarly, we reproduced the existing principle for the new constructions: an empty concrete building with no posts and no structure. This allows us to have a structure that is here for the very long term, where the internal partitions can be moved.

B: Some architectural practices have a very recognisable style. We start with this long observation where we say to ourselves, "But what can we do with the forces at play?"

This brings us to the question of the legibility of an architectural language. In your work, it appears in a finer, less demonstrative way. In the exhibition *Dispositions* by AgwA at Bozar¹, you write that you "negotiate with an architectural context". Do you see this approach as more pragmatic?

B: No. It's conceptual, really. There are ways of working that remain. There's a moment when things overlap between our language, our architecture and the forces at play.

H: Has renovation ever been the driving force behind architectural design? There have always been transformations — the Roman basilicas were transformed into churches. What we're seeing in Brussels is an interest in transformation as a place where architecture can express itself as a discipline. There may be something new out there that's really interesting.

We started to work on existing structures firstly for expediency and secondly because the emerging projects are strong. It's fascinating to try and understand how to make a project work that has a certain interest, and that is specific to a place.

B: From our very first projects, we developed an architectural language linked to existing contexts. We have learnt to position ourselves in relation to a building, which does not always have recognised aesthetic or heritage value, in the sense that it is not listed. The heritage we're working on is "nondescript". And that's exactly where we need to be more attentive. Focus on a facade. A detail.

Do you defend architecture through minimal intervention? Is this a societal bias that you are defending?

H: This is not an economic or environmental issue. Not strictly. I like the fact that we can see the traces of what we've done and that there's no "extravagance" in the technical and material solutions that are put in place. In our work, we often pay particular attention to a construction method or the way we make an opening.

At Karreveld, the question of the partitions' composition comes to the fore very strongly, and then it becomes something that shapes the project. You understand how it's done. You can clearly see the old partitions and the additions that have been made. The exterior wooden structures are the same. There's a very straightforward side to the construction.

B: Our approach — and this is the title of the exhibition *Dispositions* — is to put spaces at people's disposal so they can inhabit them. Where does architecture come into it? Is it in the colour of the plaster that we choose with particular care, or is it in the type of spatiality that we develop, based on interventions on structures, to free up the floor or a facade, to have large openings, or to avoid having columns that fall in the middle? This was the case for the Métal project, the redevelopment of a tire workshop into an evening school in Saint-Gilles, Brussels (2009). We like to say that "we make large-scale structures that are easily adaptable".

¹ Exhibition at Bozar, Palais des beaux-arts de Bruxelles, from 12 October 2022 to 8 January 2023, retrospective of AgwA's 20 years of practice, through six flagship projects. This exhibition is accompanied by a monograph.

H: Making the construction very legible and straightforward means familiarising yourself with the place. This results in a language that is not cosmetic. Beyond spatiality, there is a relationship with the material itself.

ON-SITE REUSE WORK

This finesse is in implementing the assembly between the existing and new buildings that intermingle and interlock. Is it a game? How do you approach it?

H: Calling it a game is a playful way of looking at it, but it is more of a theoretical interest.

B: The first questions about what to keep as it is while just changing the function are serious. But then there's a precise plan composition with an authentic architectural deployment. Our attention goes beyond the implementation; it also goes to the spaces created. We can create a hierarchy of rooms in relation to each other. How do you give them access to light in a deep building? How can we intelligently use what little material we have? It entails a considerable amount of work. There's a real focus on how a new building unfolds without contradicting what's already there.

And in practical terms, how did you go about it? You drew up an inventory of what was on site. Did designing based on this inventory generate uncertainties and constraints?

B: In the first phase, all the elevations of the interior partitions were redesigned. Each panel had its own dimensions; each was numbered, but there was no uncertainty because we had "too many". There was some uncertainty about the number of partitions that could be reused for the second wing, so we looked at how far we could go with reuse during the works. As for implementation, the contractor was initially reluctant for cost reasons. To install reused partitions, you need someone qualified who understands the system and is precise.

H: You step outside your comfort zone. You must work on your know-how and practice, which is not always the most comfortable or automatic thing.

B: The interesting thing is that reuse favours work rather than the circulation of materials. It's important to realise that these projects aren't cheaper because we're reusing materials. They are the same price or even more expensive. But they have a huge advantage in that we have had access to materials of a quality that we would

never have had in a public procurement contract. The windows in the classrooms opening onto the corridors were of excellent quality.

What lessons have you learned from the Karreveld project?

B: One lesson is to say to ourselves: on-site reuse is possible as part of a public procurement contract. Not only is it possible, but the result is beautiful.

H: I think that questions about the demolition of the buildings gradually came to the fore. Reusing materials in their original function is very powerful: partitions remain partitions.

How do you think we can take on-site reuse even further?

H: There are materials that we still can't recover because we can't reuse them in their original function or because they don't comply with standards. For example, in the project to renovate the SLRB/BGHM offices on Avenue Toison d'Or (2022), the external windows are being recovered for reuse in the internal partitions. These windows don't have outstanding thermal performance but still perform very well in terms of acoustics. Here, we recover materials in different configurations. On-site reuse is very direct.

B: Today, for a public contract, we proposed recovering all the structures, concrete slabs, and posts. The competition jury considered this too radical, but that will change one day. So, if a building has to be demolished, which may be the case, there may be parts of the building that can be reused as is. We're trying to make project owners believe it's possible (laughs).

As for the construction works, how did you go about dealing with a company that wasn't trained in reuse?

H: These are adventures we embark on together. You have to adapt to the situation each time. I don't know if it's possible to imagine training for this at some point.

B: We reinvent ourselves with every project. It could be more sustainable from an economic point of view. We're currently working on on-site reuse at another school in Liège. The reuse process is something else entirely. The partitions have to be cut out, recut and repositioned. You have to imagine each operation and describe it.

H: All this lacework, where we have to adjust the window lintels finely, is indescribable. When you start out, you draw up an overall plan, and then it becomes a series of micro-projects that must be considered as a whole.

B: How can we ensure that companies understand this clearly? They're not used to doing that. You have to be creative in the way you write technical documents. And it's tedious. And that's how we remain craftsmen.

H: Charging different fees for these procedures wouldn't be a bad idea. The whole inventory phase is a big job. It's not just a question of quantifying; it's also a question of redesigning to understand what can be done. And it's not something that can be separated from design nor outsourced. For the moment, it's unpaid overtime.

HOW CAN WE TURN TRANSFORMATION INTO A DESIRABLE FUTURE?

Do you see this work on reuse as common sense? How do you, as designers, position yourselves in relation to current environmental regulations?

B: This "common sense" vision is essential. What irritated us about passive construction [the regulations imposing passive construction in the Brussels region] was that we had the impression that we were limited in terms of architecture. We said to ourselves, "It makes for rather bizarre architecture", which we didn't really like, with little common sense, since this thinking sometimes led to demolition. It was amid all this thinking that the idea of reuse came about.

H: Low regulation limits experimentation, but it also means that a whole series of average projects can be brought up to a higher level — a double effect. A certain level must be respected, but sometimes, there should be exceptions for a particular architecture or context that calls for something else. How architecture unfolds through transformation takes on a whole new dimension, along with the challenges of climate change. The fact that you can look at it from another angle and say to yourself, "This is beautiful, it's meticulously crafted", and that it is a pleasure to work or live there, that's essential. Because that means you can identify with it, you can want it. It develops the identity of an approach. And then, it goes beyond the question of responsibility or pragmatism. It becomes a desired future.

That's what this publication is all about. It means moving beyond a purely technical approach to focus on design qualities.

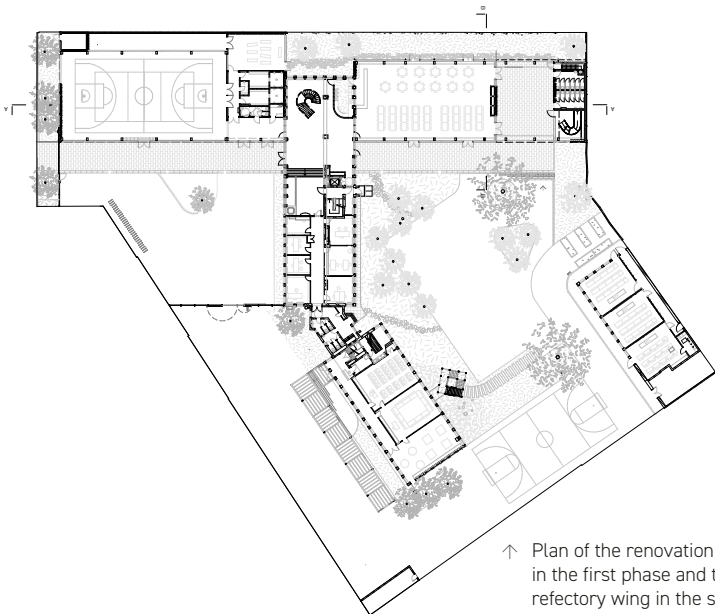
H: To increase the reuse rate, we can reuse solid carpet tiles and make 10.000 m² in one go, but it may not add anything in terms of architecture.

H: It's great that we can quantify the reuse rate. But if that's all there is to it, and people do it out of a sense of duty, it's doomed to failure. On the other hand, if it's just cosmetics, using hooks from a trendy second-hand shop, then it's very lightweight and highly open to criticism. Architecture lies beyond that.

B: There is a risk in taking figures at face value. The problem with targeted analyses is that projects that demolish everything to rebuild can be described as "exemplary". If taken literally, figures like reuse rates, et cetera, can lead to abuses.

H: Yes, but as can a purely cosmetic approach. It's essential to combine the two. We need images and figures, but one without the other becomes difficult. At Karreveld, we quantified after the fact. In the process, we just observed what was there and thought about what to do with it.





↑ Plan of the renovation and transformation of the existing wing in the first phase and the addition of a new sports hall and refectory wing in the second phase of the project.

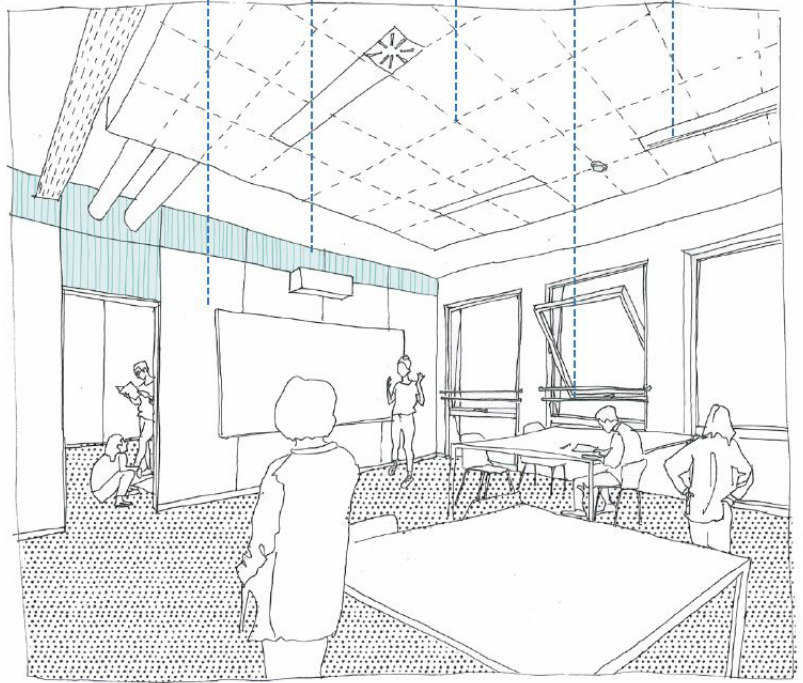
réutilisation des panneaux de cloison existante

complément de cloison en panneau bois

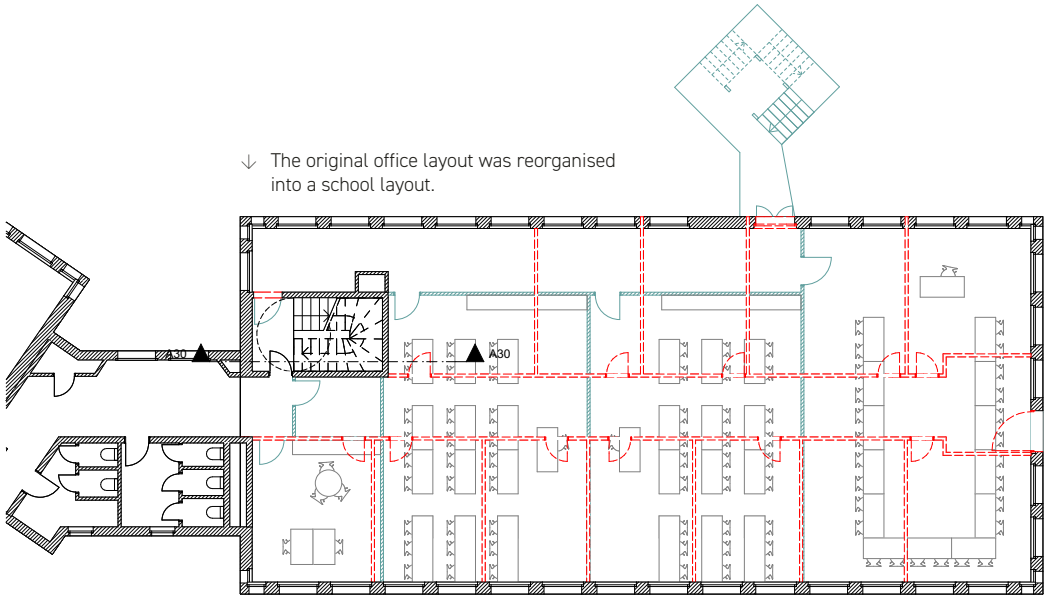
faux-plafond partiellement conservé pour acoustique

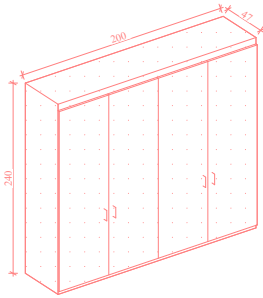
placement de garde-corps sur fenêtres ouvrantes

réutilisation et adaptation du système de chauffage et d'éclairage



↓ The original office layout was reorganised into a school layout.

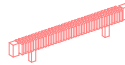




R+3: x0
R+2: x8
R+1: x0



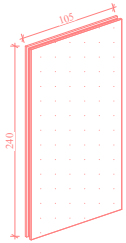
R+3: x3
R+2: x8
R+1: x7



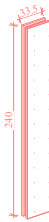
R+3: x26
R+2: x0
R+1: x7



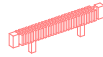
R+3: x55
R+2: x24+2
R+1: x12+4 (cadre suspendu)



R+3: x0
R+2: x36
R+1: x0



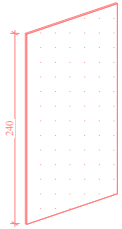
R+3: x0
R+2: x7
R+1: x0



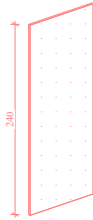
R+3: x19
R+2: x50
R+1: x6+7



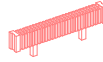
R+3: x32
R+2: x48
R+1: x41



R+3: x0
R+2: x30
R+1: x0



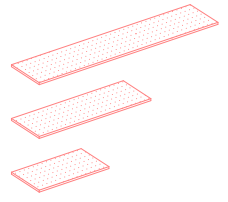
R+3: x0
R+2: x8
R+1: x0



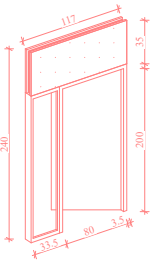
R+3: x4
R+2: x0
R+1: ?



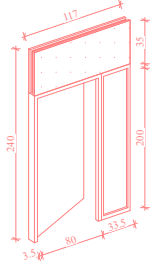
R+3: x171+9
R+2: x245+29
R+1: x325



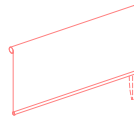
Faux plafond métallisé
35 x 78: 160
35 x 125: 200
35 x 200: 3



R+3: x0
R+2: x10
R+1: x0



R+3: x0
R+2: x7
R+1: x0



R+3: x27+13
R+2: x27
R+1: x4+?



R+3: x6
R+1: ?

↑ The existing partition walls were inventoried for reuse in the new layout as classrooms.





↑ The salvaged partition walls were complemented with wooden panels. Each floor was given a distinct colour for its door frames and baseboards.



The adaptive reuse of an office building in Molenbeek into a secondary school is marked by a modest yet intelligent design approach centred around targeted, independent design interventions. A fast-track construction process was set up that maximises the use of as found structures and materials. By preserving, transforming, and repurposing what is already available, the project minimises waste and exemplifies circular design.

