

Research catalogue.
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Urban Architecture graduation studio 2024/2025, Low Town Downtown.
TU Delft, Master AUBS, track Architecture.

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preface

This booklet serves as a collection of the research findings from my graduation project as part of the Urban Architecture graduation studio; Low Town Down Town. After describing the posed problem, the following chapters will touch upon the starting points for my design project, its relation with the research, and the research itself.

The site of the Low Town Down Town studio is situated along the Lageweg; the meeting point of the Twentieth century belt of Antwerp and the formerly independent municipality of Hoboken. On the edge of the fine-grained urban fabric of the district of Hoboken sits a large post-industrial plot which has been mostly abandoned in recent years as the companies sought to move their production premisses elsewhere, leaving the fabric of halls and workshops that has steadily grown from the early 20th century onwards laying dormant whilst the site awaits its redevelopment as part of the cities' ongoing densification. In the concatenation of halls and workshops that steadily grew from the early 20th century onwards, different metallurgical industries produced a multitude of products, ranging from oil barrels for the neighbouring petroleum industry, to car rims for German manufacturers and to beautifully decorated tin boxes which have today become sought after collectables.

The physical remnants of these industrial processes tell a story of a quickly industrialised country. A development that relied heavily on exploitative labour conditions and extractive practices both in Belgium and in its colonies. Yet, one that simultaneously resulted in a rapid growth of Hoboken's population and the emergence of a vivid community life. One that subsequently suffered notably when the companies moved their production elsewhere. How does one imagine a new future among these remnants of a past productivity? One in which a polluting extractive industry no longer has a place, but in which its productive nature is still valued. One in which a shared life of harsh working conditions no longer forms the basis of community life, but in which the site gains a certain porosity, where generous public space is created and where work, dwelling, education and play coexist as a starting point for a new chapter in the site's history?



a_school

In a collective effort, together with Sacha Oberski and Richard Múdry, we devised of an alternative urban plan for the Lageweg site through the detailed study of the existing situation. A complete overview of this plan would not be fitting within the context of this booklet, yet some important ambitions are related to this research that ought to be described; One of the main aspirations of the plan is to open up the concatenation of industrial halls through the disassembly of the structures that were least promising for a future use or too severely damaged to re-use. Thereby creating a certain porosity in the large plot and providing new public space alongside the remaining existing buildings that will receive a new use. Regarding these new uses of the re-used structures on the given site, we propose for an educational program to feature centrally along other public programs. Thereby letting the site regain its social and productive importance for the surrounding inhabitants and the wider region. My project builds upon this ambition.

Parallel to these collective ambitions, I strongly believe that our contemporary construction practice is in dire need of a *material reform*¹. In times of an ever worsening climate crisis, and a seeming inability to refrain from our reliance on harmful extractive practices, I advocate for an approach in which we build with what is at hand (if we should build at all). Working with local material and techniques where possible and always considering the potential of our existing structures. Thereby minimising both carbon emissions and negative material and societal impact on the sites of extraction, processing and construction. Despite truly applauding those architectural practices (such as BC architects in Belgium and Material Cultures in the UK) that make an effort to step outside the conventionally described contemporary role of the architect² and work towards the above-mentioned, I believe that other actors in the construction industry; namely contractors and construction workers, should ideally be active agents in these developments as well. Rather than overlooking those who build our buildings, as is so often done in architectural practice and discourse³, all involved actors could work collectively towards a common goal, where collaboration replaces conflict and where these challenges are seen as a shared responsibility.

Recognising that Flanders has an existing culture and practice of vocational education in construction which is mostly incorporated in its secondary schools, and wishing to acknowledge the value of these existing practices, the proposal of my project intends to build upon them.

As such, the project becomes a secondary school that offers vocational education which focusses on construction in a non-extractive⁴ manner. A place to share knowledge on and learn how to re-use, how to repair, and how to build with reclaimed building materials alongside those that can be grown and/or produced regeneratively. As a material starting point, the project composes of two existing industrial buildings, as well as (structural) components from the previously described disassembled halls. In this way, the architecture embodies the values that lie at the heart of the proposed education. Not dissimilar to the way in which early 20th century craft schools demonstrated the crafts that were taught within through their refined brick ornaments in their facades⁵. Thereby, the project practices what it preaches and succeeds to connect the ambitions of the masterplan with my personal beliefs.

