

the co-creator

a newsletter for collaborative creators | ecovillages.ca

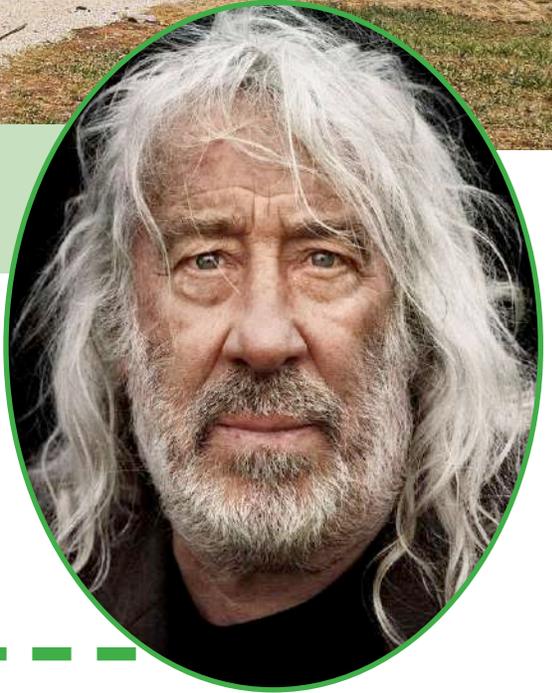
What is an Earthship?

Designed by architect Michael Reynolds in the 1970s, an Earthship is a passive home that meets six human needs:

- 1) Thermal heating/cooling
- 2) Solar and wind electricity
- 3) Contained sewage treatment
- 4) Constructed with natural and recycled materials.
- 5) Water harvesting
- 6) Food production



Who is Michael Reynolds?



The father of earthships, this architect in Taos, New Mexico, is known for pushing norms in his profession. An advocate for the use of recycled materials in building, his designs make use of car tires, aluminum cans and plastic bottles. He founded Earthship Biotecture, a firm with a global outreach offering internships for accreditation for students.

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Manitoba Earthship Build



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Earthship Biotecture Graduate



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Manitoba Earthship Build CO-FOUNDERS

Nicole Bennett and Kris Plantz



Kris Plantz holds Bridget while wife Nicole Bennett determines the next course of action

“When we decided to build an Earthship we knew we would want to be off-the-grid,” notes Nicole. “But what does off-the-grid mean to us? It meant supplying our own electricity and a way to survive without relying on outside sources. We still wanted (and have today) internet and phone line.”

“For a few years we had the great “land versus plans debate.” In the end, we needed to find property first. After writing out the must-have (trees, acres, distance to the city) and nice to have (barn, grid access, approach) lists we started looking. When we found the property, we got serious. That was the moment that we realized it was going to happen and that our lives were going to actually change,” observes Nicole.

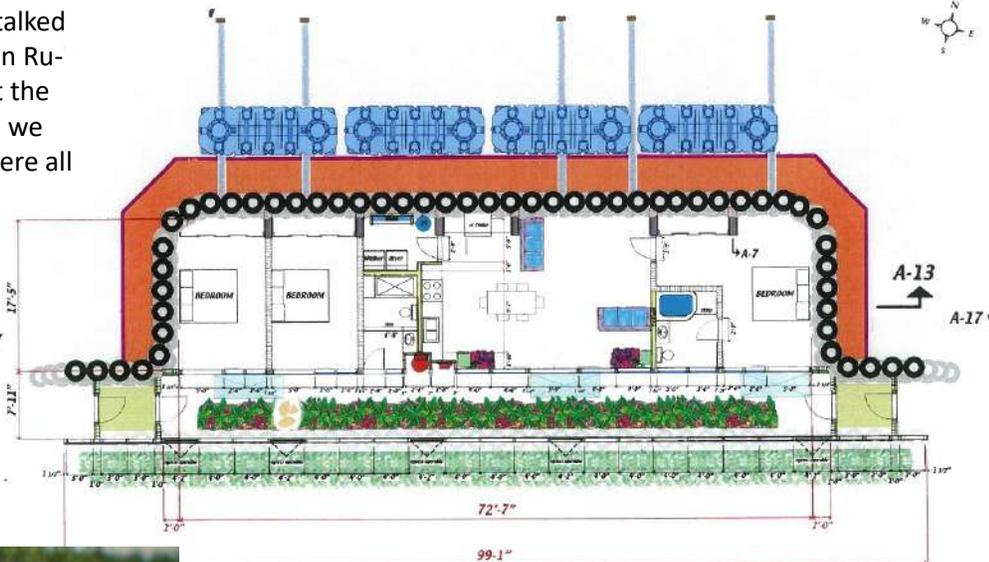
“But before we did any land shopping Kris talked with various Building and Planning Offices in Rural Municipalities. We needed to know that the RM would be friendly to our project before we moved forward. We lucked out that they were all very supportive.”

