

rebuilding livable communities

Justin Miller, RA. LEED AP
Assistant Professor of Architecture

DESIGNhabitat
Auburn University School of Architecture, Planning and Landscape Architecture

issues

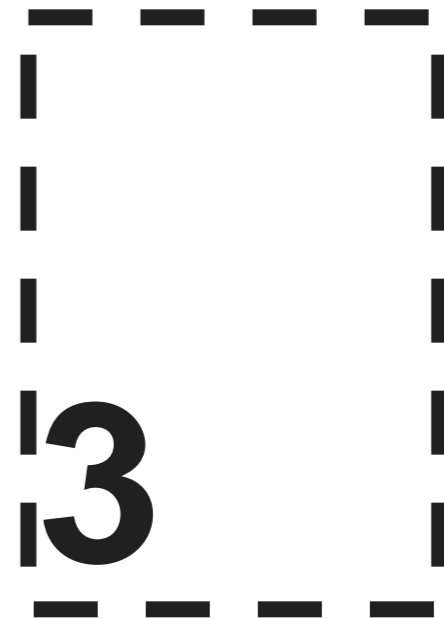
1. affordability and sustainability
2. scale-ability from the single to multiple (community)

1. affordability and sustainability

DESIGNhabitat Alabama

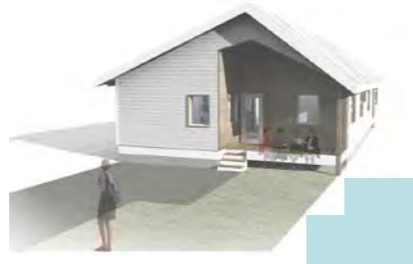
DESIGNhabitat Auburn University School of Architecture, Planning and Landscape Architecture

Alabama Association of Habitat for Humanity Affiliates



DESIGNhabitat 3 2009 _ present

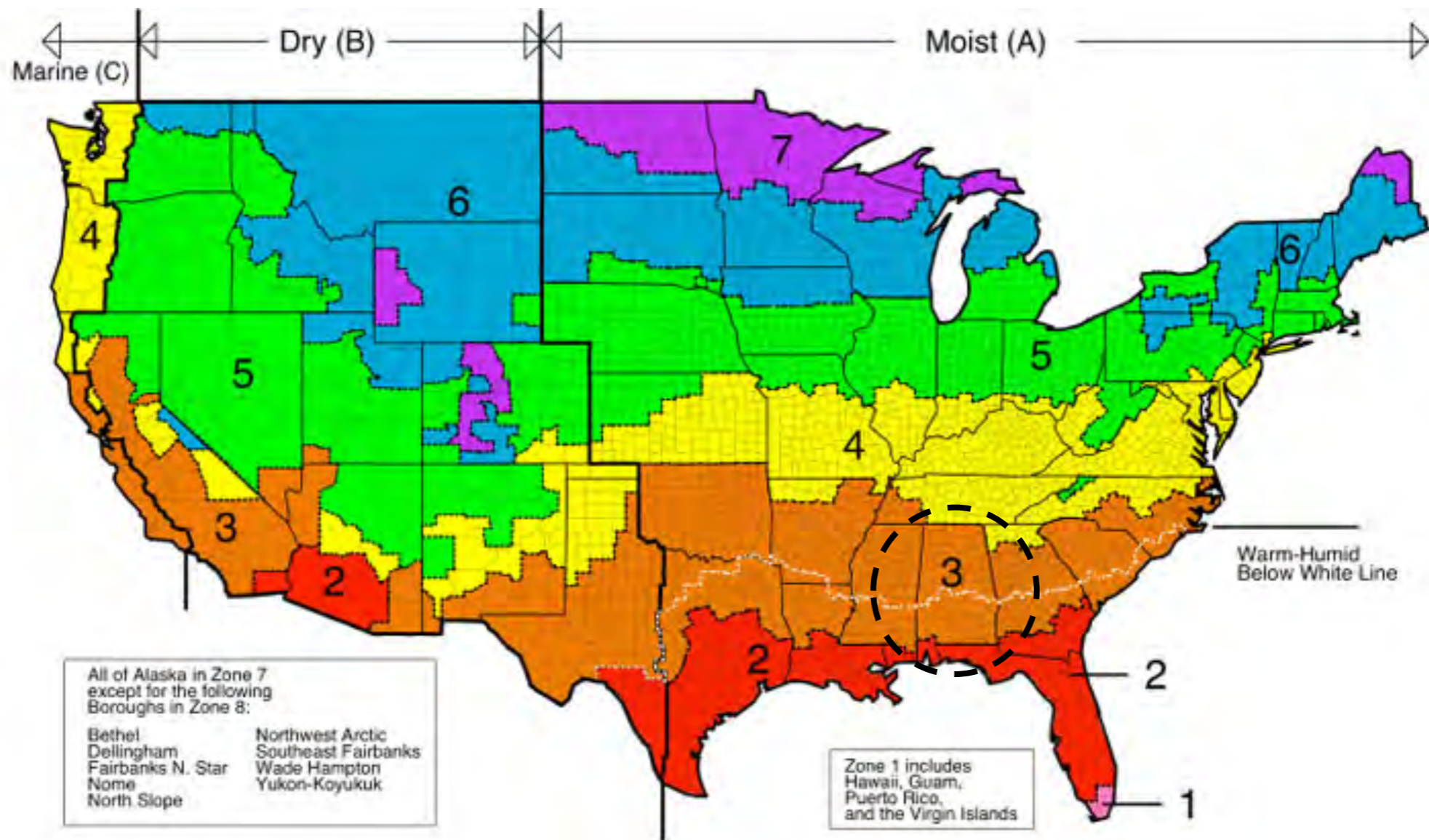
Auburn University | School of Architecture + Alabama Association of Habitat Affiliates (AAHA)



