

Ramming earth to a new level

Top builders forge association to promote new green technology

Penticton: An exterior wall reveals the inherent strength and design flexibility of insulated rammed earth construction. Project by Solum Rammed Earth Builders Ltd.

By Dermot Mack

Rammed earth is one of the most environmentally aware building technologies on the planet: insulated walls made from engineered soil mixed with a small amount of Portland cement as a binding agent, creating "insulated stabilized rammed earth." The concept sources materials locally, virtually eliminates waste and wood and provides energy savings and a thermal and moisture barrier in a single package.

Now, a number of leading British Columbia and Washington State home builders have formed the North American Rammed Earth Builders Association to elevate rammed earth to a new level. Each member is trained and certified to build stabilized insulated rammed earth walls through a program recognized by the Architectural Institute of BC.

The local builders have refined the technology to deliver wall systems that are easy to build and provide a degree of design flexibility that works as well with low-cost renovations as upscale custom homes. It is the potential energy saving, though, that may ram the system into mainstream construction.

This winter, Nicholas Hill of Solum Rammed Earth Builders Ltd. of Penticton conducted a thermal imaging test comparing the heat loss through his rammed earth wall and a conventional stick-frame wall. "The rammed earth wall had virtually the same temperature across the entire area with no thermal bridging, while the stud wall had a large number of pockets with heat loss," he explained.

That is because the insulated stabilized rammed earth wall is a monolithic unit with high thermal mass, explains Arno Schmidt of Ecosol Design and Construction Ltd., a Vancouver, Georgie-award winning builder who is completing the first

rammed earth house in Metro Vancouver this spring on Bowen Island.

Four to five inches of high density insulation is imbedded between the exterior and interior walls Schmidt explained. Both walls may have plumbing, wiring and any ducting channelled into their solid structures during the ramming process. The result, he said, is unparalleled sound deadening, energy saving, fire and moisture resistance. The walls, he added, are also insect and rodent proof and "will literally last for centuries."

Bob Deeks, president of RDC Fine Homes of Whistler, a 2007 Georgie winner, is building Canada's first stabilized rammed earth house to R-2000 and Built Green platinum standards, the highest energy-saving levels in the country. The luxury custom house is built with a mix of engineered soil, mostly consisting of sands and gravels, and Portland cement that is as strong as high strength concrete, Deeks said, while using a fraction of the cement. The house is expected to be a showcase of ecological construction when it completes this fall.

According to Hill, the flexibility of rammed earth makes it ideal for sustainable home renovations for both aesthetic as well as energy saving purposes. "Additions can be tied right to stick frame buildings," he said. Wood studs and plywood sheathing are eliminated, he noted, and the earth walls are constructed with reusable forms. Inside, rammed earth can be formed into various patterns, or left as a smooth finish that never requires painting.

Building with earth dates back centuries, Hill said, but "the future of rammed earth is being discovered right now."

Rammed Earth Builders

The following are members of the North American Rammed Earth Builders Association (NAREBA).

British Columbia

Boundary Earth Builders
Christina Lake: 250-447-6427

Canadian Overhead Store
Cranbrook: 250-505-3667
canadianoverhead@shaw.ca

Earthen Homes
Duncan: 250-748-8632
www.earthenhomes.ca

Ecosol Design & Construction Ltd.
Vancouver: 604-254-0258
www.eco-sol.ca

Rammed Earth Victoria, Builders
Victoria: 250-592-6688
www.rammedearthvictoria.com

RDC Fine Homes Inc.
Whistler: 604-932-3618
www.rdcfinehomes.com

Solum Rammed Earth Builders Ltd
Penticton: 250-493-7732
www.solumbuilders.ca

Terra-Sol Construction
Pemberton: info@terra-sol.ca
www.terra-sol.ca
Washington State

Earth Dwell Ltd.
Port Townsend: 360-385-9594
www.earthdwell.com

Shelterra Group LLC
Friday Harbour: 360-472-0097
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Randy Bachman's Salt Spring Island home, where earth walls blend with solid timbers. The home has captured environmental and builder awards for Terra Firma.



saver, according to a study by the BC Institute of Technology, which found Sirewall homes maintained consistent temperatures, and averted moisture, despite outside temperatures and weather.


The current cottage renovation, while much more modest than most Sirewall projects, shows the flexibility of rammed earth, and its potential in the home improvement industry.

The renovation involves adding a two-storey, 900-square-foot addition to a 1930s-era cottage for a retired Salt Spring Island couple.

"Alongside their hobby farm, they needed a workspace to prepare fruits and vegetables for the local farmer's market," Krayenhoff explained.

The couple hired Terra Firma to build the Sirewall rammed-earth addition to their existing kitchen. With space for a library, lounge, washroom and office, the new addition will complement an existing rammed-earth landscape wall and raised patio overlooking the ocean.

Watch for more local rammed-earth buildings in the future. Terra Firma has introduced about 150 builders to the concept, and one of the graduates, Arno Schmidt of Ecosol Design & Construction Ltd., is completing a rammed-earth house on Bowen Island. Another is underway in Whistler. Krayenhoff welcomes the competition, part of his vision to make rammed-earth construction a mainstream building method.

"Rammed earth is a realistic urban option," he said, noting that one project he is involved with is an Australian housing subdivision where up to 20 houses will be built, all partially with the Sirewall system. 

Learn about rammed-earth building

Curious about how rammed earth would work for an addition or renovation for your home? Sirewall offers hands-on introductory rammed-earth courses on Salt Spring Island.

Course dates for 2008 are April 19-20, July 5-6 and September 20-21. Over two days, participants will get an introduction to rammed earth, including hands-on experience from choosing soil, blending, ramming earth and testing forms. To register, contact www.sirewall.com