Site
 Chaussée de Gand 615
 1080 Molenbeek-Saint-Jean

Year
 2016 > 2021

Client
 asbl Pouvoir Organisateur Pluriel
 (POP)

Architect

AgwA

Team

JZH & Partners
 (structural and MEP engineering)

Daidalos Peutz
 (acoustical engineering)

Sixco
Thiran



BEHIND THE SCENES OF MATERIAL REUSE

Jérôme KOCKEROLS

Material reuse is one of the more commonly adopted circular practices in Brussels today. Materials once discarded as waste, such as cobblestones, chipboards, and raised floor panels, are almost always reused. The emergence of this approach can largely be attributed to Rotor's pioneering efforts. This cooperative design practice has championed the reuse and circular organisation of the material economy for over 15 years.

Over the years, Rotor has accumulated a wealth of knowledge and expertise in material reuse, assisting design teams and building commissioners to develop effective strategies. This expertise is evident in projects such as Zinneke, Recypark, and MULTI, where their approaches have helped shape the architectural language.

AN EXPERIMENTAL AND COLLABORATIVE PRACTICE

The Zinneke project, initiated by the commissioner of the same name (Zinneke vzw), declared specific objectives at its outset. These included preserving existing buildings and experimenting with reused materials both from these buildings and elsewhere, thus creating a sustainable and adaptive architecture. Additionally, the project sought to integrate an educational programme related to the nonprofit's activities, mainly through training programmes for metalworkers organised by Zinneke. To achieve its circular ambitions, Rotor was invited to collaborate and devise strategies for implementing reuse practices within this particular public procurement procedure and during the ongoing development of the architectural project.

The selection process for architects and MEP engineers diverged from conventional methods, inviting bidders to participate in a workshop rather than submitting a detailed concept design. The objective was to find a team willing to engage in a codesign process and to embrace the momentary opportunities that arise from available reuse materials while letting go of strict control over the building's aesthetic. Ultimately, Zinneke chose Ouest architects and Matriciel (MEP) to work with Rotor on the project design.

The design proposal included a diverse programme of workshops, storage spaces, and offices on a complex site of approximately 4.000 m² comprising two Brussels townhouses, a former printing workshop in the heart of the block, and a long warehouse. The team approached existing structures with respect, modesty, and opportunism, viewing them as resources capable of fulfilling new programme requirements. This strategy minimised interventions in the existing buildings, preserving 94 % of the original building mass. Furthermore, 12 % of the applied materials by mass consisted of reused materials, including steel beams, window frames, insulation, stairs, handles, wood decking, parquet, doors, and even entire ventilation units.

The project also experimented with alternative construction practices. During the building permit application stage, window dimensions were left unspecified, as indicated by dotted lines on the documents indicating a minimum-maximum interval for future windows since the sizes would depend on what was available at demolition sites elsewhere in Brussels. Additionally, Zinneke vzw issued multiple tenders for

reclaimed materials during the construction phase. Some of the documents instructed the construction company solely on installation, exempting the construction company from material supply responsibilities (which were taken care of by Zinneke themselves). For other lots, the tender documents explicitly specified materials from reuse circuits.

REVISITING ARCHITECTURE'S PROCESS FLOWS

The Recypark project, a new recycling facility in Anderlecht for the waste collection agency of the Brussels Capital Region, similarly challenges established procedures and process flows. In this project, Rotor collaborates with the 51N4E-led design team rather than serving as the commissioner's ally. The waste collection agency wanted to do something with recycled materials, but little did they know that the design team would integrate the reuse of materials at the heart of their architectural concept – 51N4E handed in a competition design proposing the building structure itself, originating from the reuse sector.

During the initial research phase to identify the appropriate structures and procedures needed for integrating reuse materials into the project, the design team's eyes fell on a soon-to-be-demolished former equestrian centre in Liège. This structure featured a series of 26-metre-wide glued and laminated timber arches spanning a vast continuous space. The design team had to coordinate with various stakeholders on procedures to ensure that the arches from the equestrian hall met the needs of their new use, particularly in terms of mechanical performance. Finally, the client committed to purchasing the entire structure up front, with its components stored in a warehouse throughout most of the project's development, awaiting adaptation and reassembly on the construction site.

The reuse of materials disrupts the traditional flow of an architectural project. While Zinneke's designers maintained flexibility, leaving elements uncertain until late in the process to accommodate the immediate availability of materials on the market, the Recypark project utilised a different approach. Here, the essential aspects of the design, both structurally and formally, were established at the outset, with the project developed explicitly around the reuse of the acquired structure's components.

SCALING UP REUSE

Securing the materials well in advance becomes crucial when implementing reuse strategies on a larger scale. This challenge was evident in the MULTI project, the refit of an iconic 70's office building at the heart of Brussels, where ensuring a consistent supply of reused materials was essential. For Rotor, MULTI was one of the first large-scale design consultancy assignments. It was a challenge to incorporate reuse within the formalised protocols and standardisation of construction.

As a new player in the market, MULTI's developer, Whitewood, aimed to distinguish itself by embracing a circular approach and creating a different product to attract tenants. The goal of achieving a 2 % reuse rate was not merely a commitment but also a challenge to surpass the market standard of 1 % (89 % of the building mass was preserved, but 2 % of the applied materials for the refit by mass were reclaimed). To appeal to corporate tenants requiring large office spaces, Whitewood sought overall uniformity in material application. Whitewood had to anticipate its needs in homogeneous materials by purchasing large batches upfront and storing them for extended periods while the project development progressed.

However, this approach had its challenges. For example, because of COVID-related disruptions, a demolition project crucial for sourcing raised floor panels for reuse was halted for months, causing delays in material delivery. This underscores the logistical hurdles associated with the large-scale application of reused materials.

Interestingly, working with reused materials on this scale also presented several opportunities. The scale of application allowed for the certification of materials, typically a lengthy and costly process involving testing and research. Furthermore, the architects at Conix RDBM could convince the developer to apply a higher standard of materials, resulting in a high-value end product. For instance, Belgian Blue stone salvaged from a plaza in Bruges and a flamed granite floor from the Générale de Banque were repurposed for the atrium, adding unique character and a higher level of finish than the market standard.

STREAMLINING SUPPLY CHAINS

In analysing the materials employed across Zinneke, Recypark, and MULTI, we can often identify the lineage to their "prior incarnation". For instance, Zinneke's ventilation system was used to service the MULTI building before the renovation, and the staircases in Zinneke came from public administration offices in Brussels. Every reused material has an origin. While this observation may seem obvious, and the example might be somewhat anecdotal, it underscores that, just like for new materials, an entire supply chain exists behind the reused material. All the steps in this chain are equally necessary as the implementation, being only the final link in the chain.

Therefore, materials must be sourced as a starting point for reuse. Monitoring buildings slated for demolition and mandating inventories of salvageable materials would facilitate future reuse.

After identification, the dismantling process demands precision to maintain the material's integrity. Meticulous dismantling is as crucial as the subsequent reuse of materials. Dismantling and reusing materials are two sides of the same coin.

Paradoxically, it is striking that a material loses its certification once it is removed from its original place. In the past, reuse materials were considered superior to new materials because they had already proven their ability to endure over time. This logic has been inverted nowadays.

Finally, supply chains for reusable materials can operate at varying speeds, from swift transitions of some materials being directly transported from the dismantling site to its new location to more extended timelines, with intermediate steps for processing and storage. Establishing dedicated storage facilities for reuse materials can address logistical and timing challenges.

Working with reused materials challenges traditional approaches to architectural projects, requiring different ways of making design choices, controlling aesthetics, collaboration with construction companies, compliance (or not) with rules and regulations, and material procurement and its subsequent implementation on the construction site. While this departure from usual practices entails risks, projects like Zinneke, Recypark, and MULTI emerged via ambitious commissioners willing to face those risks. As each hurdle is overcome, subsequent risks diminish due to the accumulated knowledge. Rotor's expertise had a pivotal role in shaping all of them.

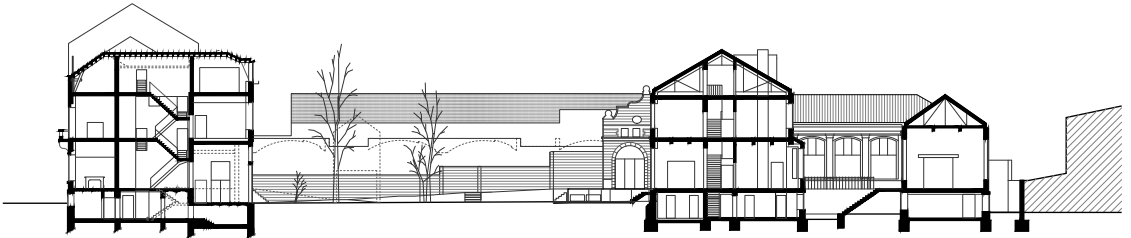
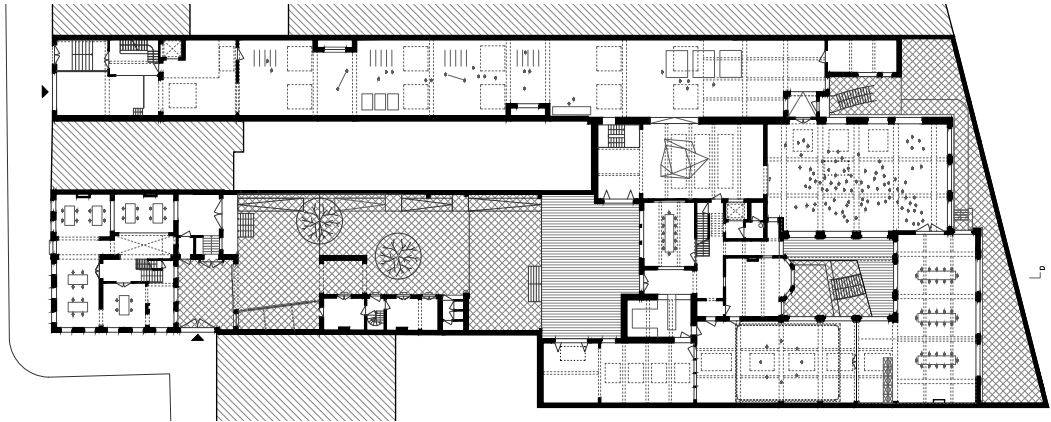
REUSE AS A WAY OF MAKING ARCHITECTURE

To compare the three projects, one might suggest Zinneke as a pioneering experiment, followed by MULTI as a scaled-up effort, and finally the structurally more complex Recypark project. However, the simultaneous initiation of all three projects and their diverse architectural outcomes reveal a more nuanced narrative of three parallel explorations. While each embraced material reuse, their implementation varied significantly, presenting distinct architectural expressions. Zinneke employs a somewhat experimental architectural language with particular architectural elements highlighting the reused components. On the other hand, MULTI aims for a more uniform and corporate aesthetic where the reuse of materials is only revealed by the patina of some of its materials. At Recypark, the architectural expression aligns with the aesthetics of the reused material. These three projects demonstrate that the reuse of materials does not have to be limited to the intended architectural language of a building but rather allows for freedom, just like with traditional new materials. It can be a choice to highlight the reuse aspect, but equally, it can blend seamlessly into the building's architecture.

ZINNEKE







↑ Plan and cross section of the offices and workshops at the Zinneke site.







The transformation and renovation of a former printing workshop complex in northern Brussels into offices and ateliers for the local non-profit Zinneke focuses on the integration of reuse materials. The project serves as an experimental platform, highlighting both the potential and the challenges of adopting circular design strategies.

Site

Place Masui 13
1000 Bruxelles

Year

2016 > 2021

Client

asbl Zinneke

Architect

Ouest + Rotor + Zinneke

Team

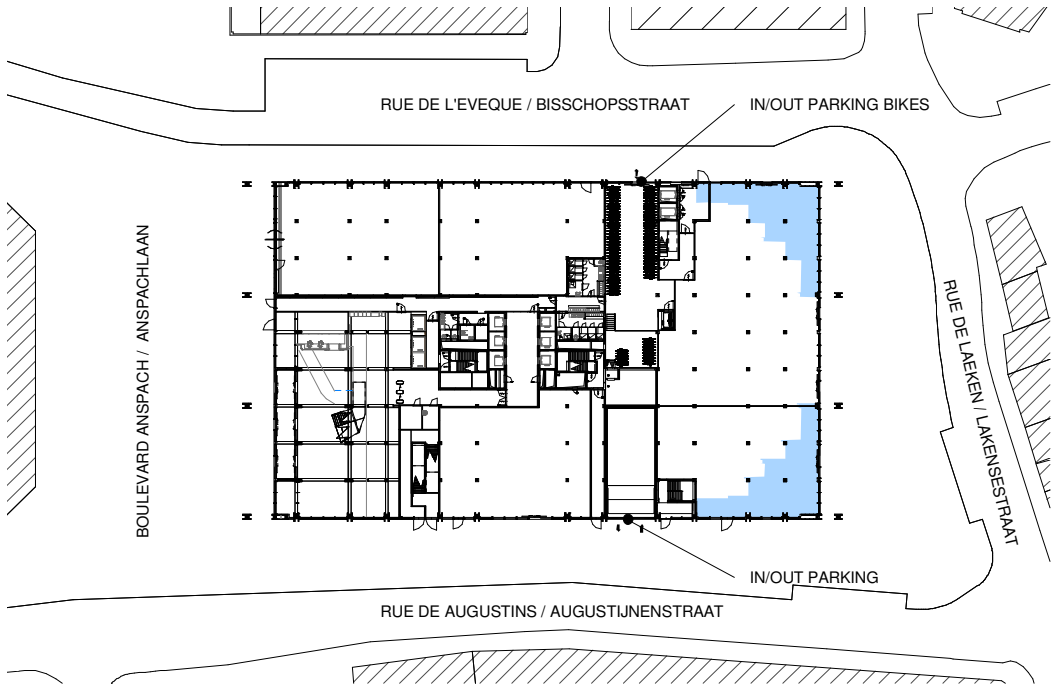
JZH & Partners

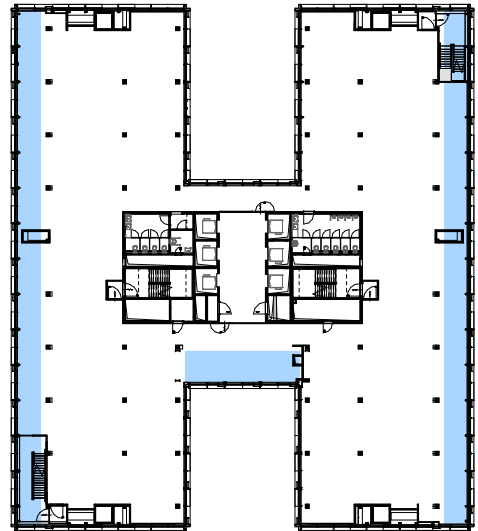
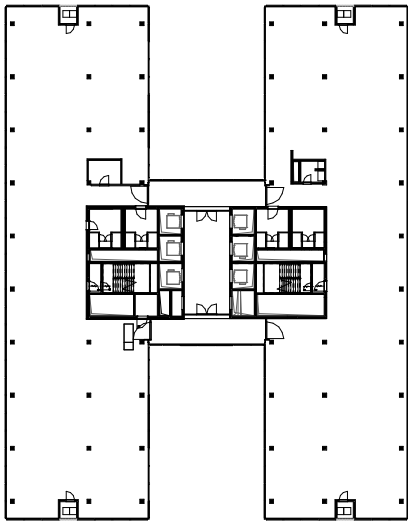
(structural engineering)

Matriciel (MEP engineering)

MULTI







↑ The existing structure was preserved and extended with a newly constructed strip on the exterior (blue).





↑ One of the biggest challenges was storing the large quantities of reclaimed materials until they could be used on site.



Transformation of a modernist office tower in the centre of Brussels. The building retains its original office function while incorporating a large-scale use of reclaimed materials all within a cohesive corporate look. The project faced and overcame significant logistical challenges in sourcing the necessary reclaimed materials.

