

ARCH jaarboek 2020 - 2021

Jaarboek van de vakgroep
VUB Architectural Engineering
Vrije Universiteit Brussel

Online / On campus

Ine Wouters
vakgroepvoorzitter

Academiejaar 2020-2021 werd opnieuw getekend door de pandemie. Toch startte het jaar hoopvol met een memorabele afstudeerceremonie aan het monumentale stadhuis op de Grote Markt in Brussel. Door de stijgende curves moesten we echter weer onze verworven skills in streamen en online vergaderen bovenhalen. Het opstarten in online modus en het langdurig volhouden ervan vormden nieuwe, zware uitdagingen. Van uitstellen tot betere tijden was dit jaar geen sprake, dus gingen symposia, thesis- en doctoraatsverdedigingen, de interactieve ARCH-week, afscheidsdrinks en babyborrels online door. In een muisklik konden befaamde internationale gastsprekers hun ervaring en expertise met onze studenten delen, of haakten we zelf in op een lezing, seminarie of congres in het buitenland. Zo konden we toch digitaal over de grenzen reizen en onze horizon verruimen. Op de korte momenten dat de cijfers het toelieten, werden werkbezoeken, stadswandelingen, ontwerpessies op de campus, onderzoeksmeetings en infodagen georganiseerd in kleine groepen of in open lucht, met een ontsmettende spray steeds binnen handbereik.

Het jaarboek 2020-2021 van de vakgroep VUB Architectural Engineering blikt terug op dit merkwaardige academiejaar. De kwaliteit van het afgeleverde studentenwerk toont de weerbaarheid en flexibiliteit van deze generatie. Ook op onderzoeksvlak was de vakgroep uitzonderlijk productief en succesvol.

Links

Studenten in het
ontwerpatelier
oktober 2020
(© Ine Wouters)

Inhoudstafel



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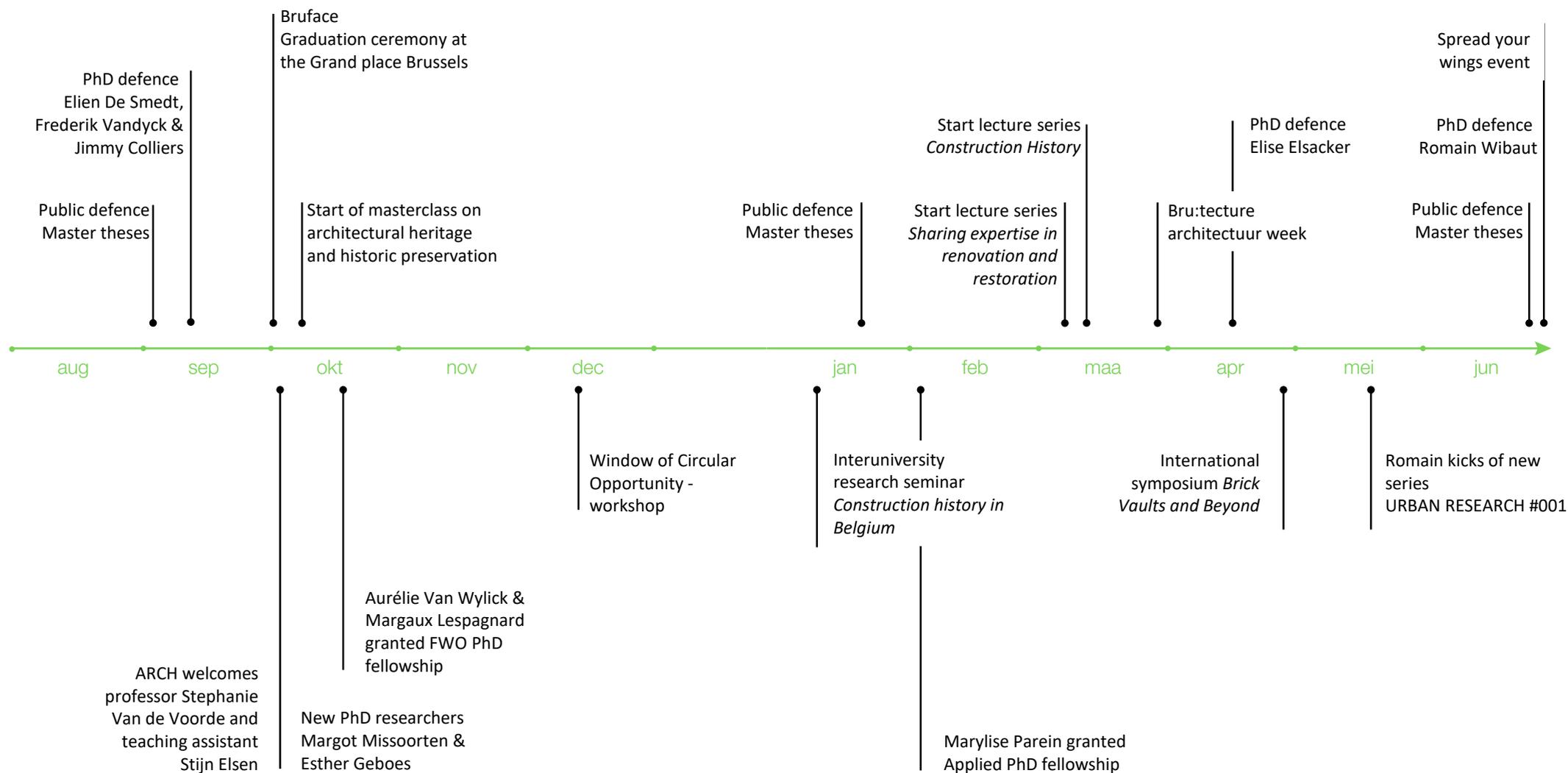
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Falsework model by master thesis student Léopold Sepulchre
(© Ine Wouters)

Activiteiten / overzicht 2020 - 2021





Eerstejaars Naomi Henkes

Interview
Esther Geboes

Facts & Figures

Geboortjaar: 1996

Huidige woonplaats: Venray en Brussel

Aantal medestudenten: 26

Favoriete vakken: Ontwerpatelier en Bouwtechniek

Andere interesses: tekenen, kunst en muziek

Door een stad dwalen en foto's maken van mooie gevels en imposante gebouwen, is iets wat ik graag doe. Vanwege mijn fascinatie voor menselijke creaties, wilde ik iets met kunst en cultuur gaan studeren. Bij de studie kunstgeschiedenis miste ik echter de mogelijkheid om zelf iets te creëren en de kunstacademie miste het wetenschappelijke aspect. Ingenieurswetenschappen: Architectuur bleek dus uiteindelijk de perfecte optie.

De VUB sprak mij aan omdat dit de mogelijkheid bood om in een internationale stad te studeren, terwijl de opleiding zelf juist kleinschalig en Nederlandstalig is. Een bijkomend pluspunt is dat je in Brussel een heleboel parels uit de architectuur in het echt kan bewonderen.

Uiteindelijk ben ik heel blij dat ik voor deze studie gekozen heb. Het is een heel intensieve studie, omdat je naast de theoretische vakken ook veel bezig bent met tekenen. Ontwerpatelier vind ik een heel leuk vak, omdat je daarbij echt je persoonlijke ideeën kwijt kan en ook leert om hier kritisch mee om te gaan. Bouwtechniek leert je over de eigenschappen van materialen en hoe je bouwdetails ontwerpt. Bij beide vakken speelt duurzaamheid een grote rol, waar ik persoonlijk ook veel waarde aan hecht.

Naast mijn studie besteed ik mijn tijd aan tekenen en ga ik graag naar musea en concerten. Ook kijk ik ernaar uit om binnenkort weer op stedentrip te kunnen gaan.

Links

De eindjury van

Ontwerpatelier: mens en
aanpasbaarheid

(© Esther Geboes)



Alumnus Pieterjan Franck

Interview

Ine Wouters

Facts & Figures

Geboortjaar: 1986

Huidige woonplaats: Mechelen

Afstudeerjaar: 2011

Favoriete prof: Ine Wouters en John Vantomme

Toen ik ging studeren, zat ik met veel vragen. Zo heb ik bijvoorbeeld lang getwijfeld tussen de studies Burgerlijk Ingenieur-Architect en Burgerlijk Ingenieur Bouwkunde. Niemand kreeg me het verschil tussen beide richtingen goed uitgelegd, maar omdat ik toen al de architectuurkriebels voelde, heb ik de knoop doorgehakt. Studeren is voor een groot stuk volwassen worden. Gaandeweg leer je jezelf kennen, met vallen en opstaan. Het was een fantastisch gevoel om te kunnen ervaren dat de mensen rondom mij in me geloofden en me pushten om tot het uiterste te gaan.

Ik heb veel mooie herinneringen aan mijn studietijd aan de VUB: de stress en de spanning bij het naderen van een ontwerpdeadline, gevolgd door de ontlasting en de fantastische momenten met vrienden. Ook denk ik graag terug aan de architectuurreizen naar Wenen, Berlijn en Lissabon. Ik heb er zoveel gezien en zo hard van genoten. Iedereen zegt 'studeren is de tijd van je leven' en ik kan dat alleen maar beamen.

Ingenieur-architect is een heel veelzijdige opleiding. Zelfs als je nog geen idee hebt welke job je later wilt uitoefenen, toch kan je er veel kanten mee uit. Neem de tijd om te ontdekken wat je boeit en graag doet en zoek vervolgens naar een job die daarbij aansluit. Succes gegarandeerd.

Ik werk ondertussen tien jaar bij Origin Architecture & Engineering, een architectenbureau gespecialiseerd in de restauratie en herbestemming van erfgoed. Restauratie is een heel bijzondere vorm van architectuur. Als restauratiearchitect streef je ernaar om de projecten waaraan je werkt te laten schitteren. En misschien lijkt het zo dat je in de schaduw van je werk loopt, maar niets is minder waar. Het is namelijk een hele eer om een stukje te kunnen bijdragen aan het erfgoed, zowel vandaag als morgen. Zo volg ik momenteel de restauratiewerken op van het Oud Gerechtshof in Antwerpen en werk ik mee aan een nieuwe toekomst voor het Vleeshuis in Antwerpen.

Links

[Pieterjan Franck op de restauratiewerf van het Oud Gerechtshof in Antwerpen](#)
(© Alexandra Deprez)

Seizing opportunities

In the previous yearbook, we summarised the challenges we were facing in light of the COVID-19 pandemic as ‘not now please’ as well as ‘alright, we’ll make something out of this’. Little did we know back then that we would still be challenged more than a year later. The last few months, we often felt like ‘oh no, not again’, but we also knew that by working together we could do this.

And we did it.

You did it. We are so proud of all of you and struck by everyone’s resilience, courage and persistence, even in the most difficult circumstances and when Teams-tiredness was bound to set in.

We don’t want to minimise the many adverse effects of the ever-prolonged measures in any way, we are all very much aware of the extreme efforts demanded of students. But, when looking back, let’s focus on the positive things that the changing circumstances brought us during this highly exceptional academic year.

Decreasing distance during the pandemic

First and foremost, even during online teaching, we noticed that talent always surfaces. Especially during meetings in small groups, for instance in the design studio or in feedback and exercise sessions, we were able to reach you, directly – or at least most of you. Because even if the attendance list of the online classes sometimes made us fear for the worst, we learned that you often simply fit the recordings of the online lectures in your own schedule.

The atelier is, literally and figuratively, the core of our department. Not only the Design Studio is normally organised here, it is also a place for interaction, cooperation, socializing and hard work. For the first and second bachelor, the Design Studio physically took place in the atelier in the safest possible way. However, in line with the changing regulations, the capacity of our atelier was limited and didn’t meet the need of all students to meet and interact with each other. Therefore, in November 2020, virtual ateliers were introduced to enhance the sense of togetherness, to discuss assignments and to get tips from fellow students. Less pedagogically sound activities occurred as well (we didn’t need to see how somebody’s refrigerator drawer was turned into a sangria holder), but then again, glad to see that you haven’t forgotten what it is to be students!

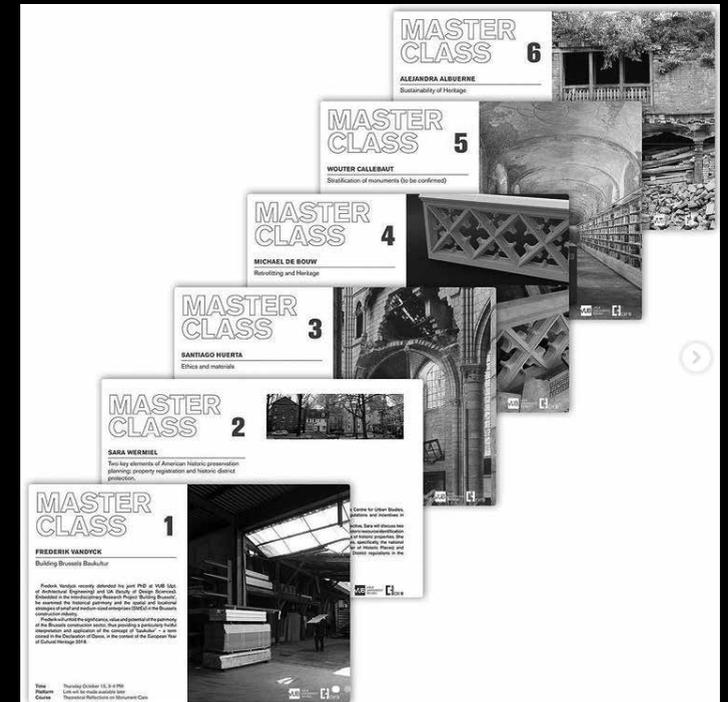
An online setting creates distance, yet it also helps to overcome distance. International students were able to follow classes from their home country, while experts from all over the world shared their knowledge and expertise with us during invited lectures, on a scale that is much wider than would normally be the case. In the course Structural Renovation Techniques, Ine

Text

Stephanie Van de Voorde
Aurélië Van Wylick

Wouters wanted to divert the attention from the COVID-19 pandemic scene and let the first master students reflect about their future job opportunities. Four Bruface alumni in architectural engineering, focussing on different aspects within the renovation sector, were invited to share their professional worries and pleasures: postdoctoral researcher Louis Vandenaabeele (ETH Zürich), director Quentin Collette (New History, USA), restoration architect Marianne De Fossé (Origin Architecture & Engineering, Brussels) and project leader integrated design Leen Lauriks (Sweco Belgium).

Another example were the six online Master Classes, organised by Stephanie Van de Voorde in the first semester, in the framework of the course Theoretical Reflections on Monument Care. Frederik Vandyck (VUB/UA), Sara Wermiel (MIT, Boston), Santiago Huerta (ETSAM, Madrid), Michael de Bouw (Belgian Building Research Institute), Cédric D’Haese (Callebaut Architecten) and Alejandra Albuérne (Bartlett UCL, London) not only enlightened the students with their latest research and projects, but all agreed to open up the Master Class for others as well. The number of external participants (up to 70 per Master Class, from Belgium and abroad) shows how much open initiatives like these are appreciated.



Thanks to our Social Media Team for getting the word out on the lecture series!
(© Frederick Vandyck)



The same goes for the online lecture series on Construction History, which was part of the course Architectural and Construction History before 1850, taught by Stephanie Van de Voorde. Highly esteemed experts such as Susan Galavan (KU Leuven), David Yeomans (Construction History Society, UK), Paula Fuentes (VUB), Heidi Deneweth (VUB), Bill Addis (independent scholar, UK) and Philippe Sosnowska (ULiège/ULB) each gave a one hour talk that not only enlightened the third bachelor students from VUB and ULB, but also seduced many other researchers and students to visit our online classroom.

Not only courses and lectures were organised online, but private and public PhD defences of our researchers as well. Depending on the time of the year, some public defences could take place on the VUB campus (with the option to follow it online), although with a limited amount of people and by following all safety measurements. This meant a personal bowl of chips instead of sharing one, so we are not complaining... Public PhD defences were made more accessible by organising them online, for example for our students, grandparents and jury members from abroad. These online defences never had so many attendees, with a maximum of 160 in the public defence of Elise Elsacker. More information on the finished PhD projects can be found from p. 71 onwards.

The final jury of the first and second bachelor was physically organised in the atelier in line with the safety regulations. Despite the mouth masks and social distancing, it was a great moment for the professors, jury members and students to end the Design Studio of this academic year. Well done!

Finally, a big shout-out to science and humanism – two elements that constitute the core of the VUB and were pivotal in facing COVID-19.

Final jury Design Studio:
First and second bachelor
(© Esther Geboes)

Afstudeerceremonie



Feestelijke afstudeerceremonie van Class 2020 op de Grote Markt in Brussel (30.09.2020).
v.l.n.r. professoren Lars De Laet, Iris De Graeve, Dirk Lefeber, Niels De Temmerman, Francis Berghmans (decaan), Caroline Pauwels (rector VUB)
(© Thierry Geenen)

De architectuurweek 2020-2021, Mètres Carrés, was een zeer unieke editie. Bru:tecture organiseerde de volledige week in een online context en het thema “Leegstand in Brussel” trok een groot aantal deelnemers. Bru:tecture zorgde niet alleen voor sfeer op de Discord server, maar onze studenten kregen ook kleine gadgets mee om van de architectuurweek een interactief en leerrijk gebeuren te maken. Tijdens deze week vol leuke activiteiten, workshops en lezingen, staken de Brusselse studenten ingenieur-architect van de VUB de koppen bij elkaar om een leegstaande hangar aan de Kanaalzone in Brussel

Tekst

Esther Geboes

Onder

Achter de schermen bij de lezing van JDMA

nieuw leven in te blazen.

De betreffende hangar is deel van Allee Du Kaai op de Havenlaan in Brussel, een project opgericht door Toestand en Leefmilieu Brussel. De braakliggende buitenruimte en verlaten voormalige opslagplaatsen van de haven (goed voor zo'n 9000 m2 aan leegstand) werden omgevormd tot een ontmoetingsplek met een verscheidenheid aan sociale, artistieke en sportieve activiteiten. In deze context werd aan de studenten gevraagd om – zonder drastische aanpassingen – één van deze hangars in te vullen. Met keuze uit verschillende

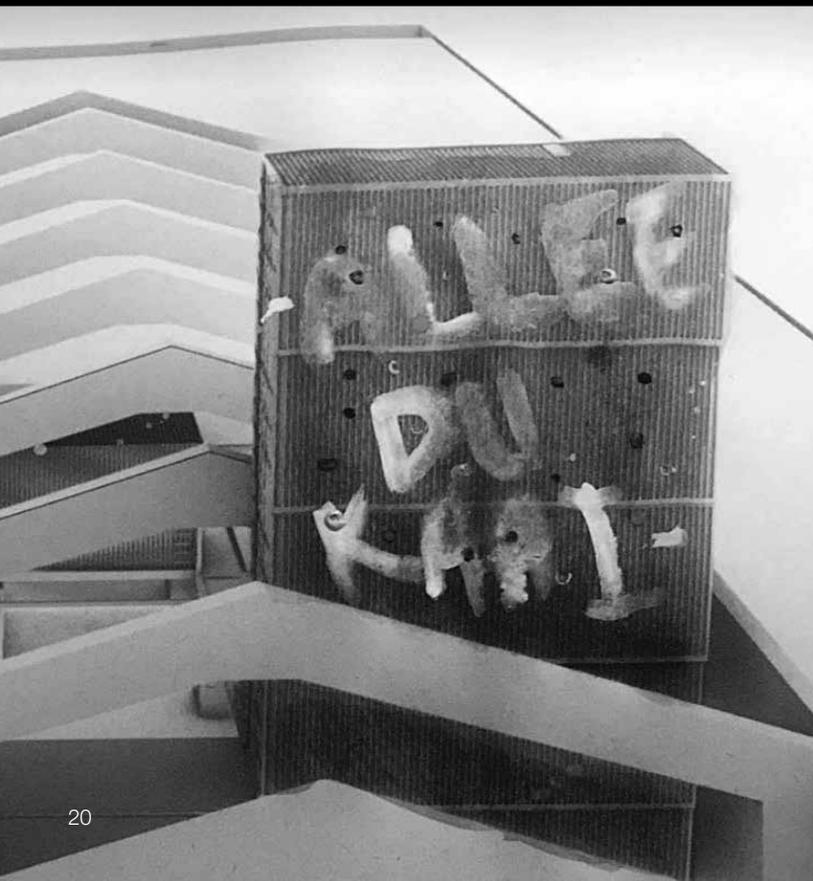


thema's, zoals modulariteit, tijdelijkheid en omkeerbaar ontwerpen, en functies zoals wonen, publieke ruimte en collectieve voorzieningen, werd er een hele week intensief ontworpen.