Stemming from the aforementioned intentions, the research as described in this catalogue aims to create insight in the existing practices through fieldwork in the form of a series of visits to different vocational schools.

After the next chapter, which contextualises the fieldwork cases, the following chapters describe the encountered practices along a structure that lends from these encounters and forms the basis for the proposed education in my project. The final chapters reflect on the research and illustrate how the findings are translated to the (design) project.

- 1 Material Cultures. (2022). Material reform: Building for a Post-carbon Future
- 2 Lefebvre, P., Neuvels, J., & Possoz, J.-P. (2021). Penser-faire: quand les architectes se mêlent de construction ; Thinking-making : when architects engage in construction.
- 3 Ferro, S. (2024). ARCHITECTURE FROM BELOW: An Anthology.
- 4 non-extractive architecture(s), a directory of design without depletion. (n.d.) <https://directory.nonextractivearchitecture.org/>
- 5 Pietsch, S., Schreurs, E., Mandias, S., & Broekhuizen, D. (2018). The new Craft School. Japsam

practice_as_encountered

The fieldwork that has been undertaken for this research consists of a series of visits of two secondary schools in Flanders that offer vocational education in construction and other disciplines.

One of these two schools is the secondary school of Don Bosco in Hoboken, which originated as a christian school in the 1940's and started developing its vocational education from the 1950's onwards. The development of this education was directly tied to the schools proximity to Hoboken's industries and its need for a well educated workforce. Among these industries, the metallurgical industry of Umicore⁶ features prominently, still maintaining ties with the school to this day. Next to construction, the school offers education in woodworking, electrical engineering and mechanics. Spread out over three visits, I spoke with Steven Arcay (pedagogical director of practical and technical subjects), Kevin Immers (technical advisor in construction), Hans Stessel (construction teacher) and some of the students from different years.

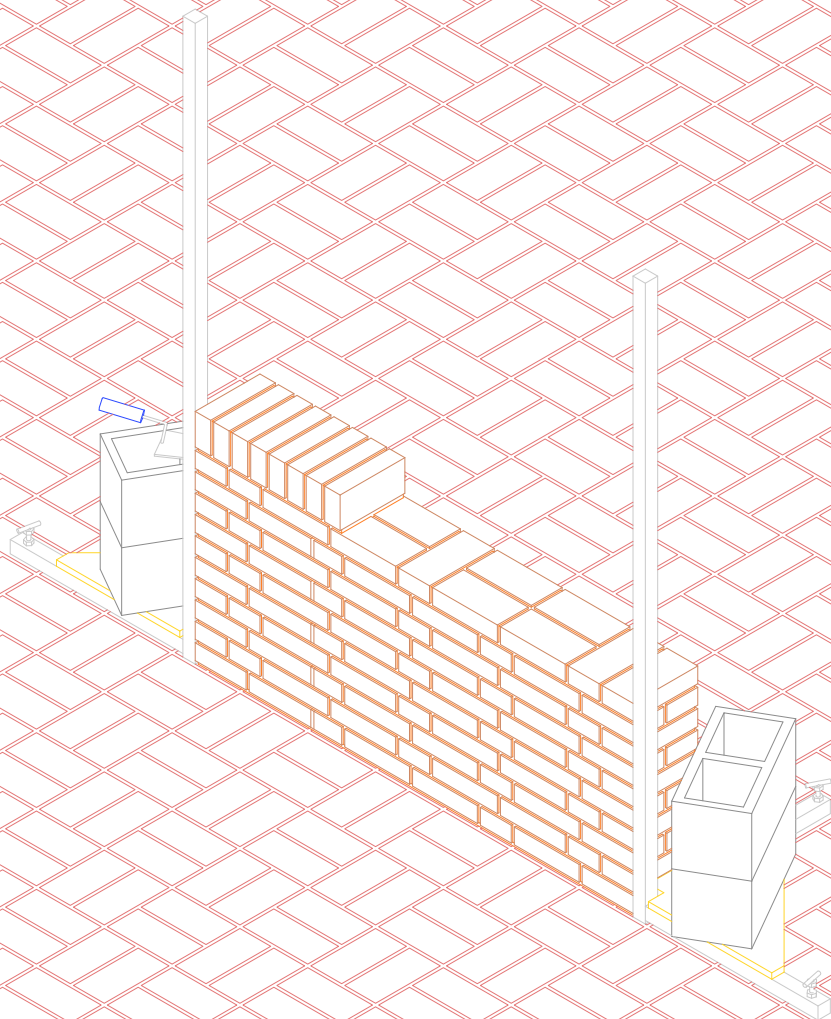
The other school to which I was pointed when visiting Don Bosco, is the school of VITO in Hoogstraten. Being the only school located in the northern region of Flanders that offers such a large variety of vocational education, it attracts students from many of the surrounding municipalities. In its education, the school offers similar disciplines as Don Bosco, with the addition of agricultural education. Here, I spoke with Geert Goetschalckx (technical advisor in construction) who worked at Don Bosco before.

