

Renewable Materials – Introduction

Alaska Centre for Appropriate Technology

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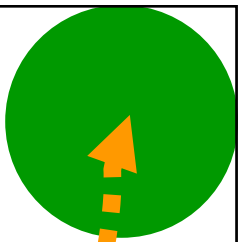
 **howell-mayhew**
engineering, inc.

Peter Amerongen

 **Habitat Studio**
& Workshop Ltd

Edmonton, Canada

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Environment Effects...



Riverdale NetZero

- Location
- Food
- Water
- Waste



Mill Creek NetZero



Belgravia NetZero

Sustainable Landscaping



- Focus:
 - Drought tolerance
 - Native plants
 - On-site food production
 - Rain water collection



Natural Landscaping

- beauty
- nature
- low maintenance
- fresh secure nearby food...

Edible forest

kiwi,
fiddleheads,
lots of berries,
apples,
herb garden,
mushroom stump

wetland,
waterfall

- Native and low water plants
- Beautiful and edible plants
- Sleep, creep, leap

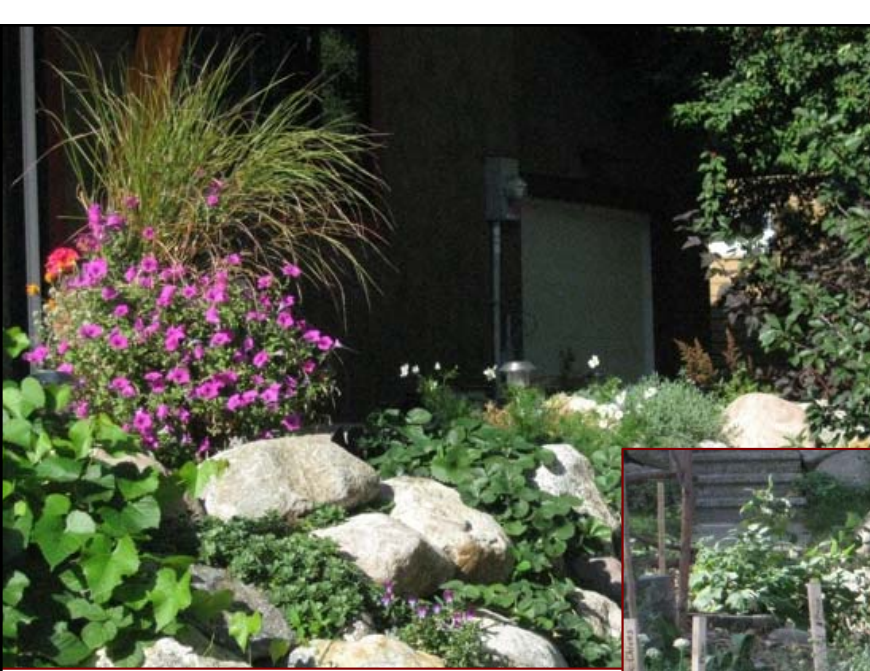


Designer: Ron Berezan TheUrbanFarmer.ca



Edible Landscaping

now in place for 2 years
starting to produce food, fruits and berries
and small amount of vegetables in the plots



- Vegetable plots
- Fruit trees, shrubs
- Forest garden
- Minimal lawn
- Forest garden
apples pears berries
- Very successful in
very dry years too