Om de studenten te inspireren ging Mètres Carrés van start met een lezing door Tine Declerck van Toestand zelf. Zij gaf de studenten enkele tips om nieuwe functies te integreren in de Brusselse samenleving en zo de problematiek rond leegstand aan te pakken. Ook Frederik Vandyck, voormalig onderzoeker aan VUB Architectural Engineering, kwam wat meer vertellen over de Brusselse Kanaalzone. Bru:tecture bleef maar uitpakken met lezingen, want ook de volgende dagen werd er steeds een lunchlezing georganiseerd. De transformeerbare schaarstructuren van Konligo werden bijvoorbeeld toegelicht in een lezing door Aushim Koumar en Lara Alegria Mira. Studenten konden hiervan thuis zelf een kleinschalige maquette in elkaar steken. Ten slotte volgde er ook nog een verrassingslezing door het Brusselse architectenbureau JDMA door Jan De Moffarts en Steven Bosmans. Zij leerden de studenten meer over herinterpretatie, transformatie en herwaardering van erfgoed en stelden enkele van hun projecten rond de Kanaalzone voor. Inspiratie kregen de studenten ten volle, want na een hele week in groep te ontwerpen, werden er veel originele ideeën en concepten

gepresenteerd.

Naast de vele interessante lezingen, konden onze studenten ook op eigen initiatief de leegstaande gebouwen in Brussel leren kennen. Een wandeling van ongeveer vijf kilometer bracht hen door het centrum van Brussel, langs verschillende leegstaande gebouwen, en eindigde uiteindelijk in de hangar aan Allee Du Kaai. Het bru:tecture team kreeg zo af en toe enthousiast volk over de vloer. Bovendien werd er een overvloedig aanbod aan avondactiviteiten voorzien, zoals de online quiz-avond en het onvergetelijke online bru:tecture feest: bru:radio. Bru:tecture heeft er weer een topeditie van gemaakt!



Links

Visualisatie van de oorspronkelijke hangar met een nieuwe invulling door groep:
Jarne Hellinckx,
Hajar Ouach,
Eloïse Desrumeaux en
Céline Clarysse
(© bru:tecture)

Rechts boven

De hangar
(© bru:tecture)

Rechts onder

Eindontwerp groep 1:
Rubi Vansoringel,
Moncef Amri,
Aya Ouday,
Oulfat Abdeslami,
Florence Van Laethem en
Camille Anaf



bru:texture

Ondanks de veelbelovende zomer werd het al snel duidelijk dat ook dit academiejaar 2020-2021 in het teken zou staan van de coronapandemie. Zoals vorige jaren stond er ook nu weer een openingsreceptie gepland, maar jammer genoeg kon deze niet doorgaan wegens de beperkende maatregelen. Niet getreurd, want we organiseerden in de plaats daarvan een leuke avond in bar PILAR. Zo kregen de eerstejaarsstudenten toch nog de kans om elkaar en andere studenten uit de opleiding te ontmoeten. En jawel, door de grote opkomst aan verschillende jaren was dit een groot succes. Een aantal enthousiastelingen voelden zich verantwoordelijk om de boel in gang te houden en zorgden ervoor dat alle verschillende jaren met elkaar kennis maakten. Met resultaat, want nadien had iedereen er meteen wat meer bekende gezichten bij en kregen de studenten uit het eerste jaar een beter beeld van wat bru:texture en hun eerste jaar aan de VUB zouden inhouden. Als bru:texture bestuursleden vonden we het een must om in het thema van de pandemie bepaalde activiteiten te organiseren. Zo kreeg bru:textile vorm, de allereerste mondmasker-workshop. Dit vond plaats op twee afzonderlijke dagen in oktober in het atelier. Heel wat naaimachines, stofjes, een zeefdruk en alle andere nodige spullen werden voorzien. In groepjes van vier had iedereen de kans om zijn eigen mondmasker te ontwerpen en te laten bedrukken met het bru:texture logo. Dankzij deze avonden hielden alle deelnemers er niet alleen een uniek mondmasker maar ook een geweldig leuke ervaring aan over. Voor de jaarlijkse daguitstap werd er naar een alternatief gezocht. Zo kwamen we terecht bij de Architectuurdagen, georganiseerd door Urban Brussels. Tijdens deze dagen werden vele gebouwen en kunstwerken tentoongesteld. Bru:texture wist een groepje mee te krijgen naar één van deze zeer interessante uitstappen.

Gelukkig konden enkele tradities blijven doorgaan, zoals de jaarlijkse sweater contest. Maar liefst elf verschillende ontwerpen werden door de studenten ingestuurd en gedurende twee weken werd er gestemd. Het winnende ontwerp mocht er terecht zijn en deed dit jaar dienst als dé bru:texture trui. Alle verschillende jaren kregen de kans deze trui te bestellen en hiermee te pronken in het openbaar of op de komende activiteiten. Het einde van het eerste semester was niet veelbelovend wegens de strenge maatregelen. Online werd er daarom wel nog af en toe afgesproken voor een ontspannende babbel of een klein spelletje.

In het tweede semester bleven de maatregelen grotendeels hetzelfde. Omdat een normaal bru:texture jaar niet bestaat zonder een architectuurweek, was het gehele bestuur vastberaden om dit hoe dan ook te organiseren. Er werd een online versie op poten gezet waarbij de hele week zou draaien rond leegstand. De studenten werkten in verschillende groepjes aan een ontwerp voor een leegstaande hangar aan de Allee du Kaai. Er werden een aantal richtlijnen en thema's opgesteld waaraan de studenten zich moesten houden. Wekenlang werd deze week voorbereid via talloze online vergaderingen. Gedurende de week zelf was er een beperkt team aanwezig op de site van

Tekst
Ferre Maes

de hangar. Van hieruit werden alle lezingen gestreamd, de groepjes begeleid en ontspannende avondactiviteiten online voorzien. Het was een zeer succesvolle editie van de architectuurweek die niet snel zal vergeten worden. Daarnaast was het ook een mooie afsluiter van een ongewoon bru:texture jaar. Volgend academiejaar belooft veel goeds en het nieuwe bestuur van bru:texture staat alvast te popelen om opnieuw heel wat reallife activiteiten te organiseren.



Rechts boven
Bru:textile workshop in
het atelier



Rechts onder
Gezellige avond in bar
Pilar

Outgoing VUB students

Chalmers University of Technology (Sweden): Niels Cauwel, Erik Van Eyck - **Politecnico di Milano (Italy):** Kim Narae - **Technical University of Denmark (Denmark):** Zoé Van Begin

Incoming Erasmus students

Politecnico di Milano (Italy): Viviana Capasso



International exchange

Text
Lars De Laet

The academic year 2020-2021 was due to the COVID-19 pandemic also a difficult year for students who dreamed of studying abroad for one or more semesters. Some incoming and outgoing students were unfortunately forced to cancel their Erasmus exchange. Fortunately, four master students had the opportunity to give their educational programme an international colour by studying abroad.

Niels Cauwel and Erik Van Eyck experienced the Swedish culture by studying their entire first Master at Chalmers University of Technology in Gothenburg. Kim Narae went during the first semester of her second Master to Politecnico di Milano in Italy. Zoé van Begin studied two years at the Technical University of Denmark (DTU) in Copenhagen as part of a TIME Exchange. She is finishing her second Master year and will follow next academic year one additional semester at our university. After this, she will have obtained a Master's degree from DTU and VUB/ULB. At the same time, our department welcomed for an entire academic year one Erasmus student from Milano, Viviana Capasso.

Zoé van Begin went two years on TIME exchange in Copenhagen:

Text
Zoé van Begin

This two-year exchange gives you the possibility to fully settle in Denmark, open up to a new culture, establish yourself professionally and create valuable friendships, which might make you think twice about settling here in the future. Copenhagen is a wonderful city that accommodates the best living experiences to its inhabitants and students, to withstand the dark winters and enjoy the bright summers to its fullest. You can calmly bike around the city and stop to lay down in the numerous parks, visit an impressive museum on Danish design, go for a swim in the sea, make a boat trip on the canals or walk around enjoying the beautiful architecture and the lively terrasses. Academically, having a very broad and flexible curriculum, DTU gave me the opportunity to individualise my courses to best suit my study interests. The fast-growing university pushes its students to gain independence and ambition, by providing numerous opportunities such as connecting with professionals in the industry, joining existing student associations or starting your own passion projects with help from the faculty. As DTU is a very international university, you will work in a multicultural environment and make friends with people from all over the world.

Top
Bellevue beach
(© Zoé van Begin)

Bottom
Boat ride on the canals in
Copenhagen
(© Zoé van Begin)





Ontwerpatelier

1

Team
Prof. Niels
De Temmerman
Simone Valerio

Via hoorcolleges en persoonlijke begeleidingssessies worden de studenten in 'Ontwerpatelier: mens en aanpasbaarheid' voor de eerste keer ingeleid in de wereld van het architectuurontwerp. Aan de hand van kleinschalige ontwerp opdrachten leren zij omgaan met begrippen als ruimte, structuur, rationeel materiaalgebruik en duurzame ontwikkeling. Centraal staan steeds de specifieke gebruikersnoden van de bewoner, de mens, en het ontwerp voor de volledige levenscyclus van een constructie, via aanpasbaarheid.

Opdracht 1 - Project LockTown: life under lockdown?

In het eerste semester van het academiejaar hebben de studenten zich laten inspireren door de enorme verandering die de lockdown in onze manier van leven en het waarnemen van de ruimte heeft teweeggebracht. De effecten van sociale afstand en van isolement herdefinieerden in zekere zin de ruimtelijke aspecten waaraan we gewend waren. De voormalige studentenkoten van architect Willy Van Der Meeren – het kloppend hart van de VUB-campus – werden het decor van een ingrijpende, maar reversibele architecturale ingreep: optoppen met een tijdelijke, duurzame constructie, die volgens een zelfgekozen scenario het leven van studenten onder lockdown meer kwaliteit gaf. Voorbeelden zijn een student die niet kan terugkeren naar familie door een tijdelijke sluiting van de grenzen, of een test-quarantainecentrum, of nog: een werkruimte voor architectuurstudenten die in groep moeten werken. Het ontwerp legde ook de nadruk op hergebruik, waardoor de constructie op diverse locaties terug kon opgericht worden zonder het minste afval te genereren.

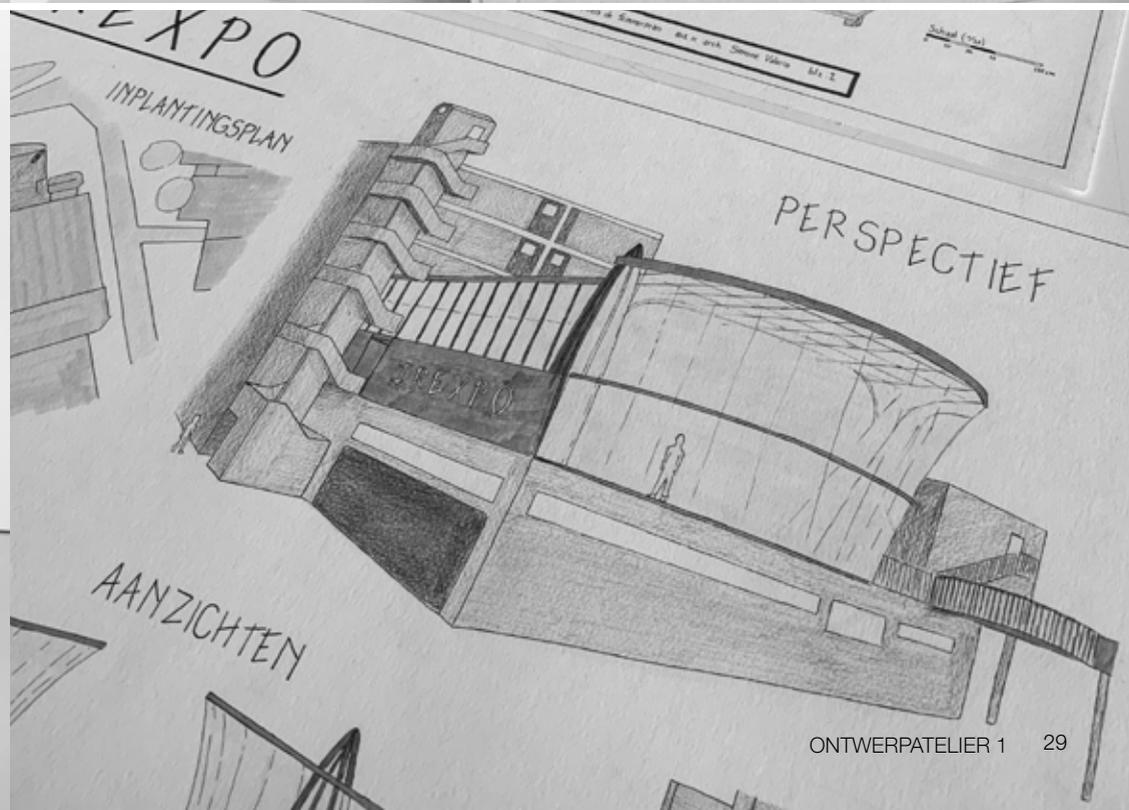
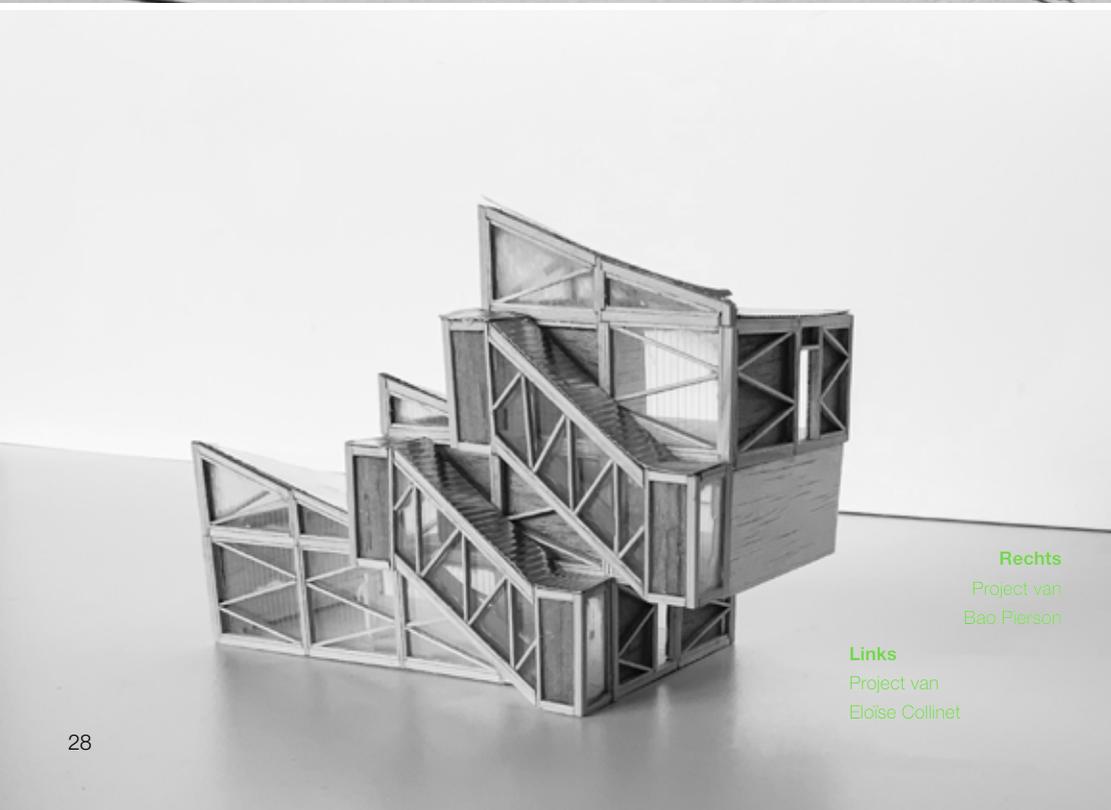
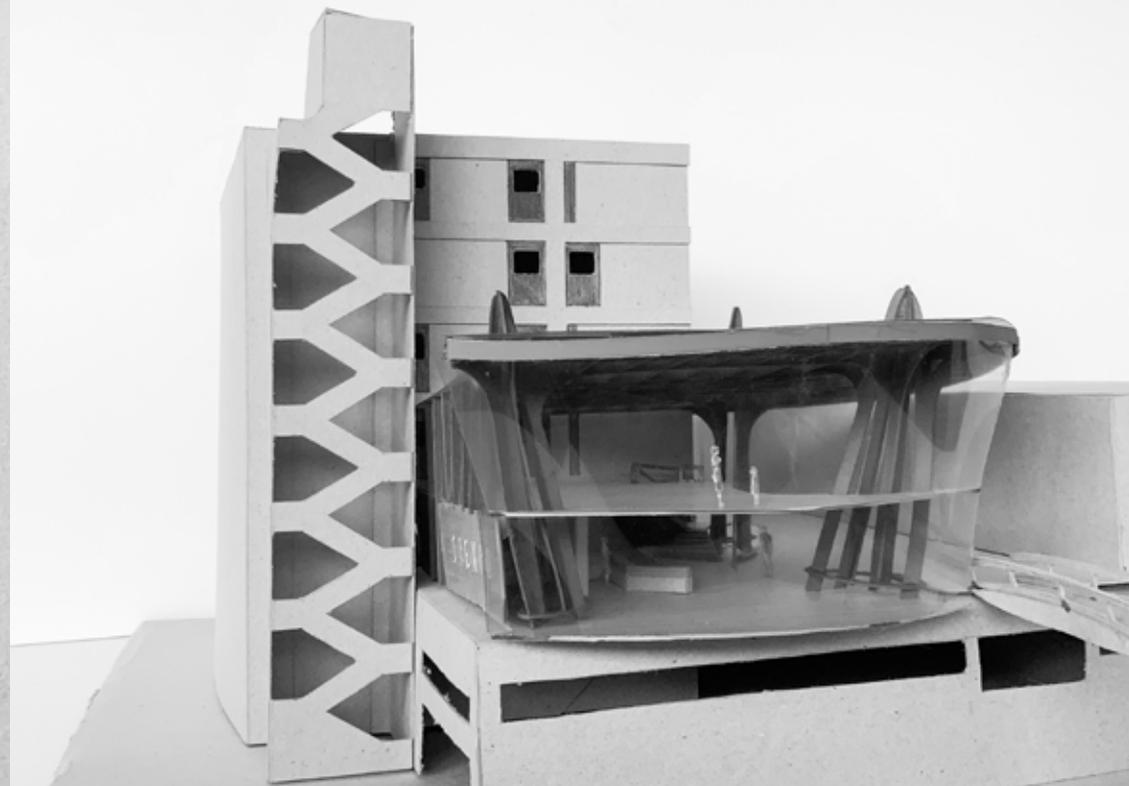
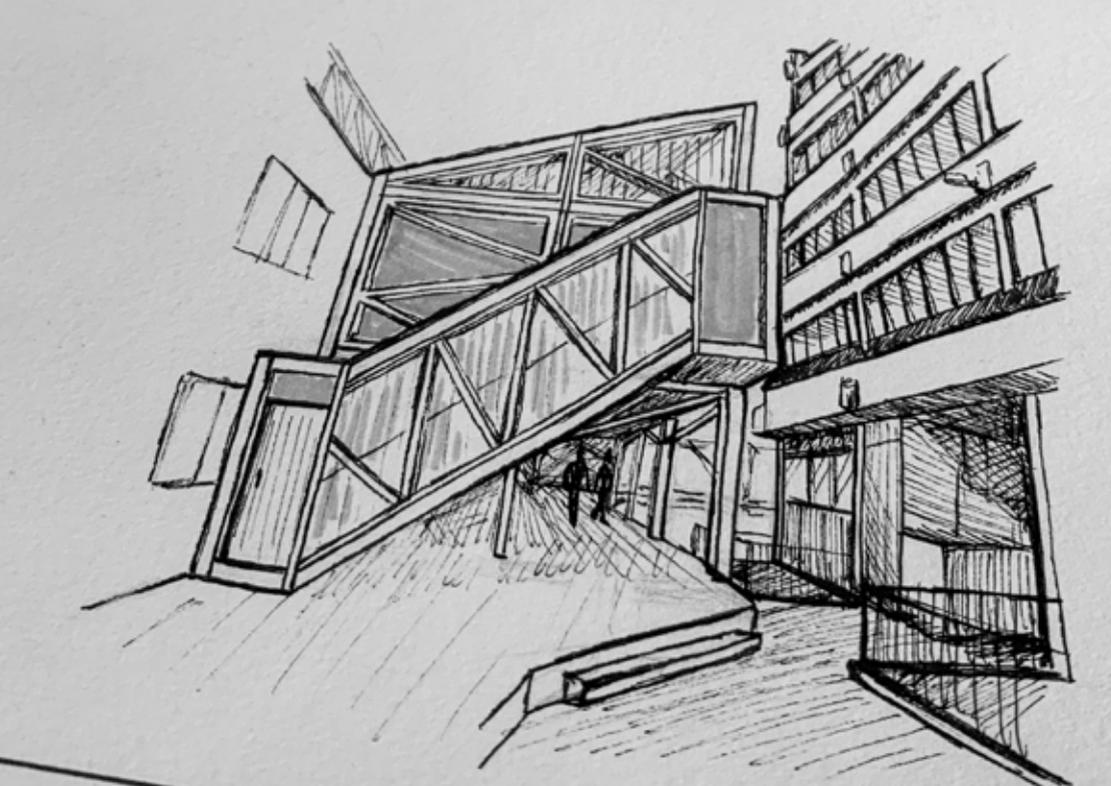
Opdracht 2 - E(X)planade: verhaal van een vergeten ruimte

De modernistische/brutalistische erfenis van de VUB-campus is bepalend voor de sfeer van de hele campus: zichtbaar beton, imposante structuren en infrastructurele elementen. Typerend is de esplanade van gebouw K: Een vergeten ruimte, weinig gebruikt maar tegelijk-ertijd zeer suggestief. Hoe kan dit platform, omringd door betonnen reuzen, een nieuwe dynamiek krijgen en hoe kan het een actieve, kwaliteitsvolle ruimte worden? Concreet werd de studenten gevraagd om de esplanade te activeren met iets attractiefs, iets dat intrigeert: een tentoonstellingsruimte annex ontmoetingsplek voor onze ingenieursfaculteit, om de interessantste bevindingen en experimenten van de onderzoeksgroepen en studenten tentoon te stellen en erover in discussie te treden, een aangename plek om te verpozen.

