Urban Traces

2017–2018

Bill Addis
Independent Scholar
BCUS Visiting Research Fellowship

The project

The central part of my contribution focused on the reuse of construction materials and components in the context of sustainable construction in Brussels.

In addition, I also contributed several lectures and individual seminars with research students in the fields of construction history and extending the life of existing structures in both the VUB and ULB. These are fields in which I have had links to staff in both universities for many years.

Duration

The Visiting Research Fellowship was awarded to me in May 2017, for a period of up to 3 months.

To fit in with my diary, and that of the Department of Architectural Engineering (ARCH) in which I was based, as well as individual staff in the department, the secondment was arranged in two parts:

- 24th September to 2nd December 2017 and
- Tuesday 16th to Friday 27th January 2018.

Context

My main contribution was with staff, students and partners engaged in a number of current projects in the field of reusing existing buildings being undertaken within the AE-Lab which involve collaboration with several external partners:

- BAMB Buildings as Materials Banks
- BBSM Brussels' Buildings: Source of future Materials
- Architects' houses in Brussels. Strategies for valorisation
- Willy Van Der Meeren Living Lab (commencing early 2018)
- Hidden Innovation. Building church roofs in Belgium (1830s–1930s)

The visiting research fellowship project

Aim

The purpose of this fellowship was to provide new insights for those architects, engineers and contractors engaged in conservation and extending the life of existing buildings to draw upon similar experience gained in the UK and other European countries. Today this area of activity is often called 'The Circular Economy'. This work will help enable Brussels professionals to benefit from best practice in other countries.

Scope

As there is a growing number of post-war buildings now reaching the end of their first life, it is proposed to focus on post-war buildings up to around 1970. The post-war urban heritage offers good opportunities but poses specific challenges: the energy performance of these buildings is much lower than that required today, yet their cultural and historical value is not yet recognized. Due to increased pressure on the urban fabric, this built heritage is under serious threat: it is subject to unnecessary demolition (total or partial), with adverse consequences in terms of heritage loss, wasted effort in new construction, and the unnecessary consumption of raw materials for the replacements.

VUB expertise

Through interaction with and collaboration between different VUB research groups the approach was truly multi-faceted, integrating expertise from technical teams with urban design and cultural teams. Such cross-disciplinary collaboration is essential when dealing with heritage and energy issues in a city's redevelopment.

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The ae-lab is the research laboratory of the department of Architectural Engineering. Within this group, specific knowledge is being developed on post-war building materials (Stephanie Van de Voorde), structural renovation techniques (Ine Wouters), Monument Care (Inge Bertels), energy performance (Filip Descamps) and transformable building systems (Niels De Temmerman). The collaboration with the department of Mechanics of Materials and Constructions MEMC was mainly aimed at the design of structures meeting requirements regarding strength and stiffness (Lincy Pyl and Tine Tysmans).

This Fellowship built upon previous research at VUB. Six of the eight professors (Van de Voorde, Wouters, Bertels, Descamps, De Temmerman and Tysmans) have gained knowledge on 'Retrofitting housing in Brussels', through the research platform

Within the overarching theme of 'The Circular Economy' the project focused on materials used to construct the built environment and assessing their current value in reuse projects to encourage sustainable solutions to retrofit the city.

'BrusselsRetrofitXl', financed by Innoviris in 2012–2016. Research projects dealt with "Understanding and conserving the post-war housing stock in Brussels (1945–1975)", "Dynamic Reuse Strategies for the retrofitting of post-war housing in Brussels" and the "Design of lightweight building components for the renovation and reconversion of existing buildings". The work I undertook served to build further on the acquired knowledge addressing the combined question of retrofitting, heritage and reuse.

The Fellowship in the context of BCUS

The fellowship project fell within the BCUS priority research theme "Sustainable urban environments" addressing the built environment and material infrastructures in Brussels.

Within the overarching theme of 'The Circular Economy' the project focused on materials used to construct the built environment and assessing their current value in reuse projects to encourage sustainable solutions to retrofit the city. These included: increasing the reuse of materials arising from demolition, reducing the use of new construction resources, and helping avoid the loss of heritage.