In contrast to the Netherlands, this type of education starts from a relatively early age. After testing out different vocations in the first two years of their education, the pupils choose a direction in their third year (age 14). From their third to sixth (and sometimes seventh) year in school, they will continue to specialise in their direction before generally starting to work in their chosen vocation soon after graduation.

The following chapters are structured along a rough distinction of three phases/scenes in the education as encountered during the fieldwork. Three phases that describe the pupils' development; starting in a safe and controlled environment and gradually working towards more complexity and uncertainty, thereby preparing themselves for their profession.

These chapters are; "the knot", "a self-assembled school" and "taking it outside".



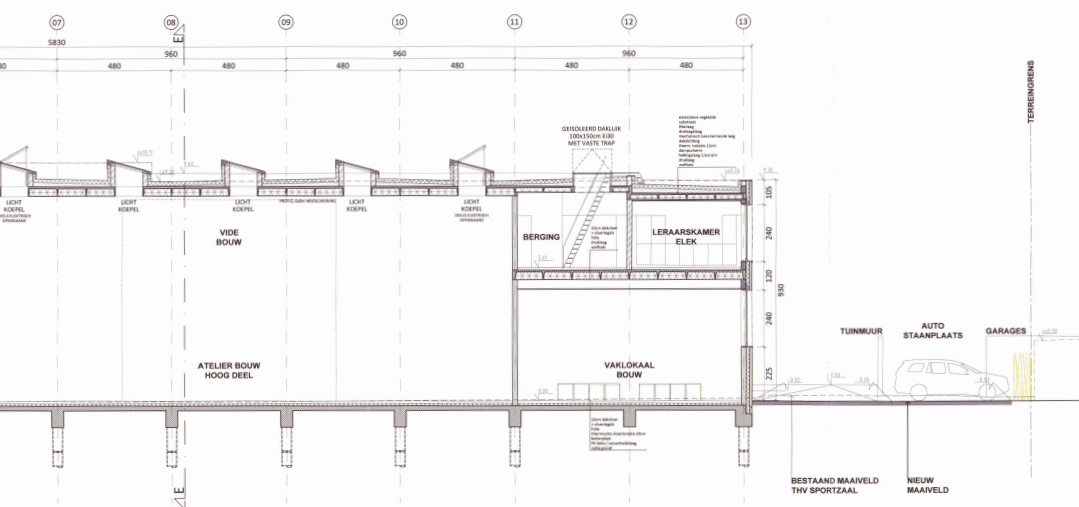


the_knot

The knot (or *knoop* in Dutch) refers to a 1:1 mockup of a part of a building that is constructed in a controlled environment. In the first years of education, the knot forms an instrumental pedagogical tool as it allows the pupils to hone their crafts, simultaneously developing both explicit and tacit knowledge on the subject.