Site

Anspachlaan 1
1000 Brussel

Year

2016 > 2023

Client

Whitewood + Immobel

Architect

Conix RDBM

Team

Cordeel (general contractor)

CES (MEP engineering)

SWECO (structural engineering)

Venac (acoustical engineering)

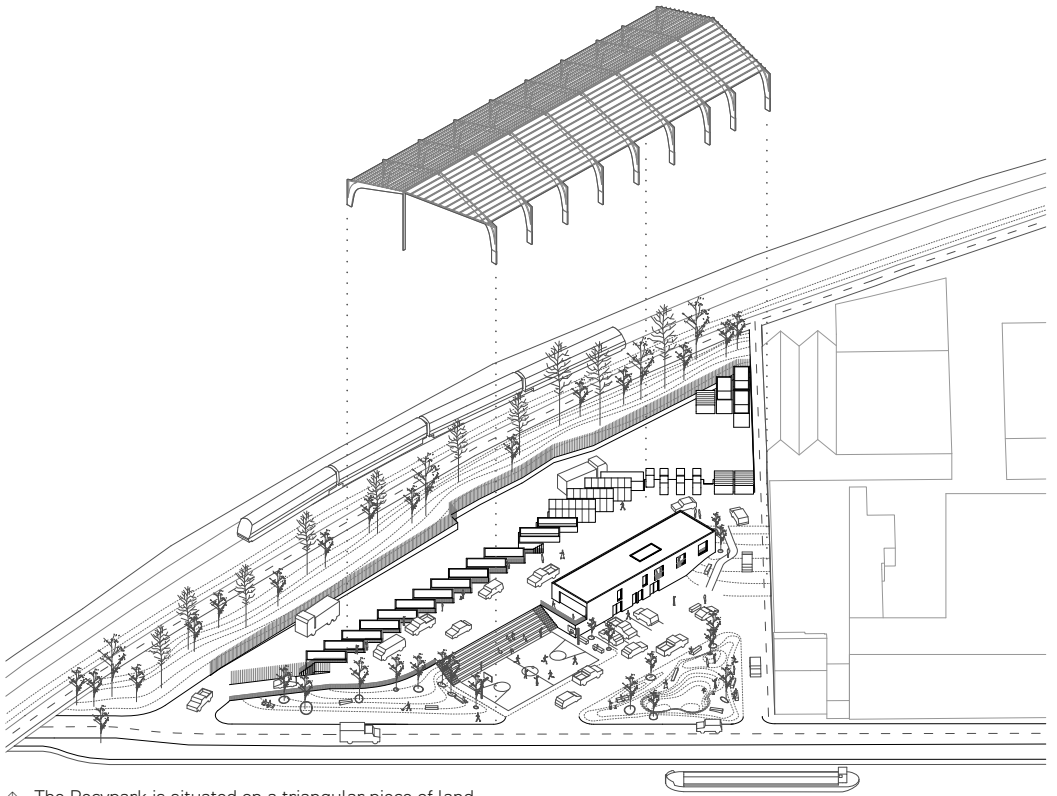
Rotor (circularity)

Bopro (safety)

Ecoworks (landscape design)

RECY PARK





↑ The Recypark is situated on a triangular piece of land. The remaining space, not utilised by the waste management company, will be used for a skatepark.



← The structure for the Recypark comes from an equestrian centre near Liège, which was to be dismantled.









Recypark is situated on a challenging triangular plot along the canal, where the Brussels waste management company sought to build a new facility. The designers not only met this demand but went further by sourcing a deconstructed riding hall near Liège to reuse its structure as the foundation for the new design. The remaining space was creatively transformed into a skatepark.

Site

Quai Fernand Demets 22
1070 Anderlecht

Year

2016 > 2024

Client

Bruxelles Propreté-Net Brussel

Architect

51N4E

Team

Witteveen + Bos

(structural engineering)

Greisch (wood structure expert)

Rotor (circularity)

Detang (MEP engineering)

Earth n Bee

REUSE RATES: SHOULD THEY BE MANDATORY?

MICHAËL GHYOOT

1. A PIVOTAL PERIOD

In recent years, recovering and reusing materials has become increasingly important in the construction sector in the Brussels Capital Region.

The urgency imposed by the climate crisis has undoubtedly contributed to this development. Similarly, the supply difficulties and price volatility caused by various embargoes, health crises, climatic disasters, and the outbreak of armed conflicts have somewhat eroded the predictability usually associated with new products, sometimes making reuse a strategy that is easier to plan and control.

However, many challenges to reuse remain. Organising the recovery and reuse of materials continues to raise several technical, economic, legal and cultural issues, both on the scale of renovation and construction projects and in the systemic frameworks that govern practices in the sector.

Numerous studies have examined measures that can be taken to overcome these obstacles. This topic has become a genre in its own right in the literature on reuse. Establishing mandatory reuse rates is frequently mentioned among the ideas often put forward.

So, what are the ins and outs of imposing minimum reuse rates?

These reflections are primarily based on work carried out by Rotor, Brussels Environment, TUDelft, LIST, and CSTB as part of an Interreg NWE project entitled *Facilitating the Circulation of Reclaimed Building Elements (FCRBE)*. The full results of this project are freely available online¹.

1 <https://vb.nweurope.eu/projects/project-search/fcrbe-facilitating-the-circulation-of-reclaimed-building-elements-in-northwestern-europe/>

2. GENESIS OF AN IDEA

The idea of setting minimum reuse rates is not new. It was already included in a 2008 UK guidance document on the reuse of materials. This suggested establishing reuse rates in contracts for work².

More recently, it has been found in a sustainability reference framework set up by public authorities in the Netherlands: the *Circulair Bouwen in 2023* platform³. It sets out various standard clauses for incorporating circular principles into public procurement. One of the appendices entitled *Meten van circulariteit: Meetmethode voor een circulaire bouw* sets out several formulas for measuring the contribution to the resource conservation indicator, including measuring the material reuse rate (expressed in mass).

The idea of a minimum reuse rate was also proposed recently during discussions on establishing a European taxonomy of sustainable investments likely to benefit from more advantageous taxation.

2 *Reclaimed building products guide. A guide to procuring reclaimed building products and materials for use in construction projects.* Wrap, 2008. See page 13: "Project Requirement [...]. To exceed a % reused and recycled content and adopt the top opportunities for good practice."

3 Platform CB'23, *Leidraad. Meten van circulariteit. Meetmethode voor een circulaire bouw. Versie 3.0* [Guidance. Measuring circularity. Measurement method for circular construction. Version 3.0]. 30 June 2022, p. 48-49. Available online: https://platformcb23.nl/images/downloads/2022/final/Leidraad_Meten-van-circulariteit-3.pdf

A proposed criterion for being considered “sustainable” stated that a construction or renovation project should incorporate a minimum of 15 % of reused materials (by mass or value). However, this measure remained on the drawing board and has yet to be transposed into the criteria currently in force.

More generally, using performance threshold measures is tempting for both public and private clients and legislators. It is based on a kind of “trust in numbers”⁴ that reflects the aspiration of harmony through calculation characteristic of Western modernity. This aspiration is increasingly reflected in various forms of “governance by numbers”⁵, using measurable quantitative data.

3. A CONCEPT IN NEED OF CLARIFICATION

However, setting a reuse rate is not, strictly speaking, a smooth process. On the contrary, it requires many parameters to be specified, all of which are likely to complicate the approach.

Firstly, the choice of unit for measuring this reuse rate is an initial source of debate. The leading candidates include mass, volume and financial volume.

Mass has the advantage of being the physical quantity used to measure amounts of matter. There is little to dispute. In practice, however, few quantities are expressed directly in terms of mass in the usual documents accompanying the planning and implementation of a project. On the contrary, there is a wide variety of standard units (linear metres, square metres, cubic metres, per unit, etc.). This entails conversion work, which can be tedious and a source of inaccuracies.

Moreover, mass induces a severe bias in favour of the most weighty elements to the detriment of other aspects. For example, if we take a typical wall made of bricks and insulation, a measurement based on mass alone will encourage the reuse of bricks (which represent 98 % of the complex) as a priority. On the other hand, a look at the environmental impact shows that, from this point of view, the reuse of insulation is preferred since it represents almost 76 % of the effects of this complex in terms of greenhouse gas emissions.

Volume has much the same shortcomings as mass. In addition to those shortcomings, it is more subject to variations depending on the context and conditions (expansion rate, shrinkage, etc.).

4 Theodore M. Porter, *La confiance dans les chiffres. La recherche de l'objectivité dans la science et dans la vie publique*. Paris: Les Belles Lettres, 2017 (1995).

5 Alain Supiot, *La Gouvernance par les nombres. Cours au Collège de France (2012-2014)*, Paris: Fayard, 2015.

The financial volume is attractive. It reflects a clear commitment by contracting authorities to devote a certain percentage of their budget to implementing reuse solutions. However, it is vital to agree precisely what is being measured: the supply? The installation? Are there any performance tests that may be required? Is there support dedicated to identifying batches and adapting procedures?

In addition, it should be noted that the different construction layers of a building do not weigh the same in its overall cost. Typically, the most expensive parts of the building (particularly the infrastructure and shell) are also those where it is most complicated to implement reuse. As a result, even relatively low overall rates (1 or 2 % in value terms) can lead to substantial quantities of materials being reused.

Finally, as recent years have clearly shown, construction costs are a highly elusive and fluctuating variable.

And that's not all. In addition to the choice of unit, the level of detail expected in the estimate of quantities must also be determined. Should the wall mortar be included? Fasteners? Right down to the smallest bolt? Where do you stop to avoid falling into the trap of a map on a scale of 1:1 that covers the territory it was supposed to represent while still guaranteeing sufficient detail to compare different bids?

The part of the work to which the reuse requirement applies should also be explicitly defined. Setting specific rates for specific parts of the work is entirely possible — and often more appropriate.

None of these difficulties are insurmountable. All can be resolved with clear frameworks and rules — the methods developed in the FCRBE project offer helpful pointers. These few considerations show, however, that we are moving away from the ideal of a single figure, applicable anywhere, at any time, and for any type of project. To avoid missing their target, reuse rates must be established in a contextual and specific manner.

4. ANALYSIS OF REUSE RATES: AN EMPIRICAL APPROACH

This observation was primarily confirmed by empirical work carried out in the context of the FCRBE project. In this context, we retrospectively analysed the reuse rates achieved in a corpus of 32 projects. We aimed to see whether consistent data emerged and whether indicative rates that could be applied more widely could be deduced.

To do this, we made several methodological choices.

1) We define the reuse rate as the proportion of materials reused within the total materials required to carry out the work. We exclude from this rate the parts of the original building that would have been preserved in their original state (which can also be expressed as a *preservation rate*). We did not study the materials recovered during demolition work for reuse on other sites. Our approach, therefore, studies only the flow of incoming materials and the fraction of reuse within it.

2) Our data is based mainly on project bills of quantities, supplemented by information from plans, project photos and as-built files. Due to the retrospective nature of our analysis, access to this data sometimes presented a challenge.

3) We have chosen to express these rates in terms of mass. Despite the inherent biases in this unit, it is the least inappropriate in this case. We have, therefore, had to convert quantities initially expressed in terms of surface area, volume or per unit into kilograms. To do this, we relied on the following sources in order of priority: project-specific documentation, conversion based on consolidated data for density and unit mass, and assumptions based on available data for similar elements. These conversions lead to imprecision that we have tried to minimise.

4) We have chosen to calculate reuse rates by constructive layer. The idea is to obtain more comparable data. Our layers were as follows:

- > Structure
- > Skin
- > Space Plan
- > Services Electricity
- > Services HVAC
- > Services Sanitary
- > Outdoor Infrastructure
- > Outdoor Surfaces
- > Outdoor Furnishing

This categorisation involved assigning each lot listed in the bill of quantities to a specific layer, which required some arbitrations and micro-decisions. Generally speaking, when we knew from the outset that there was no reuse within a layer of the project analysed, we directly counted a reuse rate of 0 % without calculating the total mass of this layer.

5) The corpus of 32 projects was divided into five categories, grouping similar types of projects:

1. Renovation of existing buildings to accommodate socio-cultural functions. This category comprises four projects with floor areas ranging from 1.000 to 4.000 m². These are solely renovation projects, which have combined reuse with significant efforts to preserve the original buildings through targeted and clever architectural interventions.
2. Housing. This category includes eight projects of varying sizes. Six have a surface area between 100 and 300 m² (the size of a house). Two have a surface area of 1.000 and 2.500 m² (small collective housing units). One has a surface area of more than 6.000 m² (large collective dwelling). This category includes both renovation and new-build projects.

3. Tertiary buildings. There are eight projects in this category. Six have a surface area between 3.000 and 8.000 m², and two are larger, with a surface area between 33.000 and 45.000 m². The work sites studied involved five new builds and three renovation projects. The programmes are varied: offices (possibly combined with conference rooms, shops, etc.), a waste collection centre, and a clinic.
4. Micro-projects and demonstrators. There are seven projects in this category, all of which have one thing in common: they are small-scale and have set themselves the goal of maximising reuse strategies. However, there are two possible scenarios: (a) four of them operate in fairly conventional contexts, and (b) the other three are closer to a form of micro-architecture that avoids certain constraints such as durability over time (temporary structures) or accommodating certain functions (no sanitary facilities, no heating installation, etc.).
5. Exterior landscaping and public spaces. This category includes five projects for developing outdoor spaces involving roadworks and landscaping. Projects range in size from 5.000 m² to over 130.000 m².

5. SOME HIGHLIGHTS

An analysis of the reuse rates for these projects highlights several points.

First, the various projects involve absolute quantities that sometimes have different orders of magnitude.

Furthermore, despite the division into layers, the rates achieved depend on the mass of materials reused. For the same surface area and skin layer, a facade made of reused facing bricks will necessarily give a higher rate than reused timber cladding.

Finally, reuse rates will vary widely for many layers depending on whether the project is a light renovation or a new build. In many renovation projects, for example, the work carried out on the structure layer is relatively minor (placing lintels on new openings, adding an annexe to an existing building, building a mezzanine floor, etc.), which is difficult to compare with the infrastructure and structural work required for a new build on an empty plot.

Our analyses confirm that it is challenging to generalise indicative rates for any type of project. Even within a homogeneous category, disparities result from the architectural strategies chosen, the materials involved, the scale of the projects, the programmatic requirements, and contextual contingencies in the broadest sense.

However, with all due caution, we can draw a few conclusions for each layer.

→ Structure. Our sample of projects shows that reusing structural elements is a practice that is beginning to spread. In new construction, the structural layer is very heavy, so even reusing large quantities of steel or wood only represents a few percentage points (of around 1 to 5 % by mass, to give an estimated range).

→ Skin. In our sample of projects, the materials most commonly reused are brick, timber cladding, glazing and insulation. These elements have very different densities, which affects the rates achieved. However, rates of between 5 % and 15 % (by mass) are plausible for projects that can apply a reuse solution to a substantial part of the facade. These rates may be exceeded if the glazing can also be reused.

→ Space plan. This layer is the most popular in our sample of projects and the one in which we find the greatest variety of reused elements. Based on our analysis, we can deduce that reuse rates between 10 and 25 % (by mass) are generally achievable for this layer.

→ Services. The data from our analyses is insufficient and too heterogeneous to derive practical indicative rates for everything to do with technical installations. Mass measurement does not lend itself well to the elements usually contained in these layers. On the other hand, the projects analysed show that a lot of technical equipment lends itself well to reuse: washbasins, toilet bowls, heating units, etc. Specific machines (ventilation units, water heaters, etc.) are also reused to a certain extent. Incentives to encourage these practices could be envisaged other than through reuse rates.

→ Outdoor. When it comes to landscaping, the reuse of road elements is a relatively well-established practice. Achieving rates of 20 to 50 % or more is quite possible for surface areas. Reusing solutions for infrastructure layers (subsoil) is still uncommon. The sample shows various furniture solutions, which vary greatly from one project to another. While it is possible to reuse street furniture materials, it is impossible to deduce plausible indicative rates.

6. A DOUBLE-EDGED SWORD

The analysis carried out has several biases. The sample remains very limited, and not all types of projects are represented. Some of the projects analysed have advanced reuse strategies thanks to specific support that cannot be generalised, mainly through public subsidies awarded as part of pilot operations.

Despite this, a few guidelines can be deduced.

The idea of a uniformly imposed reuse rate is a fantasy that could do more damage than support the intelligent and gradual adoption of these practices.

That said, formulating a quantified target for reuse — provided that it has been explicitly studied and takes account of the specific context — has its virtues in a project dynamic. This provides a clear goal for converging the various service providers' efforts.

Conducting a post-project assessment of a project's reuse rates should be encouraged. It's an excellent way of gradually building up a common base of references. The more people there are in the area, the more accurately future targets can be calibrated. It is also an essential step in initiating a continuous improvement trajectory.

At the moment, it is difficult to predict what a general roll-out of reuse across an entire region would mean for the development of this market. Despite a few targeted studies⁶, this remains little-known and poorly researched. A rapid increase in demand is likely to lead to severe disruptions in the market and perverse effects, such as accelerating unwanted demolitions to obtain materials.

Finally, remember that these rates are just a tiny facet of a practice with broader virtues. Reducing reuse to a purely quantitative approach means overlooking all its other benefits in renewing construction practices: environmental benefits, support for a local, energy-efficient economy, preservation of the cultural history embodied in materials, renewed ways of building and maintaining the built environment, etc.

As legal theorist Alain Supiot reminds us, "Reducing judgment to calculation gradually removes us from the complexity of reality, in other words, substituting the map for the territory."⁷ In many recent projects, one of the main qualities of reuse has been to give more importance to the judgment, common sense, and know-how of the various people involved. This horizon should guide our thinking on encouraging recovery and reuse practices.