Aspecten als tijdelijkheid en transformatie stonden centraal, waarbij gelet werd op de ruimtelijke kwaliteit, duurzaam materialen(her)gebruik en reversibele detaillering. Na een analyse van de plek, werkte elke student een individueel ontwerp uit, dat door de covidmaatregelen bijna uitsluitend online werd begeleid, waarbij in geen geval aan kwaliteit werd ingeboet. Ook konden de belangrijkste jurymomenten veilig op de campus worden georganiseerd, wat door zowel de studenten als de begeleiders ten zeerste werd geapprecieerd.

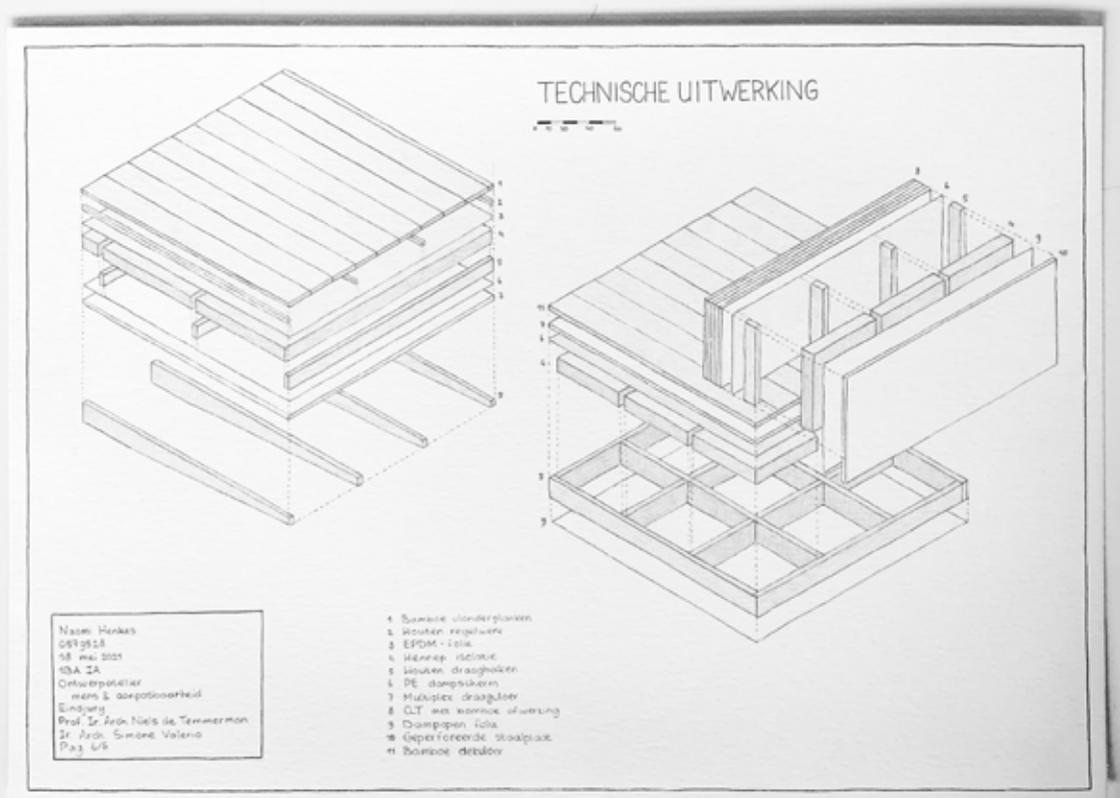
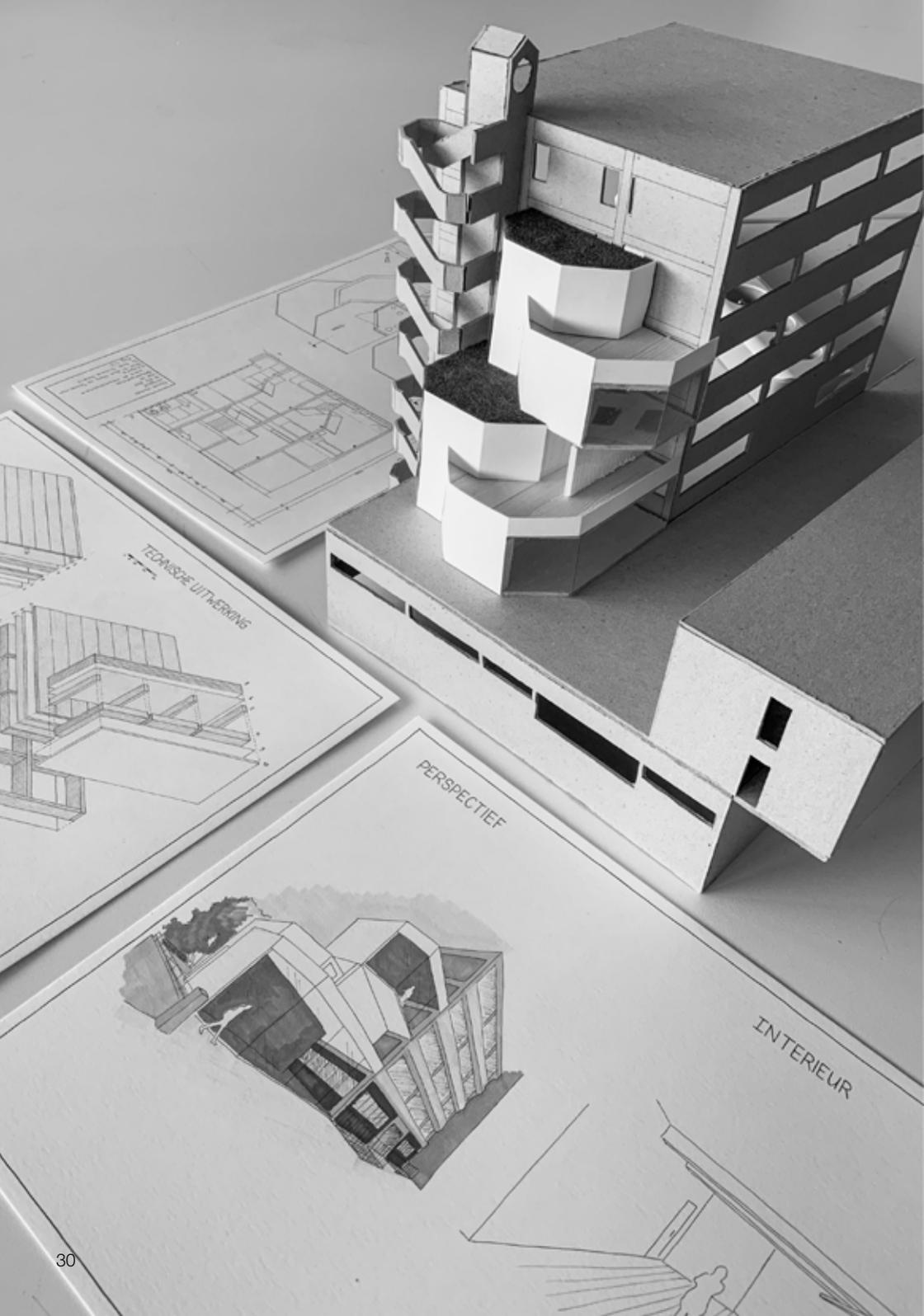
Links

Foto atelier met
Niels De Temmerman en
Simone Valerio
(@ Esther Geboes)



Rechts
Project van
Bao Pierson

Links
Project van
Eloïse Collinet





Ontwerpatelier

2

Team
 Prof. Ann Verdonck
 Evi Corne

In de ontwerpstudio Habitat & Erfgoed leren de studenten omgaan met het hergebruik van erfgoed met de nadruk op sterke hedendaagse interventies vanuit een respect voor de erfgoedwaarden.

Trans-artists in de Drongenhofkapel in Gent

De kapel van het voormalig refugiehuis van de Norbertijnerabdij van Drongen, beter gekend als de Drongenhofkapel, is gesitueerd in het Patershol, een oude wijk in het historische centrum van Gent. Deze éénbeukige kapel in laatgotische stijl kwam tot stand in 1607 en tot 1789 bleef het Drongenhof fungeren als toevluchtshuis in periodes van oorlog of andere onrustige tijden. De vervallen kapel, beschermd als monument in 1970, draagt de sporen van fraaie ruitvormige metselaarstekens, markante littekens van talrijke verbouwingcampagnes en heeft een indrukwekkend houten spitstongewelf. Dit beeldbepalend pand werd het decorum voor een reconversiestudie waarbij de studenten een museaal programma koppelden aan een kunstenaarsresidentie. Een drietal kunstenaars of creatievelingen (trans-artists) worden er uitgenodigd om tijdelijk een woon- en werkplek te betrekken, nieuw werk te creëren en publieksmomenten (exposities, presentaties, workshops, etc.) te organiseren.

Intergenerationeel wonen in Schaarbeek

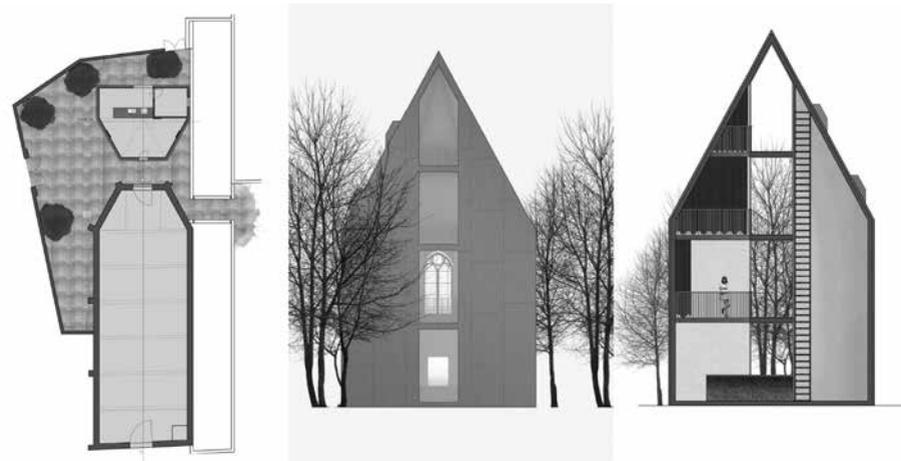
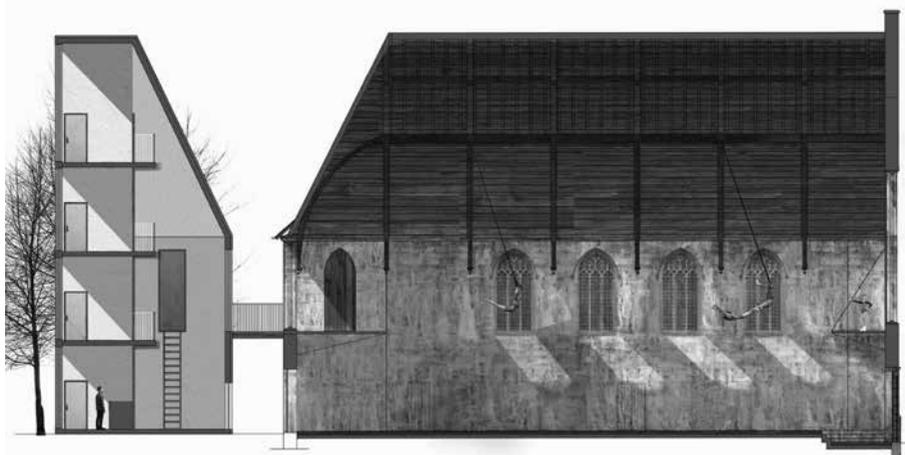
Op de hoek van de Godefroid Devreesestraat met de Generaal Eisenhowerlaan in de Josaphatwijk in Schaarbeek werd omstreeks 1930 een modernistisch kantoorgebouw opgericht dat aanvankelijk verbonden was met het pand in de Rogierlaan nr. 162. De archieftekeningen geven een goed beeld van het bouwwerk zoals het geconcipieerd en uitgevoerd werd in de jaren 1930, vóór het pand in 1988 werd verbouwd tot postkantoor. De opdracht focuste op de herbestemming tot een project voor intergenerationeel wonen voor een tiental gezinnen. In de context van de COVID-19-crisis werd het wonen voor ouderen in rust- en verzorgingstehuizen in vraag gesteld. De zorg voor grootouders en ouders door kinderen en kleinkinderen, die vroeger als evident werd beschouwd, is vandaag niet meer vanzelfsprekend. Intergenerationeel wonen, een vorm van samenwonen waarbij expliciet gezocht wordt naar een wisselwerking tussen de generaties, biedt echter een aantrekkelijk alternatief. Verschillende woontypes zoals appartementen voor mindervaliden (rolstoeltoegankelijk), senioren, studenten, eenoudergezinnen en (plus-) gezinnen worden er gecombineerd. Zorg dragen voor elkaar met behoud van de nodige privacy binnen de eigen woonunit staat steeds voorop.

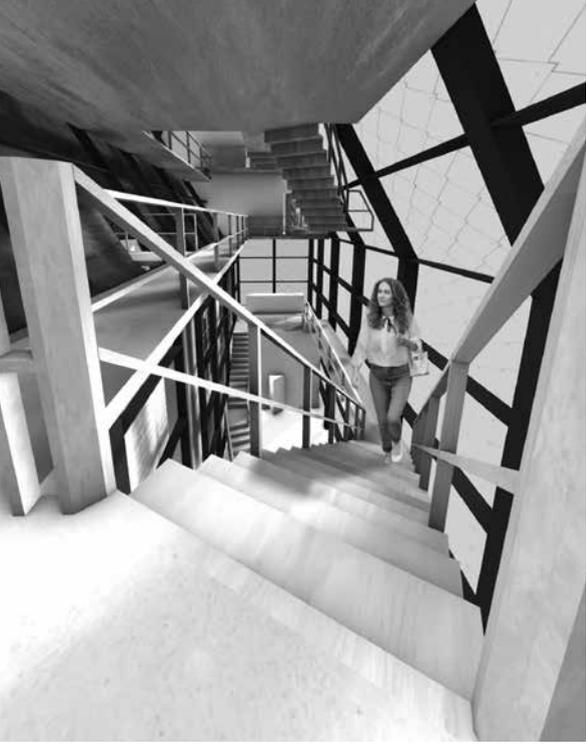
Links boven

Groepsfoto (corona-proof)
 (© Ann Verdonck)

Links midden en onder

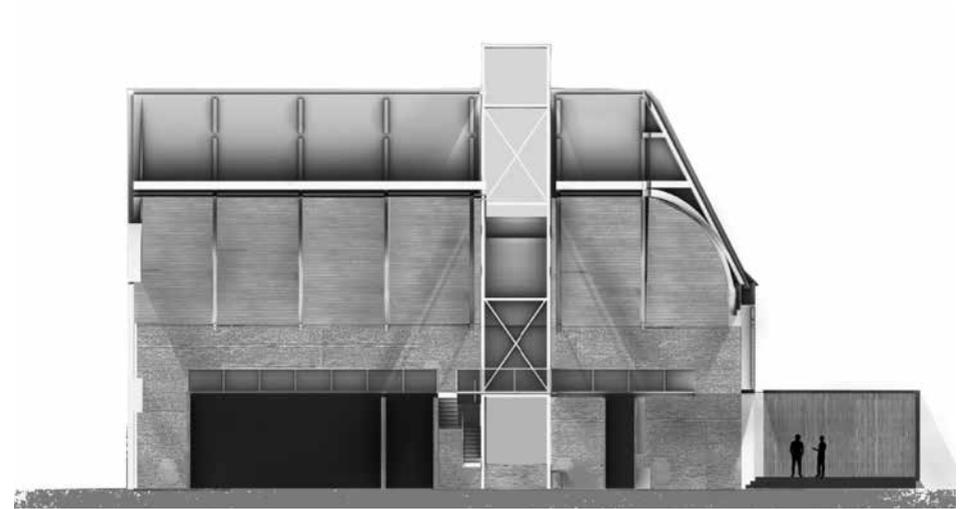
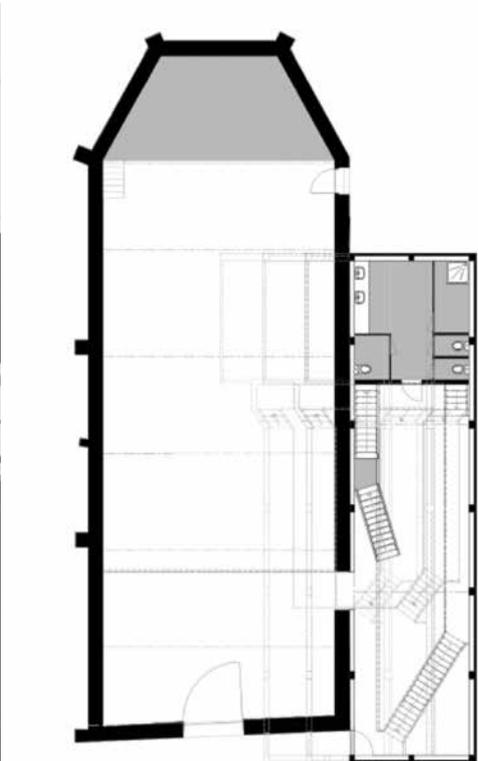
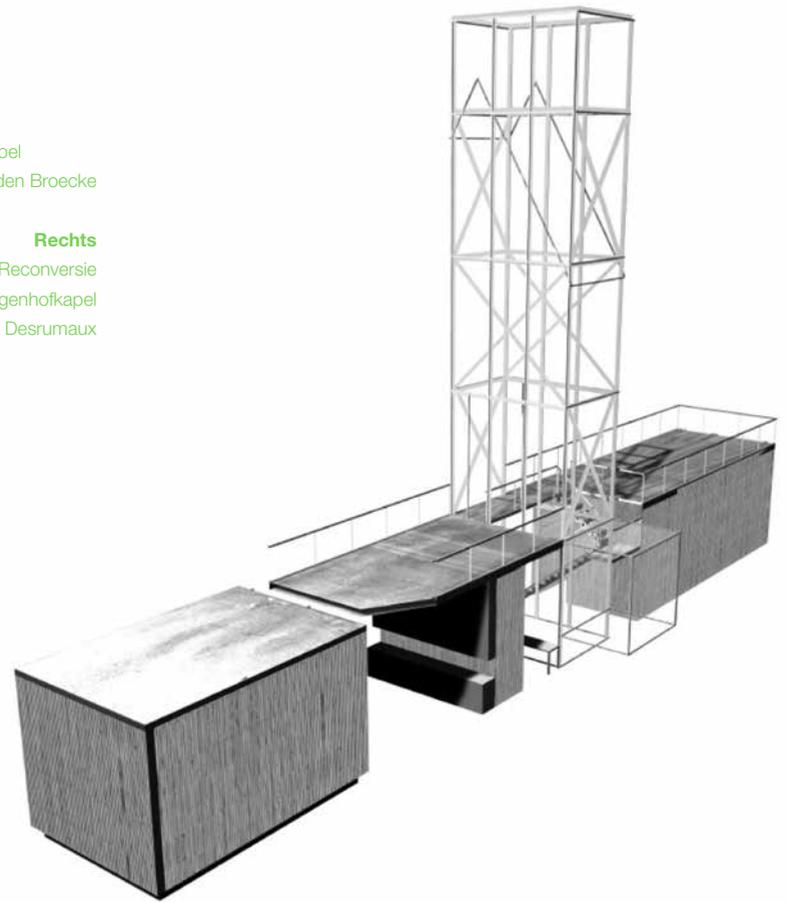
Drongenhofkapel
 van Sara Demol

