

Prefabulous Efficient & Sustainable Homes

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Today's agenda

- Play a short game
- Some advantages to prefab
- Show some of the ways prefab can be built
- Some techniques to make homes more efficient
- Questions and answers

Goals

- To identify and describe the various types of prefabricated constructions
- To describe the advantages to prefab construction
- To identify some of the ways to make a house energy efficient
- To inspire better building practices

What if there is no Climate Change?



Bottom Line

- Approximately 40% of the use of fossil fuel used in this country is used to heat and cool homes.

Environmental advantages

Financial Saving

Political advantages

Comfort advantages

- Energy use can be reduced by building our homes better.



Stick or Prefab



Stick-built!!!!



Stick or Prefab



4556 Square Feet
9 Modules

Modular!!!!



Stick or Prefab



Stick built!!!!



Stick or Prefab



12,700 Square Feet
26 Modules

Modular!

Prefab has evolved.....



To Incredible possibilities



Myths About Prefab

- Prefabs are unattractive and boxy
- Prefabs are built shabby
- Prefabs are all delivered on wheels
- Prefabs are difficult to finance
- Prefabs are like the old Sears Catalogue houses

Reasons to Use Prefab

1. Shorter Construction time
1. Less obtrusive to neighborhood
1. Financial savings

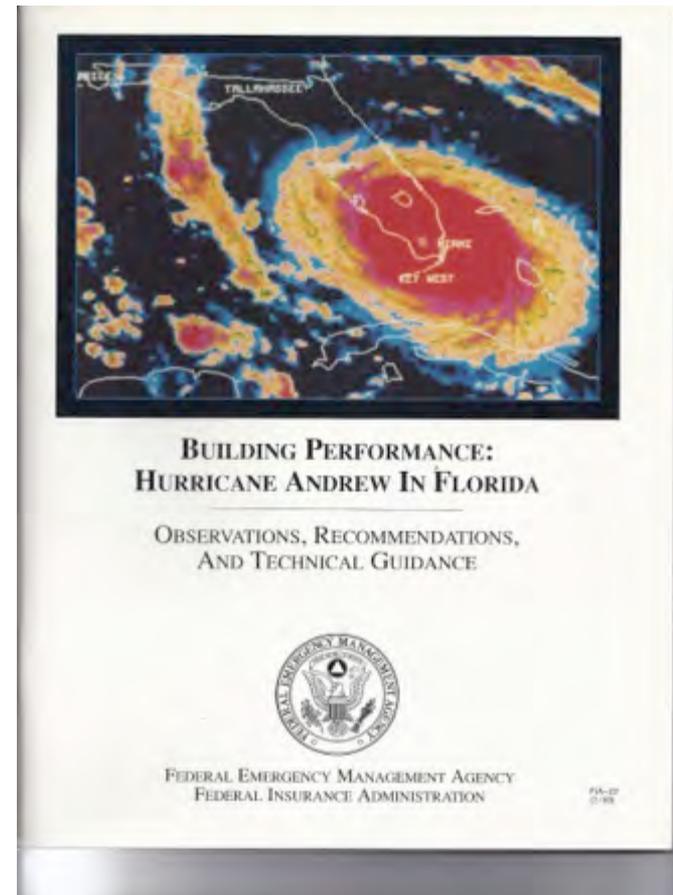
4. More Energy Efficient



Fewer air exchanges found with modular houses (11 vs.7)

5. Built stronger and with greater accuracy

Modular Homes
are Stronger
Than Site Built –
FEMA Dec. 21,
1992 Report
After Hurricane
Andrew