⁶ Mathilde Doutréleau, Frédéric Bougrain, *Statistical Analysis of the Building Elements Reclamation Trade in The Benelux, France, the UK and Ireland*, Interreg project report NWE 739 FCRBE, January 2022. Available online: <https://vb.nweurope.eu/media/16598/statistical-analysis-v15.pdf>

⁷ Alain Supiot, *La Gouvernance par les nombres. Cours au Collège de France (2012-2014)*, Paris: Fayard, 2015, p. 250.

BC MATERIALS



A NEW GENERATION OF BUILDING MATERIALS

Jérôme KOCKEROLS

Repurposing buildings and recycling materials as part of a zero-waste economy are widely seen as solutions to achieve a circular construction sector. Although they represent a step in the right direction, material flows at the European level show that at the current rate of primary resource use, even if 100 % of all waste mass were returned to the economy, it would only replace 37.8 % of the total mass. Unless we critically rethink our relationship with primary resources and how we process them into construction materials, we are essentially mopping with the tap on.

Building today involves extracting, refining, transporting, and processing resources into useable materials. It entails consuming energy and producing carbon dioxide. The energy embodied in a material is related to the distance the material has travelled, the amount of resources used to manufacture it, and how much it needs to be processed — i.e., the closer it remains to its natural state, the lower its embodied energy. Responsible supply chains are not always the cheapest but often the shortest. However, since economic cost frequently drives the choice of materials, the ecological cost of a material is usually overlooked. But is it even possible to build without depleting our resources, without relying on production cycles that span the globe, and without generating mountains of waste? Is systemic change feasible?

One recent initiative in Brussels stands out because it innovatively addresses resources and materials at every stage of their lifecycle. It critically rethinks the way resources are extracted, how they are processed into construction material, and how this material will be reused in the future. This initiative revolves around BC

Materials' products, based on established knowledge of earth as a building material (more than half of the world's population still lives in mud-built structures). Notably, this innovation does not involve a newly invented material such as a new polymer or composite material. The use of earth as a building material is as ancient as the act of building. Looking at the past through a critical lens allows us to gain valuable insights into applying familiar materials in innovative ways. Newly available technology enables us to optimise existing material cycles.

In addition to their superior thermal inertia, moisture regulation, and acoustic qualities, the earth-based products introduced by BC materials' most notable feature is the origin of the primary resource, since the earth used comes from the excavations of construction sites in Brussels. Approximately two million tons are excavated in the Brussels Capital Region annually, with 60 % of it ending up as waste. About half of this waste, or 600.000 tons, could be reused since Brussels soil proves to be an excellent building material. For example, the toponym "Zavel" or "Sablon" indicates its historical use as a sand quarry where local Brussels contractors sourced their raw materials.

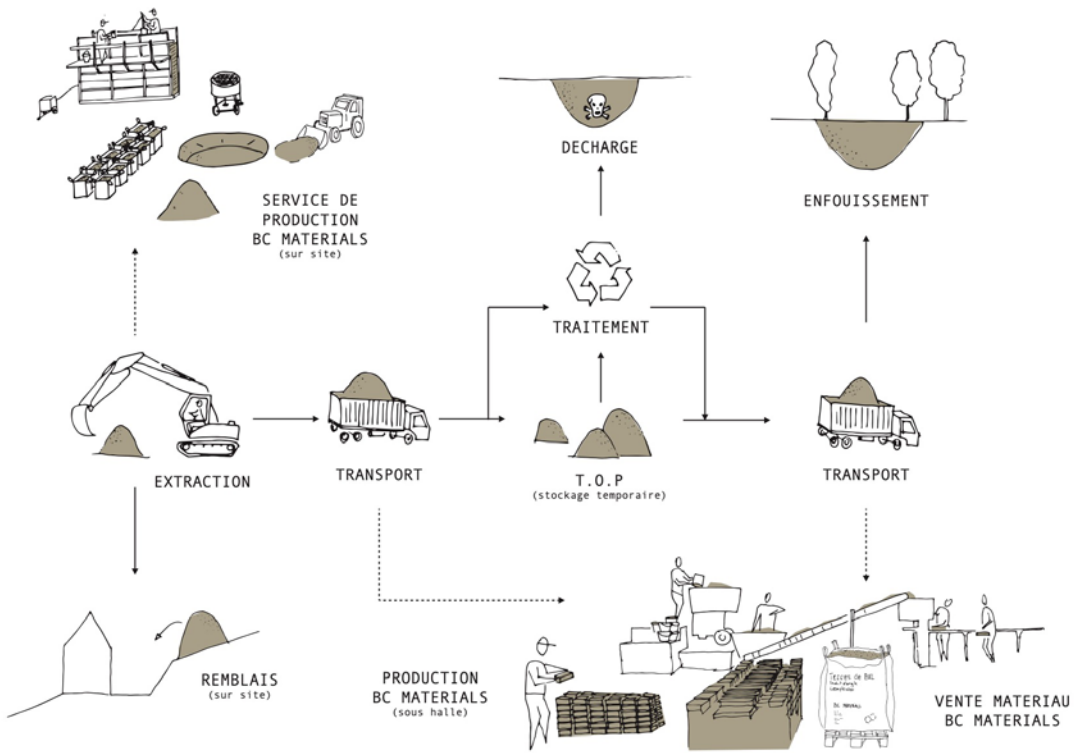
One example of the materials BC materials introduced to the market is pressed brick. While comparable to fired bricks or concrete blocks, it is machine-pressed, unlike fired bricks that require high-temperature oven baking. This method requires six hundred times less energy for production, corresponding to a 90 % reduction in CO₂ emissions. Furthermore, this production method ensures that the material's chemical composition remains unchanged, making it fully recyclable for future use.

BC Materials has also been busy developing the tools needed to scale up. Thanks to their parallel architectural design practice, BC Architects, these materials, while currently niche products, have the potential to be used in large-scale projects. For instance, the pressed brick is used as cladding for the Design Museum in Ghent, and it already holds a Buildwise certification. Furthermore, given the abundance of local soils, there most likely won't be a shortage of resources in the coming years. BC is investigating whether the vast quantities of excavated earth from the Metro Line 3 construction sites can be used as a resource for their products.

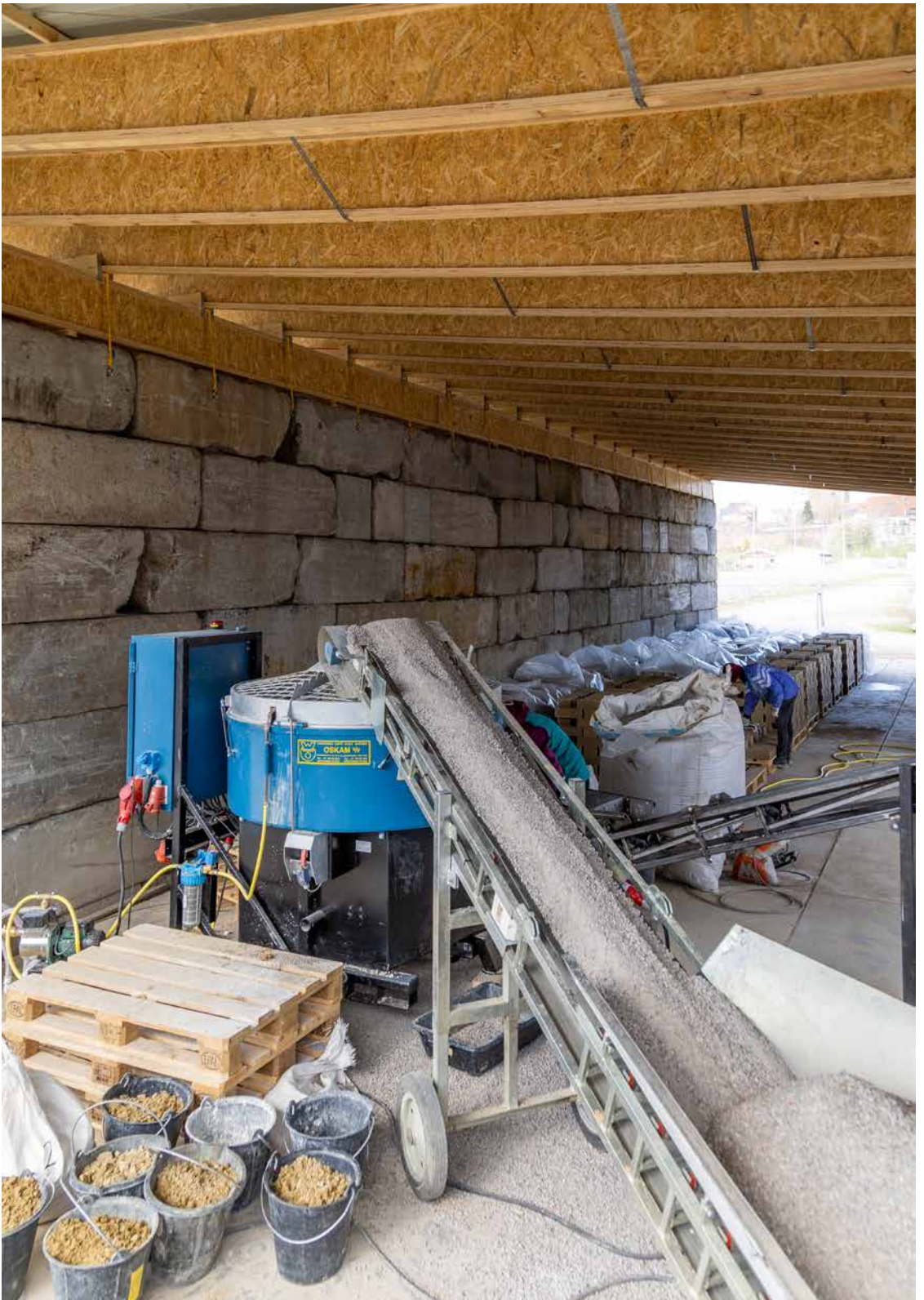
BC materials' products demonstrate that alternatives to traditional material flows and responsible resource handling are possible: locally sourced materials, short and ecologically friendly production chains, and a plan for continued life at the end of the material's lifespan.

Often, a systemic change only happens partially from the top down – it also occurs incrementally and from the bottom up. The environmental impact of the construction sector and the urgency of addressing climate change are seeping into the creative minds of architects. This awareness is reflected in the entries for the BMA Label. The BMA Label is an open call to the design practice and civil society for unsolicited research proposals related to urban development in Brussels. Many proposals in the editions of 2022 and 2023 focused on experimenting with and developing new materials. Proposals to research bio-sourced insulation materials like hemp-lime, alternatives to cement-like gypsum in concrete (*cigüe*), a street pavement mix made from fine concrete rubble (BARCA), and more holistic approaches to material use like "a climate of materiality" and "toporama," all aim to challenge our relationship with materials and resources.

Within each architectural endeavour lies an opportunity for exploration and experimentation, a chance to respond to society's challenges. Authentic architecture consistently strives to challenge the established norms and drive innovation. It serves as a tangible manifestation of the designer's ideals. Much like the advent of concrete in the era of modernism, which sought to rationalise and streamline architectural production and permit the speed of production of mass housing of a certain quality, a contemporary wave of building materials is emerging to tackle the climatic imperatives of our planet. While the notion of a universal strategy for achieving a circular and sustainable building economy is enticing, the reality demands diverse approaches tailored to specific contexts, as there is no one-size-fits-all solution. The diversity of proposals should not be viewed as problematic. Each approach can impact specific flows, materials, and resources while proving ineffectual in other domains. Other than attempting to establish generic principles, what is needed is a multitude of pioneers ready to venture beyond the conventional boundaries, colouring outside the lines and experimenting on the margins of the mainstream.









↑ A sample of the different textures and colours proposed by BC materials



BC Materials addresses the environmental impact of the construction sector by replacing standard building materials with earth-based alternatives. By tapping into urban mineral waste streams, like excavated earth, BC Materials transforms these into carbon-neutral products such as earth plasters, compressed earth blocks, and rammed earth. The innovative approach not only reduces emissions but also promotes circularity, as earth materials can be endlessly reused. In addition to sustainable and circular solutions, earth materials improve indoor air quality, enhance comfort, and provide natural, non-toxic living environments.

Site

Havenlaan 104
1000 Brussel

Used resources

Cellulose, crushed baked bricks, cement, florennes yellow clay, neuenahr clay, herschbach clay, hirschauer clay, chopped straw, maas sand, dordogne clay, rhine sand, crushed washed concrete 0/4, crushed washed concrete 4/20, löss loam yellow, brusselian sand, florennes red clay, löss loam red

BRACOPS



REVERSIBLE HOSPITAL

Caroline HENROTAY

Maintaining and renovating existing buildings is a priority measure as part of the effort to reduce the environmental impact of the building stock. In some cases, however, the very design of existing buildings only allows them to meet current needs with a simple renovation. The redevelopment of the Joseph Bracops hospital site is a case in point. The Bracops Hospital, part of the IRIS Sud hospital network in Brussels, is located in the heart of Anderlecht, just a stone's throw from Astrid Park. The hospital site has a complex layout, and the buildings are in a dilapidated state of repair. These factors were crucial in the decision by Hôpitaux Iris Sud to completely reconfigure the site through a master plan to offer patients and medical staff a contemporary infrastructure while making the most of the landscaped site and giving a new identity to this local hospital.

Having determined that too much surface area is taken up by logistics in such a cramped space, buildings such as maintenance, technical workshops, and the pharmaceutical warehouse will be demolished to make way for a new 5.000 m² polyclinic. The architects Archipelago and NU Architectuuratelier won the competition organised by the BMA by coming up with a long-term project. The master plan, which sets out to increase the density of the urban site and create a public garden accessible to residents, takes on board the need to insert the buildings into a global system that will continue to evolve. The entire project has been approached according to circular economy principles: local and sustainable materials, reversibility of buildings, zero energy principle and thoughtful prefabrication.

SCALABLE MASTER PLAN, REVERSIBLE BUILDING

The new complex of buildings is designed in clusters. The distribution principle revolves around a public square, leaving scope for future developments. Each building will have individual access from the public square, making it possible to add or remove clusters to and from the complex during the phased reconstruction of the hospital site. It will be possible to expand or reduce the hospital infrastructure and also to reassign some parts for non-hospital use without jeopardising the strategic distribution principle put in place for the hospital.

In terms of the buildings themselves, each cluster has been designed according to a model of the reversible building. This approach can be broken down into two defined strategies. Firstly, the reversible design of a building must enable it to be easily converted to other functions. In the case of the Bracops Hospital, the possibility of converting it into a rest and care home, care units, student accommodation or housing has been studied. Secondly, reversible design covers a more technical aspect of building design: how to enable future disassembly of the building or parts of the building at the end of the materials' life, in the event of a change of function, etc.

ROOM FOR CHANGE

Designing a building that can be adapted and converted requires smart decisions regarding dimensions, positioning of permanent cores and technical ducts, and structural capacity much further upstream than in a conventional project. Each of these parameters must be tested based on predefined use cases. In the case of the Bracops Hospital, the design team began by carefully studying the structural, technical and spatial characteristics of the spaces required for the polyclinic project. In addition, the team drew on the knowledge acquired as part of the European innovation project Buildings As Material Banks (BAMB), which provided tools for optimising reversibility.

The structural system, for example, consists of columns and mushroom slabs positioned in a 7.5 m modular grid. This dimension offers significant flexibility in the use of space and ease of adaptation in positioning the technical elements. Because the hospital function requires a reasonably high load-bearing capacity, the structural system is immediately adaptable to different future use cases without oversizing or any reinforcement of the structure in the event of a change of use. The modular grid of the structure is also used in the facade modules, allowing the interior walls to be positioned in different ways to match the position of the windows.

The positioning of technical and traffic areas takes into account any future needs, for example, evacuation in the event of fire or access required for different uses. Several additional recesses are provided in the floor at strategic points to allow technical ducts to pass through and water to drain away for night-time functions.

The depth of the building and the layout of a patio at its heart allows multiple functions to be organised while maximising the amount of natural light.

ASSEMBLY AND DISASSEMBLY

In addition to spatial reversibility, the design team also adopted a way of optimising material and energy flows that aligns with the fundamental principles of the circular economy. This approach is reflected in the technical choices, which favour free and renewable energy sources, local materials with a low environmental footprint, and the design of a prefabricated envelope or walls.

The facade is designed from prefabricated elements and attached to the main load-bearing structure by independent connecting elements and dry connections. This means that the facade structure is entirely separate from the load-bearing structure. Made of ceramic panels, the facade cladding is also reversibly fixed, employing independent connecting elements. The technical elements are also designed to be independent of the facade modules and included in a "technical foundation" integrated along the facade in a modular unit.