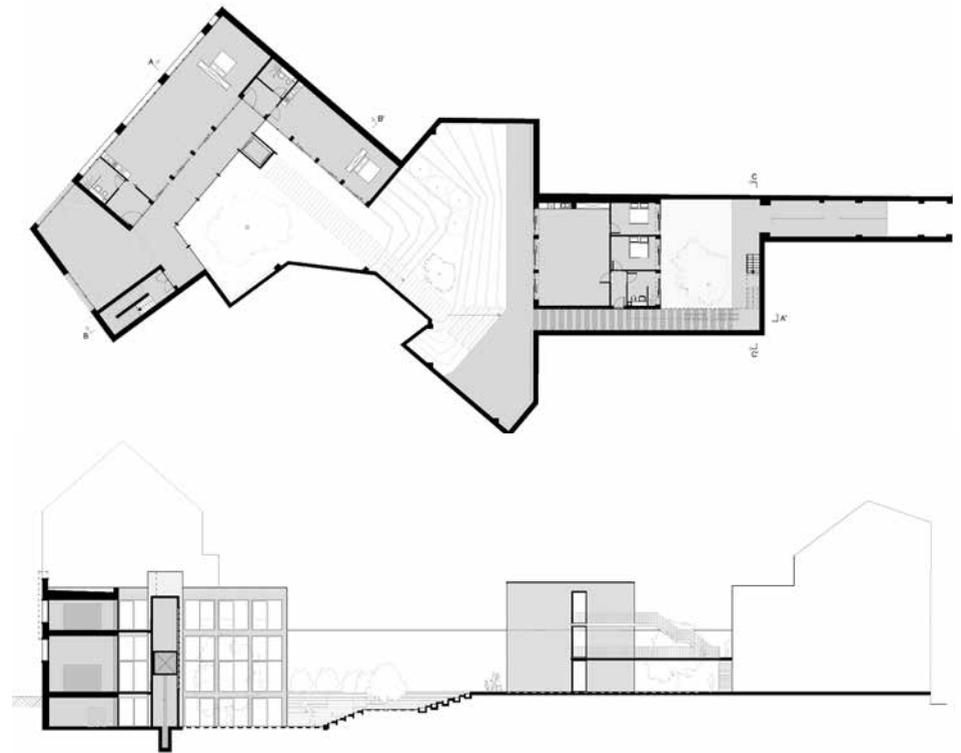




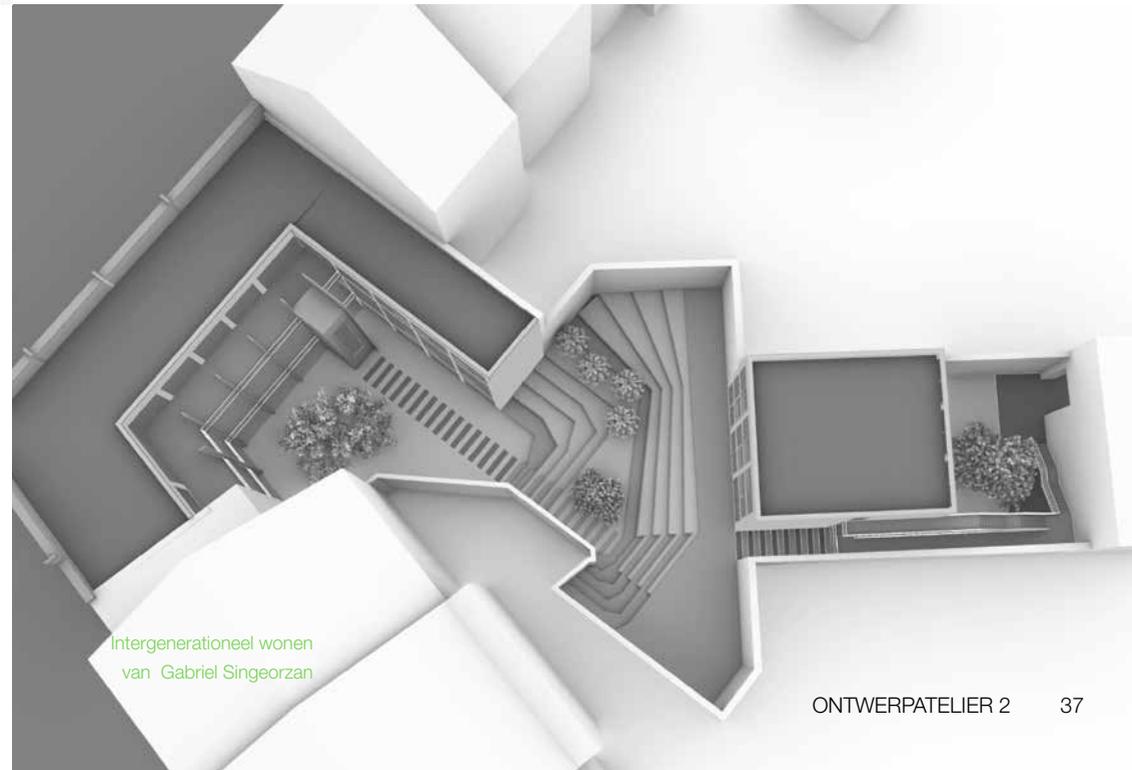
Links
Reconversie
Drongenhofkapel
van Lynn van den Broecke

Rechts
Reconversie
Drongenhofkapel
van Eloise Desrumaux





Intergenerationeel wonen
van Florence Van Laethem



Intergenerationeel wonen
van Gabriel Singeorzan



Ontwerpatelier Stadsbouwstenen

3

Team
Prof. Haïke Apelt
Stefan Braun

“For thousands of years, urban design has been confined to a few basic patterns, with an infinite number of formal variations. Sometimes the block is regular, as in classical antiquity and colonial times, sometimes it is more or less arbitrary, as in the Middle Ages, or monumental as in Vienna in the thirties. The basic typology remains the same, a street, lane, atrium, courtyard or square made up of blocks.” (O.M.Ungers - The Dialectic City)

Het onderwerp van dit onderzoek is het bouwblok in zijn verschillende verschijningsvormen. Het bouwblok vormt de openbare ruimte en wordt door deze gevormd. Wij bestuderen de condities van het bouwblok (percelenstructuur, dichtheid, porositeit, etc.) en daarmee ook de identiteit en stichtende rol van de gebouwen die het bouwblok en vervolgens de straat en de stad vormen.

Het projectgebied is deel van de wijk Nieuw Zuid in Antwerpen, een stuk stadsuitbreiding in ontwikkeling, dat zuidelijk aan ‘het Zuid’ en westelijk aan de Schelde grenst en dat gebaseerd is op een masterplan van Secchi-Viganó. Het projectgebied betreft de zogenaamde ‘Striga 0’ (een bouwblok met hoogbouw) dat een strategische rol in het verbinden van de twee wijken speelt. Uitgaande van de eigenschappen en het potentieel van de plek zal een stadsontwerp worden ontwikkeld, dat in dialoog met het omliggend stedenbouwkundig weefsel zal gaan en tegelijk een (eigen) karakter zal kunnen ontwikkelen die de plek een identiteit geeft. Het ontwerp van de openbare en collectieve ruimte, dat de cultuur van het samenleven in de stad tot uitdrukking brengt, speelt een sleutelrol. Er zullen cultureel duurzame stadsruimtelijke modellen ontwikkeld en getest worden, die deze vraagstukken zullen beantwoorden en die vervolgens de basis voor het gebouwontwerp zullen vormen.

In het eerste semester bekijken wij de stad met de ogen van een architect. Wij bestuderen de (ruimtelijke) ordeningsprincipes en zoeken via analyses en vooroefeningen relevante aanknopingspunten. De analyses worden niet losgekoppeld, maar zijn reeds deel van het ontwerp. Hierin wordt er een onderscheid gemaakt tussen prioritaire en secundaire aspecten, de focus wordt gelegd op een aantal thema’s en de eerste beslissingen die voor het ontwerp belangrijk zullen zijn, worden reeds genomen. Wij ontwikkelen via experimentele vooroefeningen een stadsruimtelijk scenario en zoomen vervolgens verder in tot de schaal van het gebouw. ‘Huis’ en ‘stad’ zullen zich aan elkaar kunnen meten in de openbare ruimte; zij zullen in een betekenisvolle relatie worden gebracht, die een zichtbare meerwaarde voor beide creëert. In het tweede semester bekijken wij het gebouw met de ogen van een stedenbouwkundige. In het verlengde van de thema’s van het eerste semester ontwikkelen wij het project verder tot en met de materialisatie en detaillering.



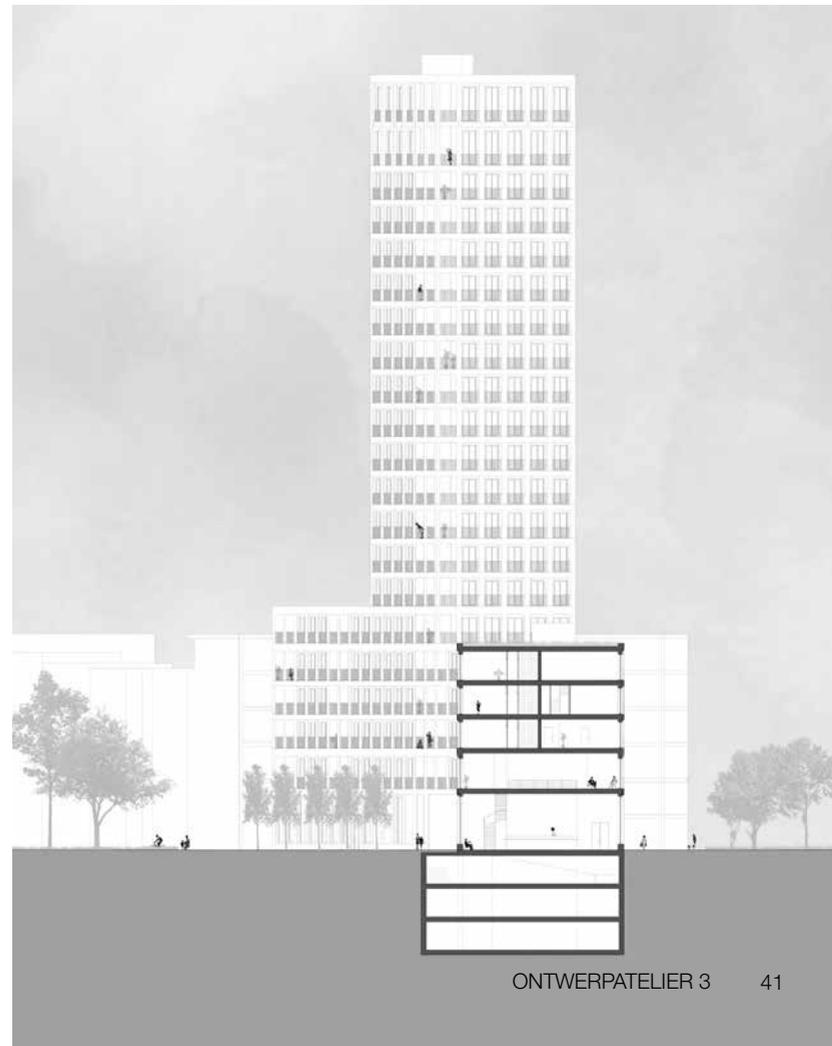
Links boven
Luchtfoto
Projectlocatie Antwerpen

Links onder
Inplantingsplan
Projectlocatie Antwerpen



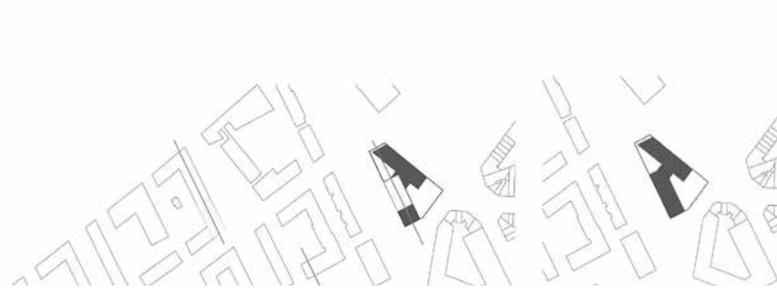
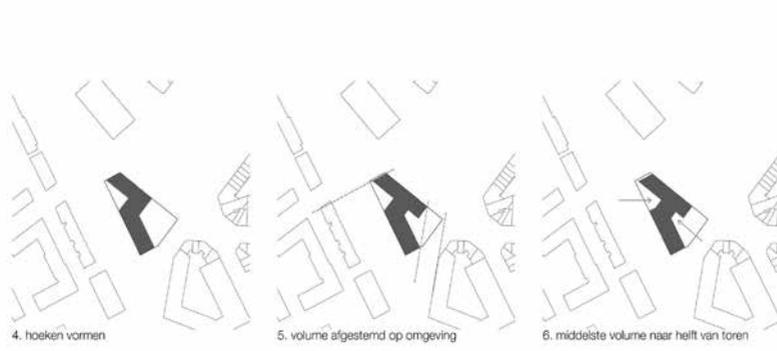
Links

Ontwerpvorstel
Kaj-Wolf Depuydt
Xantippe Van Schoor
Céline Clarysse



Rechts

Ontwerpvorstel
Ebert De Roover
Ferre Maes
Lucy Zhu
Ward Verstappen



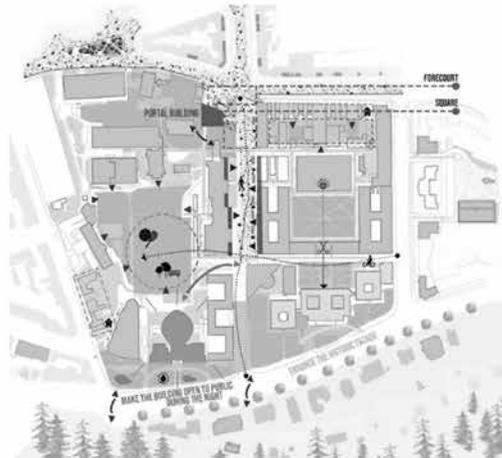
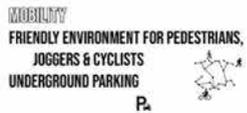
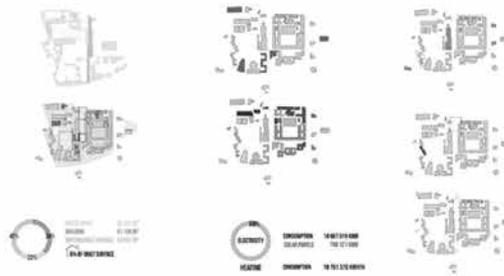
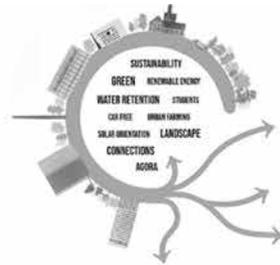
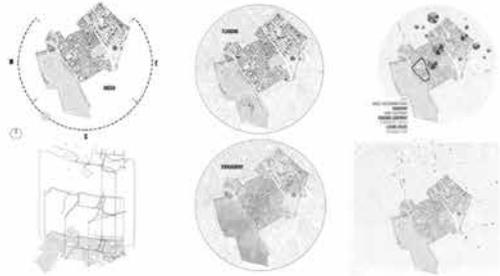
Links
 Ontwerpvoorstel
 Neel Verhavert
 Lore Vyfeyken
 Emmeline Brouwers
 Aline Verwilghen

Rechts
 Ontwerpvoorstel
 Jef Delva
 Maxime Ceron
 Sanae Chaga
 Sen Dholander

ECONVERGENCE

SOLBOSCH CAMPUS TOWARDS A NEW VISION

SAJEDEH A. AMIRI - ISMAIL AFAILAL - AMBER DEHAEN - FAEZEH HAJIBAGHERI - ELLEN LEEMANS - GABRIELLE NICOLAS



Ontwerpatelier Sustainable Design Studio

4

Team
 Prof. Ahmed Z. Khan
 Prof. Hera Van Sande
 Carole Aspeslagh
 Geert Pauwels
 Giulia Verga

The project for this year's Sustainable Design Studio (SDS) is focused on the theme of 'high density mixed use' with the objective of sustainable development of the Brussels University District (BUD). During the first semester, students worked in groups to develop a sustainable urban design framework in the form of a master plan and programme. In the second semester, students worked individually on a building or cluster within their master plan to develop a sustainable architectural project.

University and the City: Towards sustainable (re)development of the Brussels University District (BUD)

The study area is Solbosch Campus (ULB). Only a relatively small part of the campus area is built and yet the feeling that Solbosch lacks open spaces of conviviality is present. There are important topographical differences in levels. Buildings accompany this difference in height. The main problem of the campus is the lack of permeable green qualitative spaces. Small and not qualitative green spaces are scattered around the campus, lacking strength and coherence. A gradual saturation with functions made the open space structure the result of leftovers unbuilt spaces. Most of the open areas are impermeable and dedicated to car access.

The aim of this studio is to develop a vision of a University of the Future and a master plan / urban design framework that provides response to transitioning the existing campus area towards: a CO2-NEUTRAL district, a green park with high quality public space, a completely car-free soft mobility district, a built-up density of +/- 1,5 FAR (questioning the programme of learning-hub), (student) housing, economic activities/offices/work and public spaces, innovative ways of maximizing the permeable surfaces, such as NBS (Natural-Based Solutions/Landscape infrastructure) that connect with the larger landscape network.

The key aspects to explore are the identity of BUD, the good layout of functions and spaces for a University of the Future, the sustainability challenge of the university for the next hundred years, and the challenge of COVID-19.

In both semesters, the students' design work was guided by this problematic and by a set of questions to be addressed at the scale of both master plan and building scale. What is the right density and scale? What degree of environmental sustainability? What is the right mix of uses? What should the ambition of mobility reconfiguration be? What about co-production? Distinct visions of urban design based scenarios were developed in the form of Master Plans (first Sem), and Sustainable Architectural Projects (second Sem). The aim was to provide concretely illustrated and coherent set of innovative ideas as the stepping stones for creatively defining the urban project for the Solbosch Campus and deliberating a more inclusive vision for sustainable urban development of the area.

