OFFSITE CONSTRUTION: THE FUTURE?

BuildingEnergy Conference 2016

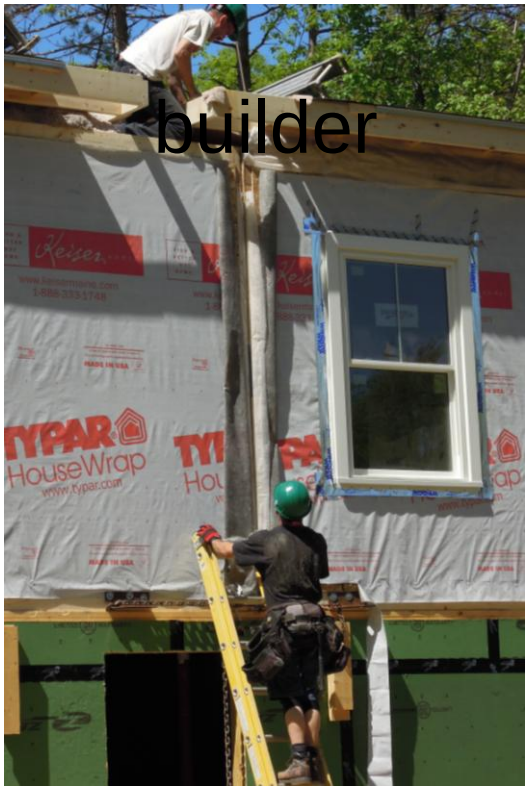
PHIL KAPLAN – **BRIGHTBUILT HOME**
BILL AYLOR – **LAKE|FLATO**
GEOFFREY WARNER – **ALCHEMY**
BRYAN HUOT – **PREFERRED BUILDING SYSTEMS & NEW ENGLAND HOMES**
TEDD BENSON – **UNITY HOMES**
ANDREW DEY – **UNITY HOMES** (MODERATOR)

BRIGHTBUILT HOME

PORTLAND, MAINE

BRIGHTBUILT HOME

WHY OFF-SITE CONSTRUCTION?



over the next 30 years **75%** of the built environment will be new or renovated

BRIGHTBUILT HOME

DEMOGRAPHIC & COSTS

Enviro Emma

Background & Demographics

Gender: M/F

Age: 35-60

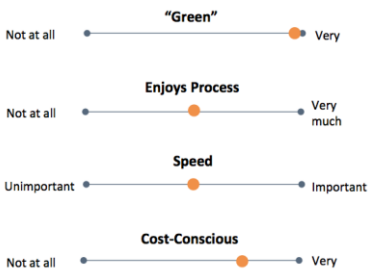
Role: Varies - broad demographic

Approach: Emotional

Income: Comfortable, Whole Foods AND Trader Joes

Actives – 19%

Typical Tendencies



Challenges/Pain Points

Getting modern conveniences but with minimal environmental impact

Comps, appraisals, cost

Techie Todd

Background & Demographics

Gender: Primarily male

Age: 40-60

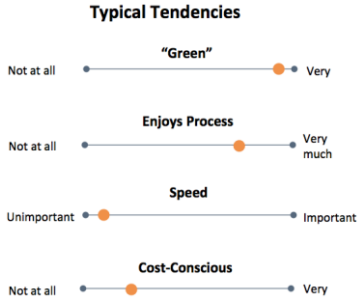
Role: Scientist, engineer, educator

Approach: Pragmatic

Income: Comfortable, but doesn't spend frivolously

Actives and seekers – 52%

Typical Tendencies



Challenges/Pain Points

Can't find what they want in the existing home inventory

Wants to "do things right"

Downsizer Dana

Background & Demographics

Gender: Couples/families, single or divorced

Age: 55+

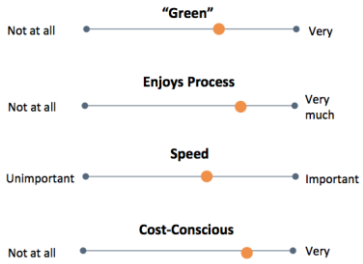
Role: Professional nearing retirement

Approach: Pragmatic and emotional

Income: Comfortable, but fixed

Sceptics and actives – 45%

Typical Tendencies



Challenges/Pain Points

Current homeowner with a large house that requires a lot of cleaning and maintenance

Concerned about multi-story house and aging in place

$170 - $200 / SF, ABOUT 10% LESS THAN STICK-BUILT…SOMETIMES

BRIGHTBUILT HOME

PROJECTS COMPLETED





BRIGHTBUILT HOME

WHAT DOES THE FUTURE HOLD?

GRAPHIC SCALE

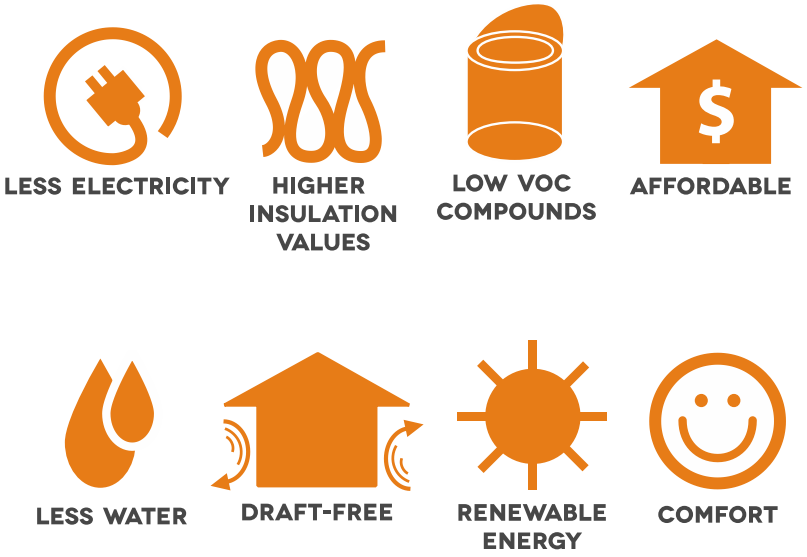
(IN FEET)
1 inch = 50 ft.

