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## ROOM AND BOARD



MEASURED ARCHITECTURE

A VANCOUVER FIRM DEMOLISHES AN EXISTING HOUSE, ONLY TO CREATIVELY REUSE SOME OF THE CONSTRUCTION MATERIAL TO BUILD A NEW, ENERGY-EFFICIENT HOME.

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PHOTOS MICHAEL BOLAND, UNLESS OTHERWISE NOTED

Long praised as one of the world's most liveable cities, Vancouver is looking to add a new feather to its cap by winning the Greenest City challenge by 2020. This is an admirable goal but as with most broad bureaucratic campaigns, it remains to be seen how much real change will follow. Buildings appear to be a good place to start, as construction and demolition account for about one-third

of the region's total waste, and operations for roughly one-third of its total energy use.

Measured Architecture Inc. is up to the challenge, meeting both of these staggering statistics head on with their Cloister House in Vancouver's West Point Grey neighbourhood. Directors Clinton Cuddington and Piers Cunnington along with project lead Katy Young employed a holistic view of the project—from the sustainable deconstruction of an existing house to the design and construction of a durable low-energy home based on the principles of Passive House. Also known as *Passivhaus*, this is a building standard for ultra-low-energy-efficient homes developed in the German-speaking countries in the late 1980s.

**ABOVE** USING CHARRED WOOD AS FORMWORK, NEW CONCRETE FOUNDATION WALLS EMERGE. **BOTTOM** TARPS ARE SET UP TO PROTECT THE WOOD FORMWORK BEFORE THE CONCRETE IS POURED.

With a growing portfolio of tailor-made homes, Measured remains interested in the basics, or as Cuddington puts it, “buildings that stand up and keep the elements out.” They are also committed to reducing the amount of energy needed to achieve these simple objectives. Cunnington describes their work as “backdrops for people's lives,” and the team saw the Cloister House as an opportunity to “get back to minimum standards of practice” and to “express the process of con-







struction," all the while seeking to deliver a project that is appropriate for both client and site.

Vacant lots are close to nonexistent in Vancouver, so almost any building project necessitates some amount of demolition. Between 500 and 750 homes are demolished in Vancouver every year with nearly all of the resulting waste sent to a landfill, even when almost all of it could be recycled or reused. Buildings get taken down for many reasons, but the existing house on this site was in poor condition and contained large amounts of asbestos. Cuddington believes that "if we can eliminate the need to demolish due to decay, then that's a step forward." Measured partnered with the City of Vancouver and Pacific Community Resources, a job-training organization, to participate in a new Building Deconstruction pilot project as part of the City's 2020 Zero Waste goals. The house was pulled apart and its

materials were sorted for recycling or reuse. This is only the second project undertaken in the program and the city is carefully tracking the salvaged materials to see where they end up. The process is currently commensurate with the cost of conventional demolition, largely through the low cost of labour, and a fast-tracked building permit process eases the pain of the extra time on site.

The Cloister House is intended to serve as a refuge in the city and is so named for its internal focus and solid architectural perimeter. Its hill-top site affords mountain and water views to the north, and the architects balance these long exterior views with shorter internally focused ones. The two-storey 2,400-square-foot house with an additional 700-square-foot laneway house are organized along a north-south spine demarcated by splayed steel or rock wall segments. The central circulation path meanders inside and out

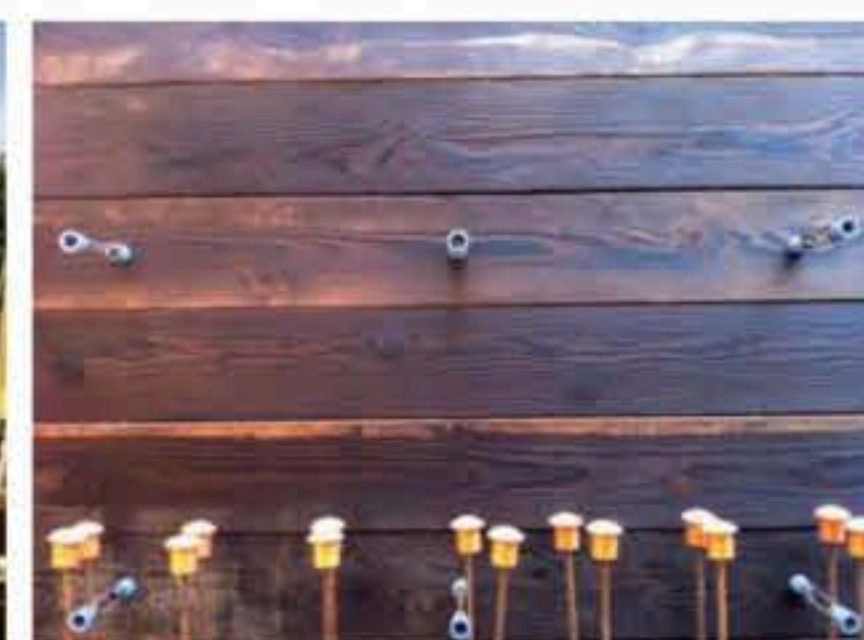
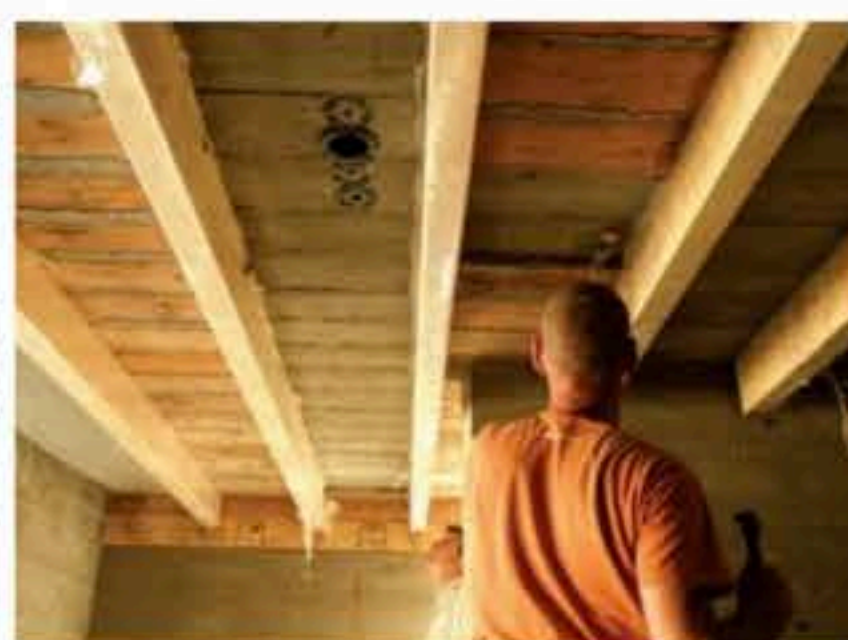
with modestly sized rooms and gardens arranged around it. The house is gently modulated in section to work with the existing topography of the site, and close attention is paid to the relationship between interior and exterior. A tiny 100-square-foot pocket garden in the centre of the house offers inhabitants the intimate view of a maple tree from the kitchen.