Left
 Project of group
 'Econvergence' by
 Sajedeh A. Amiri
 Ismail Afaial
 Amber Dehaen
 Faezeh Hajibagheri
 Ellen Leemans
 Gabrielle Nicolas



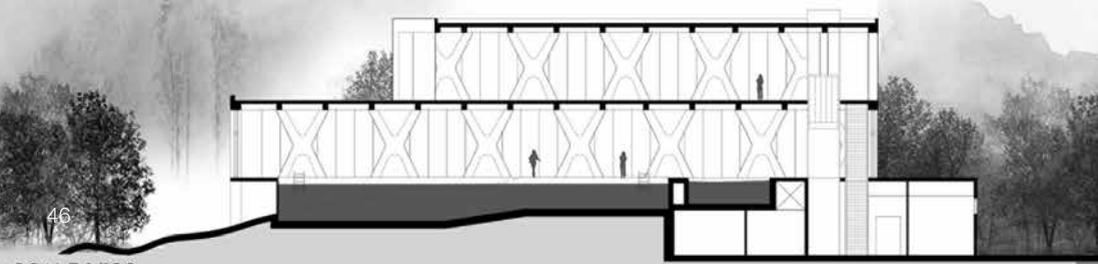


MAIN ATRIUM



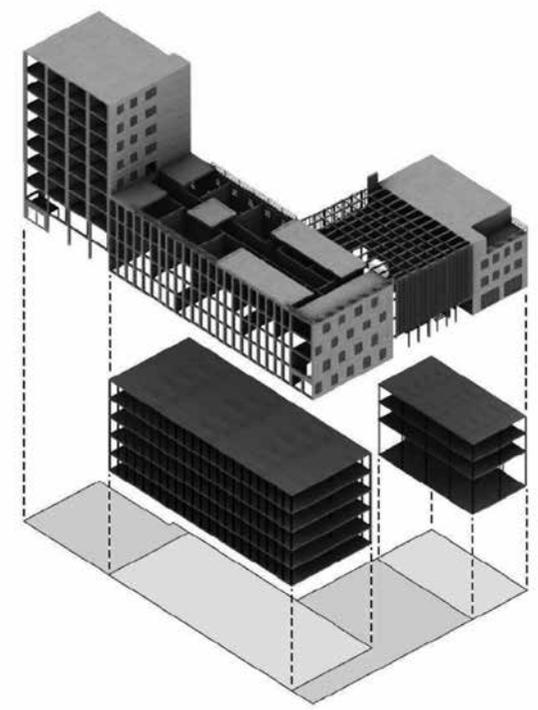
RECEPTION

SECTION B-B



46

SCALE 1/100



Left
Project of Ahmed Soliman

Top right
Retrofit of F-building by
Pauline Harou

Bottom right
Retrofit project by Alan
Zecirovic

Next page
Project of Ellen Leemans



VIEW FROM ENTRANCE SQUARE

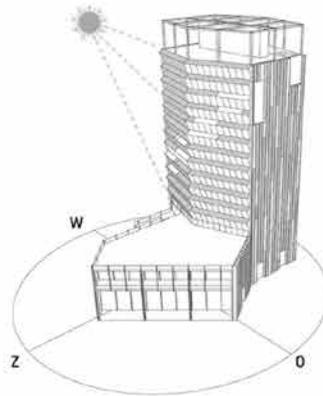


VIEW FROM AVENUE BUYL

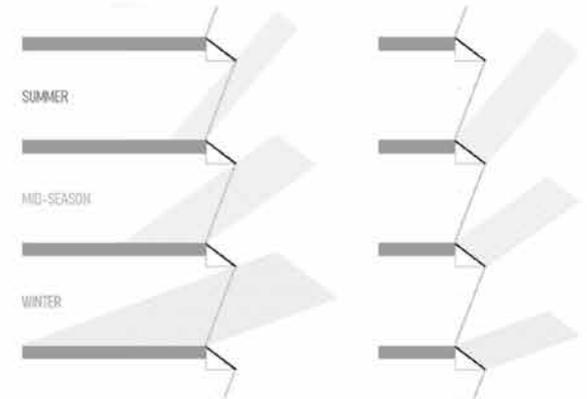
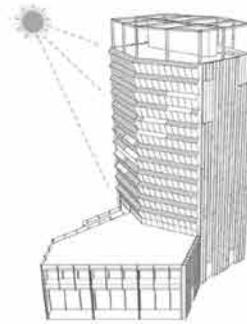


VIEW FROM AVENUE BUYL

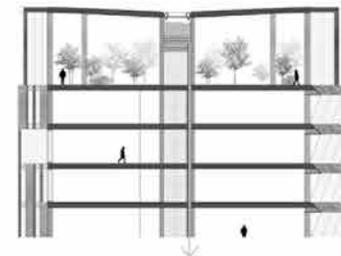
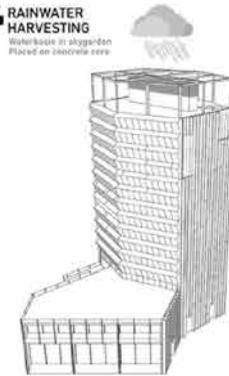
SOLAR ORIENTATION & SHADING



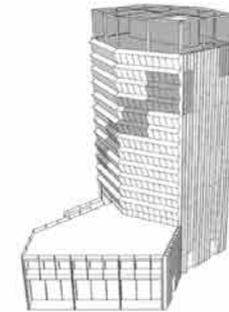
SOLAR PANELS

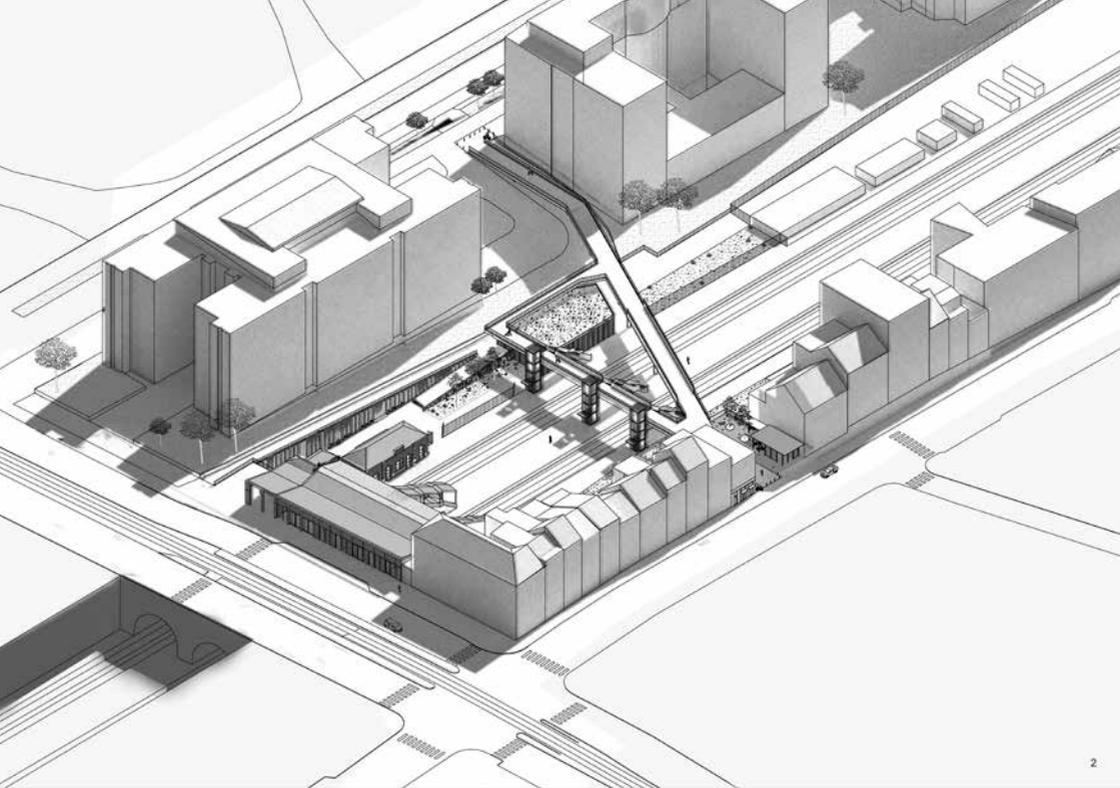


RAINWATER HARVESTING
Waterlozele in skygarden
Placed on concrete core



VENTILATION
Screen lung
From west to east
Ends in skygarden





Ontwerpatelier Advanced Design Studio

5

Team

Prof. Jonas Lindekens
Prof. Laurent Ney
Prof. Stéphane Meyrant
Aránzazu Galán González
Stijn Elsen

Forming the closure of the design education, the Advanced Design Studio focuses on developing a critical view and a personal design approach.

A nearby site is chosen: the train station of Etterbeek. The studio engages in reflecting on the meaning of future transportation nodes in contemporary urban life, reflecting on what a train station should be, what functions it should offer, and how it should function. Furthermore, the question rises how a train station should present itself towards the city, and what 'façade' it needs along the tracks. Therefore, two approaches are possible. The existing historic heritage can be incorporated in the new design to form a contemporary train station rooted in history. Opposed to this, removing the historic parts can diminish the boundary condition such that new possibilities outweigh the loss of historic material.

Project Etterbeek train station

The train station of Etterbeek is an important intermodal node in the Brussels network of public transport. The urban developments around the train station, such as the growth of both VUB and ULB, or the U-Square project, offer an important potential of new travellers for SNCB. At the same time local stakeholders are demanding the connection of the city quarters currently cut by the railway.

Left

Project by Lara Reyniers

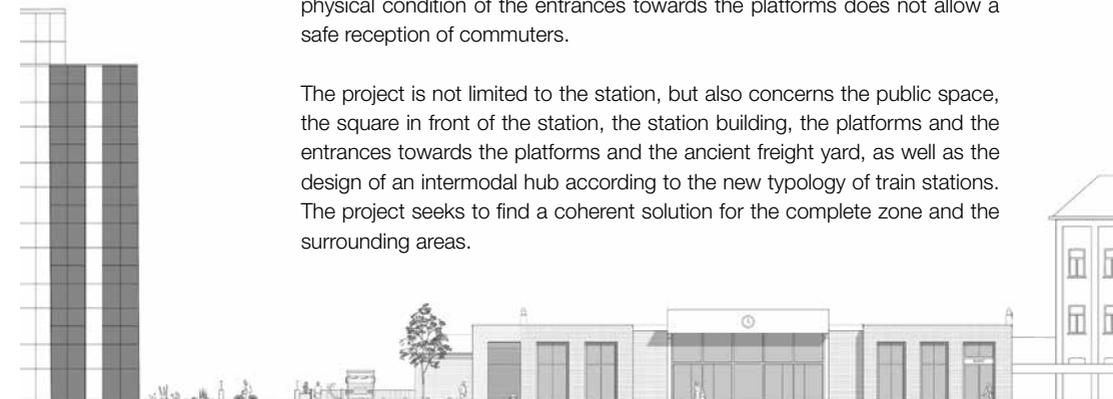
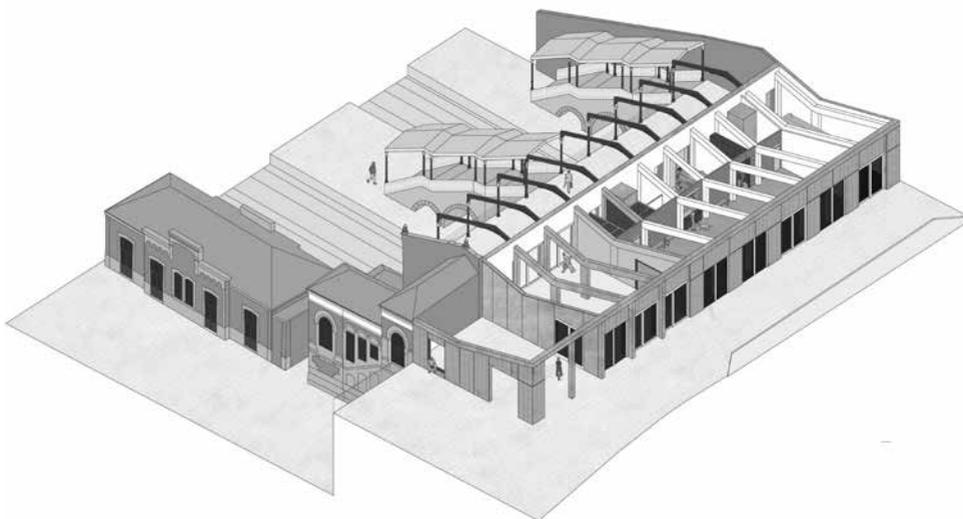
The train station contains several remnants of the rich historic patrimony of SNCB, e.g. the old train station building dating from 1880 (listed building), the bridge, the staircases towards the tracks and their canopies.

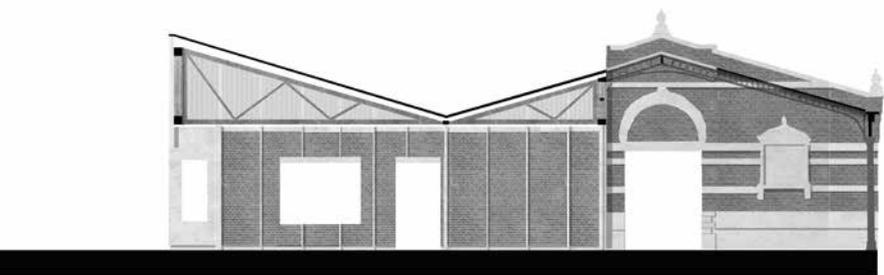
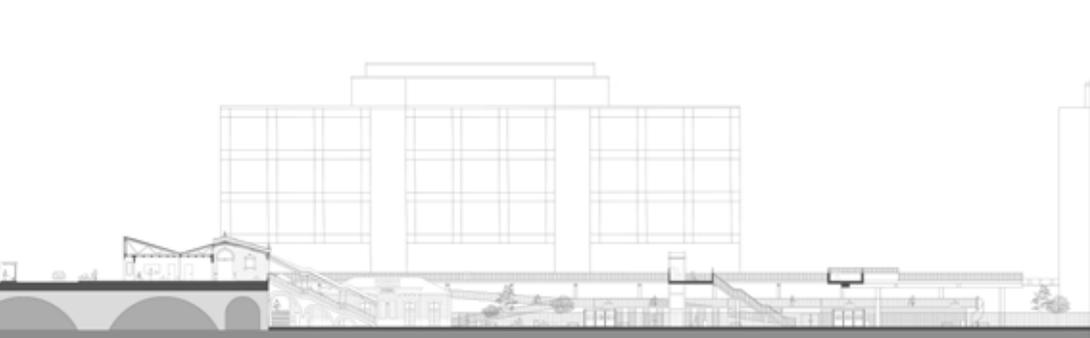
Right

Project by Ciska Giells

In its current condition the station cannot comply to the demands of a contemporary intermodal hub. It is not accessible for disabled persons and the physical condition of the entrances towards the platforms does not allow a safe reception of commuters.

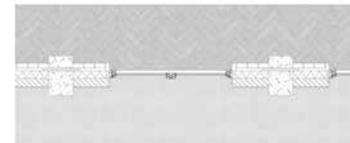
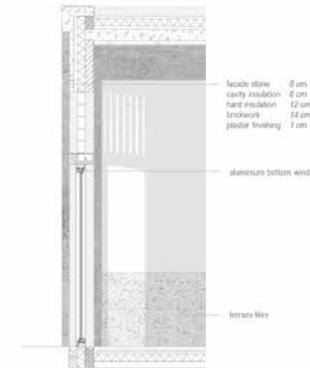
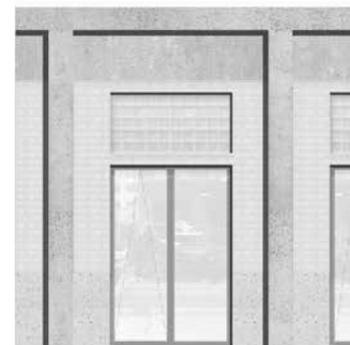
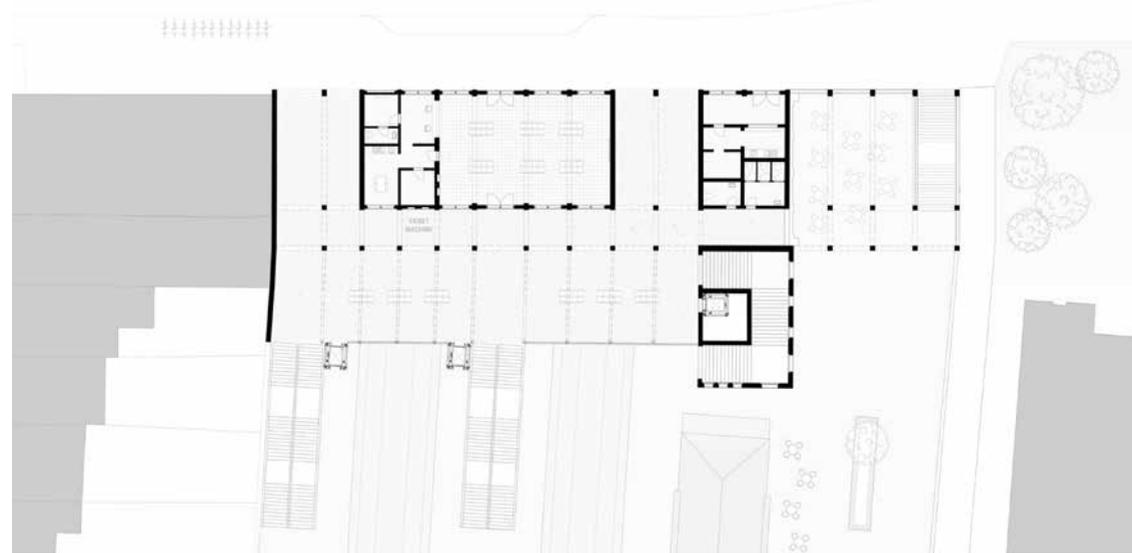
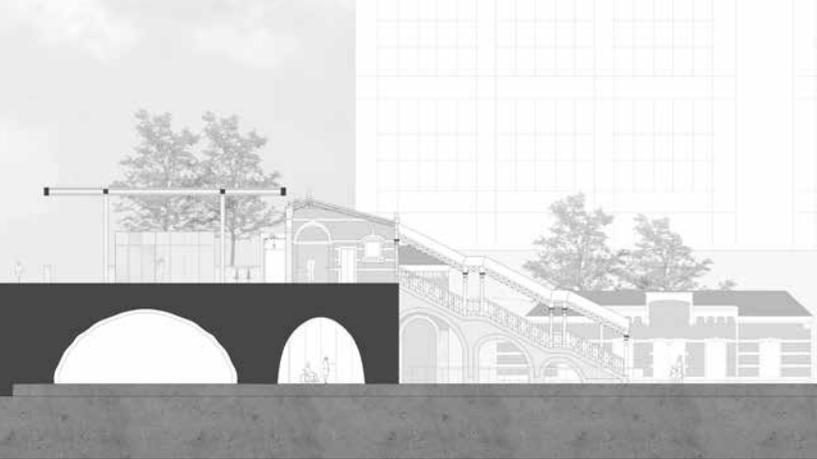
The project is not limited to the station, but also concerns the public space, the square in front of the station, the station building, the platforms and the entrances towards the platforms and the ancient freight yard, as well as the design of an intermodal hub according to the new typology of train stations. The project seeks to find a coherent solution for the complete zone and the surrounding areas.





Left
Project by
Jett Demol

Right
Project by
Léopold Sepulchre



Left
Project by
Sofie Vandermeeren

Right
Project by
Timmy Van den
Panhuyzen



Inleiding
Lars De Laet

Het onderzoek dat verricht wordt aan de vakgroep architectonische ingenieurswetenschappen wordt samengebracht in de onderzoeksgroep 'VUB Architectural Engineering' die uit een interdisciplinair team bestaat dat ingenieurtools inzet om architectuur te maken en bestuderen. Via onze expertises zetten we resoluut in op het ontwikkelen en valoriseren van nieuwe kennis voor een innovatieve, kwalitatieve, duurzame bebouwde omgeving. Gestimuleerd door inzichten uit de geschiedenis en gebruik makend van nieuwe technologieën gaan we de complexe duurzaamheidsuitdagingen voor de bebouwde omgeving aan.

Door de COVID-19-pandemie hebben we ook dit academiejaar maximaal van thuis gewerkt (Gelukkig mocht labowerk voor thesis- en doctoraatsstudenten wel op de campus doorgaan.). Maar dat wil niet zeggen dat we figuurlijk hebben stilgezeten, integendeel. Er is hard gewerkt om innovatief fundamenteel en toegepast onderzoek te verrichten dat maatschappelijk en industrieel relevant is en internationaal erkend wordt. Via het organiseren van en deelnemen aan internationale online workshops, seminars en lezingen, het verrichten van 'consultancy' opdrachten en het schrijven van naslagwerken werd het onderzoek breed kenbaar gemaakt, zowel bij experts als bij het grote publiek. Ook wordt blijvend aandacht besteed aan het valoriseren van onderzoeksresultaten via patentaanvragen en een VUB spin-off.

Op het vlak van de samenstelling van het onderzoeksteam is er wat bewegen afgelopen academiejaar. Zo mochten we maar liefst zes nieuwe doctoraatsstudenten verwelkomen in de verschillende expertises die de onderzoeksgroep rijk is, onder andere dankzij het succesvol behalen van twee 'Strategisch Basisonderzoek'-beurzen van het FWO en een 'Applied PhD'-beurs van Innoviris. En dankzij het interdisciplinair VUB-project 'Re-building Brussels' mogen we binnenkort twee extra onderzoekers aanwerven. Alsof dat nog niet genoeg is, werd de onderzoeksgroep bovendien ook uitgebreid met een nieuwe professor: Stephanie Van de Voorde legt zich sinds oktober 2020 toe op de geschiedenis van de gebouwde omgeving in een 80% mandaat. En binnenkort verwelkomen we een professor met als expertise 'Veranderingsgericht en circulair bouwen' (20% mandaat). Aangezien de aanwervingsprocedure op het ogenblik van schrijven nog volop bezig is, zullen we de naam onthullen in ons volgend jaarboekje of op onze website www.vub.be/arch voor wie niet zo lang wil wachten.