Method

The first stage was to review the existing VUB projects being undertaken with partner research groups in Brussels, and identifying suitable types of building to be included in the study. Following this review of projects, a series of four workshops were organised for all project partners.

In these workshops and a large number of smaller meetings and one-to-one discussions with VUB staff, I was able to bring my experience of the reuse of materials and building components, and the delivery of sustainable construction projects. This included:

- Reuse projects in the UK, Germany, Switzerland and Austria.
- My research and publications on sustainable construction, Design for Deconstruction, and use of Reclaimed materials and components.
- The ground-breaking work of the Waste Resources Action Programme (WRAP) in the UK, and their many publications, including the implementation of the 'recycled content' concept.

- My experience regarding reuse and sustainability from a large number of building and master planning projects.

- Case studies and project experience from the 2012 London Olympics.

A large body of information regarding this work has been given to the VUB team in electronic form, and can be made available to all project teams. This included guidance documents, case studies, published papers and books, and links to internet sites, including sites providing downloadable material.

Workshops, lectures, etc.

During my 3-month stay at the VUB, the following Workshops, meetings, discussions and lectures were delivered.

Workshops for VUB staff and external visitors

Four seminars on building and materials reuse were held (AE-Lab staff + external project collaborators):

- 26th October: Cui bono? The impact of environment-driven innovation
- 7th November: Recycled content. An effective tool for reducing landfill
- 16th November: Between rust and dust. How far down can we (re)cycle?
- 28th November: Using construction history when extending the life of structures

See attached flier and BSUC Website.

A final workshop was organised in the AE-Lab:

- 25th January 2018: Effective research related to the circular economy

Participation/Attendance at seminars/workshops

- 28th September: Research seminar in Department of Architectural Engineering
- 13th October: BCUS Lecture on “Stadssalonsurbains: Grounded City not Competitive City” – by Ewald Engelen (University of Amsterdam) and Karel Williams (University of Manchester)
- 13th November: Research seminar on Church roofs in Brussels

- 21st November: Fédération Royale d'Associations Belges d'Ingénieurs Civils et d'Ingénieurs Agronomes (FABI) – Journée d'étude "Les métaux ferreux dans la construction – Des origines aux années 1970 : 5. La fin de la Seconde Guerre mondiale aux années 1970". Namur.
- 23rd January 2018: BAMB Workshop on the Circular Economy

Other meetings related to research projects

- 20th October: Meeting with staff at ROTOR (Materials reuse firm http://rotordb.org) to discuss their collaboration with VUB and their work on various projects in Brussels.
- 23rd October: Meeting with Lincy Pyl and Tine Tysmans from the Department of Mechanics of Materials and Constructions regarding reuse of materials.
- 8th November: Meeting with Linsy Raaffels discussing her PhD on "Architects' houses in Brussels. Strategies for valorization"
- 15th November: Meeting with Camille Vandervaeren discussing her PhD work on Circular Material Management, Design for Change and Building Information Modelling (BIM)
- 17th November: Meeting with PhD student at ULB discussing her research on "Collaborations and exchanges in building in Belgium (1870–2015)"
- 16th January: Meeting with Eleni Tsangouri from Dept. Mechanics of Materials and Constructions (MeMC) at VUB, on the history, architectural conservation and non-destructive structural health monitoring applied to stone masonry towers/houses.

Lectures

- 30th October "The use of physical models in the design of shell structures 1930–1975" at ULB. See attached flier and BCUS Website: http://urbanstudies.brussels/news-event/two-public-lectures-bill-addis-visiting-research-fellow-brussels-centre-urban-studies
- 6th November "The industrial manufacture of housing: the story of the aluminium bungalow in the 1940s" at VUB. See attached flier and BCUS Website: http://urbanstudies.brussels/news-event/public-lecture-bill-addis-industrial-manufacture-housing-story-aluminium-bungalow-1940s
- 11th November "The use of physical models in the design of shell structures 1930-1975" at VUB Department of Civil Engineering.
- 24th November BCUS Public lecture on "The development of engineering design methods from 1750 to 1900". ULB. See BCUS Website: http://urbanstudies.brussels/news-event/public-lecture-%E2%80%98-development-engineering-design-methods-1750-1900