Village Run

off Sligo Road, Yarmouth, Maine

BRIGHTBUILT HOME

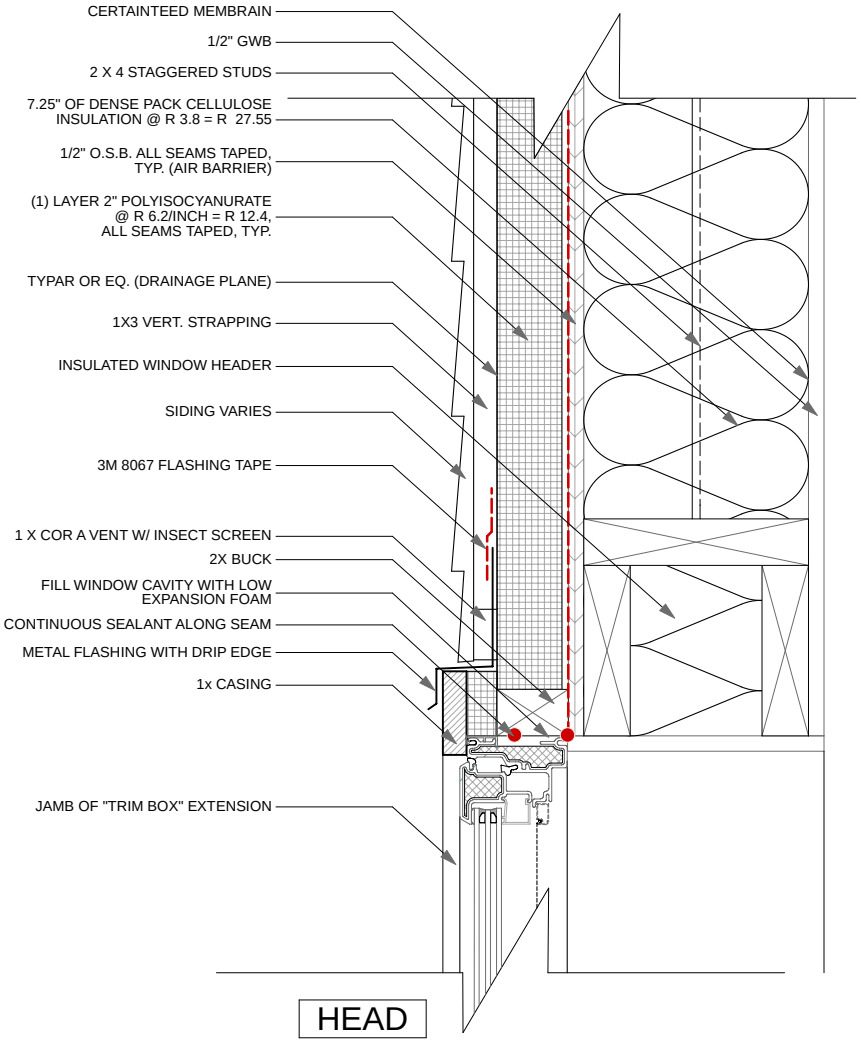
BUILDING DATA



4000-6000 kWh/year

R-20/20/40/60

1.5 ACH50



LAKE|FLATO ARCHITECTS

SAN ANTONIO, TEXAS

Porch House is founded on the idea that dwellings **shelter** us, **adapt** and **respond** to the environment, and **connect** us to our surroundings. Our dwellings are realized using sound principals that have guided Lake|Flato for over 30 years; principals of **design**, **sustainability, quality**, and **efficient fabrication** and **construction**.

We've identified the consistently successful attributes of our Lake|Flato residences and applied them to a library of pre-designed living and sleeping rooms. Working closely with the clients and the opportunities of the site, we determine the optimal combination, arrangement, and construction of Rooms and Porches. The result is a site-specific Lake|Flato house connected to the landscape, and delivered with an efficient and predictable process.

LAKE|FLATO ARCHITECTS

WHY OFF-SITE CONSTRUCTION?

IDEALS vs. PRACTICE

The Lake|Flato Porch House studio was developed to **streamline** the design process through the timely, economic, environmental, and structural benefits of **modular construction techniques**.

We focus on executing the most **appropriate** and **efficient** methods of construction and fabrication on a project-by-project basis, whether elements should be **fabricated** for site assembly or **site-built**.

LAKE|FLATO ARCHITECTS

DEMOGRAPHIC & COSTS

WHO

Porch Houses are not designed for a particular demographic, but rather designed toward **flexibility and simplicity**. The modular design of our Porch House Rooms allows for easy customization, arrangement, and connection.

HOW

We arrange Rooms on the site to take advantage of sun, breeze, and views. We connect these Rooms on the site with custom Porches, which serve to link the events of our daily lives, draw us into the landscape, and connect us to the outdoors. Together they provide the shade, light, circulation, and living spaces that make each Porch House particular to its place.