En jawel, ook dit jaar zijn we heel trots op maar liefst zes onderzoekers die succesvol hun doctoraatsonderzoek hebben verdedigd: proficiat Bert, Jimmy, Frederik, Elien, Elise en Romain! Door de pandemie zijn helaas heel wat feestelijke recepties niet kunnen doorgaan, dus we zullen wat moeten goedmaken in academiejaar 2021-2022! We kijken er naar uit!

Groepsfoto in tijden van
COVID-19-pandemie.
Zoek de 20 verschillen.
(© Collectie ARCH)



NEW RESEARCH PROJECTS

Reversible Building Design

Development of a design support tool for Brussels Environment

Promotors

Niels De Temmerman

Waldo Galle

Researchers

Jeroen Poppe

Stijn Elsen

Camille Vandervaeren

Charlotte Cambier

Margaux Lespagnard

Esther Geboes

Funding

Brussel Environment

Circular Flanders

Circular and reversible building design is a holistic strategy to increase the sustainability of our built environment. In its pursuit of an economy of closed material cycles, this strategy questions conventional design and construction choices. Effectively supporting practice in making alternative choices is therefore crucial. This means, well-thought and accessible support tools are indispensable.

To that end, Brussels Environment is taking the initiative to further develop and implement a guiding checklist with VUB Architectural Engineering. This development relies on the participation of a few dozens of future users, including building clients, architectural advisors and civil servants. During an intake survey, 54 respondents gave us insight in the current adoption of design tools and their expectations of a checklist. During nine to twelve workshops, these expectations will be translated to a hands-on tool.

Municipalities, circular building directors

A research experiment with the city of Mechelen and VVSG

Numerous cities and municipalities share the ambition to accelerate the shift to a circular construction economy. Despite their political intent, most administrations lack the capacity to study this wicked challenge, so processes and practices remain unchanged. To make a systemic change, concrete role and task definitions as well as new process descriptions are necessary. Because together, civil servants in different departments can become a 'circular building director'.

Through this project, the city of Mechelen, the Association of Flemish Cities and Municipalities VVSG and VUB Architectural Engineering examine the current and future role of municipalities in concrete design and construction projects. Understanding the set of levers which a municipality has at hand - being client, property manager and licensing authority - our objective is to develop instruments that allow every administration to shape the transition to a circular construction economy during intermunicipal workshops.

Platform for circular construction connections

A research experiment with Labland asbl and iDrops

Practitioners know from experience that innovation in construction happens at the construction site. Even a lot of circular construction connections are invented amidst saws and hammers. No surprise that this moment of knowledge creation - about how unconventional connections are made between floors, walls and roofs - is rarely captured and shared.

With this project Labland, iDrops and VUB Architectural Engineering join forces to stimulate the accumulation of circular know-how, based on the experience and skills of the construction industry itself. To this end, we will create a virtual or physical 'platform' between designers, contractors and material producers.

Join our learning network
and find out more at
[www.vub.be/arch/
circulardesign](http://www.vub.be/arch/circulardesign)

Participating in multiple
experiments such as
this demonstrator at
DOK, Labland showed
that true innovation in
construction happens at
the construction site.
(© Labland)



NEW RESEARCH PROJECTS

Re-building Brussels (1695-2025).

The construction sector as an engine for social inclusion and circularity

Promotors

AELA:

Ine Wouters

Stephanie Van de Voorde

Niels De Temmerman

HOST:

Heidi Deneweth

Wouter Ryckbosch

COSM:

David Bassens

Michael Ryckewaert

To promote the development of an innovative interdisciplinary line of research, focussing on societal challenges, Vrije Universiteit Brussel developed funding for Interdisciplinary Research Programs (IRP) which allow excellent research teams to collaborate during a period of five years. In this way, the three VUB research groups Architectural Engineering (AELA), Historical Research into Urban Transformation Processes (HOST) and Cosmopolis – Centre for Urban Research (COSM) teamed up in 2016 for the IRP programme ‘Building Brussels. Brussels City Builders and the Production of Space, 1794-2015’. Three PhD researchers - urban planner Sarah De Boeck, architectural engineer Frederik Vandyck and historian Matthijs Degraeve - investigated the viability of small and medium enterprises (SMEs) in the construction sector in Brussels, an understudied yet essential sector in economic history, and an important one for the foundational economy and the productive city. The first phase of the programme delivered a detailed inventory of the sector from material suppliers over builders to finishers over the past 200 years and yielded important insights on changing networks, infrastructural needs, hotspots, types of workspaces and their integration in urban space. As such, it identified urbanist and planning strategies to safeguard space for production in dense and mixed urban areas today.

In the second IRP programme ‘Re-building Brussels (1695-2025). The construction sector as an engine for social inclusion and circularity’, which was granted in 2021, we aim to improve our understanding of the long-term dynamics that shaped the relationship between urban construction and its ecological and social impact. This project will therefore examine the ways in which - and the reasons why - material reuse and the labour market have evolved in Brussels since the beginning of modern urban growth in the eighteenth century until today. A key long-term academic goal is to detect how the local state can install a regime in which foundational sectors can work as vehicles for both a circular transition as well as equitable labour market inclusion. Through an analysis of the Brussels’ construction sector over the past 330 years, we can gain much-needed insight in the political, economic and social processes that shape the required conditions. At the same time, this research will tackle contemporary urban challenges of the circular economy and the labour market as a stepping-stone for social mobility, reducing intra-urban inequalities.

The construction sector is a most relevant case to study because it has always played a crucial role in the employment of both skilled and unskilled, permanent and temporary workers, as well as city dwellers and newcomers. And although the construction sector is considered to be a cumbersome sector, by studying the large time period of the past 330 years, the study will reveal important evolutions and dynamics. Why, for example, are we experiencing today so many difficulties in setting up a network for the deconstruction and reuse of building materials if Brussels already had a well-organised and regulated reuse sector 300 years ago?

Construction materials are sorted and sold on the demolition site of the former Université Libre de Bruxelles in 1930
(© Bibliothèque artistique, ArBA)



Residential building by architect Marc Belderbos in Oudergem, ca. 1990
 (© architecturer.net)

NEW & INCOMING RESEARCHERS

The Brussels housing stock (1975-2000): building materials and heritage value

PhD researcher
 Marylise Parein

The architectural and urban heritage is under great pressure, partly due to demographic developments and increasingly stringent energy and comfort requirements. This applies all the more for the heritage from the period 1975-2000, which is gradually starting to deteriorate. The buildings are often drastically renovated and the original building materials are mostly ignored instead of reused, due to a lack of knowledge about them.

A first point of attention in this applied PhD project is the accumulation and dissemination of knowledge on building materials and building techniques from the period 1975-2000. What are the representative materials and how were they applied? What is their cultural, historical, scientific and technical value? The knowledge is also geared towards possible implementation in the circular economy: how are the materials anchored and can they be reused? The application of these materials will be examined within the Brussels' housing stock of the period, which will be mapped geographically, typologically and chronologically. Finally, a scientific and sustainable framework for the valuation of young heritage will be drafted. The criteria used to assess the value of 'young heritage' will be critically examined, with particular attention for the contribution of the materials to the heritage value of buildings from this period.

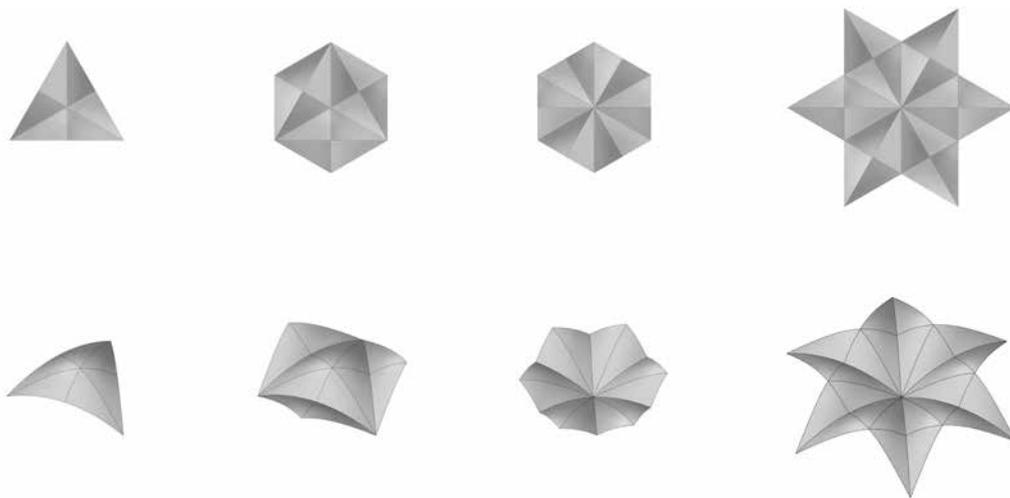
Form follows modularity:

Rational freeform surfaces based on a modular approach

PhD researcher
 Arnaud De Coster

Charmed by their large form freedom, architects and engineers feel inspired to create freeform surfaces which enable aesthetical designs with impressive spans. These spans are achieved by the structural efficiency of shells, which follows from the optimal force flow within the structural layout, inducing a dominant membrane stress state under vertical loading. Therefore, the building material is most efficiently used, making shells interesting from both a structural and economical point of view. Unfortunately, shell structures suffer from labour intensive fabrication techniques, characterized by extensive in situ formwork and falsework. Labelled by a prominent economic impact, combined with an environmental impact (e.g. single-use formworks), these structures lost their initial value in industry during the last decades.

This research proposes a new design method for the facilitated manufacturing of modular shell structures, using textile reinforced concrete composites. The manufacturing process has been considered from the design phase on, by developing an extensive range of different 'freeform' shapes from a limited set of curved module geometries and thus from a limited set of formworks. The modular approach contributes to the current societal ideal of a circular approach for construction, by encouraging reuse and allowing various combinations. The challenge of this research is to define which basic module geometries, after tessellation, lead to the largest variety of freeform surfaces. In this way, a cost and resource efficient design and manufacturing of shell structures is realised.



Freeform shapes
 (© Arnaud De Coster)



These flat glass elements, previously used to create separate meeting rooms in an office building, are now reused in the new office and atelier of Konligo
 (© Esther Geboes)

NEW & INCOMING RESEARCHERS

Closing the glass loop. Prototyping a practitioner's road map to valorise end-of-life architectural flat glass

PhD researcher
 Esther Geboes

In Europe, the building sector is responsible for almost a quarter of the total mass of generated waste and hence has a major environmental impact. To reduce that impact, the Flemish region, like others, has put forward the ambition to realise an economy of closed material loops by 2025. Architectural flat glass is a fully recyclable material, but continues to follow a linear, wasteful path from renovation and demolition sites into landfill or low-value recycling. Although various niche practices illustrate that technologies and skills are at hand to repair, reuse and recycle flat glass at high value, the proper transfer of this information into a concrete guide for practitioners is missing.

As a response to this knowledge gap, my research aims at developing a practitioner's road map – serving as a prototype for other waste flows – to support all practitioners of the building sector in valorising end-of-life flat glass. To achieve this, two questions are key. First, which circular strategies allow to maximise the value of flat glass in a closed material loop with a minimal environmental impact? And second, how can practitioners collectively implement those strategies in building projects? By the involvement of practice's stakeholders throughout the research, a road map will be developed, tested and validated to support designers, engineers and contractors in making better informed choices, close the flat glass loop and make the transition to the circular economy happen.

Preservation of Belgian interior heritage Rational interwar kitchens: concept, construction and conservation

PhD researcher
 Margot Missoorten

The kitchen, which is today considered by some as one of the most important rooms of the house, underwent a substantial transformation over the last hundred years. Its evolution and transformation is especially interesting during the interwar period, as the kitchen evolved from a space of random-placed loose furniture to a rationalised and standardised kitchen with built-in elements, which are features that are still recognisable in the kitchens we know today.

Even though these authentic 'rational' interwar kitchens are still present in Belgium, they are often replaced or discarded because of their underestimated heritage value. This is unfortunate since these interwar kitchens might hold years of history in their frames and are consequently part of our Belgian legacy, like for example the Cubex kitchen. With the right knowledge and tools, these authentic jewels could be preserved and adapted to meet the modern needs of today instead of being replaced. This PhD research therefore studies the key features and construction details of these Belgian rational interwar kitchens and will formulate a much-needed guideline containing design strategies for their correct conservation, restoration and integration in today's households. In doing so, awareness is raised on the value of these classic kitchens and shows how they can be upgraded and combined with modern kitchen furniture.

Preserved interwar
 Cubex kitchen in Maison
 Berteaux
 (© Margot Missoorten)





PhD researcher
Margaux Lespagnard

Circularity for all. Circular design guidelines towards an accessible qualitative housing market.

Belgium is currently facing a housing crisis: 4,9% of Belgians cannot afford basic utilities such as heating, water, and qualitative housing. As a response, bottom-up local initiatives are popping up. For example, sharing communal living spaces in cohousing or the minimization of the housing footprint to decrease land costs. There are also new financing solutions where homes are owned by a community, rather than by a single family.

Most initiatives only focus on financing models or initial costs. What if the building itself would be more affordable over time and what if we could lower our environmental impact at the same time? This is the promise that circular building design holds. Originally, circular building design was a strategy to minimize building waste and thus decrease environmental impact. But studies have shown that making the right circular decisions when designing can decrease housing costs in the long term and enhance virtually every bottom-up housing initiative. How does this work? For example, by anticipating future renovations and using reversible connections so the wall you build today can easily be taken apart and re-used tomorrow.

What could affordable housing mean?
(© Margaux Lespagnard)

Of course, not every circular decision will bring benefits to each project. If architects were able to combine circular decisions with housing initiatives in the most effective way, that could decrease housing costs today and on a long term. My research will attempt to pinpoint the circular design decisions that bring long-term financial benefits, to guide and advise building designers towards more accessible and qualitative housing.

Reusing reinforced concrete elements: potential for low carbon building systems

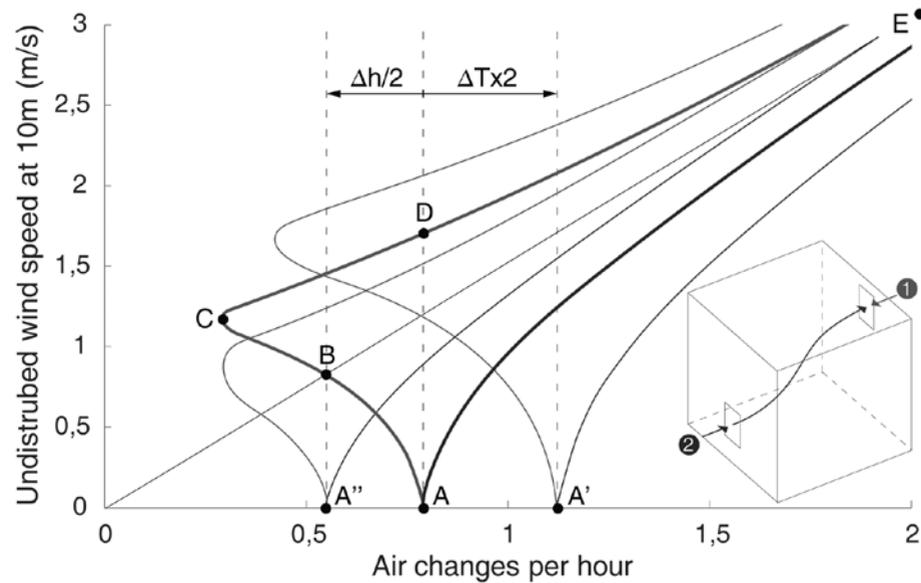
PhD researcher
Célia Küpfer

Responsible for most greenhouse gas emissions in the construction sector, concrete is the most consumed material in the world and the largest construction-related waste stream in Europe. Given the significant role of the concrete industry in environmental degradation, the identification and implementation of new environmentally efficient strategies have become essential. Among these strategies, the reuse of concrete elements from obsolete buildings in new projects is a new and poorly implemented approach that proposes to simultaneously reduce demolition waste and material consumption while supporting a more sustainable and circular economy. Research on concrete reuse in architecture has identified the obstacles hindering concrete reuse implementation, including a significant lack of knowledge about designing with reused components and gaps in assessment methods.

This PhD thesis will develop new design approaches for load-bearing structures reusing elements from obsolete structures. In parallel, adapted evaluation methods will be developed to assess the benefits and drawbacks of the designs and provide scholars and practitioners with comprehensive comparisons of structures designed with reused and/or new components.

Reusing reinforced concrete elements
(© Ingeni)





Text
Bert Belmans

Change ventilation... open a window!
Mixed-mode ventilation studied with VCVTB

Opening and closing windows is not a full-fledged ventilation strategy. The resulting air changes are too uncertain over time, due to their dependence on wind and temperature differences, and intuitive control actions by users. On the other hand, opening windows can be a viable and energy-friendly complement to mechanical ventilation. By supporting users with feedback, natural ventilation can happen in a more effective way. In addition, auxiliary energy use for fans can be reduced if they are turned off when natural ventilation is more appropriate. Because of the inherent complexity of mixed-mode ventilation solutions with natural and mechanical operating modes, a simulation approach is the only efficient way to design, optimize and test them. An open-source testbed for single and mixed-mode ventilation simulations was developed: Ventilation Controls Virtual Test Bed. VCVTB facilitates testing of control algorithms and performance evaluation with respect to broad user groups. In a case study, an advanced demand-controlled balanced mechanical ventilation system and a generic mixed-mode ventilation system were compared using VCVTB. This illustrated that combined mixed-mode ventilation can indeed be an equivalent, smart and energy-friendly alternative to fully mechanical ventilation systems. Finally, the case study demonstrated how VCVTB facilitates application-oriented research on advanced ventilation solutions and controls.

How the stack effect and wind can reinforce or counteract each other
(© Bert Belmans)

Structural Reliability-Based Design of Tensile Membrane Structures

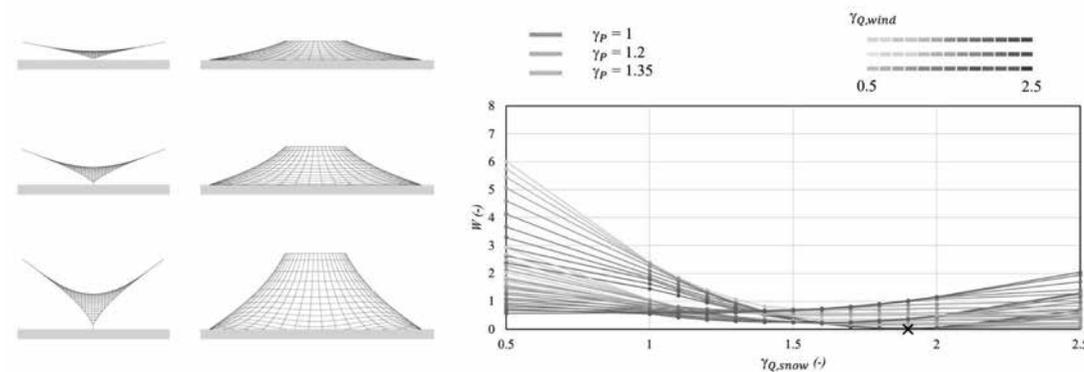
Text
Elien De Smedt

Tensile membrane structures are a familiar building concept and are used for a variety of applications such as canopies or stadium roof covers. However, there is currently a contradiction between the well developed 'partial factors method' used for dimensioning conventional structures and the expertise-based design method for tensile membrane structures.

In this research, a method to perform the reliability analysis of membrane structures has been proposed and evaluated with a cable-net structure and two membrane structure typologies. Subsequently, the partial factors were calibrated for the prestress, the snow load, and the wind load by means of a minimisation process based on six membrane structures. Finally, an existing tensile membrane structure is analysed for the calibrated partial factor combination.

The research presented in this doctoral thesis illustrates that the proposed method is a feasible method to perform the reliability analysis of membrane structures. The case study indicates an important focus for future research, i.e. the extension of the investigated membrane structures and loads as well as work towards an international comparative study for the reliability analysis of tensile membrane structures.