Houses Are More Precise – Less Air Infiltration

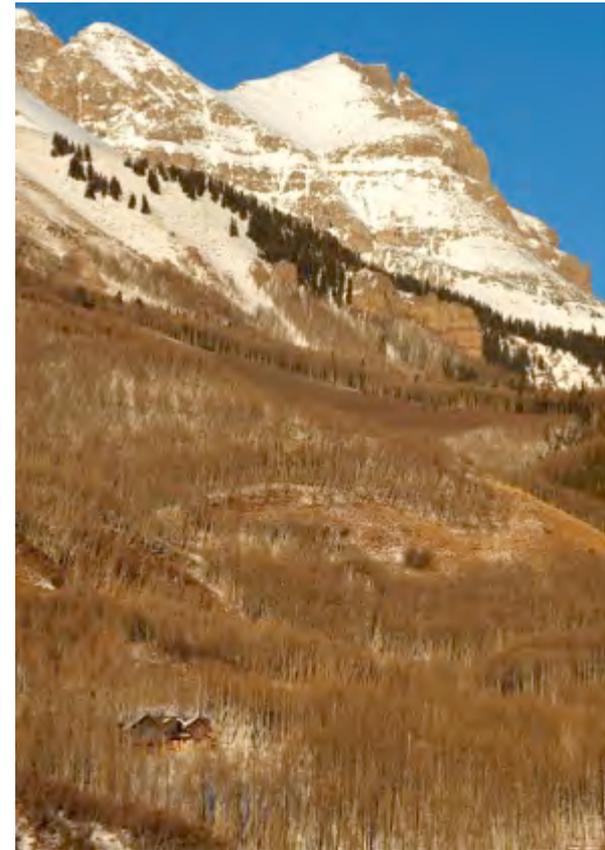


6. More predictability

6. Less exposure of the materials to the elements – less mold & possible damage to materials

6. Longer warranty

9. Easier To Build In Remote & Difficult Locations



More environmentally friendly

Less exposure of the materials to the elements – less possible damage to materials



Green Aspects of Prefab

- Less scrap generated
 - Cutoffs of wood reused
 - Some materials returned to be recycled
- Modularity built from the inside out
- Less fuel used for workers traveling from site to site
- Houses are more precise – less air infiltration.

- Materials are not exposed to the elements – less possibility of mold
- SIPs have a high R-value – continuous insulation
- Materials generally bought locally and in bulk
- Fewer air exchanges found with modular houses (11 vs.7)

Materials Generally Bought in Bulk



Factory Setting vs. On-site



Why homeowners should build a “Green” House

- Higher resale value
- More comfortable
- Save money on energy
- Healthier to live in
- Better for the environment

There are several types of prefab construction

- *Modular
- *Panelized
- *Structural insulated panels
- *Log
- *Timber frame
- *Steel frame
- *Hybrid

Modular



- 2679 Sq Ft
- Nationwide Custom Homes
- Orlando FL
- Dow Solar Shingles
- Many green + Energy features

The Wave Cottage



WaterSound, FL
1,365 Sq Ft
Nationwide Homes

Habitat **Modular** Passive House – ART House



Lancaster Project



Greenfab - Modular - Seattle



Gambion Walls / Greenfab house

Recycled Concrete Retaining wall



C3 Prefab



- Chicago, IL
- 2039 Sq Ft
- 2.16 ACH @50 Pascals
- HERS rating 48
- LEED Platinum