COST

Every Porch House is unique to its site and homeowner, but a typical completed Porch House will require roughly one year and will cost about **$250-$300 per square foot.**

LAKE|FLATO ARCHITECTS

PROJECTS COMPLETED

MILLER RANCH




BLUFFVIEW




PROW




CLINTON CORNERS



LAKE|FLATO ARCHITECTS

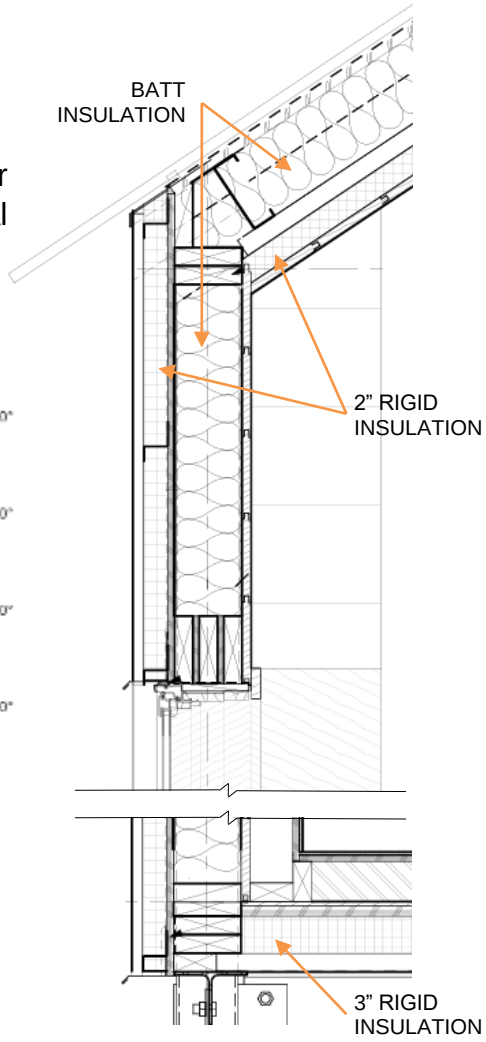
WHAT DOES THE FUTURE HOLD?

LAKE|FLATO ARCHITECTS

BUILDING DATA | PROW

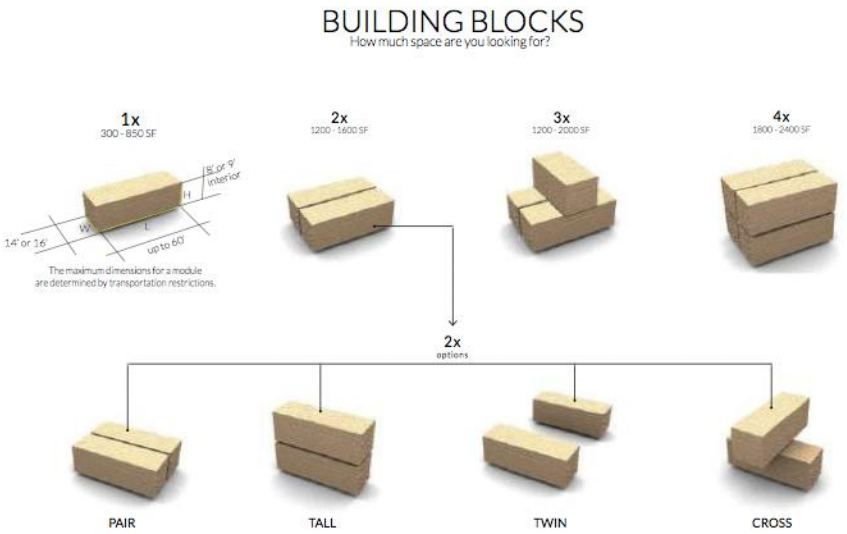
DATA COLLECTED AT THE PROW USED FOR ANALYSIS AND TROUBLESHOOTING:

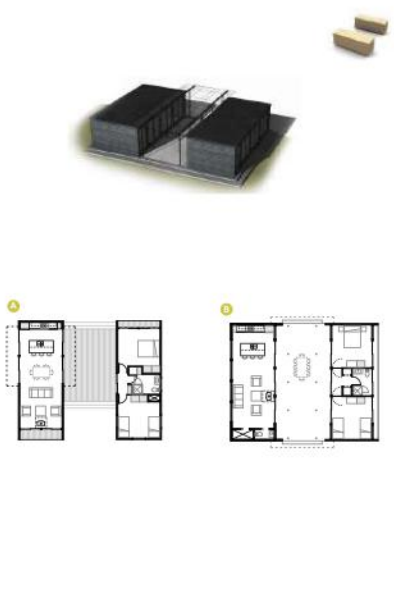
Energy end uses at a per second level, energy sources, Indoor temperature, outdoor temperature, CO_2 concentrations, Relative Humidity, solar thermal collected, boiler thermal output, water heating and central heating thermal flux.

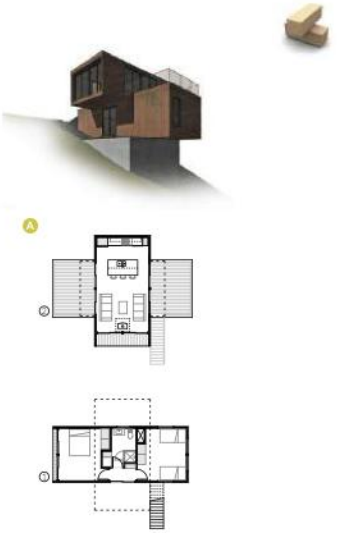


R-30 WALL ASSEMBLY

ALCHEMY
ST. PAUL, MN







MODELS

ALCHEMY Architects
www.weehouse.com 651.647.6650

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ALCHEMY

WHY OFF-SITE CONSTRUCTION?