To allow for easy future conversion, three types of wall have been planned by the design team: non-reversible load-bearing walls in the permanent cores; non-reversible lightweight walls that will not need to be dismantled or moved in future based on the planned use cases; and reversible lightweight walls for the dividing walls of the consultation rooms which may have to be moved for a different use of the space. These reversible walls feature "Velcro-type" connections and are independent of the supporting structure. They comprise an independent support system to which movable finishing panels are attached. Finishing panels can be easily removed and replaced while retaining the support system. A life-cycle cost analysis study has shown that using this reversible partition makes financial sense.

SPECIAL AMBITION OR LONG-TERM INVESTMENT?

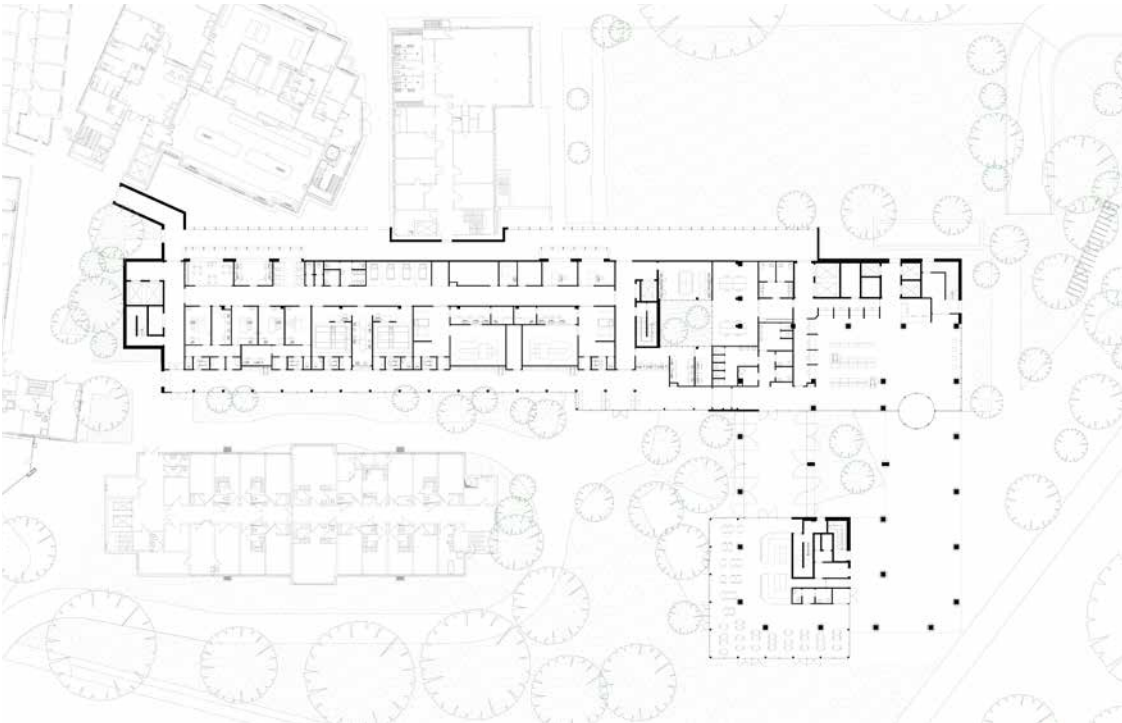
Smart decisions regarding space, structural capacity, assembly and special techniques can facilitate future conversion or the reuse of materials and installations that make up the building. Therefore, the reversible approach for an architectural project requires greater resource investment and time upstream, with a multi-disciplinary analysis involving technical specialists from the earliest design phases. A reversible project is designed not only for the predefined programme, but is also, as far as possible, tested against the critical demands of different use cases.

On the other hand, a reversible building allows for easier future renovations and conversions, thereby limiting the costs of vacancy or demolition and reconstruction, as well as the associated environmental impact. This ability to evolve in the face of rapidly changing social conditions and needs means that the building's use can be adapted while limiting the need for major work and, therefore, also the environmental impact and future costs.

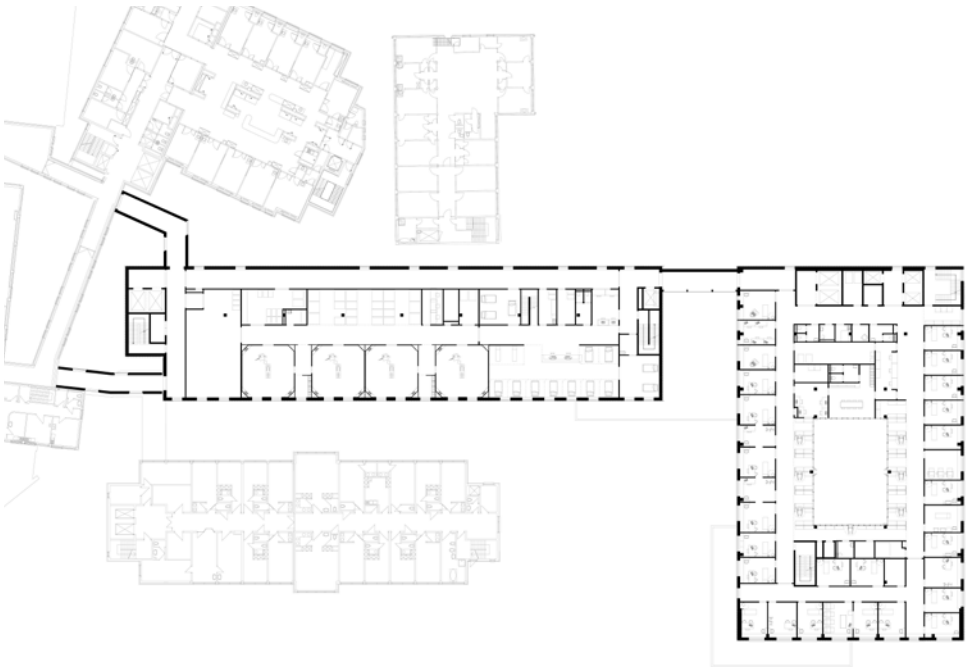
The investment of additional resources to test different use cases and to design a building that will survive the occupancy period of the primary programme also requires a fairly high level of ambition from the client in terms of commitment to a circular approach. In addition, the innovative nature of reversible solutions, the lack of any real hindsight in terms of maintenance, and the possible additional costs of such an approach could "alarm" some clients. Therefore, it is essential that good communication and information sharing (or even training) take place between producers, clients, and building managers. Information sharing and communication between the various players in the construction industry are also critical points identified in the BAMB project.

To facilitate the integration of reversible design into architectural projects, the Brussels Capital Region has developed design support tools to guide contractors and designers on reversibility. In the case of new buildings, the impact of spatial reversibility on architecture is often relatively limited. Reversible design favours a "free plan" structural design of the post and beam type, but other than that, it leaves plenty of scope for a range of architectural proposals. In this context, the tools can help guide designers' choices and objectify the criteria for comparing conceptual decisions.

In the case of renovation projects, you have to "make do" with what already exists, as the type of structure and the dimensions of the building and its spaces will impact the possibilities for future conversion. Since the Brussels objective is to extend the life of buildings, both future and existing, it is essential to take account of the building's characteristics when defining potential use cases, even if this does not necessarily involve an actual reappropriation.

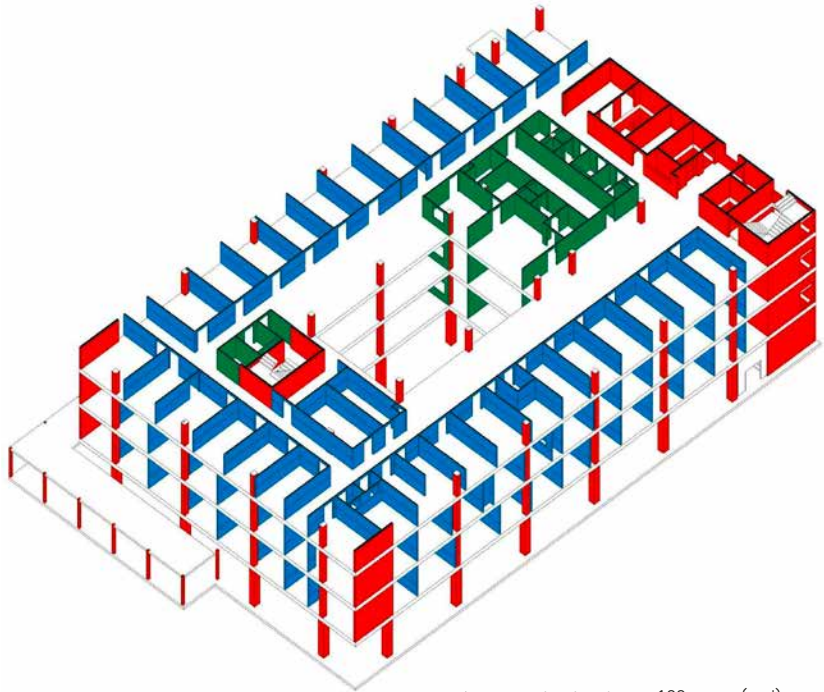


↑ Ground floor plan - the new polyclinic marks the first phase of the site's full redevelopment and fits between the existing buildings.

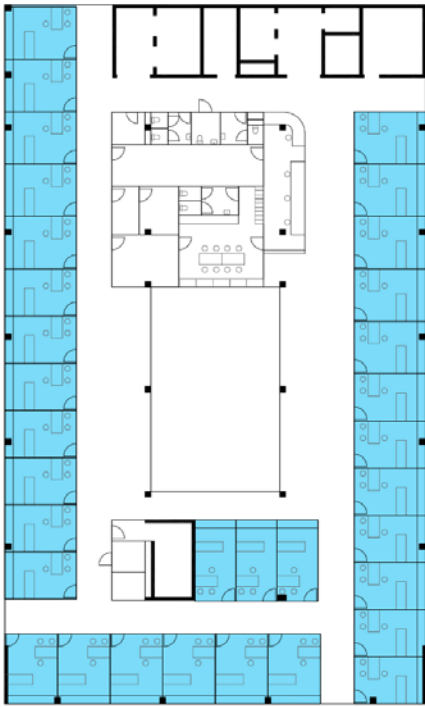


↑ Typical floor plan for the polyclinic building.

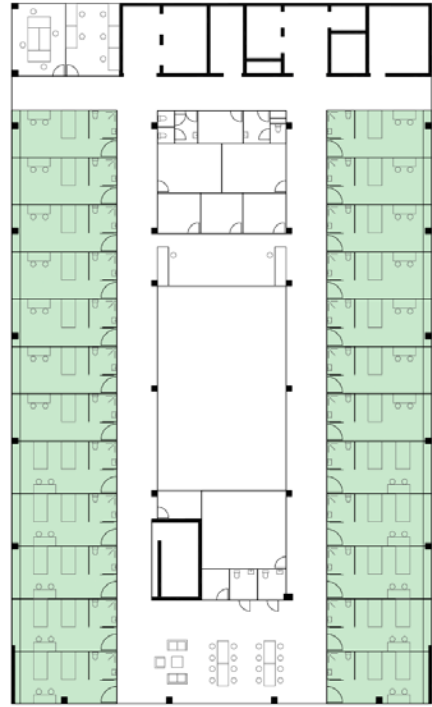




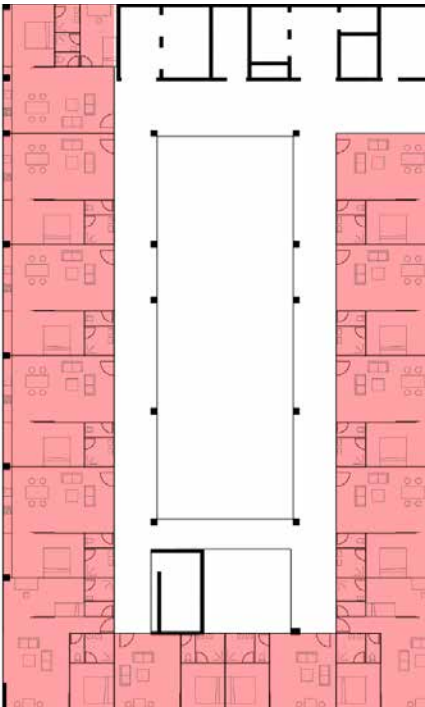
↑ concrete structure - 100 years (red),
fixed walls - 15 years (green),
demountable walls - 5 years (blue)



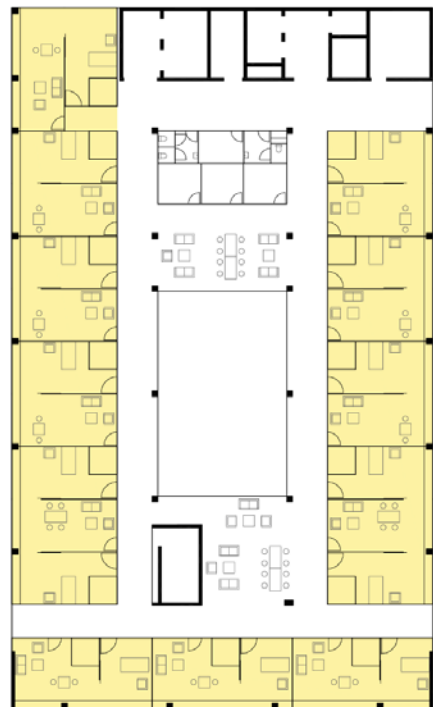
↑ Exam rooms



↑ Care unit



↑ Care home



↑ Collective housing



The transformation of the Joseph Bracops Hospital site in Anderlecht addresses the integration of new buildings into an outdated infrastructure, with a key focus on reversibility. The design allows for future adaptability by considering multiple scenarios for the polyclinic, enabling its conversion to different functions if needed. Materials are installed with reversible fixings and are chosen for their lifespan and potential for future replacement. This approach ensures long-term flexibility and usability of the new building.

Site

Rue Docteur Huet 79
1070 Anderlecht

Year

2018 > ongoing

Client

Hôpitaux Iris Sud -
Iris Ziekenhuizen Zuid

Architect

Archipelago + NU architectuuratelier

Team

BUUR
Lemaire Ingénieurs
MATRIciel
MC-carré
COSEP



ANTICIPATING, OVERSIZING

Jean-Guy PECHER

The theory goes: a new building must be adaptable to be sustainable. The aim is to make it possible for requirements and uses to evolve by reducing future transformations' carbon footprint now. By anticipating likely changes and incorporating some of their constraints in the project's design stage, it is possible to facilitate any work required during the building's life cycle, without detracting from its initial qualities.

Exploring the opportunities and limits of this principle, the BMA organised two architecture competitions in Anderlecht in 2019. Both projects share some characteristics but are nevertheless different in their approaches to the issue of adaptability.

A FOOD PRODUCTION WORKSHOP LA MANUFACTURE

Under the leadership of the company Abattoir, the Anderlecht slaughterhouse has embarked on an ambitious transformation process. La Manufacture is one of the first and most emblematic projects bringing about this change. This building will house the meat cutting and production facilities and car parks. From the outset, Abattoir saw La Manufacture as a structure that could accommodate several large-scale activities, linked to the company's own activities of course, but also to other urban functions that would find their appropriate place in the structure — a durable structure for a modular building.

To meet this ambition, the team led by architects Baukunst proposed a two-storey, double-height building made up of simple, robust prefabricated construction elements: columns, beams, brackets, and concrete floors give the

building a mechanical appearance that is intended to enable it to be built quickly and efficiently, and then easily adapted in the future. This is facilitated by architectural choices such as using a 7.4 m by 18 m structural grid, renowned for its versatility, and generous ceiling heights that allow mezzanines to be placed in the double-height areas, creating two superimposed duplexes. During the competition, the team also questioned the permissible loads to be considered when calculating the structure. By increasing the height of the beams and the compression layer of the slab by just 10 cm, it was possible to double the load-bearing capacity of the floors — therefore accommodating potentially heavier activities in the future. These examples of generous sizing — even oversizing — and easy dismantling of the building bear witness to Baukunst's approach to the question of the building's adaptability, satisfying Abattoir NV's ambitions for this project.

MOBILIS: A TEMPLE OF MOBILITY

The D'Ieteren Group — which specialises in importing and selling cars — wanted to transform its Boulevard Industriel site into a garage of the future. In particular, the group hopes to create a space where the various current and future modes of urban transport can complement each other, which means that another durable and adaptable building is needed. The architects' approach at XDGA is different. Rather than planning a building designed to allow indefinite transformations, the architects prefer to design from the outset a structure where anything can happen, and where any function can find its place.

The resulting building is composed of a square grid of concrete columns measuring 16.2 m on each side, as well as embossed floor slabs that leave a clear height of 7 m and several patios or atriums crossing the levels, ensuring sufficient natural light at the heart of the building. The embossed slab floors are oversized so that intermediate floors can be installed or suspended from them, thereby increasing the building's usable surface area. To achieve this, the load-bearing capacity of these floors is doubled, requiring the height of the load-bearing elements — beams and floors — to be increased by 25 % and the quantity of additional material by 10 %. To ensure the building's functional modularity, different vertical circulation cores are planned, each associated with one of the patios. They allow different groups to use the building at different times and on different routes. Still, they contribute to the greater future adaptability of the project by encouraging its division into several functions, each with its own circulation.