The Method Cabin



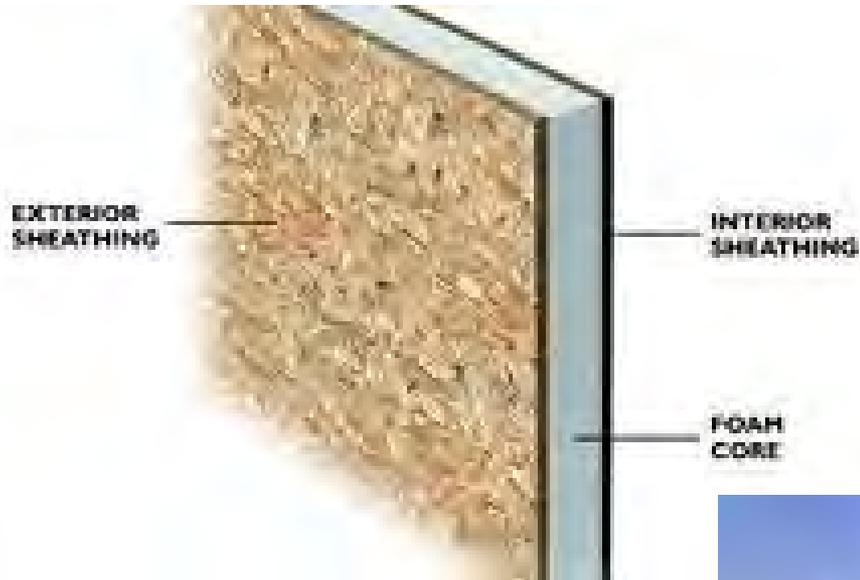
Method Homes
Glacier, WA
1811 Sq Ft

New World Whitman-Annis Home

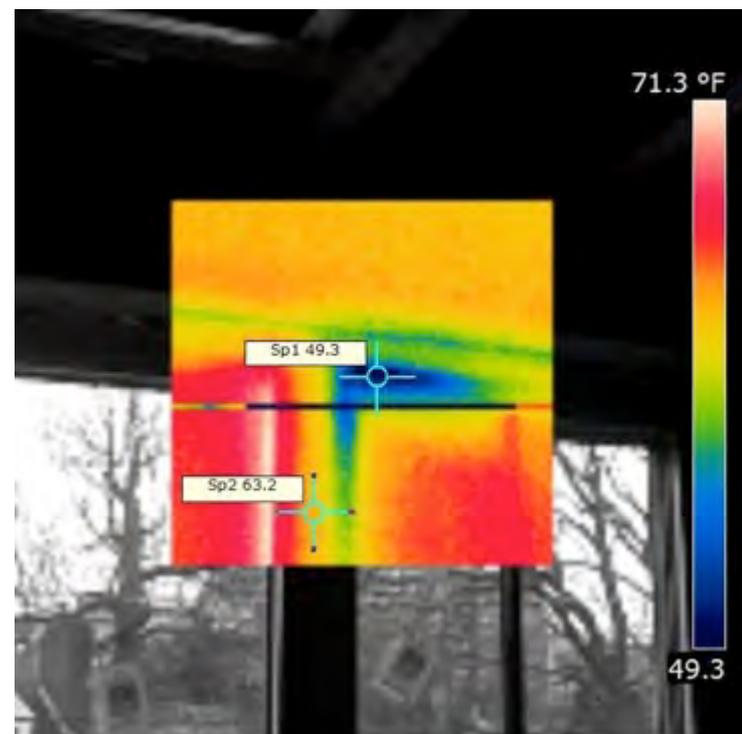


Structural Insulated Panels

SIPS



SIPs & Thermal Imaging



Passive Craftsman



GO Logic House – Passive SIPS



- Insulated concrete foundation
- Blown in cellulose insulation
- PV Panels
- Triple glazed windows
- Solar thermal hot water
- ENERGY STAR appliances & lighting
- Laundry spinner
- Solar orientation

Laundry Spinner



Cleveland Museum of Natural History House built to Passive Standards



Rileys Rosemary Beach Retreat



- Rosemary Beach, FL
- 2100 Square feet
- .08 ACH @50 Pascals
- HERS rating 52

Schaller Eco-Home SIPS



- New Hartford, CT
- 2,700 Sq Ft
- Cost - \$125 per Sq Ft
- HERs rating - 4



Recycled Materials & Efficiency



Hilltop Craftsman



- Olympia, WA
- 2100 Sq Ft
- HERS rating 37
- .65 ACH @ 50 Pascals
- Built Green – 5 Star

Panelized Construction

Two houses built side-by-side



Framing the American Dream®

by the Wood Truss Council of America

	STICK	TRUSSES & WALL PANELS	SAVINGS
TOTAL MAN-HRS	401	148	253
MAN-HRS COST @\$20/HR (COMPONENTS USED CRANE @ \$500)	\$8,020	\$3460	\$4,560
TOTAL BD. FT. LUMBER (SHEATHING PANELSSAME FOR BOTH)	20,400	15,100	5,300
TOTAL COST OF LUMBER @\$450/1000 BD. FT. + COMPONENTS @ TRUSS MFG' S SELLING COST	\$12,928	\$14,457	(\$1,529)
TOTAL LUMBER + SCRAP GENERATED	17 YDS	4 YDS.	13 YDS
TOTAL SCRAP COST @\$15/YD DUMPSTER COST + MAN-HR TO PICK UP	\$425	\$100	\$325
TOTAL COST FOR THIS 2,600 SQ. FT HOUSE	\$21,373	\$18, 017	\$3,356

Panelized construction



Panelized construction - complete



Panelizing + Timber frame



Gallatan Gateway, MT
1440 Sq Ft

Panelized New England Farmhouse

Mixing tradition with modern technology



Concord, MA 2700 Square feet
Panelized by Connor Homes
Designed by Zero Energy Design
Passive orientation
Spray foam insulation
Exterior Rigid insulation
Radiant heating & cooling
Ceiling fans
High performance windows



Rebecca Leland Farmhouse



Connor Homes
3258 Sq Ft
Chatham, NY

Everett House



- Grow Community, Bambridge Island, WA
- 1840 Sq Ft
- Built Green 5 Star
- 1.93 ACH @50 Pascals

Island Passive House



San Juan Islands
1533 Sq Ft
The Artisan Group



Concord Riverwalk Cottage



Concord, MA
1,500 Sq Ft
HERS Rating 21
ENERGY STAR 5+
Pocket Community



The Habitat For Humanity House of the Immediate future





The “wet-cores” (mechanical room, kitchen, bathrooms) of the house were prefabricated off-site to concentrate professional labor on the infrastructure core of the home where schedule and cost overruns most typically affect Habitat projects the most.