“We weren’t prepared for how long it actually took. We started building July 1, 2012 and moved in September 2013 to a partially finished home that still did not have power or running water! The majority was completed by April 2014, but we are still working on stuff even today,” admits Nicole.

Building this Earthship became a twenty-first-century barn-raising of sorts. “We never would have built this home without the help we got from so many volunteers who heard about the project,” says Nicole.

“There were over 100 volunteers in the first year who mainly helped pounding tires. We also had a journeyman plumber and apprentice that installed all the plumbing from cisterns to gray water planters. A solar hobbyist took interest for that component. A few core volunteers with skills learned from previous Earthship builds came back for the second year. The moral support and advice from other Earthship owners on Facebook was so helpful.”

“The first year the tools were simple! Mainly human labor, hammers, saws, sledgehammers,



“We have the potential to enhance the planet. People could go further. We could make the Earth sing.”

- Michael Reynolds

shovels, wheelbarrows and laser levels. We pounded all the tires and did the concrete work. From the digital side, our Facebook group, Manitoba Earthship Project helped find volunteers and keep people in the loop. In year two, the WWOOF program helped bring longer term volunteers on site.”

“We are contacted A LOT by others who are planning similar projects,” says Nicole. “At least two more Earthships started in Manitoba in 2015 (one of which we know is approved). What we really want to see is a change in code so it is easier, both rural and urban, to make better choices. Why not allow various gray water systems in cities? Why is having solar power such a big deal?”

Things need to change in legislation to actually allow wider change.”

“Our focus has been reducing waste and lessening our negative impact on the environment around us. I find it difficult to align my behavior with my beliefs. It’s about the little things and then the bigger things.”

On June 1, 2014 Nicole gave birth to Bridget May Plantz and their lives changed again.

“Living in an Earthship with a newborn feels the same as living anywhere I think. From this perspective, we really don’t think of our home as being that different but I guess it is. I do think about how she will accept as normal the way we collect our water, gather our own power, and run our unique home. I like that thought.”

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more photos at <http://ecovillages.ca>

Scottie 'Econerds' Davidson

Day Job: *Plumber*



I'm 31 years old, have worked in construction trades and earthships for over 6 years now. My passion for earthships stems from my desire to live free, grow my own food, produce my own utilities and reduce my reliance on the current economic system for life security.

I am working as a plumber in Calgary until I find paid positions on earthship builds. In 2011 I completed a three-month internship at Earthship Biotechure (EB). In 2013 I returned to EB to attend the Earthship Academy, earning my diploma. EB will now list any build I'm helping with on their website.

I was introduced to earthships via the documentary "Garbage Warrior" in 2008 or 2009. That movie planted a seed. In 2011 after my life went to crap, I found myself not knowing what to do with myself. I took a chance. I traveled to New Mexico. After 4 months in Taos, I knew I wanted to make a career out of this.

Since then, I've worked on 8 or 9 different builds, completing four from start to finish. I'd like to work a great deal more, as I've long wanted to become an earthship specialist for hire.

I became aware of Kris and Nicole's earthship through Bill Zenert, a mutual friend. I first met Bill in New Mexico during my internship. He attended the very first EB academy, and both of us being from Canada we connected and became friends.

Shortly after returning to Canada, Bill contacted me regarding Kris and Nicole's Earthship. I was there for September and October in 2012. The following spring I moved from Calgary to rural Interlake. I lived on Kris and Nicole's land, helping them build. From May 2013 to September 2013 I lived there, helping them construct their home. Upon its completion, I made the trip to Taos, New Mexico again to attend the academy."