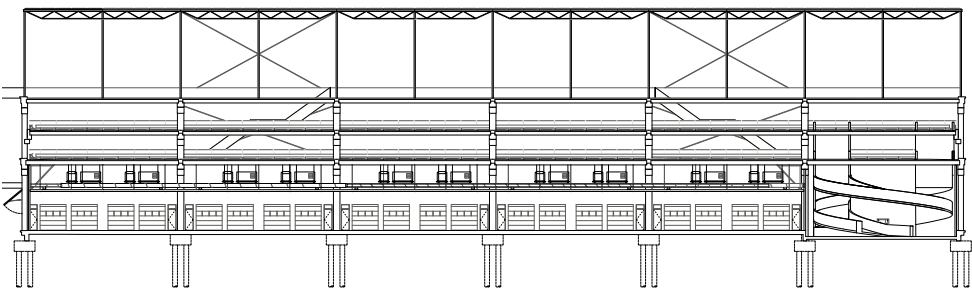
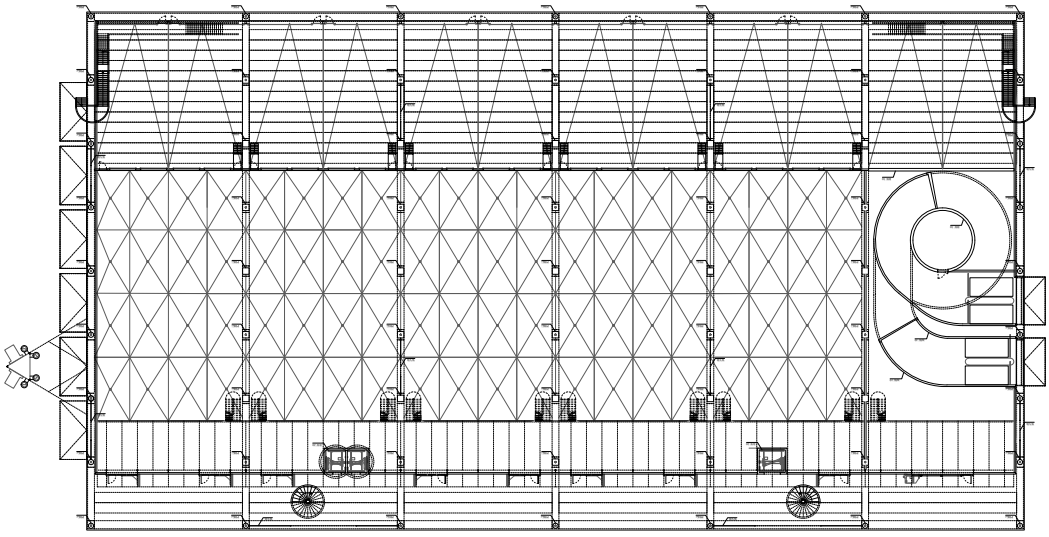
THE PROBABILITY OF CHANGE

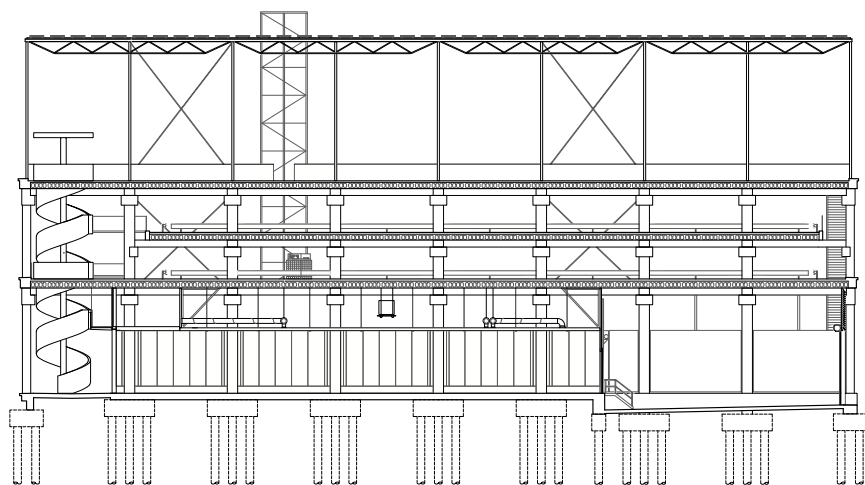
These two examples give rise to two considerations. Firstly, when and to what extent should a new building be adaptable? Should it be a requirement for a sports centre to be convertible into housing in three swift moves, and vice versa? Certainly not, but the likelihood of a major change in the functions housed in the building must be assessed. In this respect, Abattoir and D'leteren — at their respective levels — showed a great deal of lucidity in the two projects presented here. Building, transport, and food are among the sectors that emit the most greenhouse gases, which means that the activities linked to these sectors will likely undergo major changes over the next few years as part of the climate transition. While it is impossible to predict how things will change, it is nevertheless highly likely that they will change, strongly and rapidly. Failure to anticipate these changes would mean designing obsolete buildings as soon as they are built. Mobilis and Manufaktur avoid this pitfall. The two buildings have already been designed to accommodate — as far as possible — the new uses that will inevitably arise during their life cycle, particularly for an era when car usage will be much lower.

The second point of consideration concerns the oversizing of the two projects — the structures house double-height spaces, sometimes with mezzanines or intermediate floors. What's more, they have both been the subject of reflections on the permissible loads of the main concrete structure, which is sized more generously than is strictly necessary in order to allow other, hypothetical heavier functions to be accommodated. Oversizing means consuming more materials and, therefore, more energy. Are these two oversizings — spatial and structural — legitimate? At a time of climate urgency, does it make sense to waste carbon today to save it tomorrow? Asking the question does not mean that oversizing should be prevented: as demonstrated by the Anderlecht examples presented here, an initial expenditure on energy that is greater than strictly necessary is justified by the high probability of seeing a significant change in the functions and uses of these buildings. Nevertheless, when designing a project, a critical look is needed at what this notion of adaptability implies, particularly regarding material and energy consumption during construction.

MANUFAKTURE



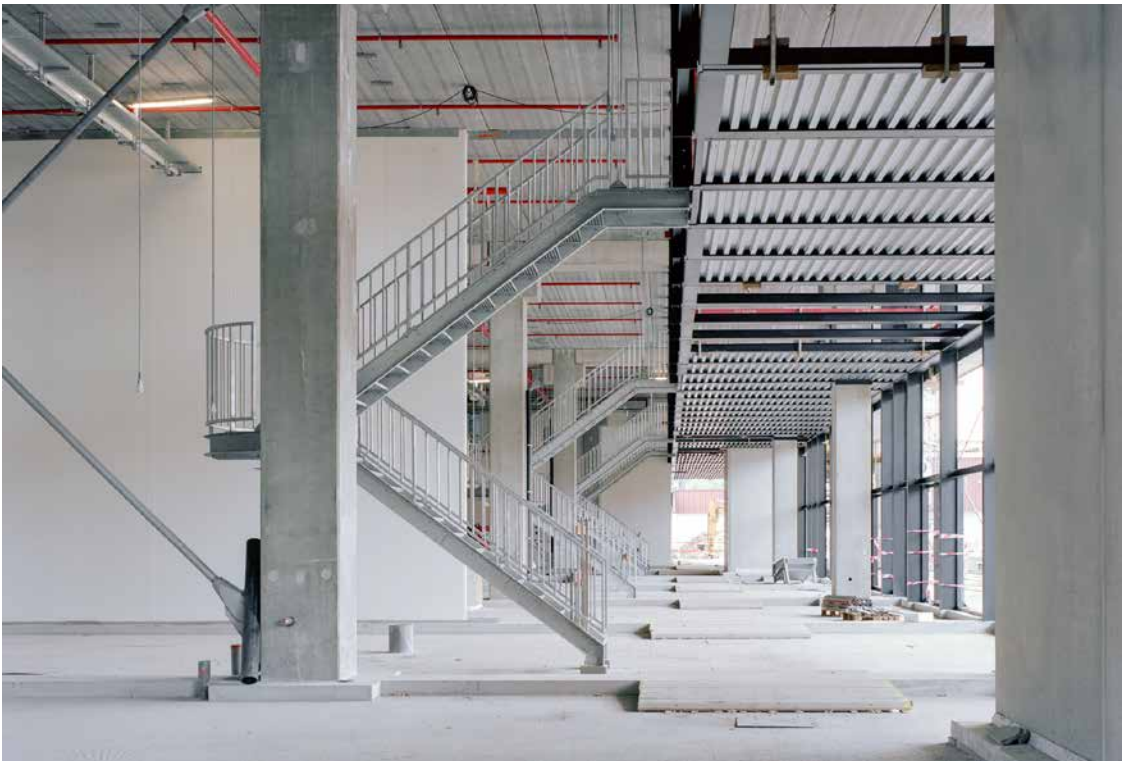




↑ The top floor was designed as a versatile space capable of hosting programs like a public swimming pool.







The Manufacture project is the third phase of the Abattoir site's master plan, following the FOODMET market and KOTMET student housing. Primarily designed for food-related activities and meat processing and a parking garage, the client saw the building as a structure that could accommodate several large-scale activities. Architects anticipated future needs by oversizing the structure, which hopefully will be realised as a rooftop swimming pool utilising leftover warmth from the meat processing facility.

Site

Ropsy Chaudronstraat 24
1070 Anderlecht

Year

2019 > ongoing

Client

Abattoir

Architect

Baukunst

Team

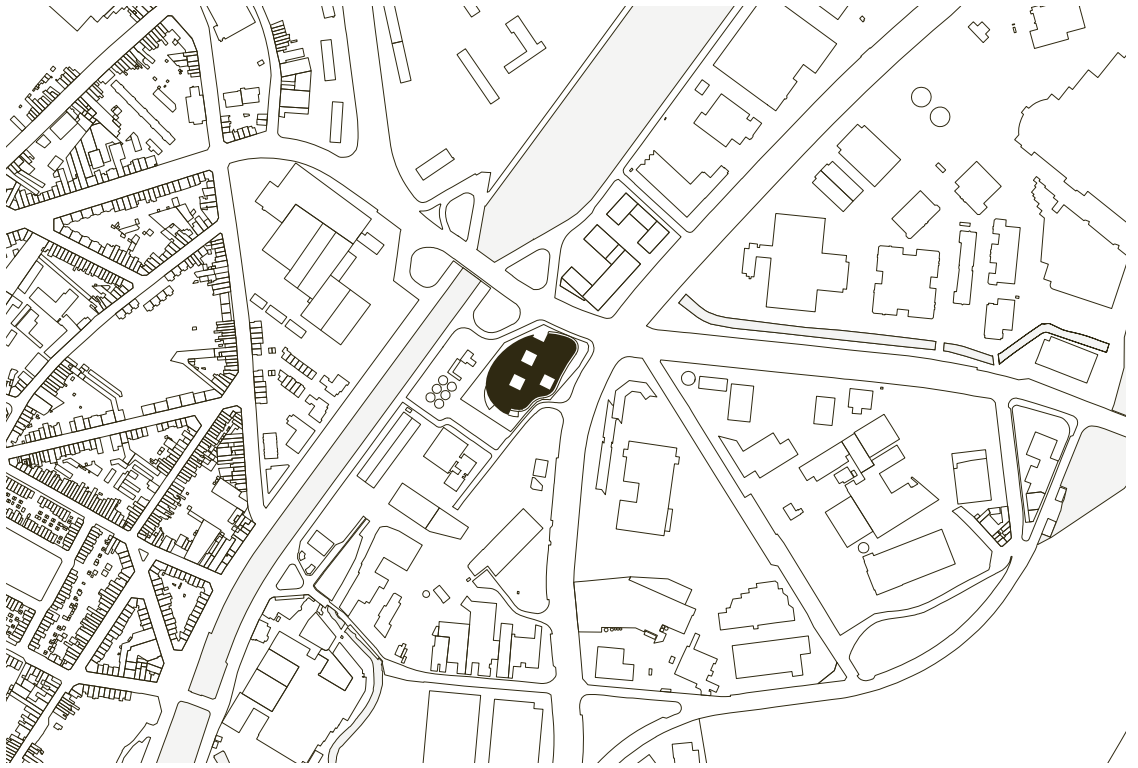
UTIL

Daidalos Peutz

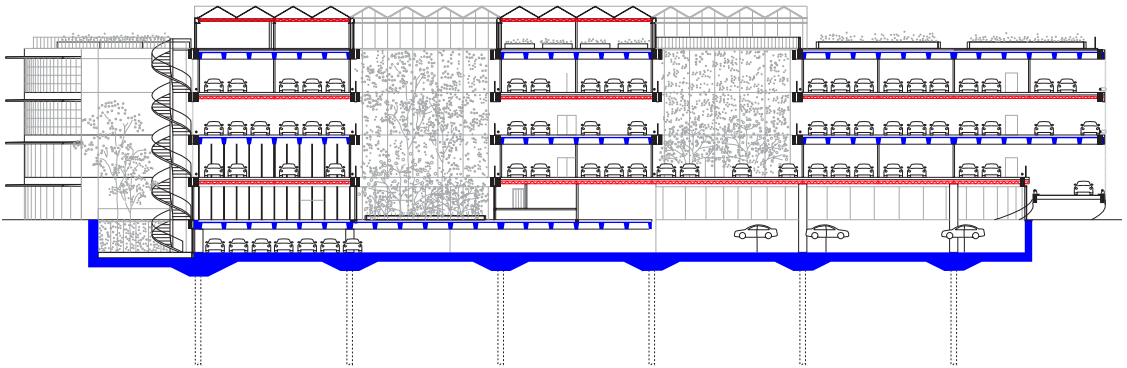
Bureau Bouwtechniek

MOBILIS

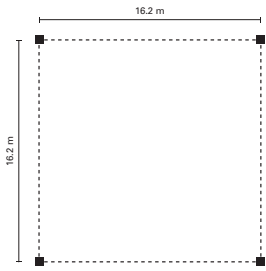




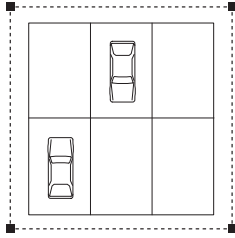




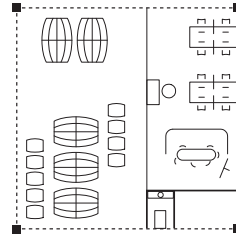
↑ Representation of the dual structure consisting of a primary concrete structure (blue) and a secondary, lighter steel structure (red).



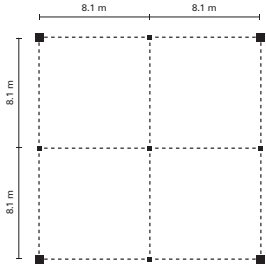
16.2m x 16.2m grid



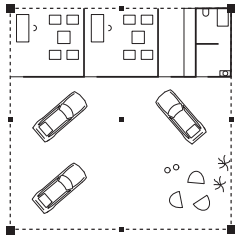
atelier



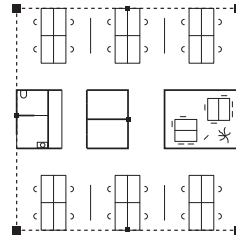
production space



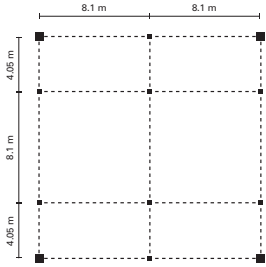
8.1m x 8.1m grid



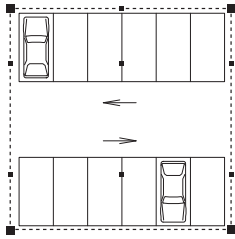
showroom



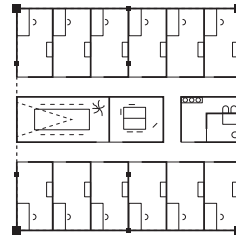
open floor office



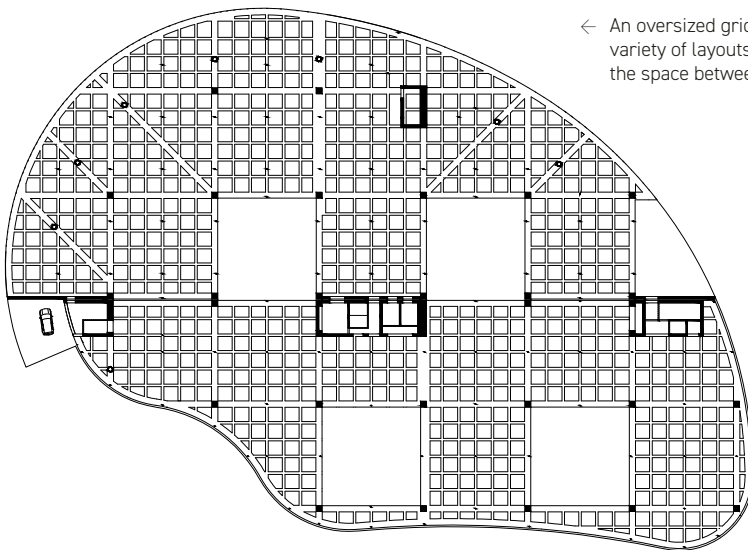
8.1m x 8.1m grid - shifted



parking



office



← An oversized grid allows for a variety of layouts and uses within the space between the columns.