DESIGNhabitat 3.0_prototype 5
We focused our efforts to design a series of prototypes for homes that are ideal for urban infill lots for Habitat for Humanity to use. As designers of houses for urban sites we become designers of cities as well, bringing to our designs a sensitivity to the vernacular of urban neighborhoods in the southeast as well as good planning for what the ideal for family living on an urban site should be. We did our best to prove through our design that sustainability does not end with building a house that uses the least material or has the most energy savings. True sustainability lies with creating good, lasting design that enhances the quality of life for its homeowners in a profound way, building a house that will be loved to begin to help build sustainable urban residential communities for Alabama's cities.



improved spatial qualities . **advanced energy conservation strategies** . fabrication methods / mix



Whole House Energy Consumption

Alabama Residential Average

\$1730/yr



Average Residence _ 130 HERS Index

(new construction _ 100 HERS Index – where energy codes are enforced)

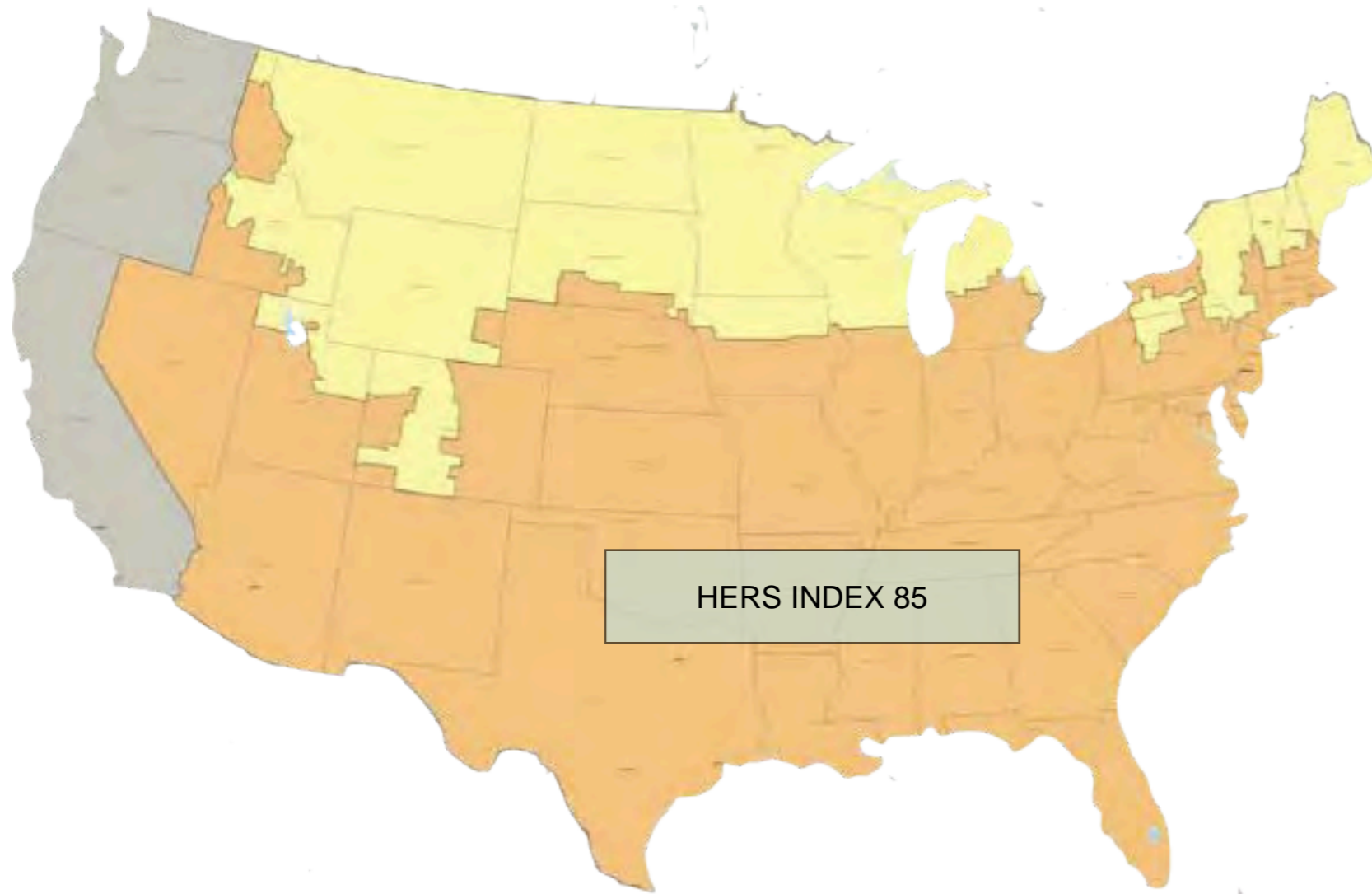
\$1015/yr



Efficient Residence _ 85 HERS Index

(high performance _ 70 HERS Index)