Due to the persistent prevalence of masonry in Belgian construction, the first knot often starts from the construction of a small wall section in a simple masonry bond. Afterwards, more complexity can be introduced throughout the exercises through the changing of the bond and the addition of foundations and/or openings, corners, interior finishes and even roof sections.

Given the central importance of the knot in this type of education, the functioning and spatial quality of the workshop spaces in which their construction takes place is important. In both schools, these workshops are characterised by tall ceilings, ample natural light and a large area of open floor space that is easily cleaned and allows for movement of materials and tools. Often, the workshops are flanked by classrooms in which specific construction theory is taught, or where the pupils draw the knots before building them.



Under construction; with an opening for which the pupils poured a concrete lintel themselves.



A clean workshop is held in high regard in the workshop of Don Bosco.



For the construction of the masonry knots, *bastaardmortel* is used; a mortar which is made without the use of cement, making it very easy to clean the bricks after the disassembly of a knot. In this way, the bricks can be (re-)used continually for up to 50 years!



Mix it! The pupils learn to work in teams from the start.



A more complex knot where a wall meets a roof, made by fifth year pupils at VITO Hoogstraten.



Pragmatism; A garage door to the outside allows for movement of large materials and tools.



The woodworking machines are kept in a separate workshop.



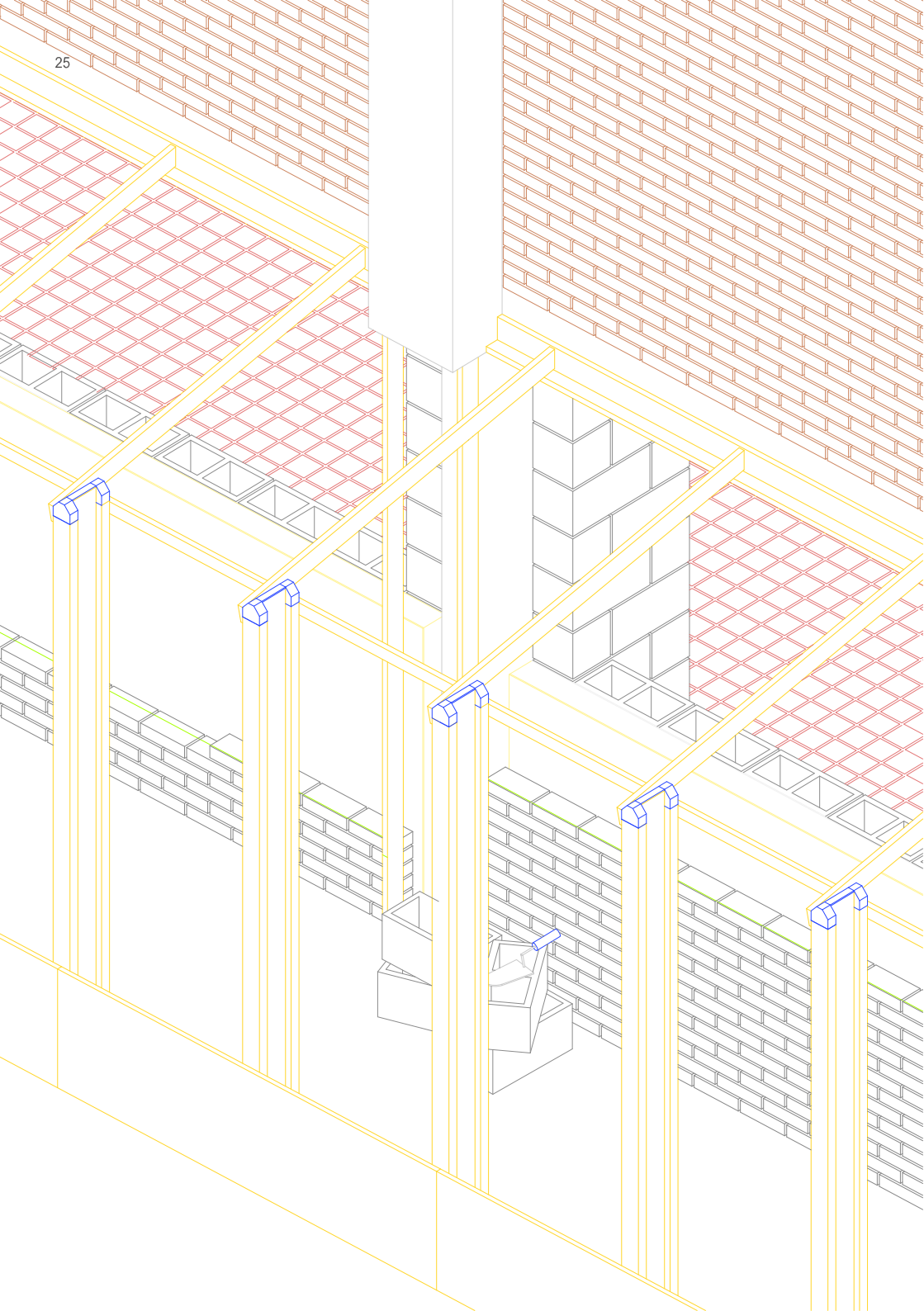
At VITO Hoogstraten, one teachers attempts to introduce more bio-based building materials in his lessons; such as hempcrete and woodfibre insulation . The others want nothing to do with it