Some additional green features



Salvaged wiring used for
fencing

Concrete flooring for
thermal mass and
masonry heater





Transom windows
to add light to
darker rooms

Clerestory Windows



Double doors used to save space + expand the room



Flexible spaces – Garage door/table on wheels



Solar Decathlon

- Began in 2002
- U. S. Department of Energy' s (DOE) Office of Energy Efficiency and Renewable Energy
- Madrid - 2012
- China - 2013
- California (Irvine)- 2013



Solar Decathlon

Leaf House – University of Maryland

2002



4D Home – Modular – Team Massachusetts



4D House



First Light – New Zealand



DC – 2011
Victoria University
of Wellington



Prispa - Romania



Madrid – 2012
Cost - \$150,000
Fabricated in 3
mos.(can now be built
in 30 days)



First Solar Decathlon in China – 2013

Team SCUT/Team Green Sun



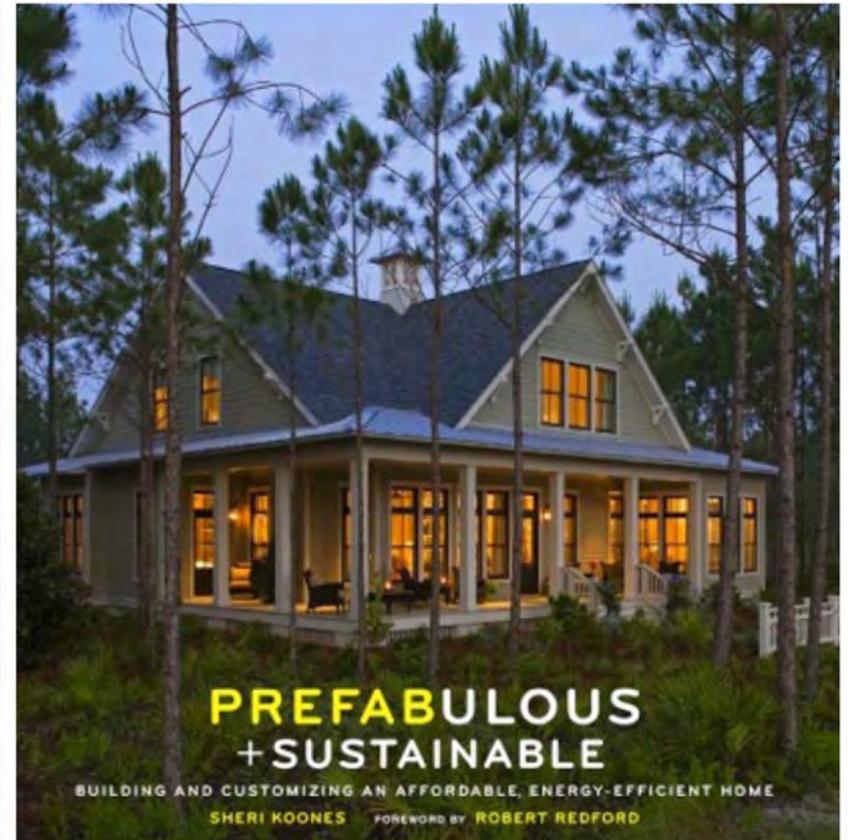
Available
April 2014



PREFABULOUS + ALMOST OFF THE GRID

YOUR PATH TO BUILDING AN ENERGY-INDEPENDENT HOME

SHERI KOONES FOREWORD BY ROBERT REDFORD



PREFABULOUS + SUSTAINABLE

BUILDING AND CUSTOMIZING AN AFFORDABLE, ENERGY-EFFICIENT HOME

SHERI KOONES FOREWORD BY ROBERT REDFORD

Thank you for coming!
Any Questions?

