10 YEARS

BATir
ANNUAL REPORT
2015-2016

UNIVERSITÉ LIBRE DE BRUXELLES
Peter Berke

Peter Berke has been studying and working abroad since he was 18 years old. Because of this international exposure, he diversified and deepened his research interests, and learned a few languages in the process. An international network of collaborations and friendships also ensued. Peter spent the first two years of his university level studies in France (Lyon) in the framework of the EURINSA international training programme, whereupon he studied mechanical engineering in aeronautics at the Budapest University of Technology and Economics. He graduated in 2003 with a master project in the field of tribology. In 2008, he was awarded a PhD in Engineering Sciences at the Université Libre de Bruxelles, completing a research project involving simulations in nanotechnology. As FNRs post-doctoral fellow from 2009 to 2013, Peter focused his research on the development of a novel computational methodology applied to quasi brittle materials. His core research activities are computational and aimed at solving complex real-life problems in structural and material mechanics. He is currently pursuing research on the computational assessment of structural robustness and on the mechanics of complex materials and surfaces.

Samia Ben Rajeb

Samia Ben Rajeb is trained as an architect, graduated in 2007 from ENSA Tunis and ENSA Paris-la-Villette. After working for several years at the famous AIA Studio (architecture and engineering) in Paris, she obtained her PhD in Architecture in 2012 (Paris). Subsequently, she received an international post-doc grant from the University of Liège to lead research programmes on digital environments for collaborative design. From 2013 onwards she was lecturer at the Department of Architecture at the University of Liège in charge of an architectural studio (master) and courses like “Collaborative design process analysis”. She continues to develop her research on collaborative design, co-design and Building Information Modelling and Management. In October 2016 she joined the BATir Department by proposing COLLaeB: a laboratory for Collaborative Design and Digital mediations in Architectural Engineering.

Daniel Dethier

In 1979, just after graduating in architecture and civil engineering, Daniel Dethier started his practice as an independent architect and as assistant to Professor Englebert’s Chair of Composition. His double interest of researcher (continuing with his studies in town planning) and practitioner immediately characterised the approach he continues to refine with BATir. In 1992, he founded Dethier Architecture and he was joined by Thomas Faes in 2005. The company employs between 5 and 10 collaborators who make up a team with a range of complementary skills, regularly supplemented by exterior collaborators in wider areas linked with architecture (artists, engineers, scientists ...), both in Belgium and abroad. The methodology of the consultancy has been refined through experience: before any design work can take place, the demand is analysed in detail, as is the programme in close collaboration with the client and the various people involved, who are always invited to contribute to the work through regular meetings. Daniel Dethier was awarded the title of Commandeur de l’Ordre de Léopold by the Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique in February 2016.

Laurent Ney

Laurent Ney was trained at the University of Liège, Belgium, and at the Rheinisch-Westfälische Technical Institute (RWTH) in Aachen, Germany. Between 1995 and 2001, he lectured in construction stability at the Lambert Lombard College for Architecture in Liège. He was appointed lecturer at BATir in 2005. From 1989 to 1996 he worked at Greisch Architectural Consultancy in Liège, after which he established the engineering firm Ney & Partners in Brussels and Luxembourg in 1998. Ney & Partners is involved with a team of 50 specialists in activities that range from structural design for road and footbridges to exceptional structures. Laurent Ney has won many professional and public awards and published titles of books on his design attitude: Freedom of Form Finding (VAI/A11, 2005), Shaping Forces (Bozar Books, 2010) and Nijmegen Designing the ‘City Bridge’ (Vantilt, 2014).

TOTAL: 101

BATir – the team

<table>
<thead>
<tr>
<th>Full-time Faculty</th>
<th>Lecturers</th>
<th>Post-docs</th>
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<td>Total: 14</td>
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<tr>
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<table>
<thead>
<tr>
<th>PhD &amp; Assistants</th>
<th>External collaborators</th>
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<tbody>
<tr>
<td>Total: 5</td>
<td>Total: 13</td>
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</tbody>
</table>
Top cited papers (Scopus)

- 199 citations

- 188 citations

- 100 citations

Impact

Urban Metabolism analysis of Brussels

The Urban Metabolism analysis of Brussels performed in collaboration with EcoRes and ICEDD, for Bruxelles Environnement has been launched (available in French only). This report contains a thorough analysis of Brussels’ urban metabolism for 2011 as well as a number of circular economy guidelines for 20 specific flows. In addition, this report has inspired the Brussels Regional Programme for Circular Economy (PREC).