Material storage is an important aspect of the school's operations. Ample storage space allows for the school to have a large variety of different materials that are constantly moving around; stored, constructed, disassembled, cleaned, stored, etc.







a_self-assembled_school

After mostly having worked and learned in both workshop and classroom for two years, where the different knots helped the pupils to hone their crafts in a controlled environment, both schools that I visited let their pupils work on 'real' projects inside the schools' premisses as a next step in their education.

This way, the pupils gain their first experience working on an actual building. Stepping outside the boundary of the comfortable workshop whilst remaining under the supervision of their teachers and having the school itself as their first 'client'.

Throughout the years, both Don Bosco and VITO Hoogstraten have worked with renovations within and changes to their school-buildings, as well as completely new-built additions in the form of a new workshop building among others. Even though both cases can be seen as relevant exercises, the teachers expressed their preference for the slightly smaller projects within their existing school buildings as it allowed for the work to be more varied. Strengthening their point; one teacher mentioned the case of the construction of a small building for a printing press at Don Bosco, where the facade area was so large that some pupils spent all of their practice hours that year laying of the bricks for the facade.

A part of the task of both teachers and the organisation of the schools is thus to always plan ahead; thinking of projects that are both useful and/or needed for the school, as well as being relevant and varied enough for the pupils in their stage of education.

Currently, the fifth years at Don Bosco are working to convert a former passage underneath one of their school-buildings from 1962 into two extra classrooms.

Digging away before the foundations for the new facade can be poured.







Laying the bricks for the new facade of the classrooms to be.

