RiverdaleNetZeroProjectNews

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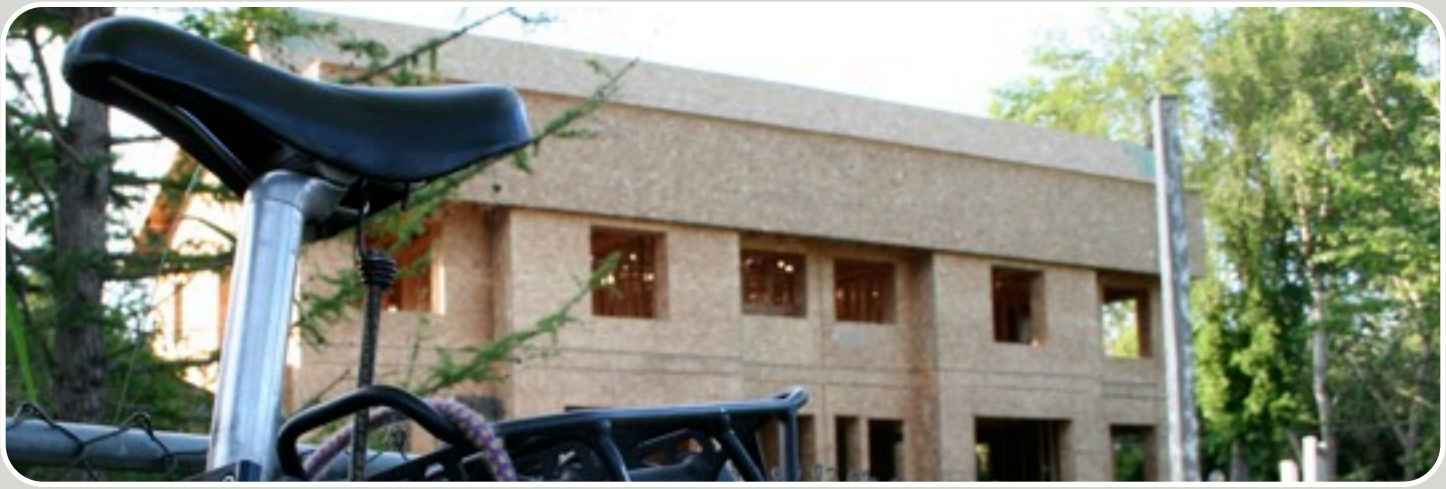

PROGRESS REPORT

Demolition, Salvage, Recycling, Foundation and Framing

It has been a busy few months on the Riverdale NetZero site. Here's how the project has advanced since our last newsletter.

Demolition

The old Twardy house was demolished on April 18th. It's always a sobering and somewhat disturbing sight to see a backhoe crunch up a house that has served people well for over 60 years.

Salvage and Recycling

Prior to the demolition, **Dave Roy** of Habitat Studio spent a couple of days salvaging every piece of metal he could get at: water lines, heat ducts, fascia, eaves troughs and plumbing fixtures. This material was taken to the **Eco Station.**

He also salvaged about 2/3 of the cedar siding that was under the vinyl, and it will be re-milled and used as window trim on the NetZero building and other projects.

The concrete was separated out of the demolition and will be crushed and reused as aggregate for road bases.

Most of the old brick chimney was also saved and we are hoping to find a use for it in the landscaping of the NetZero project.

The balance of the material from the old house was land filled.

Even this minimal amount recycling cost the project between $500 and $1000, and is not justifiable from a purely financial standpoint. However, two changes that will make it more economical to do more separation and recycling before the mechanical demolition begins are in the works. The first is dramatically higher landfill fees and diminishing landfill space, which will encourage more recycling. The other is the option to send the waste wood for use as fuel for power generation.

Not exactly an auspicious start for a project aiming to model such a high level of environmental responsibility but we will do better in the future.

Recycling at the site:
We recycle all paper, plastic and metal waste. We sort the wood into reusable material, firewood, and unusable wood.

The excavation, site servicing and demolition was done by Habitat's long-time, favourite excavator, **Gary Carter Excavating**.

You might recognize Gary's daughter, **Stephani Carter**, the dynamic, LEED-accredited interior designer who is popping up everywhere these days. She is the driving force behind **Green Alberta**, which is putting together a web-based service that evaluates construction materials based on their sustainability. This much-needed service will help designers, specifiers, contractors and home owners cut through the fog and make fully informed, environmentally responsible choices when selecting project materials.

Stephani is the sustainable materials consultant on the Riverdale NetZero team, on the board of **M.A.D.E.** (www.madeinedmonton.org), and teaches and lectures on sustainable materials.

Foundation

Harold Schimpf and his grandson **Matthew** did a great job of forming and pouring the foundation. Harold's vast experience (he turned 70 last year but looks more like 50) proved invaluable in working out the details as we poured the 17,000-litre water storage tank and the basement at the same time, while keeping the tank thermally separated from the foundation.