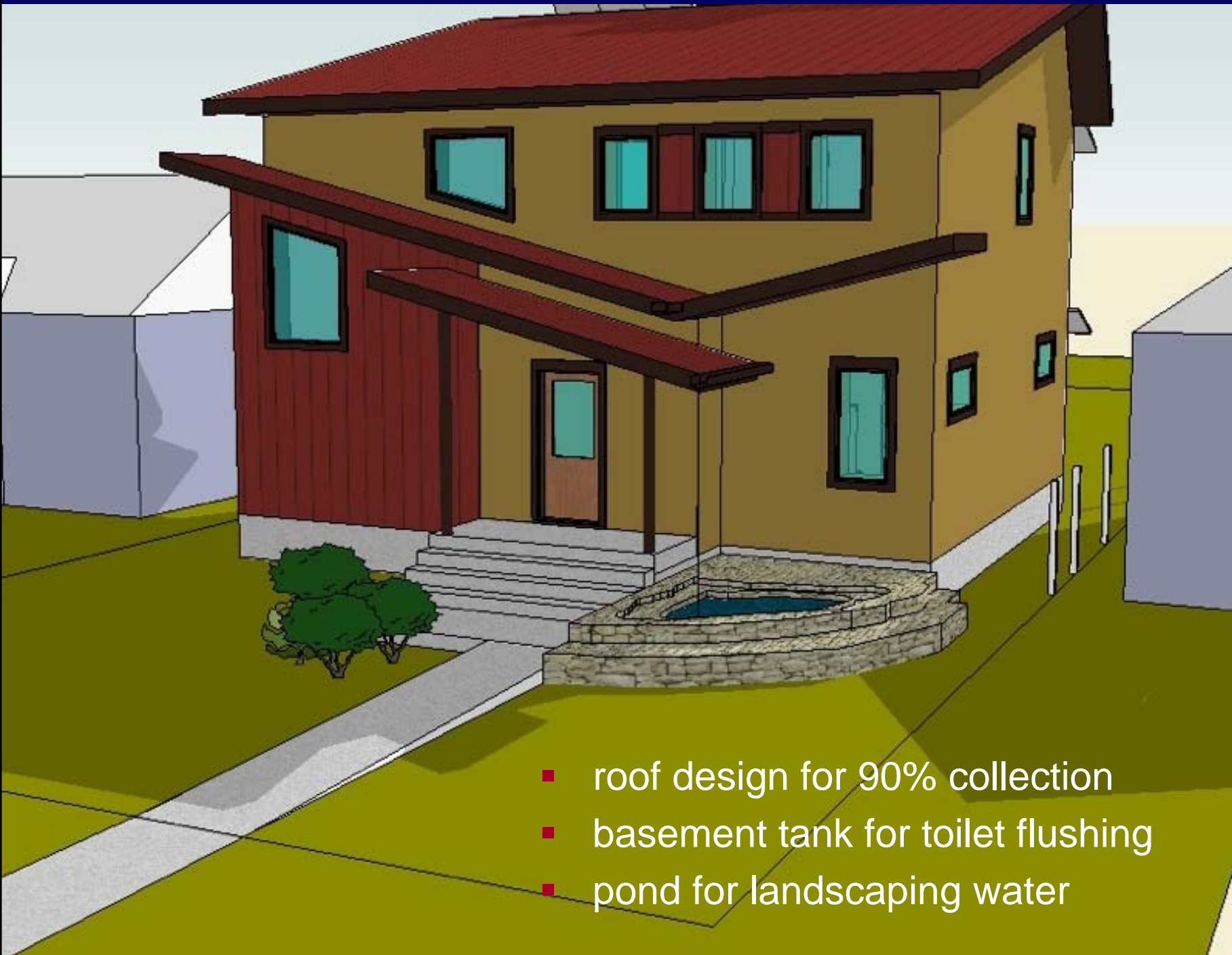


Riverdale House – Reducing Exterior Water Use

- Drought tolerant lawn
- Drought tolerant plants
- Native plants
- Thick mulch
- Thick topsoil



Belgravia NZE house – reducing exterior water use



- roof design for 90% collection
- basement tank for toilet flushing
- pond for landscaping water

Rain Water Collection

- Roof design
- Rain barrels
- Rain water distribution



Rain Water Utilisation



- soaker hoses
- gravity drainage
- provision for future pump



Storm Water Retention



- permeable driveway
- thick mulch/ topsoil
- interior discharge/ overflow



Grey Water Reuse

- We haven't used any grey water technologies
- They are not legal in Alberta
- It is important to pre-plumb houses for future grey water use
- Another NZE house in Alberta has a grey-water system for demo – not great reviews
- Expensive -- \$1400 plus \$2000



Sustainable Materials, Air Quality

- Use materials that:
 - Had low manufactured energy
 - Are cleanly manufactured
 - Have low transportation energy
 - Are highly durable
- Have high recycled content, are recyclable
 - Uses feature beams recycled from liquor store
 - Uses siding from the old house for finish exterior around the windows
 - Recycled floor from a gym
 - Recycled window and door molding

Sustainable materials database:
GreenAlberta.ca



Sustainable Materials

Easily Specified

- Locally produced lumber
- Cellulibre Insulation
- Drywall with recycled content
- FSC certified doors
- Cork flooring
- Marmoleum flooring
- Have low off-gassing of VOC's (volatile organic compounds)
- No VOC particle board with high recycled content
- Low VOC paints and varnishes
- Low VOC panels for cabinetry, shelving
- Low VOC coatings
- No added Formaldehyde MDF