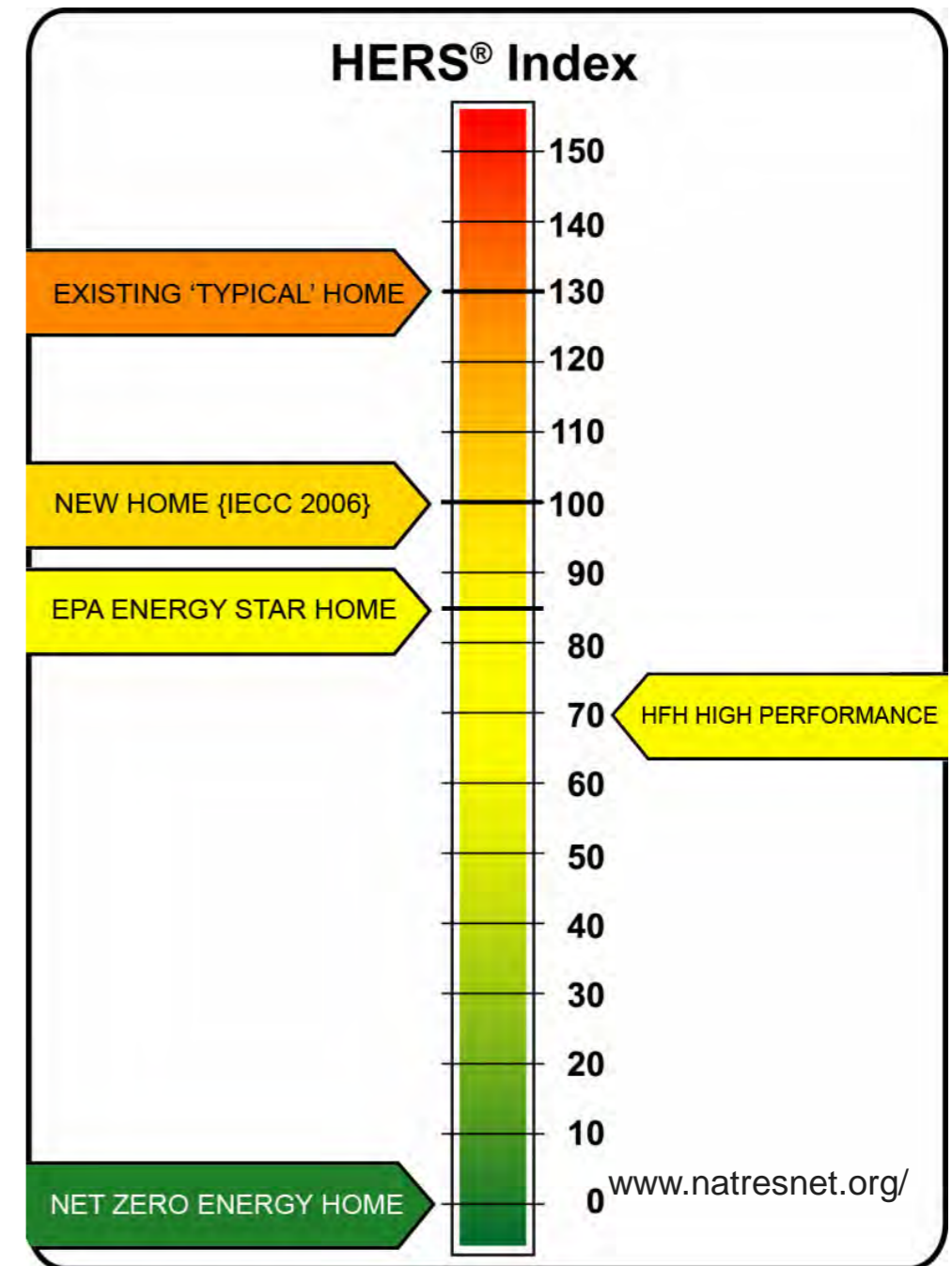


National program to recognize homes that are 15% more efficient than homes built to 2006 International Energy Conservation Code (IECC)

HERS (Home Energy Rating System)

The HERS Index is a scoring system established by the Residential Energy Services Network (RESNET) in which a home built to the specifications of the HERS Reference Home (based on the 2006 International Energy Conservation Code) scores a HERS Index of 100, while a net zero energy home scores a HERS Index of 0. (www.energystar.gov)

	HERS Index
Reference Home Score	Reference Home is assigned a HERS Index of 100, while a net zero energy home is assigned a HERS Index of 0
Reference Home Basis	2006 International Energy Conservation Code (IECC)
Scale	Each 1% <i>increase</i> in energy efficiency corresponds to a 1-point <i>decrease</i> in HERS Index
Energy Use Considered	Heating, cooling, water heating, lighting, appliances, and onsite power generation*
ENERGY STAR Requirement	HERS Index of 85 in climate zones 1–5 HERS Index of 80 in climate zones 6–8