The tank also sits on four inches of high-density **Dow SM Styrofoam** to reduce heat loss into the ground. **Habitat Studio** apprentices **Bernie Schaloske** and **Burke Stoller**, who are star apprentices in the their respective years at NAIT, worked with Harold and installed the large amount of reinforcing steel in the floor and walls of the tank necessary to prevent any hairline cracks that would result in leaking.

Most commercial concrete contains 18% fly ash, a waste product from coal-burning power plants that can be used to replace the cement powder in concrete, saving the enormous amounts of energy required to produce the cement powder. However, based on the idea and suggestion from team member and structural engineer **Andy Smith**, of **Sol North Engineering**, our supplier, **Burnco Rock Products**, was able to supply us with a mix with 50% fly ash for both the footings and the walls.

Framing

Net zero energy housing in Edmonton would be impossible without first drastically reducing heat loss from the building envelope. Considerable thought and discussion have gone into devising a wall system that delivers high insulation values, minimal air leakage, sustainability and low embodied energy without taking too long or costing an arm and a leg. Because we want the NetZero project to inspire other builders, it also has to be something others can repeat.

Collaboration between **Adam Larson** of **Green Door Builders**, Andy Smith of **Sol North Engineering** and **Peter Amerongen** of **Habitat Studio** has resulted in a wall framing system that delivers the energy efficiency we need but uses little more lumber than Habitat's standard wall, which is 2x8 at 24 inches on centre. The only additional material is the strips of OSB to separate the two 2x4 walls and line the window and door openings.

The insulation will be blown cellufibre, which is essentially recycled newspaper with a few fairly benign additives. We think this solution will be the most economical and most sustainable wall system of any of the EQuilibrium projects.

Of course, a good concept will get you only so far without someone with the ingenuity and drive to work out the kinks and actually make it to work! We were very lucky to have that person in our long time team member, **Adam Larson**.

Adam has been a partner in this quest for net zero energy housing for at least the last couple of years. He combines a rock-solid commitment to sustainability, formidable framing skills, ingenuity and an amazing work ethic. He gets to the job site in a biodiesel-powered Toyota van and his lead hand, **Murray Donaldson**, usually comes by bike.

Just watching these guys get to work makes you feel warm and fuzzy, and the feeling gets better when you come back at the end of the day to see how much they've accomplished by the time they leave.

Adam and Murray are also very careful to plan lumber use so as to generate minimal waste. The framing is nearly complete, with the smallest scrap pile I've ever seen on a job of this scale.

The front entry, balconies and balcony trellises that will carry the solar thermal collectors should be done at the end of July or early August.

Recycled Glue Laminated Timbers

The idea of using recycled glue laminated timbers (gluelams) came from **Burke Stoller**, who noticed the beautiful, Peter Hemmingway-designed church at 116 Street and 105 Avenue church being demolished near his home. We arranged to buy some of the beams salvaged during the deconstruction , but the site was quarantined because of asbestos

NETZERO PHOTOS:

Top: Before Demolition
Bottom: After Demolition

abatement activities and we needed the timbers immediately. The recycled gluelams we used had done the less edifying job of holding up the roof of a liquor store just up the hill on 96 Street.
The beams were salvaged by **Visco Demolition Ltd**, and a trip out to their yards to look at the beams revealed a beehive of recycling activity. Visco is now diverting most of their industrial demolition from landfill sites. They have their own concrete recycling operation which separates out all of the steel and, on larger projects, recycles the concrete on-site into aggregate that can be used on the new construction. All metal is recycled and sold and they are saving wood waste in their yard until they can begin shipping it to Barrhead to help fuel a power plant.

NETZERO PHOTOS:

Top: The timbers in place
Bottom: The concrete forms before pouring

The beams were re-milled to the sizes needed on the project by Habitat Studio carpenters **Bernie Schaloske** and **Burke Stoller**, using a chainsaw and Alaska mill generously loaned by forestry Masters student **Eckehart Marenholtz**. Bernie and Burke did a beautiful job of making joints that fit with near-cabinet quality tolerances on big rough beams. They then helped framers **Adam Larson** and M**urray Donaldson** muscle them into place just in time to not slow the framing down too much

Mechanical system improvements
We are still tweaking the mechanical design to try to build a bit more of a surplus into the computer-predicted performance of the house. We want the surplus to allow for differences in actual performance, and also to diminish our reliance on the quad-glazing and shutters on many of the windows.
We have a team of very bright and inventive engineers who are bringing a huge amount of collective knowledge and experience to bear on the mechanical design. In no particular order, they include: David Morrow, a mechanical engineer, retired VP with Epcor and principal of **Hydraft Development Services**; Dr. Philip Mees, a semi-retired professor of chemical engineering; Dan Langford, mechanical engineer, principal in **Solnorth Engineering** and past **SESCI-NAC** chair; Morgan McDonald, mechanical engineer and design manager for **Taylor Monroe Energy Systems**, our partner, consultant and supplier of the solar thermal system; Leigh Bond, Vice President of **Threshold Energies**, suppliers of geothermal systems; and Joerg Dyckerhoff, mechanical engineer.This illustrious group got together and were joined by Gordon, Andy and Peter to try to extract a bit more renewable energy. The ideas came thick and fast and, after considerable discussion, calculation and rumination, three strategies have

Left: The roof trusses in place

Below: Pouring the concrete.