Calibration of partial factors for six membrane structures
(© Elien De Smedt)



FINISHED RESEARCH PROJECTS

Built to construct. Learning from the architecture of construction workspaces in the Brussels-Capital Region

Text
Frederik Vandyck

The urban space of the Brussels-Capital Region, like many other cities, is dotted with remnants of a productive industrial past. The activities that took place there were generally not aimed at mass production for export, but at small-scale manufacturing in order to address the basic needs of the neighbouring city dwellers. As construction companies continue to meet the crucial demand for housing in an ever-growing city, their local anchoring must be safeguarded. Due to real estate dynamics, economies of scale and changing market conditions, the small-scale mixed urban fabric, in which the qualitative combination of various functions flourishes, is rapidly disappearing. The doctoral research therefore has set the architecture of the small-scale living-working fabric as an object of research in order to understand the spatial (adaptation) strategies of construction companies from a historical and contemporary point of view. Urban mapping, typo-morphological studies, in situ investigations and in-depth interviews with urban entrepreneurs were deployed to empirically substantiate the infrastructural needs and locational logics of Brussels' construction companies. On the basis of these insights, a policy-preparatory framework is developed in view to preserve the local anchoring of city-supporting productive enterprises.

Workspace of a general contractor in Brussels (Frederik Vandyck © Building Brussels)

This joint PhD (VUB / UAntwerpen) was funded by VUB architectural engineering and part of the VUB interdisciplinary research project Building Brussels. Brussels city builders and the production of space (1794-2015).

Hidden Innovation. Roof Frame Design and Construction in Parish Churches of Brussels and Charleroi, 1830-1940

Text
Romain Wibaut

In 1830-1940, construction of churches increased considerably in Belgium and became a matter of public concern. Until now, it was the architectural form and the decoration of these churches that almost exclusively aroused attention of scholars. By focusing on roof frames of Catholic parish churches in Brussels and Charleroi, it is demonstrated that the historical and architectural values of nineteenth and twentieth century churches extend beyond visible forms and should include their construction technology. By in-depth literature review, extensive research in administrative and building archives and systematic on-site measuring campaigns, the doctoral dissertation subsequently investigates the influence of architectural styles on the design of roof structures, explores the role of different building actors in the design and construction phase of these roofs and draws the attention to the evolution of material, form and techniques in the construction of timber, metal and reinforced-concrete roof frames. All in all, it is a key to enter in the world of roof structures in Belgian churches, to contribute to their heritagisation, as well as to support proper maintenance, protection, and rehabilitation projects.

Metal roof trusses at Saint Mary's church in Schaerbeek (© Romain Wibaut)

This joint PhD (VUB – KU Leuven) was part of the research project Hidden innovation: Building church roofs in Belgium (1830s-1930s): construction technologies, architectural-historical contextualization and present heritage challenges in international perspective, funded by the Research Foundation Flanders. It also received funding from the VUB Strategic Research Program on Construction History and from the Brussels-Capital Region (urban.brussels).



MYCELIUM MATTERS

An interdisciplinary exploration of the fabrication and properties of mycelium-based materials

Text
Elise Vanden Elsacker

Environmental pollution and scarcity of natural resources have led to an increased interest in developing more sustainable materials. Therefore, this research turns towards biology as a source of inspiration for the next generation of biomaterials. The kingdom of the fungi represents a fascinating and evolutionary ancient biological group of eukaryotic microorganisms. Filamentous fungi are ubiquitous in soil habitats, in which they grow as long filaments, called hyphae, forming a complex network of mycelium by degrading any type of organic plant-based material. The white-rot fungi even developed the ability to degrade harsh lignin polymers in wood structures and therefore have great promise for the fabrication of biomaterials. In recent years, the exciting characteristics of filamentous fungi did not go unnoticed in the context of biodegradable materials, providing a low-cost and environmentally sustainable solution compared to the production and life cycle of petroleum-based materials. These composite materials are realised by growing the fungi into lignocellulosic fibres, thereby valorising organic waste streams and generating dense materials with a construction material application.

This interdisciplinary study explores the principal factors affecting mycelium materials' biological and material properties and enlarges the potential of new fabrication technologies for architectural applications with fungal organisms. Ultimately, the research provides novel insights and a comprehensive overview of several crucial aspects that come into play during the production of fungi-based lignocellulosic composites. A method for selecting fungal species that incorporates biological, chemical and mechanical performance criteria has been developed. The interaction between fungi and their feedstock and the material properties of different types of feedstocks are investigated. Then, the optimisation of mechanical properties with different types of additives is studied. A novel fabrication process to produce large-scale architectural formwork is developed. Finally, various digital additive fabrications and design strategies that improve the colonisation of the fungi in a given geometry are explored.

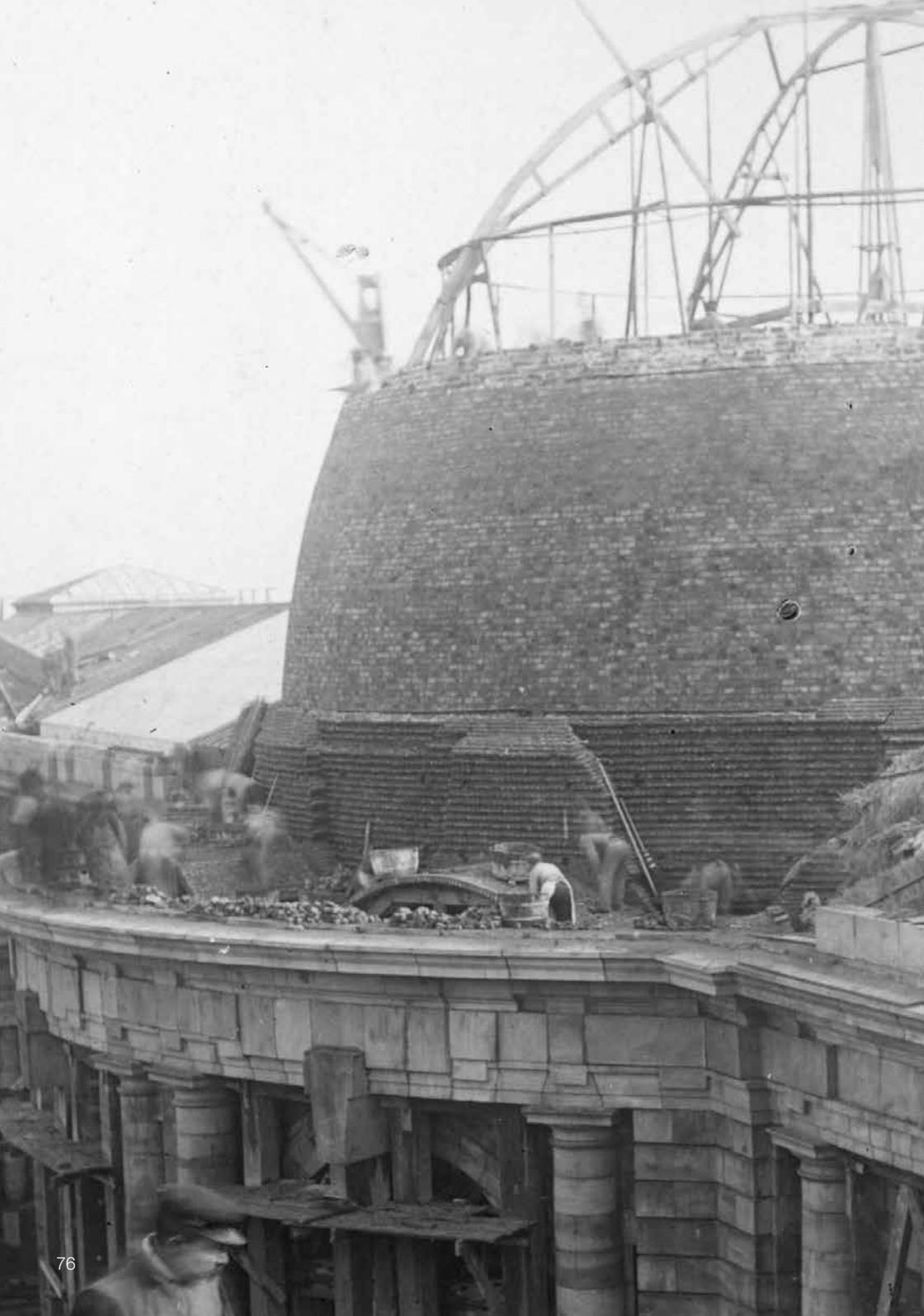
Top
Grown mycelium sample

Bottom
Mycelium composite
shaped with robotic wire-
cutting
(© Elise Vanden Elsacker)





Mycelium composite
(© Elise Vanden Elzacker)



Organizers
Stephanie Van de Voorde
Rika Devos (ULB)

Interuniversity research seminar on Construction History

On 7 January 2021, we organised an online seminar for ongoing research in the field of Construction History in Belgium. The full day of presentations was composed of a mid-term PhD presentation by Robby Fivez (UGent), a number of presentations on advanced research, as well as several short pitch presentations on starting research – e.g. by our own Margot Missoorten and Marylise Parein. The presentations were grouped in four thematic sessions: Materials and Agency; Building the post-war period; Past to Present; and International exchange. After each presentation, and during the round table at the end of the day, the floor was opened for a discussion, kickstarted by three esteemed external reviewers: professors Silke Langenberg (ETH Zurich), Bernard Espion (ULB) and Johan Lagae (UGent). The book of abstracts is digitally available on the department website and the research portal of the VUB.

The seminar gathered over 50 participants, from various disciplines and professions. Opening up the field as such was particularly stimulating to create new dynamics and explore new approaches. The seminar held the promise of very interesting construction histories to be told!

Organizers
Paula Fuentes
Ine Wouters

International symposium 'Brick vaults and beyond'

Vaults have been historically regarded as the ideal structure to span imposing spaces in representative and monumental buildings. Several studies have been devoted to the topic worldwide and cover the evolution of vaulting from antiquity to the progressive abandonment of vaults in the eighteenth century. Yet, also in the following centuries, interesting evolutions in vaulting techniques took place as they were extensively used in historicism and attempts were made to adapt vaults to modern architecture. How did the changing architectural styles and functional needs, together with the introduction of new construction materials in the nineteenth and twentieth centuries, transform vaulting techniques?

The Marie Skłodowska-Curie grant funded via Horizon 2020 has allowed post-doctoral researcher Paula Fuentes to focus on the construction of vaults in Belgium in this period. Her findings were striking, especially because of the unexpected discovery of a large number of tile vaults. After two years visiting Belgian buildings and archives, we can conclude that tile vaults were very common and well-known in this country between 1900 and 1950.

Dome of the Royal
Museum for Central Africa
in 1906, probably one of
the first applications of a
tile vault in Belgium
(© Charles Girault
archives at RMCA
Tervuren collection)

The research results were positioned in the international context during the online symposium 'Brick vaults and beyond. The transformation of a historical system', co-organised by Urban.Brussels in April 2021. Over one hundred international architects, historians, engineers and preservationists participated in the symposium. And those who could not attend, are invited to read the book *Brick Vaults and Beyond: The Transformation of a Historical Structural System*, published by Instituto Juan Herrera and the Vrije Universiteit Brussel.

Stephanie Van de Voorde**Text**

Stephanie Van de Voorde

1 October 2020 was my first day on a new job: a new function, yet not in a new environment. I arrived at the VUB early 2013 as a postdoctoral researcher, doing research on, among other things, post-war building materials, young heritage and twentieth century building culture. Before that, I obtained my diploma of architectural engineer at Ghent University in 2005. After having completed my PhD (Ghent University, 2011) on the history of concrete construction in Belgium in the nineteenth and twentieth centuries, I also worked at the Flemish Architectural Institute and the University of Antwerp, doing research that mostly related to the history of architectural education in Belgium.

As of this academic year, I combine research activities with teaching: 'Architectuur- en Techniekgeschiedenis 19de en 20ste eeuw', 'Geschiedenis van de Stedenbouw' and 'Architectural and Construction History' in the bachelor programme, and 'Theoretical Reflections on Monument Care' in the master programme. In addition, I am also chair of the master thesis jury, together with Professor Rika Devos from ULB. As such, you'll meet me several times throughout the educational trajectory. And maybe afterwards as well, as I also (co)supervise PhD students.

The titles of the courses I teach already hint at my main field of expertise and interest: the history of the built environment, and how to deal with that environment today. Because indeed, history is not just about acquiring knowledge about the past. History may take place in the past, but it exists in the present, as Dana Arnold wrote. A nuanced insight and sensitivity towards the historical framework in which we work and live in, including the evolution of its embedded cultural value and historical stratification, is therefore necessary to be able to make a respectful, sustainable contribution to it. Not only today but also tomorrow.

A second common thread that runs through the courses is the lasting impact of the contribution of architects and engineers, not only to the built environment but to society and the environment at large. Last year, the focus was on the covid-19 crisis, but let's not forget the many other major challenges we are facing. By looking into some of the most renowned projects, theories and innovations that took place throughout history, I therefore hope to increase the awareness of the consequences of the decisions you take, as architectural engineers to be.

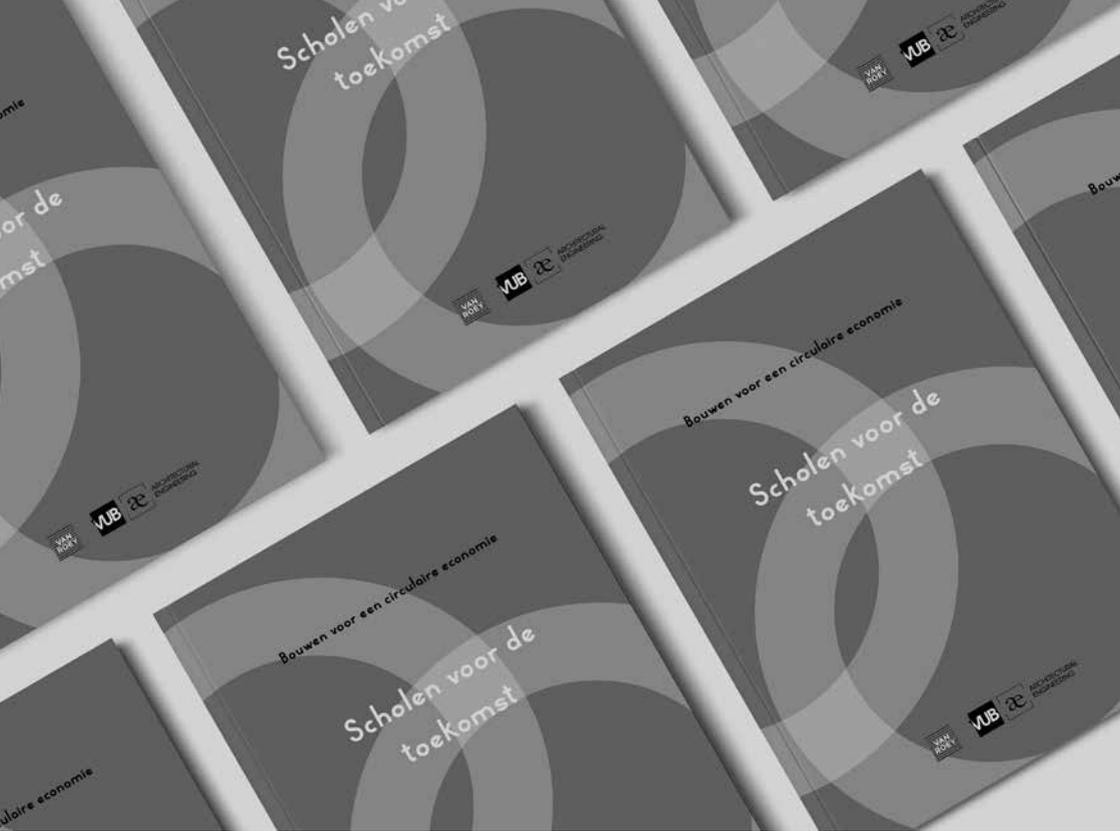
A proper understanding of how the built environment came about involves a critical analysis of the relation and collaboration between the various actors involved. As a construction historian, I try to break away from the classical approach and go beyond the purely architectural design by the architect. I also highlight the fundamental contribution of other actors involved, such as engineers and contractors, but also material producers and governmental agencies and institutions that produce norms and building regulations, for instance. This broader view can even be enlightening in terms of the multidisciplinary environment you will be working in in the future.

Lastly, I hope to pass on that typical VUB attitude: passionate, committed, humanistic, open-minded yet critical – redelijk eigenzinnig. See you in class!

The cover picture of my PhD on concrete construction in the 19th and 20th centuries. It is still one of my all-time favourite pictures. It doesn't stop to intrigue me: Who is that man? Who designed this staircase? How was it constructed? Does it still exist?

(© Institut français d'architecture, Centre d'archives d'architecture du XXe siècle, fonds Hennebique)





OUTREACH & INNOVATION

Text

Ine Wouters

Waldo Galle

Niels De Temmerman

Lars De Laet

Romain van Wassenhove

Although the research topics at VUB Architectural Engineering are of great interest to a wide audience of architects, engineers, historians and practitioners, we are aware that it's not (only) by publishing a PhD dissertation online that professionals will implement the knowledge and tools that have been developed at the department.

Books

In 2021, urban.brussels - the administrative body that supports territorial development in the Brussels Capital Region - launched the new series urban.research to disseminate results of studies they ordered. The very first issue #001 is dedicated to the research efforts of Romain Wibaut who uncovered Brussels' roof structures of the 19th and 20th centuries. Jelena Dobbels reworked her PhD research on Belgian general contractors into the book 'Building a profession. A history of general contractors in Belgium (1870-1970)', published by ASP. In the book 'Brick vaults and beyond', postdoctoral fellow Paula Fuentes framed her research insights into a broad international perspective: the building practice in Belgium is compared to innovations in Europe and the United States.

Design guide 'Scholen voor de toekomst'
(© VUB Architectural Engineering)

On the initiative of Group Van Roey and supported by Circular Flanders, Waldo Galle and Stijn Elsen developed a concise guide for clients and designers who want to realise future-proof and circular school buildings. Hands-on insights, supported by numerical analyses, help practitioners on their way to a circular building economy. This guide is the third issue in the series 'Building a Circular Economy'. Download this issue for free on the dedicated web page: www.vub.be/arch/circulardesign.

Konligo's new office building at Circularium

The team of the VUB spin-off Konligo has designed and self-built a circular office and workspace at the Circularium in Anderlecht. Almost all components and building materials (steel structure, wooden beams, glass panels, stairs, carpet tiles,...) are reclaimed and applied according to the principles of Design for Disassembly: all connections are dry and reversible, making this a true circular building, easily adaptable and fit for selective dismantling, and re-use or recycling of its materials at the end-of-life.

Patent for a connection system for bamboo structures

An innovative connection system for bamboo structures was developed as part of Romain van Wassenhove's master's thesis during his Erasmus exchange at EPFL, with Lars De Laet (VUB) and Anastasios P. Vassilopoulos (EPFL) as supervisors, in collaboration with Kenny Verbeeck (Bollinger+Grohmann) in the starting phase. The removable connection system can be used for a wide variety of applications: from modular furniture to temporary structures. This collaboration has resulted in a patent, a scientific article and a start-up B'Novus, which aims to market modular bamboo furniture that can be personalized through an online configurator.

Connection system for bamboo structures
(© Alain Herzog)

THEORETICAL REFLECTIONS ON MONUMENT CARE

In this course, master students took a journey from the past to the future, with our architectural heritage as a backdrop. We reflected on why and how we should preserve and conserve architectural heritage, and how this evolved during the past centuries. Students were encouraged to take a critical stance on how to deal with architectural heritage in the future, also in relation to particular themes such as sustainability, young heritage and authenticity. How to interpret Koolhaas' statement 'Heritage is overtaking us' for instance? And what about the rapprochement between circular building and heritage studies, that can foster a circular turn in heritage?