SITE DESIGN

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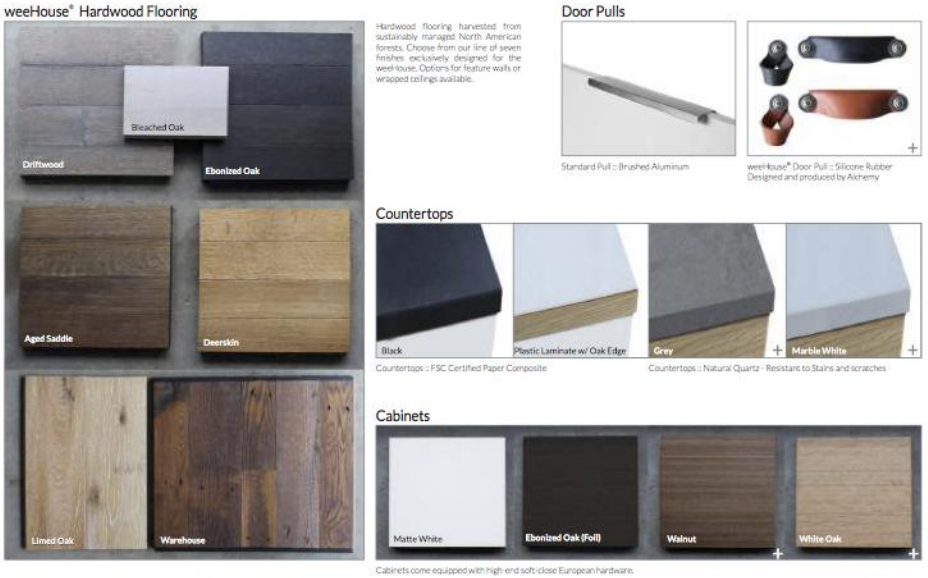


INTERIOR FINISHES

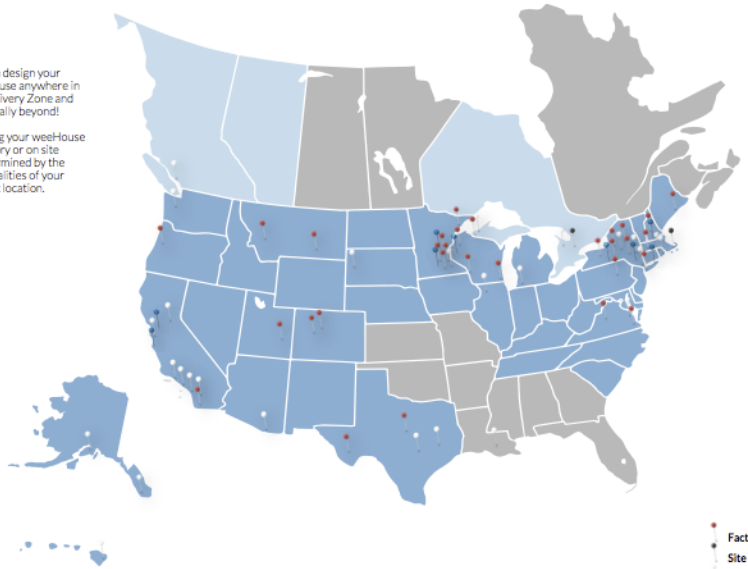
ALCHEMY Architects
www.weehouse.com 651.647.6650

ALCHEMY

DEMOGRAPHIC & COSTS

We can design your weeHouse anywhere in the Delivery Zone and potentially beyond!

Building your weeHouse in factory or on site is determined by the practicalities of your specific location.



LOOK WHERE wee CAN GO

ALCHEMY Architects
www.weehouse.com 651.647.6650

How much does a weeHouse cost?

It depends upon where you want to live, how big your weeHouse is, and what upgrade options your choose.

1x 450 SF 1 bed, 1 bath		$80K-$90K	$90K-$100K	$110K-$125K
1x 850 SF 2 bed, 2 bath		$120K-$150K	$130K-$160K	$180K-$210K
2x-3x 1350 SF 3 bed, 2 bath		$180K-$220K	$180K-$230K	$290K-$330K
4x 2000 SF 3 bed, 2.5 bath		$240K-$300K	$270K-$330K	$350K-$400K

Cost for modular portion of the work only– no site or delivery fee included. Budget ranges allow for all standard finishes, plus costs for additional materials and systems such as spray foam insulation, in-floor hydronic heat, wood-wrapped walls or ceilings, custom siding design, and custom cabinetry upgrades. All of the above estimates are for single houses. Developments and duplicate modules would reduce the total project cost.

MODULAR BUDGET

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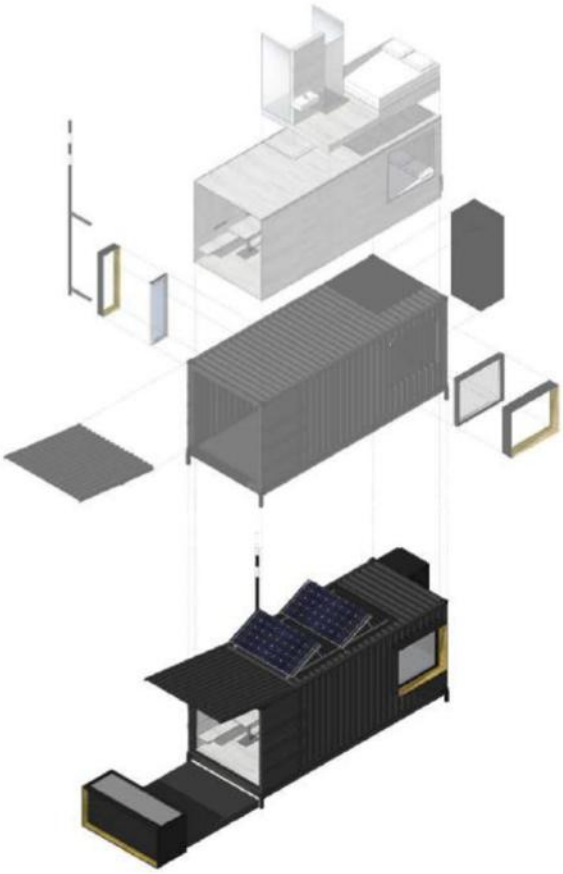
ALCHEMY