Shortly after, Scottie was also involved in an earthship build in Rivers, Manitoba.

With that many people, a community arises around the effort.

"The community around an earthship build is amazing. Usually builds are set up as WWOOF (World Wide Opportunities on Organic Farms) exchanges where volunteers from all over the world come help build. So there's a wide diversity of very friendly people who come out.

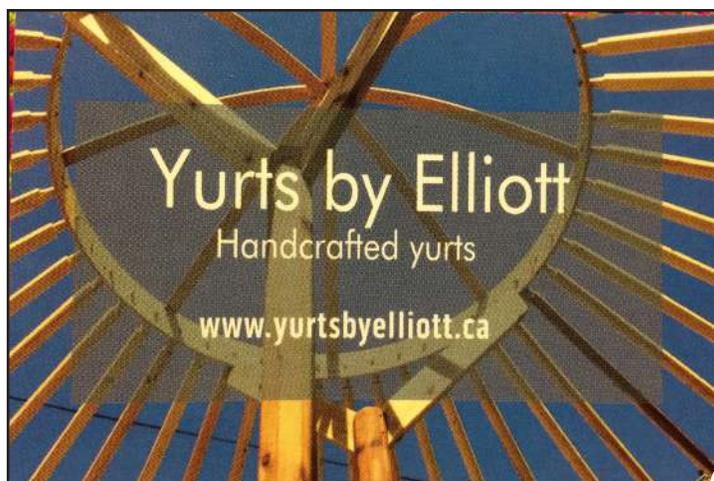
Earthship owners are usually well-networked and talk to each other often. Usually when someone new is looking to build an earthship, they will reach out to existing home owners and ask for assistance in some way. Consulting others with related experience helps a build operate much more effectively.

Nine out of 10 times, everyone in that local earthship community wants to help grow the worldwide community and see it thrive."

Scottie's own vision has had to change over the years.

"My vision originally had been to be an earthship specialist for hire. However most are not willing to pay someone like myself to help a build go smoothly. Most people building earthships are DIY'ers. Often they would rather

...continued on page 9



The Aspen Root Passive House

Mavis Lewis-Webber and Randy Webber

by Randy Webber

The Aspen Root Passive House is the culmination of a 25-year journey for Mavis Lewis-Webber and Randy Webber. Mavis, an early childhood educator is a pioneer in Manitoba championing environmental education for pre-school children. Randy has worked in the Manitoba Environment industry for over 27 years, mainly in government and more recently in the non-profit sector. Both are committed to living a sustainable lifestyle.

The Aspen Root Passive Home began as a dream for a beautiful, practical, sustainable, energy efficient home on our rural property near Gimli, Manitoba. The name "Aspen Root" was chosen not only because the Aspen is the dominant tree species on the house site, but also because of one of the characteristics of the Aspen tree – its roots spread from a mother tree and continue to support new trees, even after the mother ages and ultimately dies. It is our hope that the concept of Passive House will follow the pattern of the Aspen and grow and spread in Manitoba, even after we are gone.



An important part of our approach is to encourage and support the development of local expertise in the design and construction of energy efficient buildings. Where possible, we have used local businesses and sustainable building products. The primary team members include the architectural design team at Bridgeman Collaborative Architecture and the building team at Sundial Building Performance. A number of innovative design/construction techniques have been included to help make this house a candidate for certification as a Passive House.

Passive Houses are buildings in which comfortable indoor conditions can be achieved throughout the year with minimum energy expenditure. Passive Houses must meet stringent requirements for both design and construction. They are certified on a thorough quality check of their design and construction as seen in the box to the left.

