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We explore a design-led build-to-rent development and how to construct a circular economy

BETTER

BUILDING

SIMONE DE GALE

The powerhouse architect and RIBA Board member discusses her path to success

WORKPLACE **DESIGN** Wellbeing and sustainability

sit at the core

CONTRACT FURNITURE



BUILDING A **CIRCULAR ECONOMY**

Sustainability is no longer just a buzzword, it is now an essential consideration across the board with the construction industry at the forefront

The importance of retrofitting buildings to meet new standards is high on the agenda, as is reusing materials. Dutch company New Horizon are leading the charge as "urban mining" specialists, who dismantle buildings with the aim of stocking up on as many materials as possible for reuse.

There are also a wealth of reuse marketplaces gaining traction that offer the industry and individuals a place to connect, and buy and sell leftover building materials. More than ever, architectural and design studios are reinventing existing building stock and restoring period features in the buildings they renovate. With this in mind, we asked a panel of architects to discuss how their studios are sourcing materials for projects and adapting their material use in order to create a more circular economy.

IAIN MONTEITH, RIBA, ARB DIRECTOR, LOADER MONTEITH

Loader Monteith Architects are a Glasgow based practice specialising in new build bespoke homes, housing, extensions and conversions, working throughout the UK. They design for living, learning, playing, growing, caring, meeting and more – all with sustainability in mind. Their work covers green belt land, conservation areas, and listed buildings. As a specialist conservation accredited firm, they place restoration at the core of what they do. www.loadermonteith.co.uk



IAIN MONTEITH, LOADER MONTEITH

The architecture and construction professions need credible base processes to ensure the sustainability, quality and longevity of built projects. A readily actionable approach for studios is adapting and reusing what already exists. Many of our projects involve working with existing buildings. As such we take the opportunity to advise clients that the building they have is (usually) useful - it just needs to work harder. There is already so much material in the foundations, floors, walls and roofs which can be reused, reimagined and enhanced. We always assess materials available either on site or that can be sourced locally for reuse. We believe it offers the opportunity to reinforce the character and identity of the project, rooting it in a specific place and time. Additionally, working with tight budgets forces us to think creatively and consider materials in a different way.

This thinking has always been inherent in our approach and is demonstrated in our first project as a practice 'The Collectors House'. This is one (small) example where reclaimed materials are used from the structure through to finishes. Here, we stripped back the structure to expose the existing rafters and put them on display. Locally we sourced reclaimed timber flooring from a nearby school sports hall, putting it to use throughout the kitchen and dining space. Reusing existing materials relies on clients accepting the approach and understanding the global benefits. At Ceangal House, the client was committed to reclaiming and reusing masonry and stone available from existing buildings that were demolished as they came to the end of their life. The reclamation involved an enormous commitment from the client, who reclaimed and hand cleaned over 4000 original bricks.

This act allowed us to design the building specifically around the reuse of the materials and the structural slab was set approx gomm below FFL to accommodate the bricks. They also act as a thermal store, so the end result is not just aesthetic but environmental, with the life of the material estimated now to extend beyond 200 years.

As a specifier, it is not always simple to say 'yes' to the reuse of materials. There is apprehension around the longevity and suitability of materials or components, i.e reclaimed slates may be beyond their useful life for weather proofing, but suitable for flooring. Structural fabric such as timber must also be assessed by consultants to ensure their suitability.

Where our projects are not able to benefit directly from reuse, we look to source responsibly from manufacturers and suppliers that can prove materials which are recycled, referring to sources such as the BRE Green Guide to specification. Ensuring we understand and specify materials that lend themselves to being reused by future generations helps us to consider the life of materials beyond our own buildings and lifetime. As material availability becomes scarce, and costs invariably rise due to external pressures, material reuse will not just be a sustainable approach to construction, but a necessary one.