A comprehensive view of the building process from beginning to end has resulted in a number of simple but effective low-tech construction methods to reduce the amount of material and energy needed to build and maintain the house. Measured looked to rigorous Passive House standards for energy efficiency when developing their design, and came very close to achieving the stringent 15 kWh/m<sup>2</sup> in heating and cooling energy. Finding appropriate window assemblies proved difficult, and when the alternative solution would have resulted in reducing the overall number of openings by 15-20 percent, they and the client decided that they couldn't sacrifice the views for a relatively small gain in efficiency.

Using Passive House principles, the all-concrete construction employs an eight-inch-thick interior structural concrete wall with four inches of insulation and rain screen, plus another five inches of thermally broken hung concrete wythe on the exterior. These cantilevered exterior panels allow for maximum continuity of insulation. One of the problems with concrete, from the standpoint of material efficiency, is that two wood walls must be built to construct the concrete one—in this case, four wood walls for two concrete walls. Contractor Julien Winfield proposed to mitigate this excess by building a more intelligent formwork system of shop-fabricated 4' x 8' modular units. The modules could be easily manoeuvred on site and reused from level to level as well as on future projects. The forms are essentially boxes made of plywood and dimensional lumber that are faced with a finish material—in this case, charred tongue-in-groove fir planks. Charring eliminates the need for chemical preservatives and deepens the grain, leaving a rustic high-relief surface

OPPOSITE TOP THE EXISTING DWELLING NECESSITATED DEMOLITION DUE TO ITS POOR CONDITION AND THE PRESENCE OF ASBESTOS. ABOVE, LEFT TO RIGHT SORTING THROUGH THE SALVAGEABLE MATERIAL; A VIEW OF THE PREVIOUS HOME AS IT WAS BEING DEMOLISHED.

BELOW, LEFT TO RIGHT THE WOOD RESULTING FROM THE DEMOLITION OF THE EXISTING DWELLING; INSPECTING THE NEW WOOD FLOORS SUPPORTING A CONCRETE POUR ABOVE; FORM TIES; MOVING FORMS INTO POSITION; THE EXPOSED CHARRED WOOD; THE FINISHED CONCRETE SURFACE.



that the architects found desirable. In addition, Measured plans to use about 10-15 percent of the charred boards as soffit material, and some will be used to construct the perimeter fencing. Winfield will store the remainder for use on a future job. Exposed yellow cedar beams appear to float in mid-air within the HBV wood-concrete-composite floor system designed in consultation with Fast + Epp Engineers.

Further design and construction ingenuity can be seen where threaded form ties pass through walls to become the attachment system for demountable interior panels. The potential for a relentless all-concrete interior is tempered by hanging cleated panels of Venetian plaster and white oak millwork locally sourced and milled by Nico Spacecraft. The panels offer some design flexibility over time and afford easy access to the electrical wiring hidden behind. Additional ser-

vices are corralled along the central spine and stair—a feature that is irreverently twinned with a custom steel slide, because fun and sustainability are not mutually exclusive.

The ideal world envisioned by Vancouver's Greenest City challenge must undoubtedly include delivery models like those used in the Cloister House, a small project that demonstrates what is possible when all members in the delicate building ecosystem—city, client, architect, contractor (too often at odds in our current flawed world)—are finely tuned and working in concert toward common goals. The Cloister House is scheduled for completion this year. **CA**

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