Theoretical and historical insights were supplemented with an analysis of international policies and best practices in the field of restoration and conservation. To really experience the sense of power and cultural significance that our heritage is imbued with, and to get a grip on how theoretical insights can be translated into practice, we planned to visit six ongoing or recently completed restoration sites, guided by some of the most renowned experts in the field. Yet, for reasons we all know by now, most of the site visits could

Professor
Stephanie Van de Voorde

Assistant
Frederick Vandyck

Bottom
On 8 October 2020
Erik Hendrickx
(Origin Architecture &
Engineering) guided
us around at the VUB
Rectorate, explaining how
they prepare this
building for the future, yet
with respect for its past.
(© Frederik Vandyck &
Stephanie Van de Voorde)

not take place as planned. Luckily, we were able to visit the restoration of the VUB Rectorate, under the expert guidance of Erik Hendrickx, project leader at Origin Architecture & Engineering, in charge of the restoration. The iconic, ellipse-shaped Rectorate building, designed by Renaat Braem in the early 1970s as a symbol of an open and tolerant worldview, was listed in 2007, thus becoming the youngest monument of the Brussels-Capital Region. Being in service as an administrative building for almost 50 years, the building was in urgent need of a thorough restoration campaign. Students were fascinated by the murals that Braem applied himself on the various floor levels. They also endorsed and experienced the added value of the decision taken by Origin to restore Braem's original concept of open plans wherever possible, while at the same time bringing the building up to date, in terms of safety and comfort. The works are being done in several phases; we look forward to visiting it again when it will be fully ready for another 50 years to come!

By the way: in addition to the site visits, an online lecture series was organised as well. You can read all about it on pages 12-15 in this yearbook.



LIGHTWEIGHT STRUCTURES

Different types of lightweight structures are being taught to our students in the courses 'Form-active structures' and 'Spatial Structures'. During lectures and workshops, they learn the design and development of a whole range of structural typologies, as well as the structural behaviour of these constructions. Examples of lightweight structures that are being studied are membrane structures, pneumatic structures, domes, compression-only structures, fabric formwork, bending-active structures, gridshells, etc.

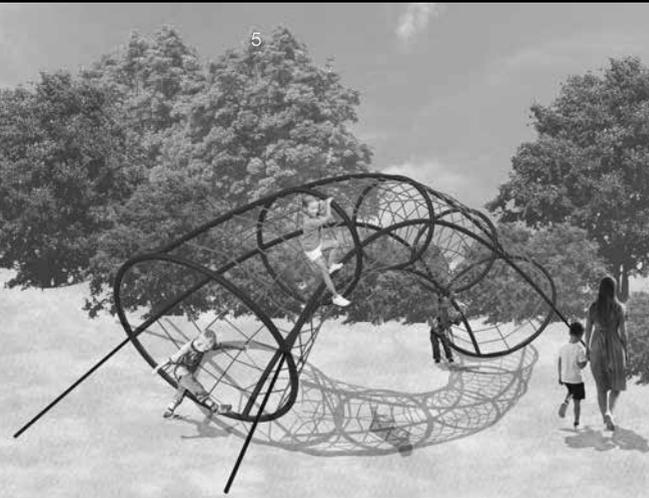
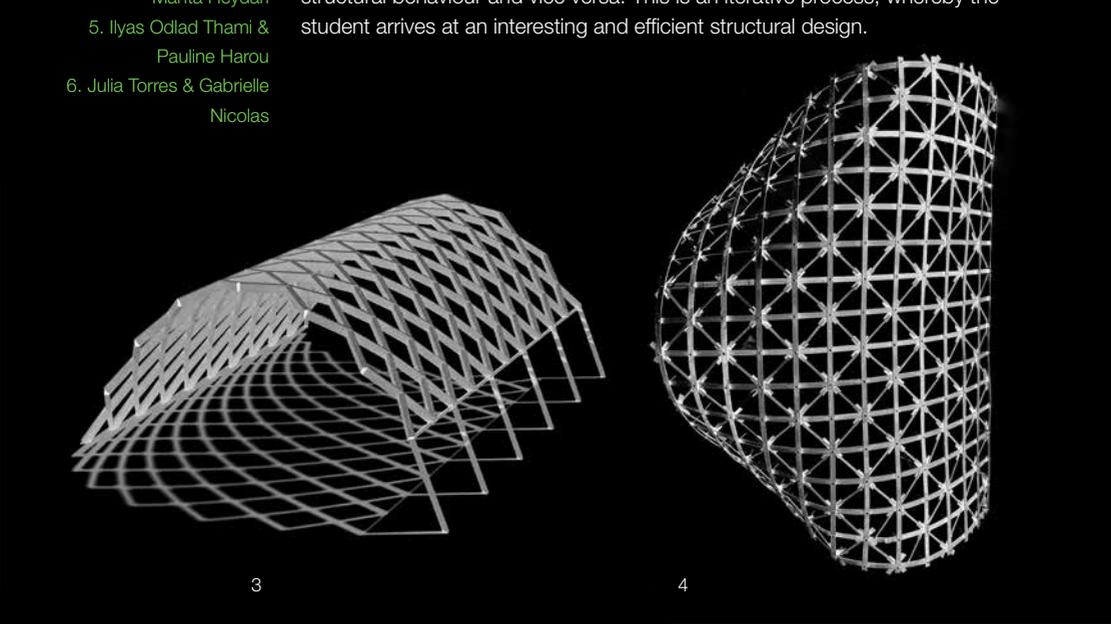
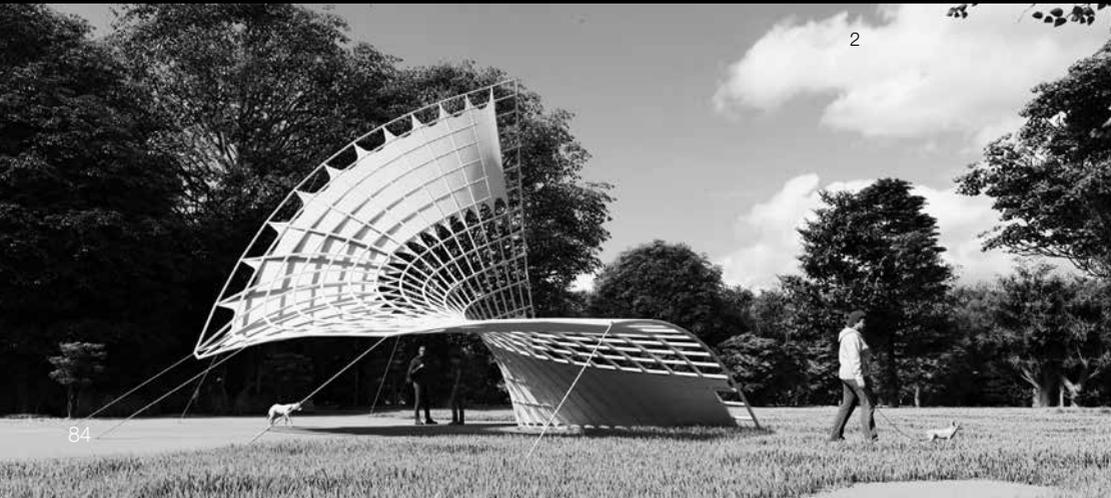
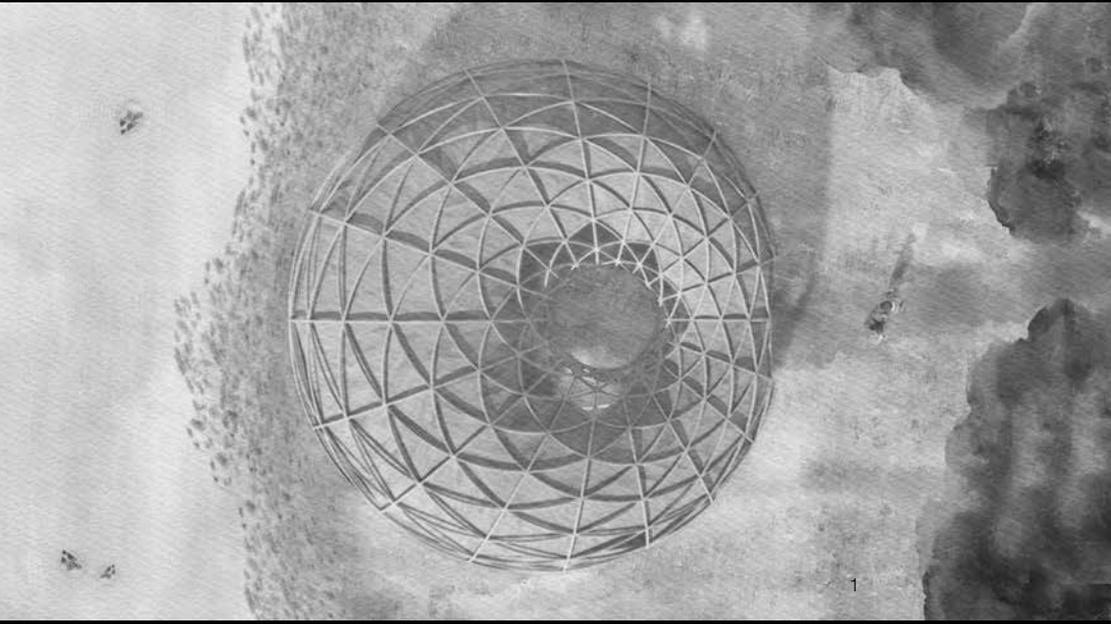
Professor
Lars De Laet

Assistants
Aurélie Van Wylick
Maarten
Van Craenenbroeck

Students' projects:

1. Felix Bambust & Willem Mevis
2. Ahmed Soliman
3. Alan Zecirovic & Samir Kennoun
4. Eva Vangansbeke & Mahta Heydari
5. Ilyas Odlad Thami & Pauline Harou
6. Julia Torres & Gabrielle Nicolas

After a semester of theory, exercises and workshops dedicated to these specific structural typologies, the students get the opportunity to design and analyse a membrane structure (Bachelor) or one type of spatial structure (Master) for their final task. The design has to meet the requirements involved with the typology, function and location, which are chosen by the student. Then, the student will structurally analyse the design. In this phase, it is important that the student understands the implications of the design on the structural behaviour and vice versa. This is an iterative process, whereby the student arrives at an interesting and efficient structural design.



PARAMETRIC DESIGN OF TRANSFORMABLE STRUCTURES

The 1MA BRUFACE course 'Parametric design of transformable structures' introduces the students to kinematic structures and Design for Change as two strategies towards sustainable design. Through lectures and workshops, students gain insight into the use of life cycle assessment, scenario planning and design information management. During exercise sessions, students are taught how to use digital parametric design tools (Rhinceros 3D + Grasshopper) to help them in the design and evaluation of a transformable concept.

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Niels De Temmerman
Assistant
Liesbeth Arnouts

Bottom
'Chavilion' by Pauline Harou, Razan Atwi, Ahmed Roshdy and Hana Taherazar

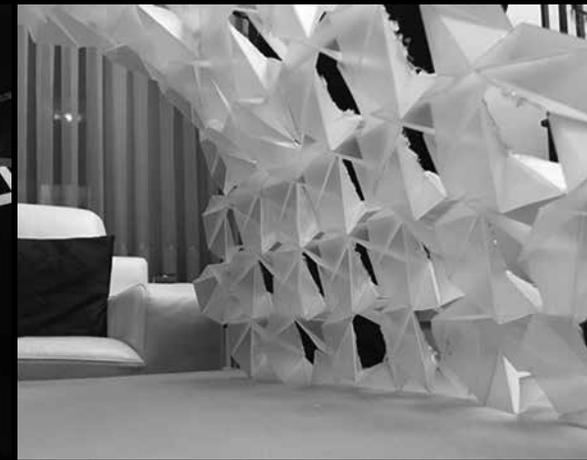
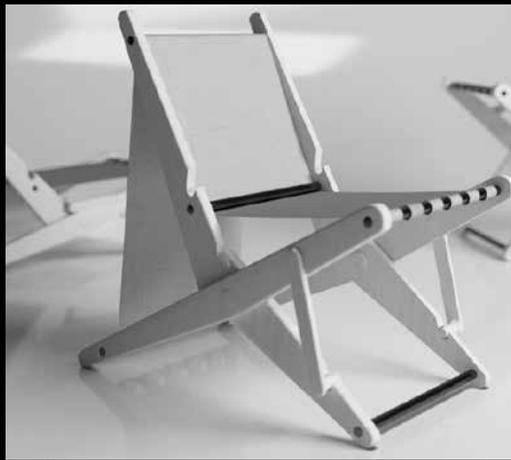
Top left
'Blooming Flower' by Viviana Capasso, Ilyas Oulad Thami, Sara Ould Bouya and Eleonora Rubinacci

Top right
'Hive Fun' by Gabrielle Nicolas, Julia Torres, Sarah Trentin and Esteban Welschen

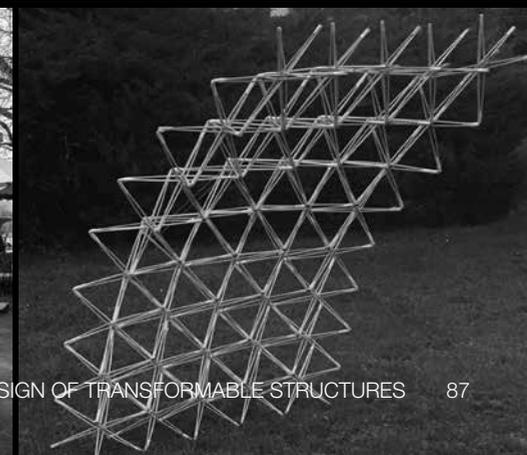
Bottom left
'Folding Fan Frame' by Samir Kennoun, Willem Mevis, Alan Zecirovic and Faina Saleem

In the final assignment of the course, the students apply the knowledge gained during the course and thereby demonstrate insight, creativity and critical reflection. The expected outcome is a parametric design of a transformable concept which operates on one or several of the following four levels: material, component, structure and urban scale.

This year, the students had the opportunity to design an innovative lightweight pavilion/structure that shows new insight in structural typologies. The structures had to display a strong vision of structural design and innovation, the only constraint being that the structure had to be transportable by airplane, which means that it had to fit into six boxes each with a maximum external size of 1x0.75x0.65 m and a maximum weight of 32 kg. The structures were judged by examining the materiality, the level of structural innovation, constructability, transportability, architectural expression and overall originality.



Bottom right
'The Wave' by Ellen Leemans, Amber Dehaen, Mahmoud Aburaidan, Majda Ghalem and Zhengkun GU



BACHELOR IN DE INGENIEURSWETENSCHAPPEN: ARCHITECTUUR

Eerste Bachelor (1 IA)	SP
STUDIEDEEL	
Architectuur- en techniekgeschiedenis 19de en 20ste eeuw - S. VAN DE VOORDE	3
Bouwtechniek: massiefbouw - I. WOUTERS	4
Chemie: structuur en transformaties van de materie - H. RAHIER & I. DE GRAEVE & G. NUTTIN	6
Informatica - J. LEMEIRE	4
Logica en wetenschapsfilosofie - B. VAN KERKHOVE	4
Mechanica 1 - T. VERSTRAETEN	5
Ontwerpatelier: mens en aanpasbaarheid - N. DE TEMMERMAN	12
Perspectieftekenen en voorstellingstechnieken - N. DE TEMMERMAN	4
Wiskunde: algebra, analyse en meetkunde - G. SONCK	9
Wiskunde: gevorderde analyse en meetkunde - G. SONCK	6
TOTAAL:	57
Tweede Bachelor (2 IA)	
STUDIEDEEL	
Beeld, vorm en kleur - A. VERDONCK	3
Bouwtechniek: skeletbouw - H. VAN SANDE	4
Computergesteund ontwerpen - L. DE LAET	4
Fysica: elektromagnetisme - J. DANCKAERT	4
Geschiedenis van de stedenbouw - S. VAN DE VOORDE	3
Licht-en verlichtingstechniek: grondslagen elektriciteit, licht en visuele omgeving - V. JACOBS	7
Materiaalkunde - I. DE GRAEVE & H. TERRYN	4
Mechanica 2 - D. LEFEBER	4
Mechanica van materialen, vloeistoffen en constructies - D. VAN HEMELRIJCK	5
Ontwerpatelier: habitat en erfgoed - A. VERDONCK	12
Théorie de l'architecture 1 - R. DEVOS	3
Thermodynamica - S. BRAM	3
Wiskunde: voortgezette analyse - S. CAENEPEEL	6
TOTAAL:	62
Derde Bachelor (3 IA)	
STUDIEDEEL	
Analyse van constructies, inleiding stabiliteit - T. TYSMANS	5
Architectural and Construction History - S. VAN DE VOORDE	4
Bouwmaterialen - D. SNOECK & H. TERRYN	5
Bouwtechniek: installaties - H. VAN SANDE	3
Bioclimatic Design - A. KHAN	5
Elasticiteit en sterkteleer - L. PYL	4
Form-active Structures - L. DE LAET	4
Ontwerpatelier: stad en structuur - H. APELT	12
Ontwerpen van constructies - T. TYSMANS	5
Ruimtelijke planning: theorie en praktijk - K. BOUSSAUW	3
Soil Mechanics - B. FRANÇOIS	5
Theory of Urban Planning and Design - M. RYCKEWAERT	3
Keuzestudiedeel	3
TOTAAL:	61
KEUZE STUDIEDELEN	
Academic English 2 - C. BOLLANSEE	3
Academic English 5 - R. NYE	3
Algemene taalkennis Frans II - J. BERTONE	3
Economie en bedrijfsleven - I. SCHEERLINCK	3
Milieuaspecten van het ingenieursberoep - H. RAHIER	3
Redelijk eigenzinnig. Nadenken over mens en maatschappij - K. VERSTRYNGE	3

MASTER OF SCIENCE IN ARCHITECTURAL ENGINEERING (BRUFACE) *

First Master (4 AE)	SP
COURSE	
Design of Concrete Structures - S. DE SUTTER	5
Design of Steel Structures - W. HOECKMAN	5
Energy Performance of Buildings - F. DESCAMPS	6
Parametric Design of Transformable Structures - N. DE TEMMERMAN	4
Post-war History of Construction and Architecture - R. DEVOS	4
Research Methods in Architectural Engineering- I. WOUTERS & A. KHAN	3
Spatial Structures: Design and Analysis - L. DE LAET	4
Structural Renovation Techniques - I. WOUTERS	4
Sustainable Architectural Design Studio - H. VAN SANDE & A. KHAN	8
Sustainable Urban Design Studio - H. VAN SANDE & A. KHAN	8
Elective courses	9
TOTAL:	60
Second Master (5 AE)	
COURSE	
Advanced Design Studio - J. LINDEKENS, L. NEY & S. MEYRANT	12
Master Thesis Architectural Engineering	24
Compulsory courses	12
Elective courses	12
TOTAL:	60
COMPULSORY COURSES	
Architectural Engineering and Construction Project Management - Y. RAMMER	4
Daylighting in Buildings - V. JACOBS	4
Design Project Competition - P. BOUILLARD	4
Low Energy Design for Sustainable Buildings - F. DESCAMPS	4
Theory of Architecture and Urbanism - A. KHAN	4
ELECTIVE COURSES	
Construction - N. DECLERCK	5
Design of Engineering Constructions - D. VAN HEMELRIJCK & C. NYS	5
Experimental Techniques for Testing, Non Destructive Techniques and Structural Health Monitoring - D. ANGELIS	5
Form-finding and Structural Optimisation - T. TYSMANS & T. MASSART	3
Geotechnical Engineering - B. FRANÇOIS & P. GERARD	6
Industrial Techniques for Water Management - B. HAUT & M. HUYSMANS	3
Infrastructure and Mobility - P. BOUILLARD	5
Innovation in Construction Materials - T. TYSMANS & O. REMY	4
Internship (40 days) - L. PYL	10
Internship (60 days) - F. ROBERT	4
Introduction to Construction Engineering - Y. RAMMER	4
Light and Lighting: Visual Environment and Domotics - V. JACOBS	4
Mechanics of Composite Materials - E. MOUSSIAUX	3
Prestressed Concrete - B. ESPION	4
Robustness of structures and reliability of materials - P. BERKE	3
Room Acoustics - S. VANLANDUIT	3
Steel Bridge Construction - W. HOECKMAN	5
Structural Analysis and Finite Elements - P. BERKE & L. PYL	4
Structural Design - M. MAILLIE	3
Theoretical Reflections on Monument Care - S. VAN DE VOORDE	3
Timber and Masonry Structures: Renovation Techniques and Construction Pathologies - R. MATRICHE	4
Urban Sociology - P. LANNNOY	5

* Voor deze Engelstalige opleiding bestaat een Nederlandstalig equivalent 'Master in de Ingenieurswetenschappen: Architectuur'.



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 Desrumaux Eloïse
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 Henderieckx Louise
 Huygh Elias
 Jansen Nelson
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 Likoya Ruth
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 van Daalen Rebecca
 Vangansbeke Eva
 Van Schoor Xantippe
 Verhavert Neel
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 Ba Alawi Mohammed
 Bambust Felix
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 Dehaen Amber
 Dewulf Thomas
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Polytech Marseille:
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Colofon

JAARBOEK 2020 - 2021

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V.U.

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