PROJECTS COMPLETED

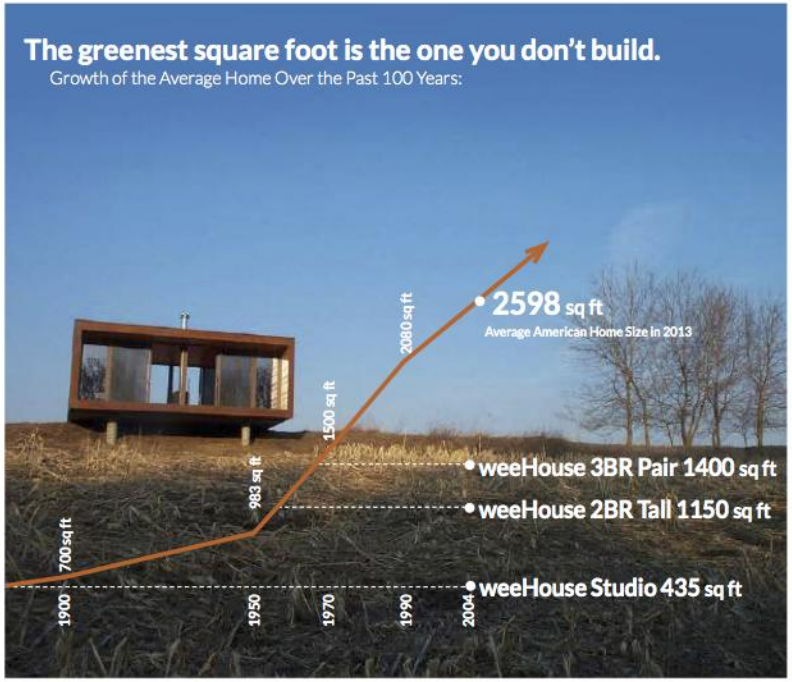
ALCHEMY

WHAT DOES THE FUTURE HOLD?



ALCHEMY

BUILDING DATA



LARGE SPACE, smaller package
The weeHouse achieves a 'big house feel' in a smaller package by judicious use of floor-to-ceiling glass, open kitchens, reduced circulation space, and built-in cabinetry.

MORE QUALITY, LESS CONSUMPTION
With less stuff, your money and our Earth's resources go further. Simply, less is more.

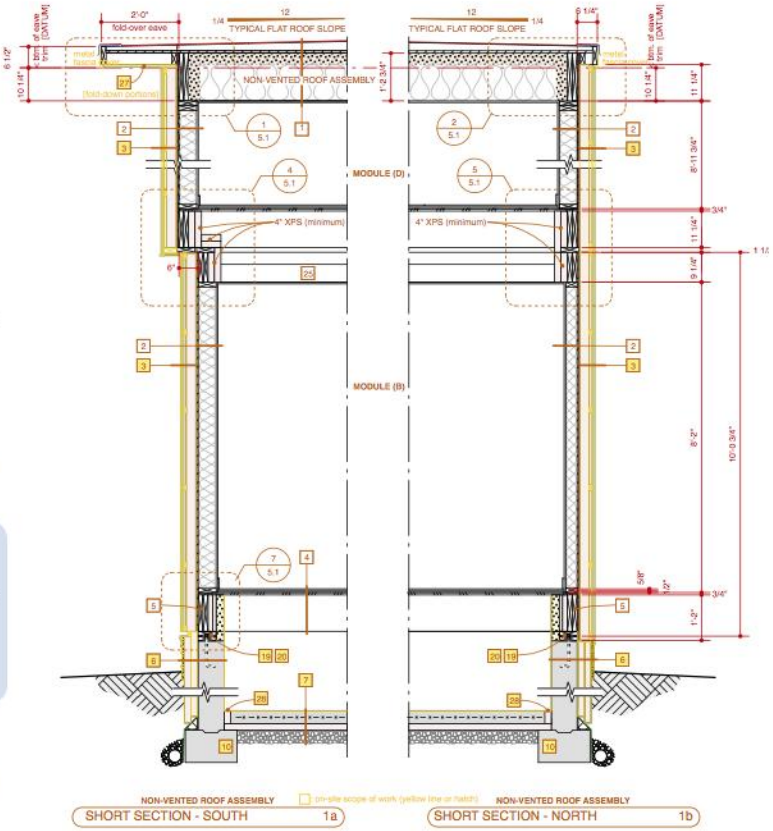
PASSIVE SOLAR DESIGN
The combination of a well insulated building envelope, solar orientation, shading, and natural ventilation allow the weeHouse to be heated by the sun and cooled with the wind. Fold-down overhangs protect your glazing and walls from summer sun and rain.

REFLECTIVE ROOF
White rubber roofs reflect the sun's heat. Vented roof spaces allow additional heat separation.

RENEWABLE ENERGY
Our homes are easily integrated with Solar PV (electricity) and Solar Thermal Collectors which collect the suns energy.

GEOTHERMAL HEATING
Ground source heat pumps which use the Earth's 55° year-round ground temperature as latent energy to heat or cool fluids running your house. Urban or rural sites can be served by tubing buried in deep wells or in large fields.

UPGRADE TO weeZERO
How far is far enough? The weeZERO takes it all the way. By combining low-tech passive solar principals with the most high tech renewable energy technologies, the weeZERO is able to produce as much energy as it consumes. Talk to us about the costs and energy reductions you can expect. It's good for you and good for our Earth.