BRIAN LACHAT, SENIOR ARCHITECTURAL PROJECT MANAGER & CARA BROCHIN, INTERIOR DESIGNER NELSON WORLDWIDE

NELSON Worldwide is an award-winning firm delivering architecture, interior design, graphic design, and brand strategy services that transform all dimensions of the human experience, providing their clients with strategic and creative solutions that positively impact their lives and the environments where they work, serve, play, and thrive. www.nelsonworldwide.com

BRIAN LACHAT & CARA BROCHIN, NELSON WORLDWIDE

As the architecture industry moves closer to net zero energy buildings and passive housing, architects are learning that sustainability requires a holistic approach of both operational and embodied carbon to mitigate climate change. Architecture firms are evolving the design process and the built environment around reuse. adaptation, and resiliency. One of the most effective zero carbon practices is the circular economy, which involves industrial processes to help restore or regenerate products and materials by design. The superior design of materials, products, and systems enable resources to maintain value, extend life, and significantly reduce waste. To build a strong circular economy, architecture, design, and strategy firm, NELSON Worldwide, has a unique approach that is beneficial to the sourcing materials process.

NELSON is a pilot partner with the Material Bank's program to reduce carbon emissions from our material choices. The Material Bank is a time-saving resource for NELSON architects and designers, serving as a one-stop-shop for sourcing materials. Through this program, designers can select samples from multiple vendors across different fields for each project. Smaller samples are collected by Material Bank, which are then packaged together



to minimize waste and sent to their homes or office. Once the samples are no longer needed, Material Bank has a user-friendly return program that promotes reuse, recycling, and reduces waste. Since implementing this program, the NELSON team has reduced our carbon emissions by approximately 6.8 metric tons and eliminated the shipment of over 12,000 packages.

A great example of when we were able to create a more circular economy was at Bearing Bike Works in Atlanta, Georgia. Bearings Bike Works is a popular afterschool program that invites children of all ages to build a bike of their own while successfully developing the skills to transition into the workforce. They use parts and pieces of old bikes that have been donated or found and refurbish them to generate new life- creating their own internal circular economy. This project includes the renovation of an old auto repair facility. In the interior, the primary structure, timber scraps, fencing, and metal ceilings were salvaged for reuse as much as possible. You can see these pieces throughout some of the millwork, display designs, and more. Additionally, local salvage yards and closing businesses around the community allowed the opportunity to salvage creative signage and décor throughout. On the exterior, the Quonset hut roof panels were repurposed for exterior metal soffit materials.



Question Time

JOHN PUTTICK, DIRECTOR, JOHN PUTTICK ASSOCIATES

John Puttick Associates is a London-based architectural studio specialising in civic, public and community buildings and working throughout the UK. The studio was founded in 2014 with a competition-winning entry for the refurbishment of Preston's Brutalist bus station, which reopened to the public in 2018 to critical acclaim, demonstrating the practice's skill in delivering a technically challenging civic project which has secured the future of a Modernist icon. www.johnputtickassociates.com



JOHN PUTTICK, JOHN PUTTICK ASSOCIATES

Repurposing existing buildings has been a core aspect of our work at John Puttick Associates since the practice was founded in 2014. Our earliest small projects – a gallery for emerging artists, the interiors of a residential building – sought to give new life to existing spaces. In 2015 we won an international competition to refurbish the Brutalist Preston Bus Station, taking this process to a larger scale. Regardless of size, our approach has consistently been retaining an existing building as the starting-point, seeking to optimise the environmental benefits of reusing materials while tailoring a structure to its new use. At Preston Bus Station this meant addressing a building that – while architecturally important – was neglected and did not meet contemporary needs. Aside from its architectural merits, the 1960s concrete structure represented a significant investment of embodied carbon and we worked with a team of specialists to tackle technical deficiencies to prolong its lifespan. From an organisational perspective, the



project required changes to the way the building was arranged – we introduced these with the minimum of removal of existing fabric, seeing the process as careful 'surgery'. Wherever possible we repurposed removed building fabric on the site itself. An example of this is the reuse of original Iroko timber barriers to form new seating for waiting passengers – making good use of the material and bringing a sense of warmth to the visitor experience.

More recently we have tackled complex challenges of adapting existing buildings to entirely new uses. In the centre of Grimsby Town we are working on the adaptation of a series of Victorian maltings and warehouses into a centre for young people. The structures are in various states of repair and so a range of approaches are needed - from simple conservation of the better-preserved buildings through to salvaging materials for later re-use from those in a state of near-collapse. This requires detailed coordination with contractors to ensure salvaged materials are dismantled and stored with care. Again, we are reusing materials creatively wherever possible - including repurposing original roof trusses for joinery. Where new functions cannot physically be accommodated by the existing building - the sports hall and climbing wall, for example - we have developed new-build structures. The creative combination of existing and new structures is essential to extending the life of buildings in many cases, often requiring a highly considered design process to ensure architectural heritage is respected.

