MONAD

LOCATION
Vancouver, British Columbia

SIZE
1,171 m²

COMPLETION
2012

ARCHITECT
LWPAC (Lang Wilson Practice in Architecture Culture)

STRUCTURAL ENGINEER
Fast + Epp

ONSITE CONTRACTOR
Trasolini Chetner Construction

PREFABRICATION AND WOOD FABRICATORS
Controlled Architectural Systems Assembly and Intelligent City Research and Development

PROJECT OWNER / DEVELOPER
Intelligent City Research and Development

Project Overview

Located in the Kitsilano neighbourhood of Vancouver, MONAD contains four homes ranging from 79 to 186 m² each. The four-storey structure is built on a lot that would have traditionally held just one single-family house.

Designed to change the way people view urban living, MONAD serves as the prototype for a larger building technology platform—an innovative approach to designing modular structures. The smart building methodology balances the prefabricated paradigm against the need for comfortable, urban family housing.

MONAD's unique multi-storey, multi-family construction system was conceived by architects at LWPAC to demonstrate the viability of building structures that are sustainable, desirable, affordable, easy to build and modify—and made using engineered wood products.

The building features open, yet customizable, spaces and a roof garden for the top two homes, one of which is occupied by the two principals from LWPAC and their family. MONAD was designed to demonstrate an adaptable, scalable housing system which uses prefabricated wood components that can be modularized and used in a wide range of situations and building opportunities.

While prefabrication provided many advantages of automation, including accuracy, cost effectiveness and speed of construction, MONAD features several key differences from typical modular construction. They used applied technologies to design, configure, manufacture and deliver the wood structure. The design is highly adaptable and configurable, since shop fabrication allows better precision and quality. And most importantly, this design approach can be used for mid-rise construction and potentially taller buildings.

Photo courtesy of Nic Lehoux

"From the beginning, we said that the MONAD platform needed to be capable of constructing taller buildings, and it can. So, our original decision to use wood was based on our ability to prefabricate off-site and develop an even greater degree of automation with wood in that process."

***Oliver Lang**, Principal and Creative Director of LWPAC, President of Intelligent City*

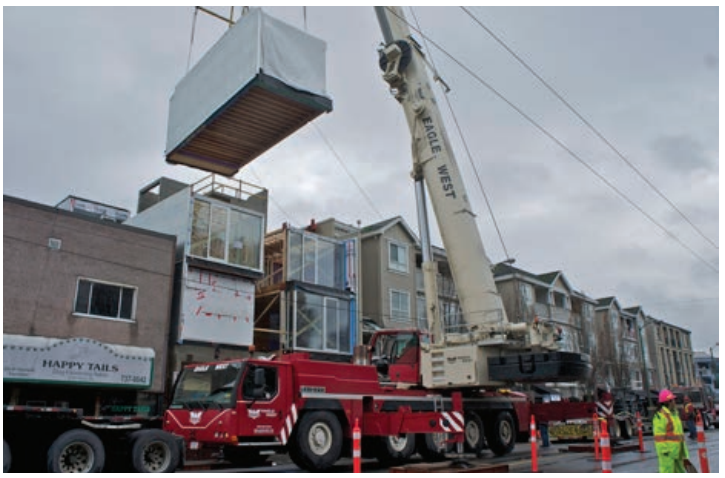
Wood Use

MONAD was built using a combination of laminated veneer lumber (LVL) and parallel strand lumber (PSL) for the beams and columns, along with I-joists for roof and floor joists. Dimension lumber was used for wall studs and non-structural partitions, and plywood sheathing was used throughout.

The architects chose wood because they wanted an adaptable material that could be easily and accurately machined using their advanced software. They also wanted a highly sustainable, carbon-neutral building system, and knew that wood is efficient in sequestering carbon. The all-wood building was constructed over a concrete podium; the only steel used was for connectors.

Speed of construction was also a significant benefit as offsite fabrication reduced waste and allowed for improved quality control. Factory fabrication took about three months and new efficiencies with the system will allow future projects to be fabricated and built even more quickly. Installation took just two days; the entire project was craned into place and erected over a weekend.

MONAD's prefabricated elements were made by Controlled Architectural Systems Assembly, a joint-venture between Intelligent City Research and Development (LWPAC's sister technology company) and Preform Construction Ltd., a manufacturing operation based in Surrey. LWPAC is currently working with Intelligent City to launch a new manufacturing facility with greater automation integration and more advanced machine and assembly tools. The new capabilities will allow them to expand the MONAD concept to build additional projects even more quickly and efficiently.



Photos courtesy of Nic Lehoux

The wood grain featured in this profile is western hemlock.

FOR MORE INFORMATION

This profile is published by Forestry Innovation Investment, the Government of British Columbia's market development agency for forest products.

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naturallywood.com