GREEN DESIGN

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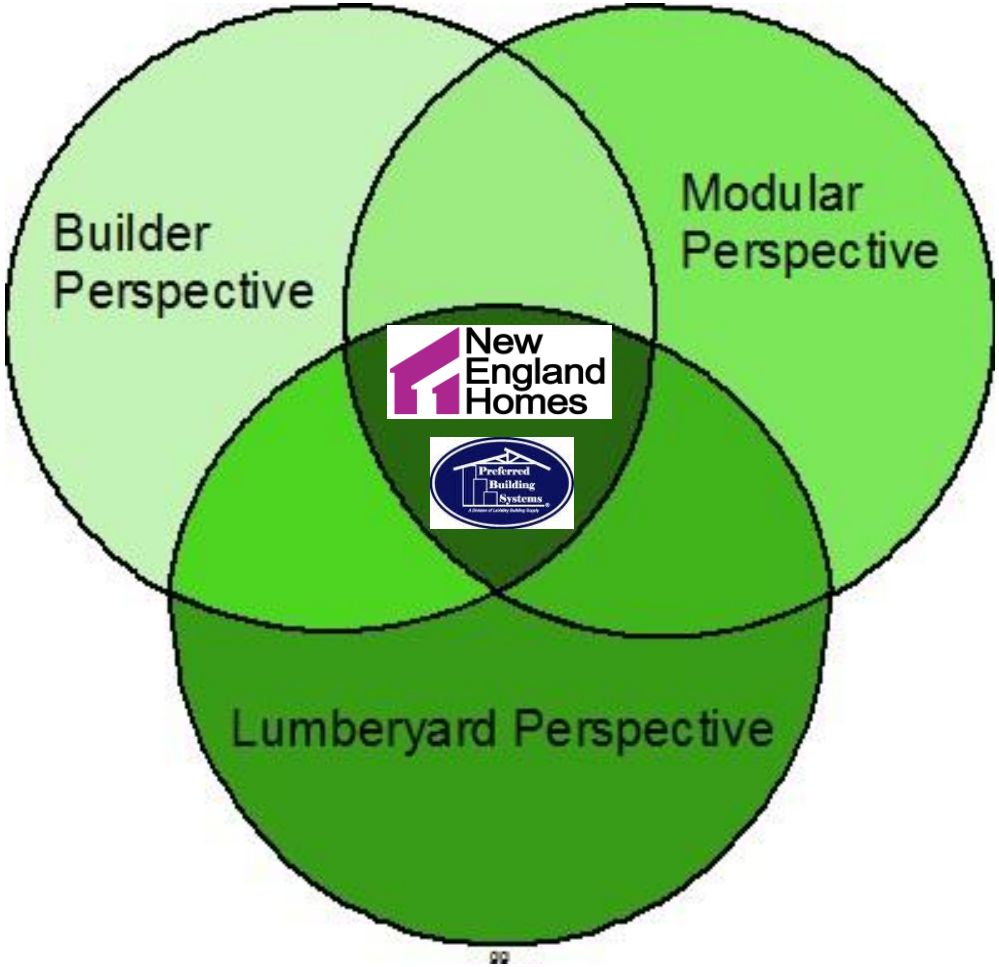
www.weehouse.com 651.647.6650

PREFERRED BUILDING SYSTEMS/NEW ENGLAND HOMES

CLAREMONT, NEW HAMPSHIRE



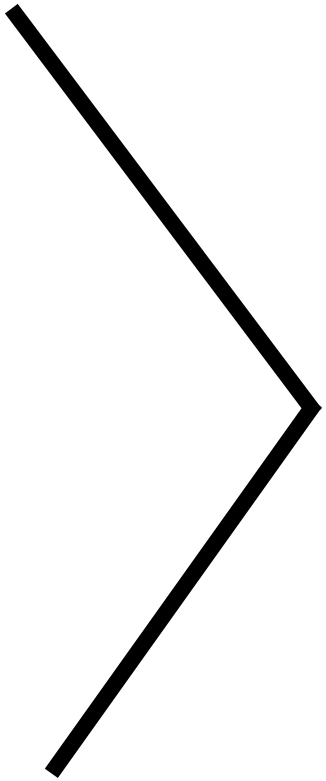
We are a **manufacturer** that sells wholesale to builders & developers throughout New England

PBS/NEH

WHY OFF-SITE CONSTRUCTION?

Challenges with any construction project

- Labor
- Soft Costs
- Time lines
- Weather
- Job site security



- Minimal site impact to neighborhood
- Secure structure
- Coordination support for the builder with labor allocation
- Reduces risks of weather, security, safety concerns.
- Reduces cost over-runs with change orders
- Can reduce permit to completion time from 8-10 months* to as quick as 3-4 months.
- Lowers builder's <u>in place</u> costs for the structure

$ Frees up a builder to focus on developing new business

*2014 Survey of Construction

PBS/NEH

DEMOGRAPHIC & COSTS

Who we serve:

Architects

Builders

Spec Builders

Municipal offices*

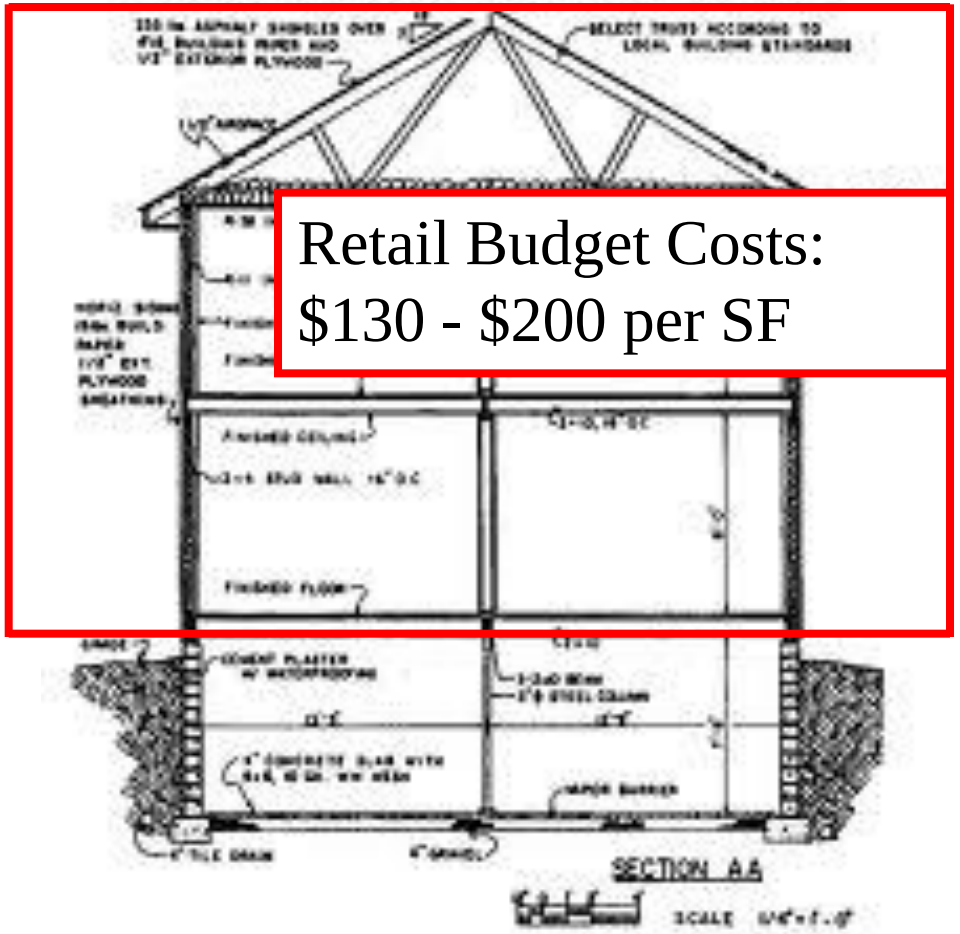
School Housing*

First Time Homebuyer*

Developers (Multifamily)

Empty nesters looking to downsize*

Energy Efficient/High Performance clients*



PBS/NEH

PROJECTS COMPLETED

2007 – Year End 2015: 422 Projects in New England

- Beach Houses
- City Infill lots
- Cottages
- Country Homes
- Municipal
- Primary Residential

PBS/NEH

WHAT DOES THE FUTURE HOLD?

Crystal Ball is only as good as to how we respond these challenges:

- New Construction will be subject to and directed by new regulatory standards and compliance
- Aging workforce
- Efficiency of supply chain management
- Educating public and traditional industry the benefits of offsite construction.

Market Potential:

Today - Off Site Construction with modular accounts for less than 3% of all new construction starts.*

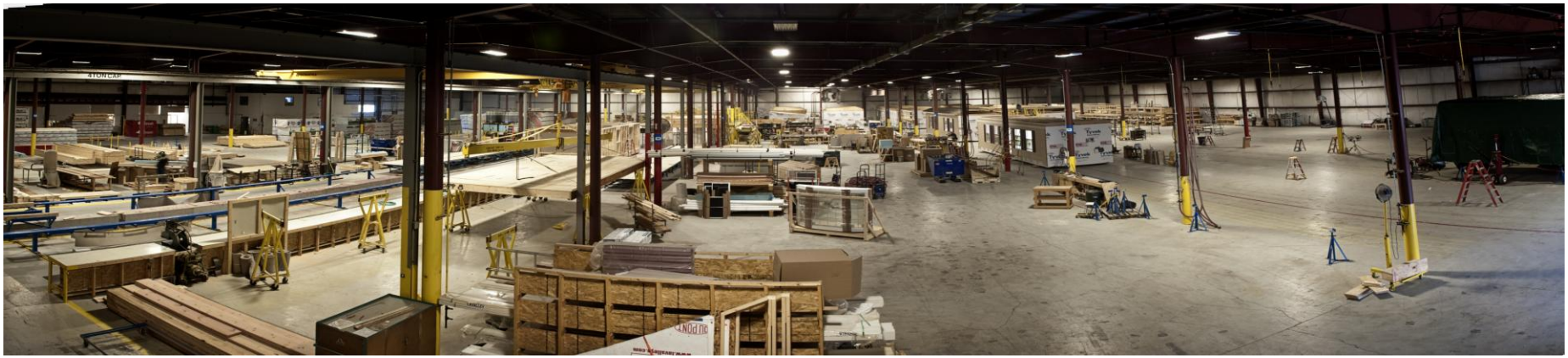
* Modularhomecoach.com 1/21/16

PBS/NEH

BUILDING DATA

Built First Modular Passive House in 2010 in the USA

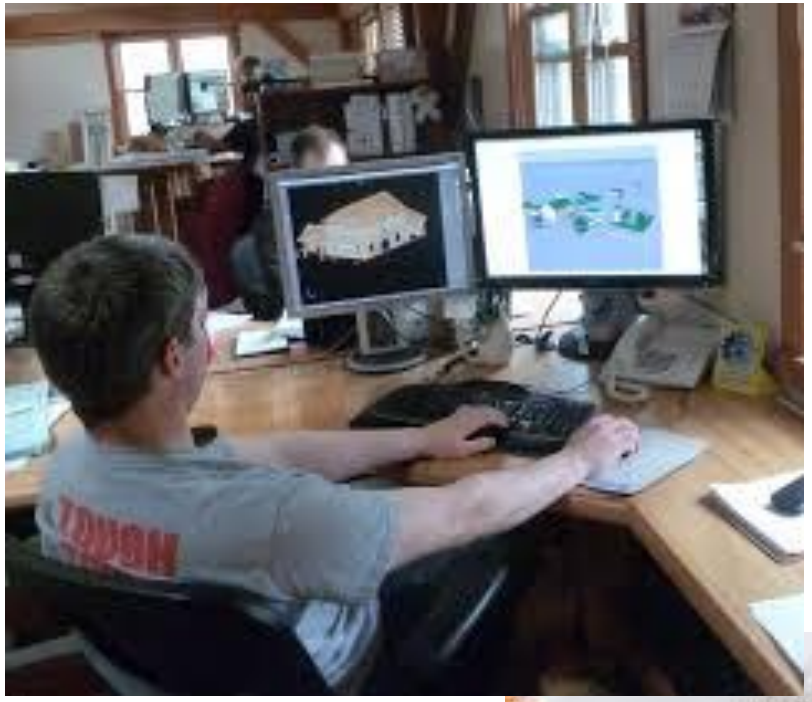
Production line process is less than 3 weeks