The Mobilis project in Anderlecht by D'leteren, Belgium's oldest car importer, aims to create a 24.000 m² multifunctional and flexible building for automotive and other future activities. The building features an oversized primary concrete frame and a secondary lighter steel infill, allowing for a diversity of future uses, ensuring adaptability for evolving mobility needs.

Site

Boulevard Industriel 51
1070 Anderlecht

Year

2018 > 2024

Client

D'leteren Immo

Architect

XDGA

Team

UTIL

Studiebureau Boydens

Daidalos Peutz

Securisan

Pam & Jenny

CIRCULARITY AND TIMELINESS

NEW ROLES AND CHANGING ATTITUDES IN ARCHITECTURE

Colm MAC AOIDH and Jérôme KOCKEROLS

The making of architecture never follows the simple linear route that the idealists or determinists would have us believe. It is a constant set of negotiations — between internal intents and external forces, between certitude and chance — in which different modes of working and thinking continuously overlap.^[1]

Jeremy Till, architect and writer

It is striking that each of the projects in this publication, as well as demonstrating proficiency in the act of building as a technical matter, also display a certain openness to seizing opportunities. Opportunity is closely linked to chance, but it is also related to timeliness (from the adjective timely). Timeliness was defined in the Ancient Greek concept of *Kairos* as the fact or quality of happening at the best possible moment or most opportune time. However, Thomas Rickert points out that it also encompasses a spatial meaning since “the earliest uses of *Kairos* were grounded in a sense of place.”^[2]

Therefore, timeliness is as much a spatial concept as a temporal one, referring to the possibilities, opportunities, and potential arising from a particular context — social, cultural, and material — at a given point in space and time. This positioned, situated aspect of timeliness is reflected in the contextual approaches adopted by the practitioners featured throughout this book.

CHANCE AND SEIZING OPPORTUNITIES

There is a difference between leaving things to chance and the ability to recognise chances, to decide whether or not to accept them, and knowing how to make the most of them once seized. For example, the brief for the Karreveld school project by AgwA didn't require the reuse of the existing partition panels and other elements, and circularity was not a specific ambition pursued by the client. A very tight schedule for the development and construction of the project forced the architects to think beyond conventional project timelines and construction methods. The architects took this opportunity to develop an architectural language based on the materials found on site. Similarly, as Mark Tuff explains elsewhere in this publication, the architects of KANAL found meaning in “as-found” elements such as “equipment, fixings, finishes, marks of use and traces of history, all of which contributed to the atmosphere of the place.”^[3] This dialogue with the past became essential in developing the project's narrative.

SITUATED

Universal, standardised, one-size-fits-all approaches often fail to consider local and contextual realities. Rather than following a general or overall strategy, a situated attitude based on timeliness approaches projects and opportunities on a case-by-case basis to determine and make the best possible use of their potential. According to Anne Lacaton from architectural practice Lacaton & Vassal, “This is part of a new strategy of urban planning that is not based on a big masterplan or looking at things from on high, but on taking the situation on the ground, dealing with that situation and improving it.”^[4]

While this change in approach relates to architectural and urban projects in general, circular and reuse practices bring it most clearly into focus through how they engage with and are a response to what is already there. The decisions taken by a practitioner are considered responses to the context. Instead of starting from a blank slate each time, they engage with the material, temporal, and spatial conditions as found, introducing a new layer to the existing: *thinking with* instead of *thinking from above*. The practitioner's role is to reconsider previous decisions, anticipate future evolutions, and thereby take actions that are timely for the current moment and situation: What materials are available, what is the context you are working in, and what is needed?

While the projects for Zinneke and MULTI share a common approach of material reuse in their architectural designs, implementing this approach within each project diverges significantly. MULTI strives for a coherent and corporate architectural language, necessitating large batches of reused materials and encountering logistical hurdles. As a result, Zinneke embraces experimentation and a more diverse and localised application of reused materials, resulting in a rawer, more eclectic aesthetic that does not aspire to any pretence of finishedness or uniformity.

NEGOTIATED

All the parameters and constraints of a project, whether physical, technical or legislative, form the basis of a negotiation between a multiplicity of actors with different and sometimes conflicting desires and intentions. Evaluating existing buildings against the weights of contemporary standards sometimes reveals instances in which they are too small in terms of surface area, too low in terms of ceiling height, and deemed unable to provide the desired comfort levels or other quantitative requirements. The practitioner's task in adaptive reuse is to manage the friction between these constraints, soften these edges, and find a negotiated solution that represents the best manner to intervene in and transform each situation. For example, according to regional urban planning regulations, the bedrooms in SLRB/BGHM's General Jacques building are technically too small to be considered fully-fledged bedrooms. Nevertheless, SLRB/BGHM believes that the existing building, with its preserved original features such as integrated kitchens and wooden parquet flooring, offers alternative, additional qualities that counterbalance the shortage of surface area in the bedrooms.

By contrast, transformations that take a strictly technical approach rather than a more holistic view of how inhabitants will live in the space are often less successful, and can even make a building worse in terms of user experience. Anne Lacaton argues, "Any technical issue should always be solved in parallel with an improvement in the quality of space and the quality of living."^[5]

INDICATIVE RATHER THAN REGULATIVE

Clients and authorities understandably like to have precision from the very start of a design project to avoid uncertainty and risk, but this has the potential to become unnecessarily restrictive. Overly prescriptive norms and regulations don't always lead to excellence. When applied without due consideration of other factors, they can become unhelpful and even end up having the opposite effect than intended, hindering the development of a qualitative solution.

Alternatively, a more open approach can leave room for manoeuvring and allow for more opportunities to be seized. One way of achieving this is to reconsider planning processes that are overly prescriptive from the outset since, as architect Jeremy Till points out, "the production of architecture in its very contingency resists the imposition of direct prescription."^[6]

Permitting proposals to be indicative rather than prescriptive opens the possibility of designing differently. The choice of aesthetics can come later in the process based on what is available on-site and on the market at a particular time. For example, in the building permit plans submitted for the project Zinneke, a dotted line indicated the approximative areas of window openings rather than showing precise sizes and positions. This allowed the shape and type of window to be confirmed during the construction site, depending on what windows were available on the reclamation market at that moment, resulting in a more unexpected yet remarkable aesthetic. Being indicative rather than specific during the planning stage allowed the project to take advantage of opportunities that arose during the construction process that could not have been known in advance.

MATCHMAKING BUILDING AND PROGRAMME

A similarly open approach could be applied when defining a building's programme. Architecture is, to a certain extent, inflexible. This represents something of a paradox because while buildings are designed for a specific demand, at the same time, they have a long lifespan and are often adaptable enough to transcend their original intention. Buildings are physically rigid but programmatically flexible. That's why a church can become a climbing wall, as in the case of Maniak Padoue, or a brewery can be transformed into a school like Egied van Broeckhoven. Given the existing physical constraints, instead of trying to shoehorn a particular function into a building as an initial step, shouldn't we first consider the programme's suitability rather than try to force it? This matchmaking doesn't necessarily entail finding an exact mirror of the programme and building but rather the best possible alliance between both.

CONCLUSION

Adaptive reuse and circular projects respond to "as-found" environments, engaging with the potentialities of a given time and situation. Perhaps the fact that practitioners are open to working with opportunities presented by fortuitous timing and unexpected contingencies isn't merely coincidental. We can also see this as an approach or an essential posture towards reuse and circular practices, combining technical precision and the indeterminacy of chance. Architect Yeoryia Manolopoulou proposes "an architectural approach that sees the design process continuing after the drawing stage, accepting the indeterminate and questioning the degrees of control demanded from and exercised by most architects... This acceptance of chance in architecture would not contradict its tendency to create autonomous and resilient forms but simply counterpart it."^[7]

Whereas chance and uncertainty generally tend to be excluded as much as possible from construction projects, the concept of timeliness suggests that a more fluid attitude is essential in dealing with circular and reuse projects. On all sides of urban development in Brussels, we observe a changing attitude in which project promoters, developers, contractors, designers, and government authorities all start to take on board the principles of timeliness, chance, situatedness, and negotiation, engaging with the existing reality on the ground and adopting a new approach to intervening in and transforming the city as well as the environment.

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STADSATELIER DE VILLE



CIRCULAR COLLABORATION TO SURPASS THE LINEAR MODEL

Anton MAERTENS

In 2016, Architecture Workroom Brussels claimed that "A good city has industry," as if they were cursing in church. Industry in the city creates jobs (for the working class), diversifies economic activities, develops social cohesion, and depends less on the whims of the service sector. Bolstered by the Brussels planning agency, BMA, and Mark Brearley, it became evident that there were many good reasons to retain or revalorise the industrial sector.

For BC materials, it was the key impetus behind setting up our offices in the Tour & Taxis zone. As a production company that transforms excavated earth into building materials we needed three crucial things regarding the space: 1) Malleability that allowed for expansion for our potential growth curve; 2) Affordability, as we hardly had income when BC materials started in 2018; and 3) Accessibility for trucks and large vehicles to receive the ingredients e.g. the "waste" of excavated earth and to deliver finished products (big bags of plaster, rammed earth, or block palettes). In hindsight, it's difficult to imagine any other place in the centre of Brussels that would work for us.

TO BE (TEMPORARY) OR NOT TO BE (TEMPORARY)

Being technically off-grid (we're not connected to the water network or the electricity grid — we are thankful to get electricity via our neighbours at Brasserie de la Senne) and with an easy-to-dismantle structure, we have always been ready to move out quickly if needed. Because we have a temporary contract of 1 year with the possibility to extend each year, and we know that the Brussels fire brigade will take up headquarters on "our" lot by 2028,

we began scouring the neighbourhood for empty lots. We opened a discussion with the Port of Brussels and they, being receptive to our needs, mentioned a 5.500 m² barren terrain in the TACT zone (Terrain à côté de Tour & Taxis) site coming available with a 30-year contract. But there would be a competitive open call for the lease, with a strong emphasis on circularity.

Although we rejoiced at this opportunity — our production grew tenfold in just a few years, and we needed more space — it was clear that we didn't have the means to develop 5.500 m². But would it be necessary? We know many organisations in a similar situation. Like us, they started their business in Brussels — tapping into the resources or "waste" available *in the city* but persistently undervalued. They also risked being driven *out of the city* by the constant competition with real estate market forces. We approached 1) Rotor DC (a pioneer in reclaimed and dismantled second hand building materials), 2) Sonian Wood Coop (reclaiming wood from the Sonian and other nearby forests), 3) Natura Mater (consultants in reclaimed and biobased materials), and 4) Tournevie (construction workshops and tool library): an absolute dream team of circular brothers and sisters, and wrote a proposal called StadsateliêrdeVille: a site dedicated to production, distribution, innovation and training with circular materials focused on the plus values and synergies. We won the lease from the Port.

ROTOR OUT, DEMOCO IN

As it happens sometimes with circular dreams, reality has other plans. Rotor DC, one of the most established partners in the group, had to exit the plan because they couldn't bridge the time between having to leave their Anderlecht site urgently and the eventual readiness of the TACT site. Although we considered developing it ourselves with the other group members, the financial reality dictated otherwise. Developing a project like this requires several hundred thousand euros (permits, foundations, electricity,...) even before the first compressed earth block has been laid.

During workshops with the universities ULB and UGent, we delved into different scenarios (basic, intermediate, and full development). We sparred with various developers to see who had a similar circular mindset and wanted to take a risk in pursuing this circular dream. Excel sheets were made, ROIs were calculated, but even with the attractiveness of the site and sexy (albeit poor) partners, enthusiasm dwindled. Then, as it also happens in a surreal city like Brussels, chance encounters change everything. Over some casual drinks, we met Pieter Broeckaert, director of Democo Brussels, who was looking for exactly the kind of spot we were developing at Tour & Taxis. Democo is a contracting company focused on building material reuse. At that point, it was dismantling in Brussels and moving all its material to Hasselt, where Democo's headquarters were situated — only to be later installed back in Brussels. They sought a space to store their reclaimed construction material to be ready for the circular transition that the sector would finally commit to with the Green Deal of 2019.

THE MAGIC MATCH OF URBAN, BIOBASED, AND GEOBASED

It became clear that these organisations were a great match as they covered what we think is the future of building: a coherent mix of bio-based materials, geo-based (unbaked) materials, and second-hand or "hard" materials. Although we held many meetings to bridge the gap between a large player and many smaller players, we eventually agreed upon a circular charter, a rent cap for other circular players, and a competition for selecting an architectural team, which BMA demanded as part of the lease from the Port.

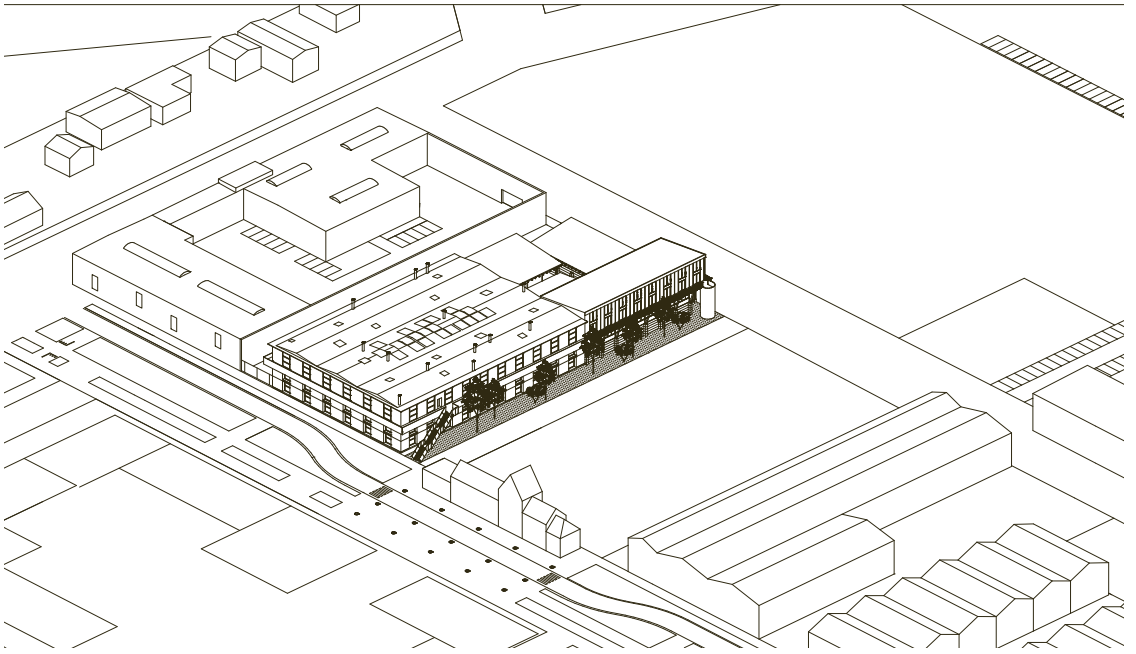
Instead of a classic blank sheet and a programme, we called upon the architects to make plans with the inventory of BC materials' current site (every square metre calculated and categorised), Democo's many resources (for example, steel beams from a large hall recuperated by Demeuter and Mathijs Desiere's team) and other materials supplied by different stakeholders. It seemed like a constricted framework for the architects, but in reality it triggered their creativity even more, giving way to fascinating contributions. The most convincing was the Schenk-Hattori/Babini-Geysen proposal that would be selected for the building, while BC architects would upgrade the BC materials hall. This way, the building could exemplify having a low carbon footprint and a mix of productive activities in halls with research labs and offices on top, embodying the dialectic of theory and practice.

But it would also literally and physically showcase what the material producers make and incorporate that into their building. Moreover, the fact that the Port offers a 30-year lease (with a possible extension of 3 x 10 years) of the terrain, after which the terrain should normally be restituted as it was, gives the most apparent circular incentive to build for dismantlement.