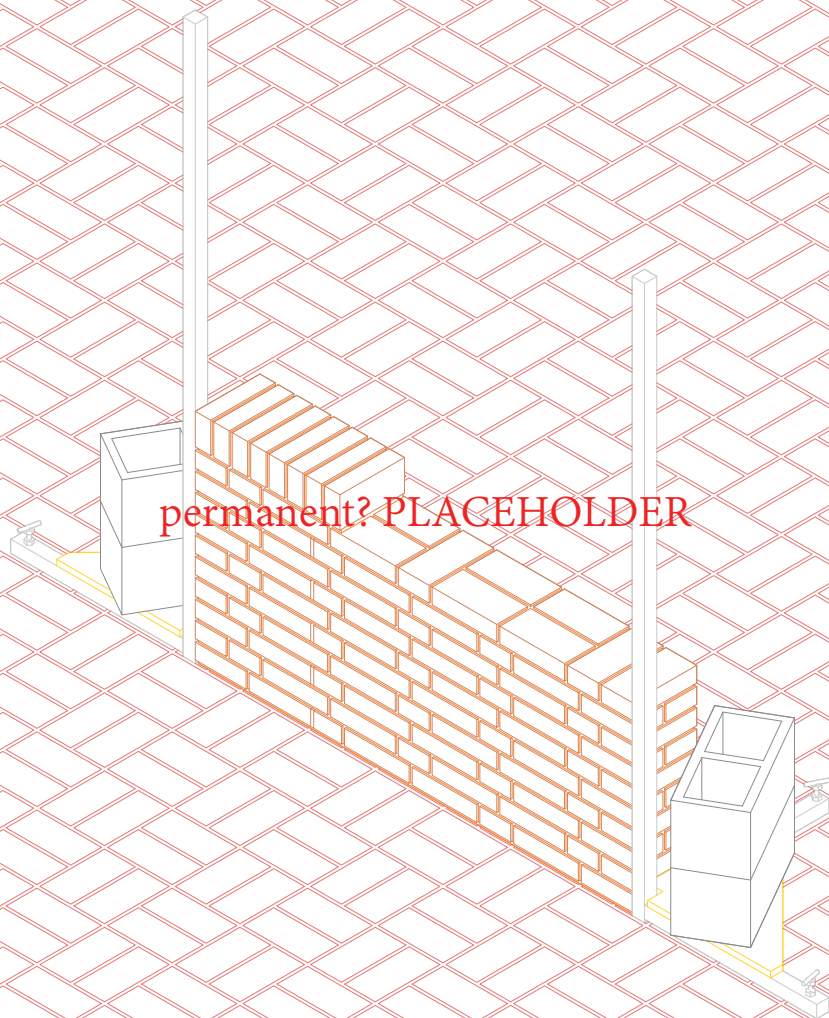


A temporary canopy was built to create a shelter from the rain.



Classroom or construction site?





taking_it_outside

As a final phase in the education at both Don Bosco and VITO Hoogstraten, the sixth year pupils embark on a construction project outside the school's premises. In doing so, another step is taken away from the previously known comfort and control and more new complexities are introduced, thereby preparing the pupils well for their work after school.

Whereas many pupils from VITO Hoogstraten often work on complete new-built projects, Don Bosco's more urban locality allows them to do more renovation projects. Hans (teacher at Don Bosco) explains how the school's relation with Umicore allowed them to take on the project to renovate a number of houses in Moretusburg (a neighbourhood that was erected for the labourers of the surrounding industries during Hoboken's industrial expansion) that are owned by the company. The renovation of these houses comes with a whole new set of challenges that even the teachers cannot always foresee. As is often the case with renovation, some potential problems and/or challenges only unveil themselves after the work has already started.

When working on a renovation project, the pupils (always under guidance of their teacher) don't just work on construction, but also learn how to carry out selective demolishing in a safe manner and how to be creative in their solutions regarding unforeseen situations.



One of the houses in Moretusburg that the students are currently working on.



Existing meets new.



A pile of recuperated bricks, potentially to be used on the garden wall.



A newly built metal-stud wall in one of the houses.







After the submersible pump broke down over the weekend whilst draining the groundwater from the garden for the work on new foundations of an extension, Hans and the pupils discuss how to continue without it.





Whilst digging for the new foundations, they found that the existing garden wall was built directly on the soil without any foundations. A quick eccentric foundation was poured to keep the wall from collapsing!





How to fix the formwork?



lessons_from_learning

The fieldwork and interviews that have formed the base for this research have shown me that there are many valuable lessons to be learned from the existing practices in this type of vocational education.

Of these, I believe that the structuring of the education as described, wherein more complexity and uncertainty is gradually introduced over the years, is especially valuable. Hence the structuring of the chapters along these steps.

Furthermore, the way in which the use of the *bastaardmortel* allows for the materials of the knots to be 'continually' re-used points to an interesting friction. The seemingly circular practice that constitutes this continuous practice of construction, disassembly, cleaning and storing, is quickly lost as soon as the work outside the workshop starts. When working on projects both inside and outside the schools' premisses, a logical transition occurs towards our conventional construction practice; working with new fired bricks, cement mortar and reinforced concrete among other non-renewable materials and constructing in such a way that the materials are not easily recuperated. How could these circular practices step outside the comfort of the workshop?