Average annual square footage production 130,000 sf and growing

UNITY HOMES

WALPOLE, NEW HAMPSHIRE



UNITY HOMES

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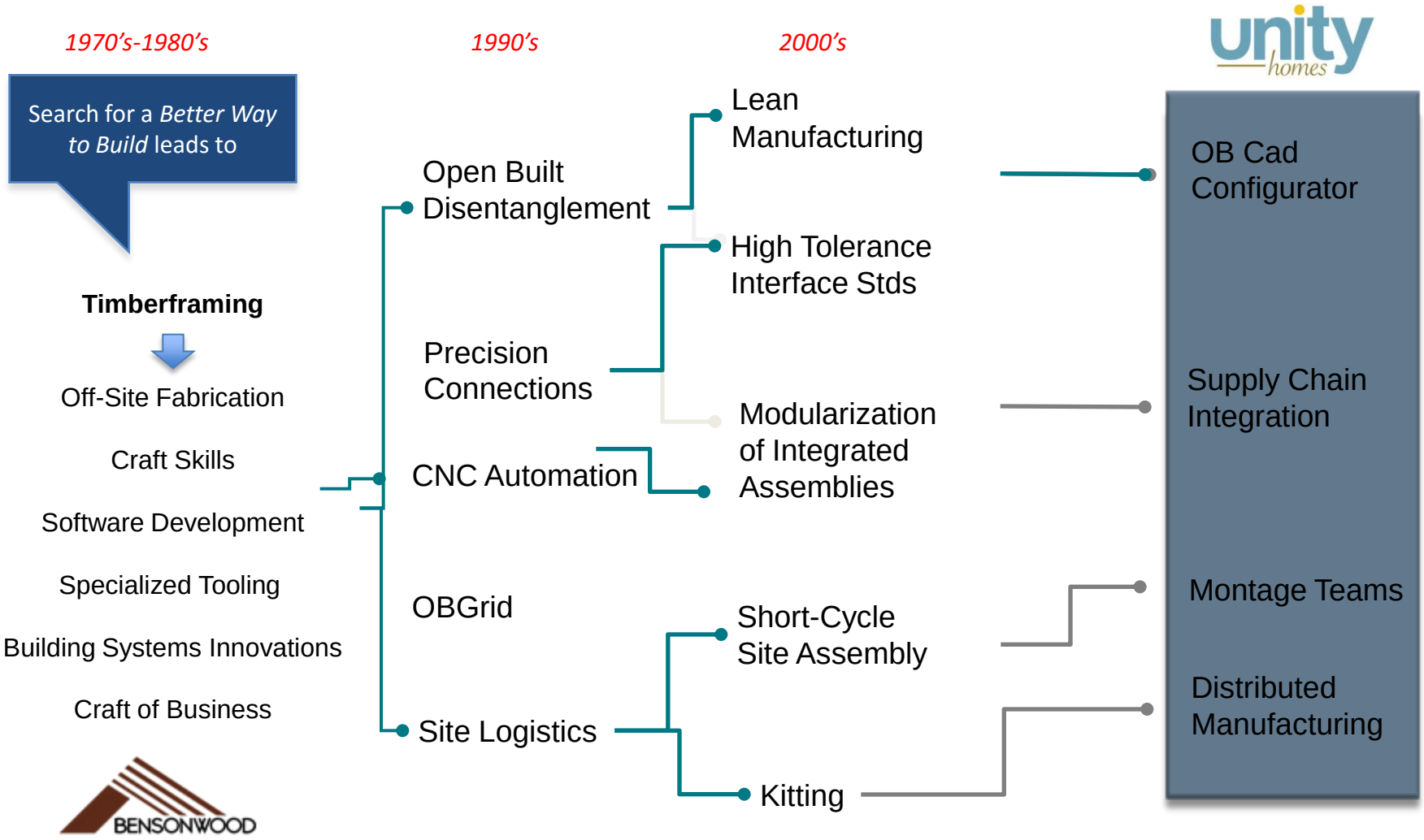

UNITY HOMES

DEMOGRAPHIC & COSTS

Retirees

Young families

Same Sex Couples

Environmentalists

Current homes
$200K-$400K
$150-$180 psf

UNITY HOMES

PROJECTS COMPLETED

Tradd

Xyla

Värm

Zūm

UNITY HOMES

WHAT'S THE FUTURE HOLD?

UNITY HOMES

BUILDING DATA

Typical Insulation:
Wall: R-28 – 35
Ceiling/Roof: R-38 –45
Air-tightness:
<.6ACH@50Pa

Selected Product Line Features

	Objective
ENERGY	• **Fossil Fuel Free** • **60 - 100% reduction in H & C expenses over conventional**
BUILDING CYCLE	• **20 days** (2 days for weather-sealed building envelope)
FINANCING COSTS	• **Reduced term, reduced exposure**
CONSTRUCTION COSTS	• **A 10-15% reduction over a conventional custom-built home**
RANGE OF DESIGN	• **Full range of design configured off of 4 volumetric platforms**
TRIM OPTIONALITY	• **3-5 Trim Levels: Good, Better, Best, Custom, *Branded***
HEALTH	• **Highest air quality standard attainable; Low/No VOCs**
REPAIR & REMODEL	• **70-80% of renovation cost for a conventionally built home**
JOB SITE WASTE	• **< 80 lbs vs 10,500 lbs standard construction**
ENDURANCE GUARANTEE	• **50 yr guarantee on building envelope (shell)**

OFFSITE CONSTRUTION: THE FUTURE?

BuildingEnergy Conference 2016

CAN WE TALK?