Sustainable retrofit of urban blocks and buildings in Brussels

Development of a multi-scale and multi-criteria pre-assessment tool for sustainable retrofit (collaboration with BBRI and UCL).

www.brusselsretrofitxl.be/projects/b%C2%B3-retrotool
On 20th October, the ADEB-VBA has organised a launch event:

**Launch of the BIM Guide:**
PhD students on emerging towns.

**Towns in Ethiopia** coordinated by the Faculty of Architecture
Building for Sustainable Urban Development of Small Regional
Within the framework of the ARES-CCD project ‘Local Capacity
emmc15/
mechanics at various length scales. http://sites.uclouvain.be/
methods aiming at an improved understanding of materials
physics, chemistry etc.). Contributions included experimental
have different backgrounds (mechanical or civil engineering,
and ULB. The conference gathered researchers who have a
content/uploads/2016/10/The-Guide-to-BIM-v-1.0.pdf
for the guide for the Building Information Modelling elaborated
on the rich experience built in practice.

**Conferences and workshops**

**BA Tir** hosted the 15th edition of the European Mechanics of
Materials Conference (EMMC15) organised under the auspices
of the European Mechanics Society (Euromech) by UCL
and ULB. The conference gathered researchers who have a
common interest in the mechanics of materials but possibly
have different backgrounds (mechanical or civil engineering,
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**Launching the BIM Guide**

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for the guide for the Building Information Modelling elaborated
by F. Denis (supervision Y. Rammer) http://adeb-vba.be/wp-
content/uploads/2016/10/The-Guide-to-BIM-v-1.0.pdf

**BA Studios Team**

**Stéphane Meyrant, Stéphane Jourdain, Daniel Dethier,
Jan-Thomas Van Hoof, Joël Meersseman, Yves Bettignies and
Rika Devos**

**BA3 studios: University and the city: a new entrance for the Solbosch campus and the Library and Learning Centre.**

The BA3 studio took on two challenges closely related with
the University's building needs today. The first assignment
aimed for quick (4 weeks), but individual proposals for a new entrance to the Solbosch campus. The following questions were assessed: How to better articulate the presence of ULB in the city quarter? How to provide students and university collaborators with a more welcoming entrance with places to meet, adapted to campus life? The structural challenge was in creating a fit cover for these functions. The second assignment was based on the joint ULB-VUB Library and Learning Centre at the Plaine campus and was conceived as group work (4 groups). The project confronted students for the first time with a complex and highly detailed programme, dealing with future needs and practices in learning and studying at the university. Questions on a fit representation of the university were tackled, together with diversified user needs and distinct challenges in the structural design and detailing of the building, including a pedestrian bridge. The project benefitted largely from direct exchanges with the university’s project coordinators, introducing students to the demands and concerns of users and commissioners.

**MA Studios Team**

**Laurent Ney, Stéphane Meyrant, Aranzazu Galan Gonzalez,
Carole Aspeslagh, Séverine Hermand and Ahmed Z. Khan with
the collaboration of Hera Van Sande, Geert Pauwels, Jonas
Lindekens, Jan de Moffarts (VUB).**

**MA 1 Studio: University and the City: Sustainable (re)Development of the Crown Barracks - Adaptive Re-use & Mixed-use**

The project for this this year’s Sustainable Design Studi focused on ‘Adaptive Reuse and Mixed-use’ for sustainable (re)development of the Crown Barracks in Brussels. With this focus, and taking into account the student housing challenge and the potential of these barracks in the broader university-city relationship, the main problematic for SDS was formulated as: How to integrate these Barracks in the urban fabric that acts as a catalyst for unfolding a sustainable [re]development of a university neighbourhood? While addressing this focus and problematic, 8 distinct visions of urban design based scenarios have been developed in the form of Master Plans, and 32 Sustainable Architectural Projects. They provide a concretely illustrated and coherent set of innovative ideas as the stepping-stones for creatively defining the urban project for the Barracks, and deliberating a more inclusive vision on their sustainable development.

**BA Tir – the Education**

**MSc in Civil Engineering: shaping your future**

Our MSc in Civil Engineering graduates are able to design,
model, build and operate structures in the domain of buildings
(public and private), industrial buildings, and infrastructures.

**MSc in Architectural Engineering: the best of both worlds**

Our MSc in Architectural Engineering graduates synthesise the ways of engineers and architects within the building process. They can design relevant buildings, coordinate multidisciplinary projects and build complex constructions.