In addition to using Passive House Certification requirements for building performance, our home construction has been optimized for comfort over the anticipated lifetime of the building (+/-50-75 years). For example, we made the design decision to not include active heat pumps, but instead provided a better envelope and a heating system that could easily accommodate active systems in the future, if we wanted to further decrease energy use. While the project is targeting Passive House Certification requirements, because they are the most stringent and broadly agree with project performance values and goals, it also is designed to easily adapt to net-zero and/or off-grid and be converted to barrier free. It uses many pioneering natural products, finishes, and local materials whenever possible. ...continued on next page

Heating

- Specific space heating demand $\leq 15 \text{ kWh}/(\text{m}^2\text{a})$ or alternatively: heating load $\leq 10 \text{ W}/\text{m}^2$

Cooling (including dehumidification)

- Total cooling demand $\leq 15 \text{ kWh}/(\text{m}^2\text{a}) + 0.3 \text{ W}/(\text{m}^2\text{aK}) \text{ DDH}$
or alternatively: cooling load $\leq 10 \text{ W}/\text{m}^2$ AND cooling demand $\leq 4 \text{ kWh}/(\text{m}^2\text{aK})$

$\theta_e + 2 \text{ } 0.3 \text{ W}/(\text{m}^2\text{aK}) \text{ DDH} - 75 \text{ kWh}/(\text{m}^2\text{a})$

but not greater than: $45 \text{ kWh}/(\text{m}^2\text{a}) + 0.3 \text{ W}/(\text{m}^2\text{aK}) \text{ DDH}$

Primary energy

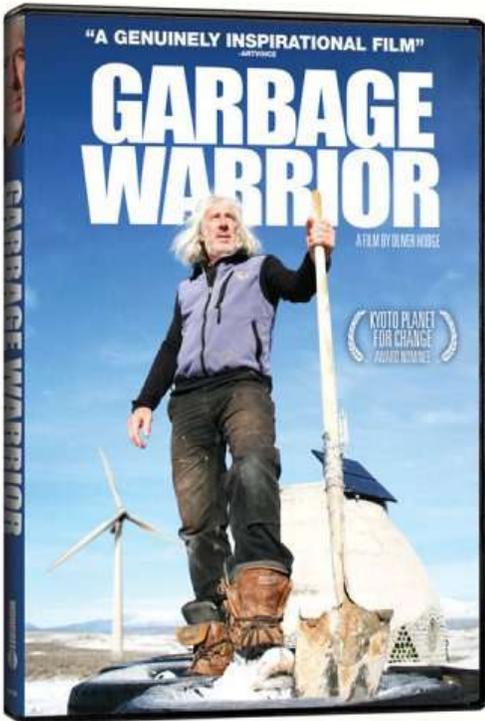
- Specific primary energy demand for heating, cooling, hot water, auxiliary electricity, domestic and common area electricity $\leq 120 \text{ kWh}/(\text{m}^2\text{a})$

Air tightness

- Pressure test result, $n_{50} \leq 0.6 \text{ h}^{-1}$

Passive House Institute Certification Criteria for Residential Passive House Buildings, 13/09/2013.

Movies



Garbage Warrior

A film by director Oliver Hodge, Garbage Warrior explores the life of architect Michael Reynolds. Garnering a 7.8/10 rating on IMDB and 80% on Rotten Tomatoes, it is a provoking, thoughtful documentary.

Hodge introduces the viewers to the life and challenges of Michael Reynolds in a very empathic way. We see Reynolds exit from his schooling with high hopes and dreams. He is drawn to the Taos area of New Mexico where he begins to build what has been on his mind. Some people are drawn to his vision, and at first his plans really take off. With video of the first experimental Thumb House made from recycled material including beer cans, it is a film that portrays the visions and dreams of an architect that is still ahead of his time.

Winner of Vancouver International Film Festival's Most Popular International Documentary Film in 2007

www.garbagewarrior.com

Aspen Root

The Aspen Root Passive Home will use 90% less energy than the total energy needed to maintain occupant comfort in a "typical" new build high performance home in the Manitoba climate zone. At the same time we expect the home will provide higher levels of comfort, durability, and usability for the lifetime of the home.

The team has systematically documented the house construction to help provide a roadmap for those who choose to follow us on our journey. As we move into the next phase we will continue to document building performance. Real time temperature and humidity data from sensors embedded in the floor, walls and roof systems will be available and aid in future enhancements to design and construction techniques. The 90+ sensors will enable the team to actively monitor the interaction between occupants, environment, active systems (mechanical) and passive systems (design and enclosure). The data will help challenge many of the basic assumptions that often restrict the development and acceptance of higher performance construction techniques.