The example of the hempcrete knot at VITO Hoogstraten (p. 20) illustrates that, despite the effort of some, the broader culture in these schools can be seen as somewhat conservative; often denouncing the use of more bio-based and/or recuperated materials. According to Geert Goetschalckx, this aversion towards the use of less carbon heavy and more bio-based and/or recuperated materials in construction mostly stems from the pride of the teachers, who feel that by 'experimenting' with other materials and construction methods they are not able to pass on the craft that they have worked hard on to develop. What would it take for this attitude to shift? For these teachers to be able to feel proud to work with something that might be new for them? To work together on reforming the construction industry, rather than feeling threatened by it?

The project envisions a place where these attitudes may shift and where pride can be found in a collectively effort towards a common goal.



demolition_for_recuperation

Another strand in the research that was undertaken this year consists of a series of site-visits to a demolition site in Hoboken, Antwerp. The demolished building in question was a school building from Academie Hoboken. Due to apparent structural problems, the renovation of the building proved difficult, resulting in the choice for demolition and a new-built school building.

Interestingly, the chosen demolition contractor specialises in material recuperation. The company; Jamapro, mostly focusses on bricks. Yet if other materials in the buildings that they demolish can be easily recuperated, they won't shy away from doing so.

This fieldwork helped me understand more clearly the potential value of designing and building for eventual recuperation of its materials. From not using glue, to refraining from mortar with a high cement content, to slightly over-dimensioning structural timber elements and more. There are many aspects to think about when designing for potential disassembly and recuperation.

Additionally, the fieldwork highlighted the spatial needs and challenges that come up in the processes of demolishing, sorting and storing.



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Over the course of four months, the urban figure of the school was slowly taken away. Leaving a temporary hole behind in the urban fabric of Hoboken.





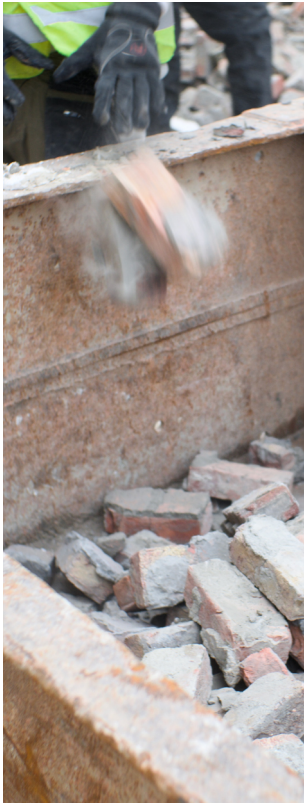
All materials were sorted into piles in the former courtyard of the school. Aside from the brick, most materials were sorted to be brought to a recycling centre. Due to its small dimensions, the timber was shredded to be turned into biofuel or particleboard.



In order to be able to continually remove material from the site throughout the demolition process, a first 'hole' was made in the building, opening up the courtyard through the street so the trucks could enter the site.







Brick is the main character. An estimated 70% of the brick in the building was recuperated in the process, thereby forming the company's main source of income. The manual labour that this process relies on should however not be overlooked. The company mostly works with people that take on the job on a project basis. Breaking apart the bricks, cleaning of the mortar and sorting them based on how damaged they are is all done by hand. Brick by brick.



A small percentage of all the bricks is cleaned and sorted on-site. Yet most is transported to the company's facility, where the remaining bricks are processed and stacked on pallets before they are sold.









a_material_inventory

Continuing the theme of building upon what is there, I set out to work with both two existing buildings as well as a multitude of different (reconfigured) components from the surrounding halls in the project. This ambition resulted in a series of site visits, in which I, often slightly overwhelmed by the site's material reality, started photographing, measuring, modelling and drawing both the buildings and components with which I wanted to work.

Despite the fact that this phase proved fundamental in the design process, I had a hard time not losing myself in every little detail that I encountered, as the scale of the project and the allotted time simply did not allow for it.

Yet, still believing in the premise of the project, I decided that I should focus on certain fragments of the project in which the reconfigured elements feature, rather than wishing to be able to trace back every single component.

The next spread serves to give a small insight in this process.