Bottom: The house as ofJune 19th.

emerged that promise significant improvements.

The first is to install a short set of low-cost, ground-connected piping around the foundation and under the garage. When connected to a heat exchanger, the water in this piping will provide a small amount of heat in the winter and very low-energy cooling in the summer, should it be at all necessary.

The second strategy is to incorporate a very small heat pump to take more useable heat out of the solar thermal storage tank, which lowers its temperature and increases the efficiency of the solar thermal collectors in the winter.With a bigger temperature difference between the incoming water and the solar thermal collector surfaces, more heat can be harvested.

The third is to add a smaller water storage tank for summer hot-water needs and quicker response times.

The calculations are complex and dynamic and need more work to get exact numbers – particularly in the case of the heat pump on the solar thermal tank – but the indications so far are good enough that we are committing to the small heat pump and the ground-piping loops. A lot more work also needs to be done on the control systems.

We think this approach of combining solar thermal and heat pump technologies has tremendous potential for other, bigger projects and are we very excited to be trying it out here.

Interesting as this all is, the real story is how a group of high-calibre engineers and specialists are willing to donate their time and talent to make this work. This is great example of the sort of generosity of spirit that has made this project possible and keeps it moving along. The media has been very interested in the project.

Team members have been on feature stories in the Edmonton Journal three times, St. Albert Gazette, Global TV, CFRN TV, CBC Radio, CJSR radio, Charles Adler On-Line across Canada, CBC Wild Rose Forum across Alberta, and CKYL radio in Peace River.

ECO SOLAR HOME TOUR

The Riverdale NetZero Project had its first open house during the June 9th **Eco Solar Home Tour**. (www.ecosolar.ca) The tour, organized by team members **Janne Hicklin** of **Hicklin Consulting Service** and **Lorie Saito** of **Kitska Designs**, was a roaring success. Over 500 people visited the site and were ably guided to the site via a hybrid ETS bus by D**rew Delbaere**, **Zack Borutski**, A**lex Jacob** and **Max Amerongen**. Once on site people were guided by **Joanne Moffat** who was also instrumental in pulling together some FAQ's that were posted throughout the house. Once inside, they were shown details of the wall system, insulation, air barrier and other details that make the envelope so energy efficient. **Adam Larson** of **Green Door Builders**, carpentry instructor, **Greg Peters** from **NAIT**, **Vince Campbell**, **Paul Whinncup** and **Peter Amerongen** all of **Habitat Studio** were kept busy pretty much non-stop answering questions and showing the fine points.

From there they went up stairs for an explanation of the proposed mechanical system with **Andy Smith** of **Solnorth Engineering**. **Morgan McDonald** of **Taylor Munro** was there from Vancouver to explain how the solar thermal system will work. The solar power system was presented by **Gordon Howell** of **Howell-Mayhew Engineering**.

The traffic was heavy all day causing **Adam Larson** to remark at the end of day that he was more tired after a day of talking than he would be after a good long day of framing. Fortunately, our intrepid crew was able to get away one at a time just long enough for some wonderful homemade calzone (pizza filled pockets) prepared by Riverdale NetZero supporter **Cathy Roy.**

Line up at the Eco Solar Home Tour

SPREADING THE WORD

To paraphrase the sage counsel of supporter Mark Craft, CEO of Planet Organic Markets Ltd, ***building one exceptional house will have little impact if the word doesn't get out.***

To make sure the NetZero Project has a lasting impact, team members have been busy spreading the word about what we're trying to accomplish.

In the past few months, team members have made presentations about the project at the two different standing-room-only presentations at the Telus World of Science in Edmonton, the Cold Climate Building Conference in Edmonton, a NAIT in-service a CMHC forum and a SESCI public forum at the Solar Energy Society of Canada conference in Calgary, the Net Zero Energy Home Coalition Forum in Calgary, and a SESCI-Calgary information session. We continue to tweak the seminars to answer questions that people are asking and to work at developing innovative ways to communicate the NZE concepts. We are developing a series of FAQs (now up to 80 questions) for our web site to help people understand the design choices.

Welcome

Welcome to Natasha Goudar and Scott Harris! They are helping us co-ordinate fundraising, sponsorship, a revamping of the website and other public education activities. This media savvy, dynamic duo have given us some badly needed momentum in these areas.

Newsletter:

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