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R I Q T S L M B E E R E I U E
E R H I I E U N S C C W N R C
Y B V S T D H C H N I H U B T
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ecology
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geometry
greenhouse
housing
housing
humidity
innovation
level
passive house
patagonia
performance
permaculture

permits
pounded
recycle
reynolds
sledgehammer
taos
tires
vapourbarrier
windship



A Closer Look

Earthship Biotechure

Official website
<http://earthship.com/>

Earthship Academy Facebook Group
<https://www.facebook.com/EarthshipAcademy/>
<https://www.earthshipglobal.com/>

Manitoba Earthship Build

Official website
<https://sites.google.com/site/earthshipmanitoba/>
Manitoba Earthship Facebook Group
<https://www.facebook.com/groups/manitobaearthship/>

The Aspen Root Passive House

<http://www.bridgmancollaborative.ca/aspen-root-passive-house.html>
<http://www.passivehousecanada.com/projects/aspen-root-passive-house/>

Rivers Earthship Build

Rivers Earthship Facebook Group
<https://www.facebook.com/groups/1330251873656055/>

EcoNerds Inc.

Scott Davidson
econerds.inc@gmail.com
<https://www.facebook.com/EcoNerds.Inc/>

Join the Discussion

New posts on ecovillages.ca include...

6 small town music festivals in Manitoba you need to tune into

Manitoba is home to many music festivals. Here are a few of the lesser known ones.

Ecovillage Workshop at The Gathering

Find more information about a workshop about ecovillages at CCEDNet's event The Gathering at St. John's High School.

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Rivers Earthship Build Tom and Sarah Plosker

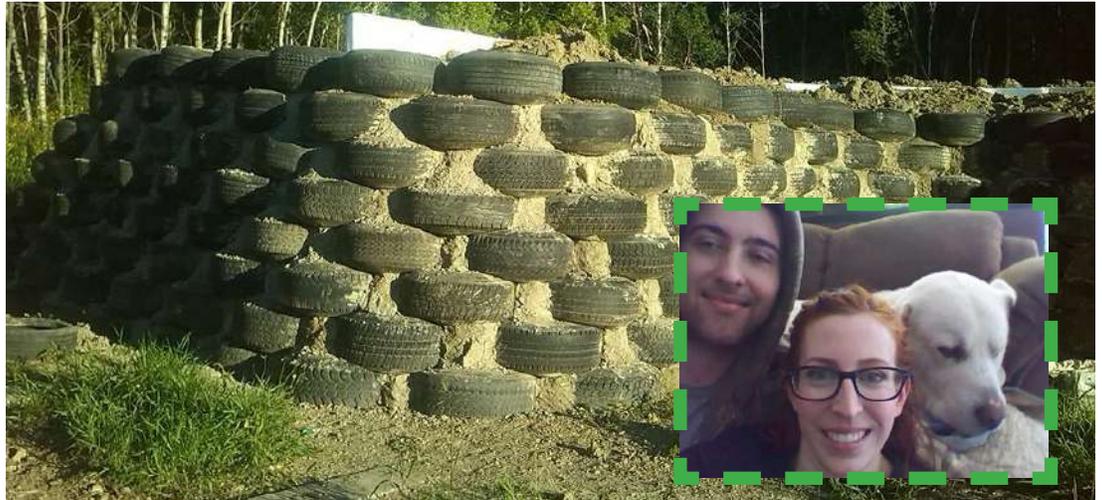
Tom and I lived in the “student ghetto” when I was going through university. It was cramped, and we could hear our neighbours beside, above, and below us. We were seeing a huge increase in our water, electric, and grocery bills every year. At the same time, our paycheques were not keeping pace.

We wanted a solution to these problems. That solution we found in the independence and self-reliance that comes hand-in-hand with being off-grid.

This started with lots of googling and YouTube. We watched “Garbage Warrior” a few years after it came out and got really excited about Earthships. Three-foot-thick rammed earth walls separating us from the -30 degree Prairie winter weather were very appealing! (Along with giant windows on the south-facing wall letting all the wonderful sunlight in).