DECARBONISING INDUSTRY

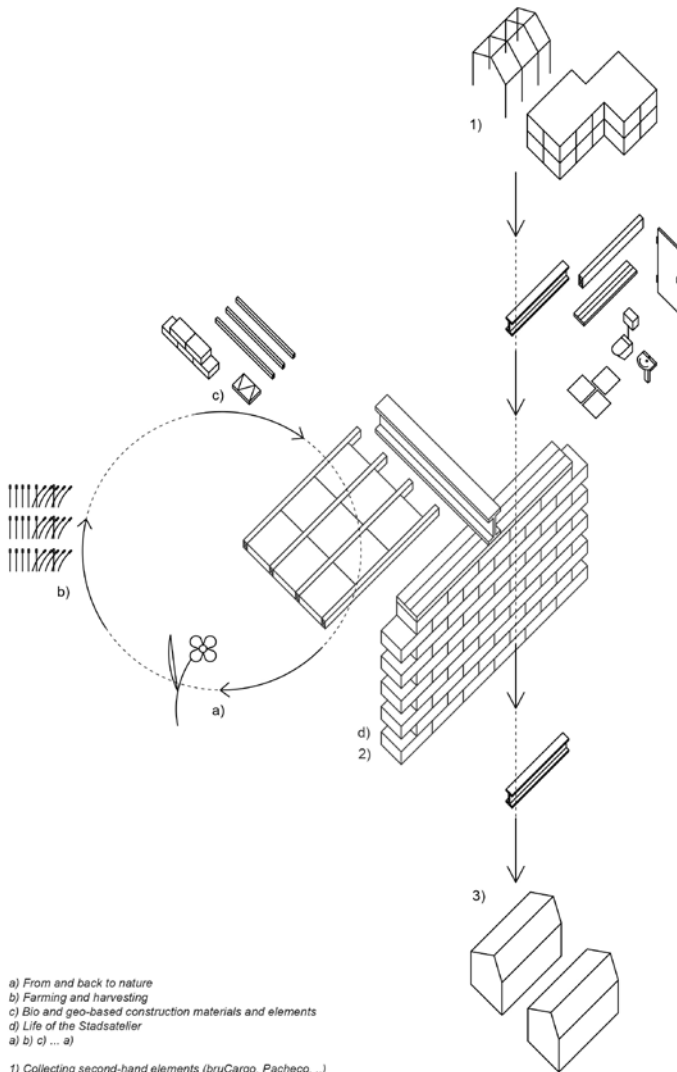
The Circularity Gap Report 2024, which concluded that the global reuse of materials *decreased* instead of *increasing*, states: "At the heart of this challenge lies the pivotal role of industry and governments. Industries must reevaluate their production processes, and governments must not only incentivise and encourage sustainable practices but also regulate and penalise wasteful ones. It is a collective responsibility that necessitates collaboration on a global scale."

Can we stand on the shoulders of old industries and expect to produce differently? Can we tap into the giant waste streams and eco-design our way out of dangerous climate change and wastefulness? There's a famous African proverb: "If you want to walk fast, walk alone. If you want to walk far, walk together." At StadsatelierdeVille, we will walk together to valorise waste, innovate with blends and combinations, distribute it to builders, and train them to use the best circular materials available.

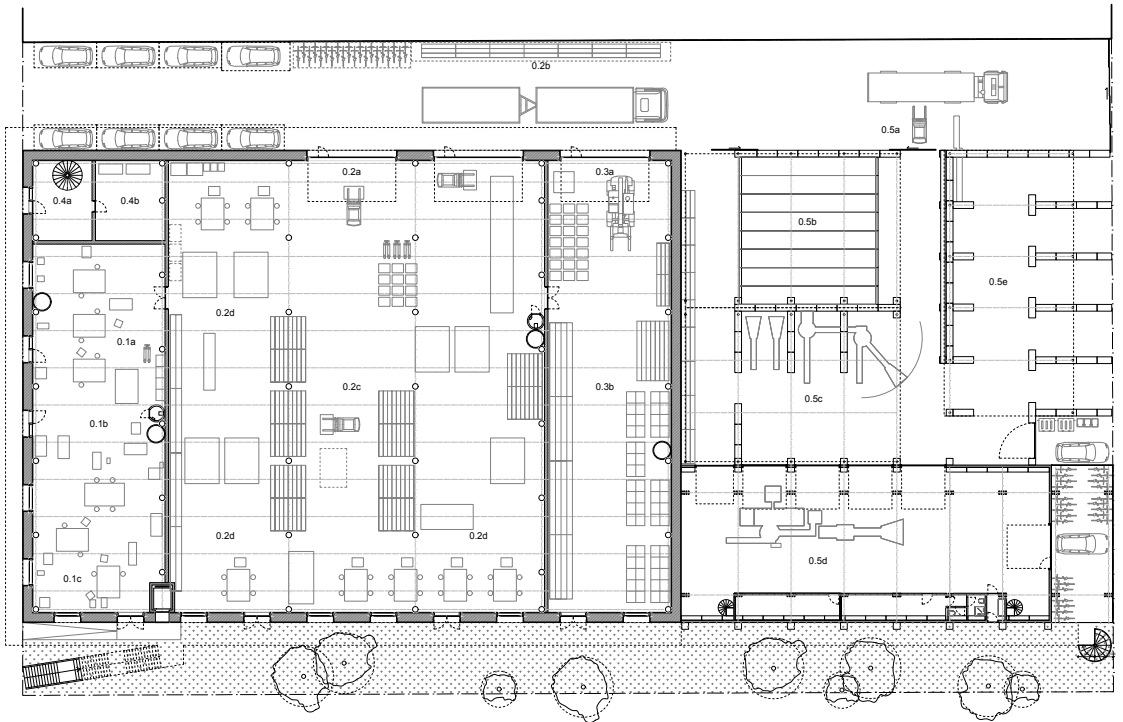
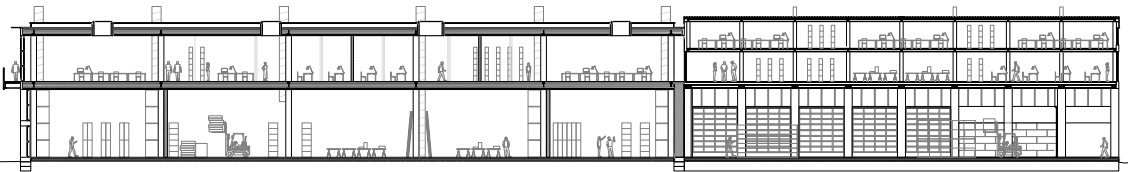


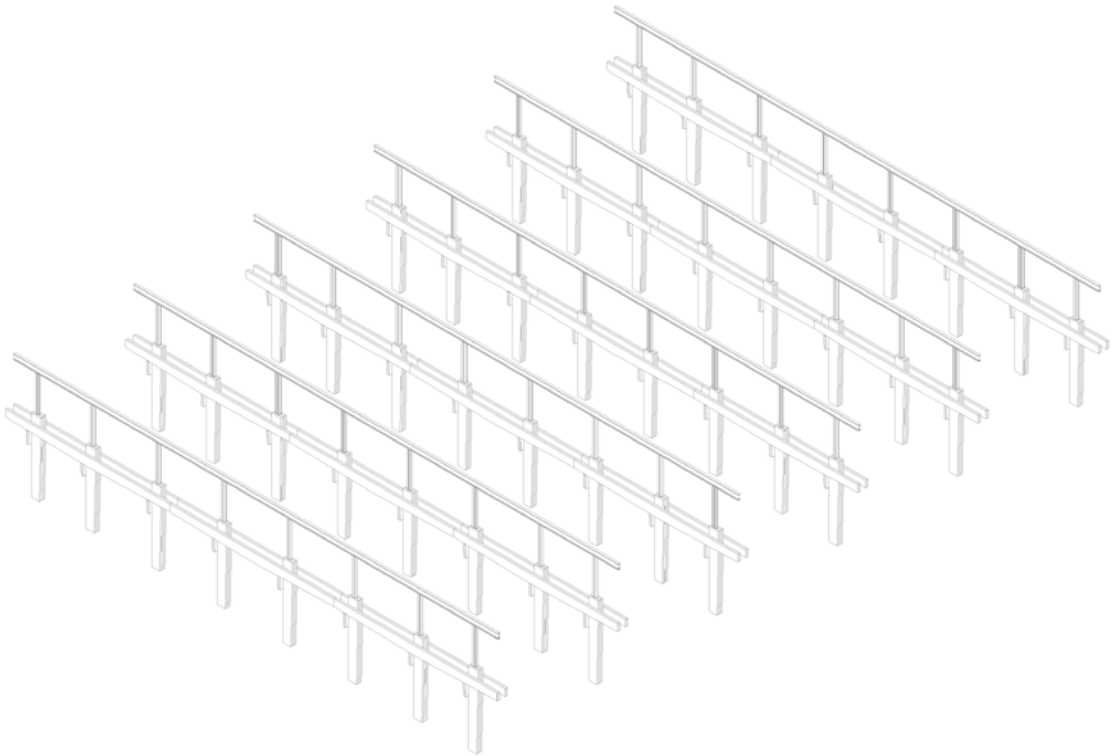
↑ The new Circular Hub and BC production site is situated on a land-leased plot in the port of Brussels.



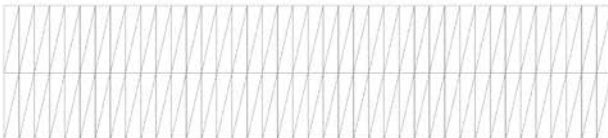


- a) From and back to nature
- b) Farming and harvesting
- c) Bio and geo-based construction materials and elements
- d) Life of the Stadsatelier
- a) b) c) ... a)





Demuyhok, Kortijk
187X HEA180 5m
155 used, 13 missing

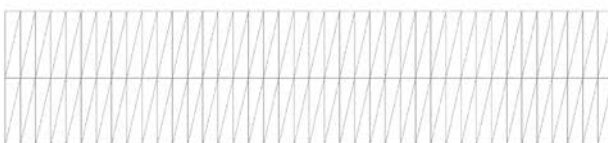


Prefab concrete vaults (unarmed)
250-300X1100cm
80 new

← The structural concept of the project was shaped by a specific quantity of reclaimed beams and columns sourced from deconstruction sites in and around Brussels.



Brucargo, Brussels 9X IPE450 20m 6 used
Brucargo, Brussels 8X IPE450 20m 6 used
Brucargo, Brussels 18X IPE450 5.5m 6 used
Demuyhok, Kortijk 187X HEA180 5m 99 used



Prefab concrete vaults (unarmed)
250-300X1100cm
80 new



Stadsatelier de Ville marks a significant advance in circular construction in Brussels. Situated on a land-leased plot in the port of Brussels, the building is designed to be entirely dismantlable at the end of the lease. It features a horizontal structure crafted from reuse beams sourced from local deconstruction sites, while the vertical structure is mainly made of pre-stressed straw blocks that provide both thermal insulation and structural support. This project embraces the complexities of a circular approach and demonstrates how it can fundamentally reshape the way we design and build architecture.

Site

Anna Bochdreef 22
1000 Brussel

Year

2022 > ongoing

Client

Democo + BC materials

Architect

**Schenk Hattori + Babini Geysen
+ BC architects**

Team

**Ney & Partners / WOW
Buro Kiss
D2S
iVec
Lars Junghans**

AUTHORSHIP AND THE OPEN-ENDED NATURE OF CIRCULAR ARCHITECTURE

Colm MAC AOIDH

The projects presented in this book embody a transition in the architecture of Brussels, a change in attitude that has been accompanied by the development of a new architectural expression. Observable shifts in what might be described as the architect's signature have begun to reveal the ways in which circular practices of adaptive reuse are challenging and redefining the notion of authorship.

The making of architecture is an inherently collective act, a work of many hands and minds in which it is impossible to distinguish every individual contribution. If authorship in architecture is already blurred, an emerging array of practices that take concepts of circularity and adaptive reuse as their starting points are blurring it even further. It is not a coincidence that many of the projects featured in this volume represent collaborations not just between different architectural offices, but also between architects and clients, contractors, community associations, civil society groups, local and regional authorities, and a range of other actors. Successful co-operation depends on being responsive, able to look at things from multiple perspectives and being prepared to change your point of view. Material reuse and circular projects are collaborative by nature — they require a co-ordinated, holistic approach, an understanding of the life cycle of the building, and constant communication across each stage of the design and construction process. Material flows — how materials are sourced, salvaged, stored and distributed — need to be managed, which requires developing synergies between architects, engineers, material innovators, construction companies and governmental bodies. Projects such as Stadsatelier de Ville, Zinneke, and MULTI among others

demonstrate distributed forms of authorships that both depend on and acknowledge the contributions of the many different actors involved.

Reuse of materials and the transformation of existing buildings go hand in hand — in the same way as materials that until recently were viewed as construction waste are now recognised as valuable resources, buildings previously dismissed as obsolete and fit only for demolition are being re-evaluated so that their potential might be realised. In the case of recent built heritage in Brussels, office developments from the mid- to late 20th century, commonly viewed as mediocre or banal and thought to have no architectural merit, provide the basis for a new wave of adaptive reuse projects that includes Takeda and Arlon-Trier. Through a careful re-reading and valorisation of the existing situation that acknowledges and tackles the flaws as well as the possibilities, these new interventions strengthen and rearticulate the building to create spaces of a quality, character, and generosity far beyond what would be possible to achieve through demolition and rebuilding.

Where exactly the authorship lies in these kinds of projects might not be as easy to define as in a typical, traditional new build, but just as working with existing contexts doesn't limit or diminish the creativity of the architect, neither does it represent a loss of authorship or autonomy. Instead, a hybrid authorship emerges in which the intervening architects appropriate the existing building in the same way as a musician reinterprets a score: through making it their own, they create a new work from the existing, but it is not necessary for them to claim full authorship in order for their interpretation to be acknowledged as a creative

act. As Austrian architect Hermann Czech maintains, "A transformation is not inferior to a new structure; it is not a compromise. In a transformation project the elements of the existing building and the changes made to it form a union with the newly introduced elements. This union constitutes a substantive work in its own right."^[1]

These new, expanded models of authorship better reflect the architect's changing role in contemporary society: as ecological, resource and, social challenges force a continued shift in architectural and urban practice away from *tabula rasa* towards engaging with the existing, architects need to become more adept at continuing what others have begun and beginning what others will continue. As Czech puts it, "When one recognizes that every design process consists of a series of decisions, and that later decisions are determined by earlier ones, it will make no essential difference whether the earlier decisions were one's own or someone else's."^[2] Engaging with the work of previous authors simultaneously forces contemporary practitioners to confront the reality that their own work will someday be adapted and reworked by those who come after them. According to architects Flores & Prats, "There is an understanding that our intervention is just another step in an ongoing process that will include other interventions over time."^[3] Designing a reversible/demountable building starts out from a similar acceptance that it will at some point be disassembled and reused by others in the future. Authorship is therefore not just distributed in space, but also across time.

Does the lack of an immediately recognisable signature represent a refusal of authorship or dereliction of responsibility on the part of the architects involved? I would

argue that instead of rejecting or abandoning authorship, practices of circularity and adaptive reuse represent a reimagining of the very concept of authorship, questioning what it can mean as a way to ensure that it remains relevant.

Stamping your signature on a building created from scratch is relatively straightforward. Recognising the latent potential in an already existing building and being able to unlock this through an intervention that transcends not only the intentions of the previous architects but also the preconceptions of contemporary society takes an altogether more skilled, nuanced, and confident author. Rather than being motivated by a desire to pepper the city with vanity projects, the creative teams featured in this publication are more concerned with actively contributing something altogether more positive to the urban life of the city. For them, authorship extends to how the building is used by its inhabitants, and how it can continue to evolve in tandem with their changing circumstances and needs. Reinforcing the open-ended nature of both architecture and authorship through projects that build on the strengths of the existing context and are robust enough to withstand further adaptations, these practices redefine architecture as more than a static *fait accompli*, revealing a collaborative, multi-authored process of permanent evolution, an ongoing dialogue in time and space.

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ISBN 978-2-9603291-1-7
D/2024/15682/01

October 2024

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In Brussels, we once demolished buildings without remorse, discarded materials to waste in the blink of an eye, and built for a lifespan of fifty years or less. But times have changed. Reuse architecture has emerged as a central focus in the city's architectural agenda over the past two decades, and the mindset is shifting. Circularity is now at the forefront — yet it encompasses far more than reusing materials salvaged from demolition sites.

This book explores 14 architectural projects in Brussels, each offering a distinct take on circularity. Working with salvaged materials isn't new — Palladio, for one, valued them for their proven strength over time. Yet today, materials that once met certification standards often lose their worth upon dismantling. How can we overcome such industrial-age challenges? And how to find meaning in the “as found”? Some buildings are saved for their heritage or emotional value, but how do we reveal the potential of the anonymous, everyday structures in our city? And when new construction is necessary, how can we design with temporality in mind — creating buildings that are not only robust but also adaptable, dismantlable, or made from materials with minimal impact on our planet?

By showcasing these architectural works, this publication aims to demonstrate that circular architecture is not niche. It's in its infancy, but our ambition in Brussels is to bring it into the mainstream.

ISBN 978-2-9603291-1-7
D/2024/15682/01

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