**MA1 Multidisciplinary Project**

The students in MA1 in civil engineering are grouped in small teams of 4 or 5 to perform the full structural and geotechnical design of a 3D building according to Eurocode prescriptions (including structural and geotechnical analyses and dimensioning with Eurocodes, connections details and drawings).

**Architectural Studios**

The architectural studios are conceived as a central, continuous training over the five years of study. Professional architects and engineers provide inspiring contributions in these studios, based on the rich experience built in practice.

**Awards**

Armande Hellebois: special mention for her PhD thesis entitled ‘Theoretical and experimental studies on early reinforced concrete structures. Contribution to the analysis of the bearing capacity of the Hennebique system’ (2013, supervised by Prof. B. Espion) from the Associazione Edoardo Benvenuto for the research on the Science and Art of Building in their historical development. www.associazionebenvenuto.org

Brice Delsaute: René Houpert 2nd Prize awarded at the 2016 Young Researchers competition organised by the AUGC at ULG for his presentation entitled ‘Monitoring and modelling of the viscoelastic properties of cementitious materials’ in the framework of his PhD jointly supervised by Prof. S. Staquet and Prof. J.-M. Torreni (Ifsttar, Université Paris Est).

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Joint training activities

Structural Design Project

3rd Bachelor Civil and Architectural Engineering: the students have to perform the architectural, structural and geotechnical design of a medium-scale building (car showroom, theatre, multifunction industrial building …). The in-situ context and function of the building are taken into account in order to develop the architectural design. The combination of architectural and civil engineering students in small groups of 3 to 4 students provides an ideal framework to stimulate the discussions and to exchange various perspectives between the students.

Design Project Competition

BATir organised on 1 December 2015 the 13th Real Estate Design Project Competition. With more than 80 students enrolled in Architectural Engineering, Civil Engineering, Architecture and Business Engineering master degrees from ULB and VUB, the competition was a true success! The purpose was to redesign the BRYC (Brussels Royal Yacht Club), the Brussels marina, including the integration in the Brussels Region Canal Development Plan. 8 teams designed their project within only 24 hours only and they were highly appreciated by a selection committee composed of practitioners.

Internships

The Ecole Polytechnique de Bruxelles (Université Libre de Bruxelles) offers their students the unique opportunity to spend 3-month internships in companies. The emphasis is put on the student’s personal development.
Alumni under the spotlight

Sophie Lambrighs,
MSc Civil Engineering 1994

Sophie Lambrighs has been recently appointed as CEO of Home Invest Belgium. She graduated as a Civil Engineer in 1994 and from the Executive Master in Management (Solvay Brussels School in Economics and Management).

She started her career in Structural Design in Brussels (BGroup) and Paris. After spending 10 years at AXA Belgium first as Project Manager and then as Investment Manager, she joined Immobel in 2013. She always maintained the collaboration with BATir as a part-time lecturer, initially in structural calculations and later organising the Design Project Competition.

Kristel Mazy, MSc Urban Design and Regional Planning (2008), PhD (2014)

Kristel has been appointed full time associate professor of the Faculty of Architecture U Mons. Trained as an architect (Horta, 2007), Kristel graduated as an Urban Designer (2008) and PhD (2014) from BATir. During her research she addressed the urban and port challenges around Brussels’ canal. She then worked for a few months for the Brussels Region before joining U Mons.

Stephan Cloitre,
MSc Civil Engineering 1994

Stephan has been recently appointed Executive Vice President of JLL (in Atlanta, USA). He graduated as a Civil Engineer in 1994 and has 22 years of domestic and international experience in the following specialties: Corporate Real Estate, Integrated Workplace Management Systems (IWMS), Performance Management, Process Improvement, Business Intelligence, Contracts Management, Change Management, Space Planning and Design, Facilities Operations and Maintenance. In his current role, Stephan leads a global team of 200 professionals dedicated to help organisations solve business issues through technology enablement. Stephan also serves as a ‘Top Rated Faculty’ for CoreNet Global’s Master of Corporate Real Estate Programme.

Elise Stramare, MSc Architectural Engineering 2008

Elise has been recently appointed Facilities and Real Estate Manager by Infrabel. She graduated in 2008 after having played the essential role of student representative of the first cohort in Arch. Eng. in BATir. She started her career in structural design (Arup, located in Milan), then joined CFE (Brussels) as structural engineer and later Kemin Industries (Veronella) as customer service manager.