Where we are working on new-build projects, specification of materials is critical to reducing carbon footprint. The building's structure often makes the most significant impact to this - we are working with structural engineers to specify recycled steel or sustainablysourced timber. Beyond this, procuring materials from demolished buildings for new projects remains highly challenging. In some situations we have found it successful to work with contractors at an early stage to ascertain materials that may become available between projects - but this remains a case-by-case approach. Ultimately broader change is needed allowing the systematic sharing of salvaged materials between sites, perhaps encouraged within Planning Policy. Finally, wherever we are designing a new building it is important to remember that it will - one day - become a retrofit or re-use project itself. Creating buildings that allow flexibility for future reconfiguring and the intelligent use of detailing to allow future demountability have become important design considerations when positioning architecture within the concept of a circular economy.



EVE WALDRON, FOUNDER, EVE WALDRON DESIGN

Eve Waldron Design is an architectural design consultancy specializing in interiors, founded in 2000. The practice works across a range of sectors: commercial, education and residential. They offer a full design service acting as lead consultant from concept through to completion, as well as furniture consultancy and supply. They pride themselves on developing schemes that are contextually appropriate and reflect the inherent quality of a material and craftsmanship.

material and craftsmanship. www.evewaldron.com | www.ewop.co.uk

EVE WALDRON, EVE WALDRON DESIGN

Conversations about sustainability have become increasingly difficult to avoid in interior design circles, and rightly so - the building sector contributes over 40% of worldwide carbon emissions, and that cannot continue.

Over the last few months, since we were commissioned to work on the interiors of the Entopia Building, the Cambridge Institute for Sustainability Leadership (CISL)'s new headquarters, Eve Waldron Design have been engaged to turn conservations into actions, embarking on our greenest and most ambitious project to date. Rather than demolishing an existing structure and building a new one, CISL have been retrofitting an existing structure, a 1930s neo-Georgian former telephone exchange in central Cambridge, in a green, carbon-neutral manner that aims to achieve multiple sustainable building and wellbeing certifications, including BREEAM (Outstanding) and the WELL Building Standard (Gold).

We are keeping circular economy principles in mind at all times, knowing that CISL, as a world leader in its field, expects the project to serve as an exemplar for future sustainable retrofits around the globe. In practice that means using a range of bold recycled, recyclable and reused, mainly bio-based materials. For joinery, we are using hemp sheet material bound with a sugar-based resin, birch plywood and bamboo, with carcasses made from recycled plastics. The tiles for the kitchen backsplashes are made from 98% recycled materials, approximately



60% of which would normally end up in landfill, and the flooring is linoleum, which captures more climate-harming CO2 than it releases. Kitchens are made with wood from a renewable giant bamboo species renowned for its CO2-absorbing and oxygen-producing properties, as well as its extreme durability, with worktops made of recycled plastics. For upholstery, we are using hemp and wool and some fabric made from recycled bottles. Some of the chairs and barstools are made from compressed hemp.

Furniture manufacture in the UK produced 835,300 metric tons of carbon dioxide emissions in 2019, and so strong circular principles apply- approximately 60% of the furniture is second hand or reused. This proved to be a challenging process that required considerable wit and ingenuity. As CISL's own existing furniture is disassembled and in storage we've had to base our choices on small photos that have presented certain assumptions about materials and colours that haven't always been accurate. We explored Cambridge University's own second hand furniture store - they keep products on their database called Warp It, which is available to all university communities. We have, for the most part, and with certain compromises, been able to find what we were looking for, but it's definitely been more timeconsuming than purchasing new! As the process has advanced it has been interesting to hear views from different members of the team - on which furniture they like aesthetically and for what reasons. It has highlighted to me the importance of design in sustainability. - as 'good design' ensures its own longevity in that we want to hold on to it and reuse it. Ultimately, the longevity of aesthetic design surely must be equally as important as physical durability. Measuring sustainability criteria in the interior sector has a long way to go to become comparable and easier to evaluate, and our choices of materials and products can always be challenged. We hope that the finished Entopia building serves as a case study for what is possible as well as a lab for trialling materials.