The decision to buy land was very exciting! That purchase made it seem very real to us. You don’t spend that kind of time and money for the right spot to build unless you’re committed to following through! Some of the factors we weighed in deciding land included no more than a 45 minute commute for work, and a more rural area versus somewhere that used to be rural and is now small residential plots. We chose our piece of land because it’s close to a small town with all the amenities we could need. Our closest neighbours are some horses and wheat fields. We also chose to build the earthship further away from the grid road, compared to many homes out here. This meant paying to build a longer drive, but we felt it worth it for the privacy.

Tom and I had been talking about building an earthship for a number of years, and finally we said let’s just do it, and things progressed from there. The starting point was when we moved to Manitoba for work in 2013, knowing that this move was permanent. It took us a while to find the right piece of land, determine a layout of the earthship that worked for us, find out what all we



needed to meet municipal regulations, collect tires, break ground, and so on. All of this was very new to us! We learned a lot on the fly or through the internet.

It was helpful with Tom being a jack-of-all-trades. He has worked in new home construction as well as custom machining. We also worked with an architectural technologist to draw up the blueprints and get them stamped so that we could qualify for a building permit.

In the process we met a lot of people who have worked on earthship builds or who have built their own. Some were on the Canadian Earthships Facebook group (whom we’ve never met in person) and some right here in Manitoba. It is extremely useful talking to people who have built their own earthship and have lived in it for at least a few years. It helps to assess what works and what doesn’t. People were very generous in material and time. We received bottles, cans, and tires for use in the build.

Volunteers helped pound tires, which is a lot of work! We have had to learn a lot about solar power setups and electricity in general.

We were initially estimating 3–5 years to completion. It turned out that the first two years were spent getting our ducks in a row, so in the end it will be 5-6 years total. We are still working on it today! We’ll get the roof up within the next year and then we can slowly work on the interior as things progress.

...continued on next page

Rivers Earthship

Once finished, we plan to grow a lot of our own food (we've been doing this to some degree already). Lots of little projects in the works (e.g. a solar heated tub, beach area for our pond, and a wind turbine or two. I mean, if you can do something using passive energy sources versus fossil fuel, then why not? There is definitely something to be said about a minimalistic lifestyle that is tied in with nature.

We would love to see more eco-friendly homesteads. Anyone interested in it should think about if it's right for them based on their own interests and goals. It's not for everyone: it takes a lot of hard work initially, but it pays off. With rising food costs, it makes sense to grow your own food. Same with rising energy costs: solar and wind power are more cost effective every day.

more photos at <http://ecovillages.ca>

Scottie Davidson

figure things out the hard way than pay for a specialist.

My vision evolved. Today I would like to find a way to purchase a sizeable property in Alberta. With that I would start working on a dedicated Earthship community.

One way would be with an Earthship Bed and Breakfast. This way people interested in learning more about earthships, could rent one for a one night experience. This would allow Canadians who cannot make the trip to New Mexico the opportunity to learn about Earthships without having to cross a border. Also, Earthship Biotecture is very interested in spearheading a "Canadian Earthship Academy." If I had the land, I would contact Michael Reynolds and open one. At his Academy in Taos, an average of one third of the students in every session is Canadian.

With a potential like this, where do we learn more about them?

"Well, if one is looking to learn more about earthships, I would suggest first starting with the movie "Garbage Warrior." That movie explains what earthships are and how they work beyond a basic interest. One of the best ways to learn is to get your hands dirty and volunteer on a build. Or contact a builder like myself to ask questions. As a community we are happy to talk and share knowledge. Earthships are my passion and I can talk your ear off.

Look them up on the web. Read about them. Find where the closest one is to you, and attempt to make contact with the owners. Most owners are great about showcasing their home to people with a genuine interest in earthships.

Here in Calgary I completed the Econerds Earthship greenhouse on Grow Calgary's urban farm as an open public building that anyone curious can visit.

If you are serious about learning how to build an earthship, I would highly recommend making a trip to Earthship Biotecture and attend the academy. The skills and know-how one gets from EB will save a lot of time. The little tips and tricks can save a large amount of time during a build. If you are looking to build your own earthship but don't have the time to go, others like myself are for hire to make sure the build goes smooth and everything goes in at the right time.

