

GREEN TECH THE SERIES COLUMN FOR DECEMBER 17, 2015
HEADLINE: NATURAL BUILDING: IS IT THE FUTURE?

As we come to the end of another year, I have seen more advances this year in certain areas of sustainable building than I have for well over 10 years. Natural Building is slowly, but surely, coming of age. Buildings made of earth and straw are no longer the domain of hippies and those with the “back to the land” outlook on life. At the same time, some individuals and builders simply don’t trust these methods, even though they have been around for ages. Misconceptions are probably the largest stumbling blocks. One example is the often heard comment about straw bale homes, “It’s straw so it rots.” Yet there are straw homes built in the US that are over 150 years old. In fact, both wood and straw are cellulose materials and wood certainly does rot, but earthen building construction has been around since 5000 BC in China. In fact, it was the method of choice up to 2000 BC in this country.

As is the case with a lot of natural materials, once the mainstream gets their mind around it, it becomes sophisticated and expensive, having lost the hands-on approach that made it rugged and affordable. Two such building materials that have acquired an acceptance and are recognized by most of the building inspectors, provided they are given stamped drawings that is, are straw bale and rammed earth. The growth over the past few years, to where small general contractors can specialize in these methods, is now upon us.

Straw bale is probably the one natural material that has seen the most acceptance. First used in the state of Nebraska in the late 1800’s, the vast majority of these homes are still standing. Straw bale is widely accepted as offering an insulation value of R-30-35, depending upon how tight the bales are packed. They are assembled in two common methods, full wall assembly or used as the infill on a timber frame/post and beam assembly. The infill method is simple to understand; they are not structural. When used as wall assembly, the bales are stacked up. A method of compressing the bales is used where a plate is set on the top of the pile and compressed towards the foundation. As stated, building departments usually ask for stamped engineered drawings and, now that this method is recognized in the building code, the difficulty in the past to get approvals in some areas has now been alleviated.

Getting a mortgage is possible and so is home insurance. Tests done by CMHC on fire resistance shows a burn rate of less than half that of a wood frame wall.

There is no limitation on design or size. I have seen interior walls done in both wood frame and straw bales. The largest consideration is getting dry, well packed consistent bales for a project. As an alternative natural building method, straw bales are likely the leader in the number of homes built in the past few years.

Rammed Earth homes elicit the image of dirt walls that could, conceivably, come tumbling down if they shake and in any area that is earthquake susceptible, this held some truth in the older methods of assembly. Today, rammed earth homes have evolved considerably. Such examples include the St. Thomas Church in Shanty Bay, outside Barrie, Ontario, built in 1838-41 and the NK'MIP Desert Cultural Center built in British Columbia, which was built in 2014. The later is the largest single wall rammed earth assembly in North America.

Rammed earth building benefits from the construction advancements developed over the past few years. The days of making wood forms and tamping the soil are past. In fact, they are now usually a blend of local clay, sand and sometimes gravel. The composition of the clay used in early assembly was critical to the overall integrity, along with even compaction in the forms. The revival, as we see it today, started in the 80's. It has been a slow acceptance, gaining speed over the past 5 to 10 years. Today, concrete forming technology, the actual metal forms used for concrete, have advanced this assembly, utilizing pneumatic compaction tools with a soil blend that contains Portland cement in its formula. This admixture technology has made it possible to mix the hydrothermal properties to the best strength. In the past few years, utilizing the, now popular, rigid foam panels, often called ISO board, between the inner and outer layers of rammed earth has produced consistency in insulation values.

The walls are typically 18" thick and the mixing of soils gives the walls a uniquely different finish. In fact, the use of coloring in the earth mix has been known to add even greater appeal for some walls. Like straw bale, these 18 inch thick walls, correctly compacted with a 6 inch thick rigid foam inner core, have an R value of over 40. There are claims amongst the rammed earth builders that, when blended with Portland cement, they can reach compression strength similar to poured concrete.

The growth of natural building has spawned the Ontario Natural Building Coalition and they have grown considerably over the past few years. Their annual conference will take place at Camp Kawartha, near Lakefield, Ontario from April 2-3 this coming year. Designers and builders who follow their methods and designs are listed on their website. Go to www.naturalbuildingcoalition.ca for

more information. The growth of these two natural materials, in particular, shows a continued acceptance of natural materials in building assembly.

As this is my last column for 2015, I would be amiss to not express my thanks to those that have offered their assistance on both sides of the border, a list that would fill a page so I will offer my appreciation to those I have leaned on for technical assistance. Here at home, the folks at the Kingston Whig Standard and, specifically, Kim Popovich, deserve a special “Thanks” for allowing me to bring the ever changing world of sustainable building to you each and every week. I appreciate my partner Donna for editing these columns each week. Lastly, to my readers who weekly add to my inbox, its your interest and questions that make this column what it is. Merry Christmas to everyone!

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