BATir is very proud of their Alumni. Many more to come.

MSc in urban design and regional planning

This programme was not organised this year. We are working on redesigning it and expect to launch next year 2 new programmes in English in collaboration with VUB: a Master in Urban Studies (120 ECTS) and an Advanced Master in Sustainable Urban Design and Regional Planning (60 ECTS).

Life-long learning: Executive Master Large Construction Project Management

The design, execution and operation of major construction projects are more and more complex: technological innovation, international contract context, new financial packages in an ever competitive sector. This is why ADEB-VBA, ULB and VUB have decided to launch for the 7th time a part-time life-long learning programme designed to cope with the mutations of the construction sector.

Summer School

LGC Team (S. Staquet, B. Delsaute, O. Leclercq and G. Vanhooren) co-organised an international DTU-COST-RILEM doctoral course entitled “Service Life of cement-based materials and structures” at the Technical University of Denmark in Lyngby, Denmark, August 15-19, 2016 with more than 60 students coming from 27 different countries.

Graduates 2015-2016

<table>
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<th>Programme</th>
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<tbody>
<tr>
<td>BSc Arch. Eng.</td>
<td>9</td>
</tr>
<tr>
<td>MSc Arch. Eng.</td>
<td>26</td>
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<tr>
<td>MSc Urban Design</td>
<td>2</td>
</tr>
<tr>
<td>MSc Civ. Eng.</td>
<td>35</td>
</tr>
<tr>
<td>Executive Master Large Project Mgt</td>
<td>20</td>
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TOTAL: 92
BATir – the Cooperation with Developing Countries

BATir is coordinating for the 3rd time a joint capacity building project with Université Libre de Bruxelles, Université Catholique de Louvain and University of Liège as Belgian partners to support the institutional development of the Institut de Technologie du Cambodge located in Phnom Penh, Cambodia. The project is supported by the Belgian cooperation through the ARES-CCD Agency (www.ares-ac.be/cooperation-au-developpement). The current project aims at developing the research capacity and infrastructure. Already 8 research projects and 5 PhD students are funded. The library is supported through training and procurement. The Technology Transfer Office has been created as well as a new Maintenance Office and an information system.

BATir – Spin-Off

We are proud to have launched our first spin-off: Kabandy, enabling construction professionals to deliver building information models using open standards www.kabandy.be Best wishes to our two young and talented entrepreneurs: Dr. Rajan Filomeno Coelho and Dr. Benoit Descamps.

BATir – Fundraising ‘Tomorrow. Think to give back.’ (M. Welters)

After the Ecole Polytechnique de Bruxelles (Université Libre de Bruxelles) called to support the new Science and Technology Hub in La Plaine campus, Michel Welters (MSc Civil Engineering, 1985) decided to answer positively. Michel is a well-rounded, balanced and result-oriented CEO, entrepreneurial Civil Engineer and MBA with solid international experience (multi-lingual). He has hands-on style with long-term perspective. He specifically targeted his support towards BATir research and teaching activities. Thanks to his significant sponsorship, BATir has been able to purchase a 50kN triaxial test for their geomechanical laboratory. BATir sincerely thank their Alumnus Michel Welters and hope you will share his motto ‘Tomorrow. Think to give back.’

BATir – the Consultancy

Urban Metabolism as a support tool for a sustainable transition towards a circular economy of the Brussels-Flemish Metropolitan Region, OVAM

Philippe Bouillard, Head of BATir
Partners

BATir is a partner of BRUFACE joint programmes with VUB

The Faculty of Architecture is partner of the BSc in Architectural Engineering

Sponsors

ADEB-VBA and VUB are partners in the Executive Master in Large Construction Project Management

Structural and Material Computational Mechanics
Research Unit (SMC)
Prof. T. J. Massart
thmassar@ulb.ac.be

Civil Engineering Laboratory (LGC)
Prof. B. Espion
bespion@ulb.ac.be

Laboratory of GeoMechanics (LGM)
Prof. B. François
Bertrand.Francois@ulb.ac.be

Architecture and Architectural Engineering Research Unit (AIA)
Prof. R. Devos
Rika.Devos@ulb.ac.be

Institute for Urban Design and Regional Planning (IUAT)
Prof. Ph. Bouillard
Philippe.Bouillard@ulb.ac.be

Funding Agencies

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Isabelle.Toussaint@ulb.ac.be