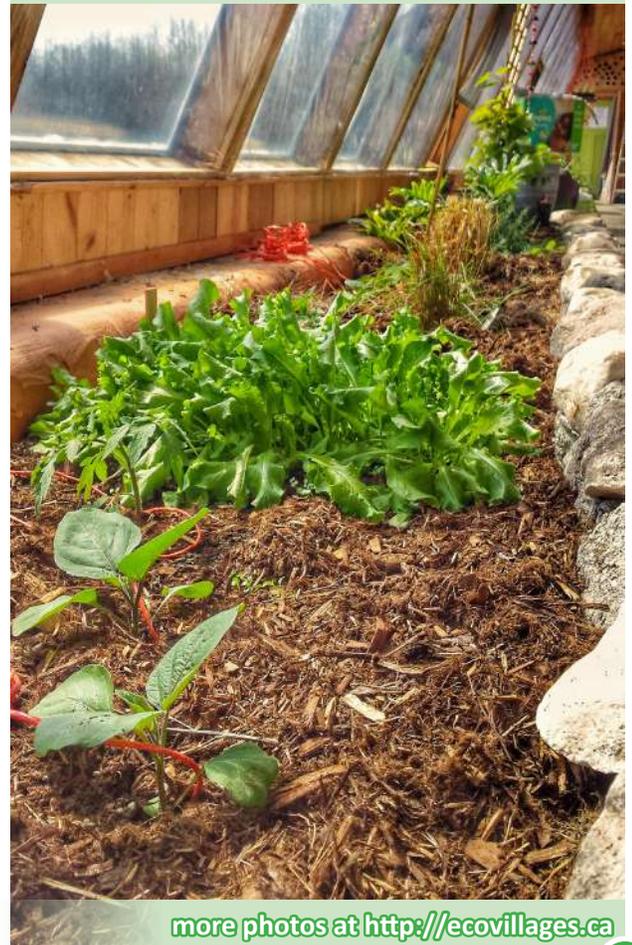
Manitoba Earthship

"I hope she learns from us about community, living sustainably, and making dreams reality. She is going to hear a lot of stories, especially about what we lived without while building. Like bucket showers, washing in the creek, our 'barn' living room, camping in negative temperatures, and so much more."

Would they do it again?

"Kris always says 'we wouldn't do it!'" exclaims Nicole. "What he means is we would not build our own home with our own hands again. There was, and still is so much work involved! I'm happy we did it. But I'm with him, we wouldn't want to do this again. But then again, this was the most cost-effective way to do this... so maybe we would."

Nicole, Kris, and their team have built a durable, sustainable future and set a significant precedent. The construction of this Earthship home represents a new paradigm. If people are willing to reimagine a new homestead, we may find that there is an abundance of help, resources and people cheering the next Earthship build.



more photos at <http://ecovillages.ca>

A Wider View

Photos by Scottie 'Econerds' Davidson

The promise of what earthship and passive housing offers is profound. By changing housing design and doubling down on current construction techniques and honing in on metrics, nearly all of the carbon footprint is removed from the footprint of an average home.

An additional effect is that fewer resources—both financial and otherwise—are required for home ownership.

With south-facing glass walls and a north-side berm, the passive heating of earthships reduces the need for forced air. By reducing the need for active heating, fewer natural gas and electric resources are consumed. The hydroelectric cost is reduced.

Earthship design utilizes captured recyclable material for the construction, further reducing the carbon footprint.

Earthships represent a significant, viable housing alternative to the pictures we are used to seeing. Community built, they are a global movement with accreditation offered by Earthship Biotechnology. Earthships appear in Africa, Europe, Australia and Asia. Their very creation stimulates education, community building and the possibility of new types of jobs. With sustainability baked in, an earthship could represent a symbol of sustainable, community-created edifices.



Earthship Biotechnology

An academy started by earthship founder Michael Reynolds in Taos, New Mexico, it trains and provides accreditation to students. The practicum for students in Taos usually means building hostels for students in attendance. Operating since 2016, more than 600 students from around the world have attended. A location in Patagonia serves students at the southern tip of South America.

Earthship Biotechnology students often complete field studies overseas with disaster relief. In Haiti and the Philippines, earthships are built as sustainable, typhoon-proof buildings.

Read more at earthship.com



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