Lucky Finds

- recycled fir glue-lams
- recycled fir trim
- recycled hardwood flooring
- recycled cedar trim



Materials and Resources

- Meticulous deconstruction of 100-year old house that was replaced
- Reuse of flooring, bricks, lumber, doors, misc millwork
- Recycling of most iron, steel, copper, and wire
- No dumpster on site after demolition



Material Usage



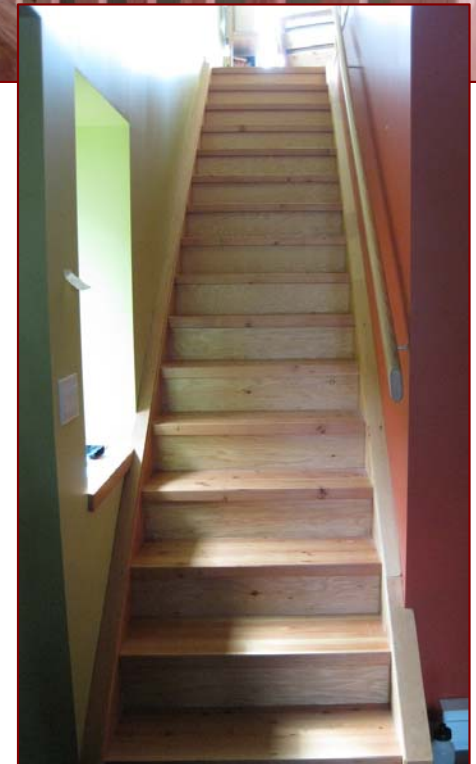
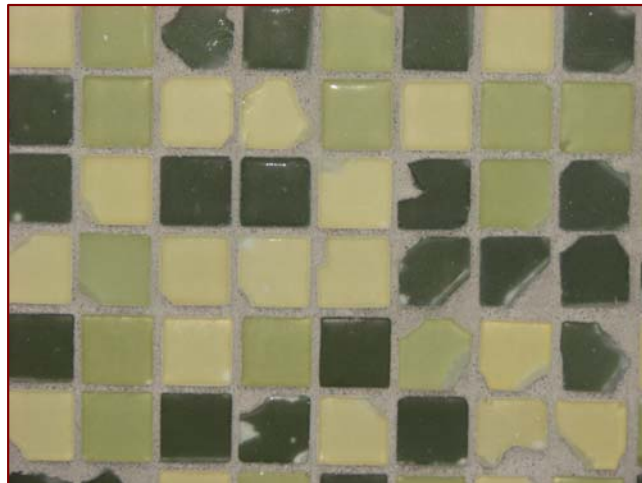
- R56 wall with same amount of lumber as standard 2x6 construction
- Recycled newspaper insulation
- 50% fly ash concrete reduces consumption of concrete
- Standing seam metal roofing for durability



Recycled Materials



- Recycled flooring as casing and railing
- Reused doors
- Recycled gluelams as stairs and railing
- Recycled glass tile



Recycled Materials



- Recycled gluelams as structure, stair and misc finishing
- Recycled bricks
- Foundation bricks
 - Even the old sidewalk blocks were broken up and tastefully reused in the patios and back yard sidewalk.



Reduction and Reuse

- Efficient framing
- Optimum Value Engineering
- No dumpster
- Old houses were demolished for each of these NZE houses.
- Riverdale and Mill Creek NZE houses were stripped all the metal, doors, flooring

Extent of waste from house and garage framing at Belgravia NZE



Recycle

- Wood
 - Cardboard
 - Plastic
 - Metals
- Separate firewood from the remaining OSB, plywood, and trashy lumber.
 - Put a sign on the waste wood for people to take as they walk by -- most of it gets picked up.
 - Divert most of the cardboard, metal and plastic. Started about 5 years ago and now have pretty good compliance.
 - Normally have a small bin on sites.
 - Tried sub-contracting waste haul but it was too expensive.
 - Tipping costs rising dramatically. Getting more economical to collect and deliver recyclable materials.



Sustainable Materials

... can we really choose anything other?

www.riverdalenetzero.ca

www.greenedmonton.ca

www.habitat-studio.com

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We welcome any feedback, questions, suggestions, comments and challenges to anything we present.