Status	Approved by the RESNET Board of Directors. To be implemented as of July 1, 2006.



HERS (Home Energy Rating System) Modeling

REM/Rate v 11.2 - example.blg

File Go To Site Libraries Reports Graph Export Options Help

Foundation Wall Properties Summary

#	Name	Type	Length	Height	Depth	Hgt AG
1	Uncond Bsmnt	Uninsulated	0.0	0.0	0.0	0.0
2	Cond Bsmnt	R-11 Draped, Full	128.3	8.0	7.0	1.0
3	1st Lvl	Uninsulated	0.0	0.0	0.0	0.0
4		Uninsulated	0.0	0.0	0.0	0.0
5		Uninsulated	0.0	0.0	0.0	0.0

New Delete Copy

Foundation Wall Properties

Name: Uncond Bsmnt

Type: Uninsulated R=1.10

Length (ft): 0.0 Height Above Grade (ft): 0.0

Height (ft): 0.0 Depth Below Grade (ft): 0.0

Location: Between unconditioned basement and ambient/ground

ANNUAL ENERGY COSTS

	baseA	baseABCDEFGHI	DIFF	% DIFF
Heating	\$ 712	\$ 459	\$ 254	35.6%
Cooling	\$ 187	\$ 122	\$ 65	34.9%
Water Heating	\$ 213	\$ 178	\$ 35	16.4%
Lights & Appliances	\$ 519	\$ 519	\$	
Photovoltaics	\$ 0	\$ 0	\$	
Service Charges	\$ 336	\$ 336	\$	
Total	\$ 1968	\$ 1614	\$ 354	18.0%
Average Monthly	\$ 164	\$ 135	\$ 30	18.0%

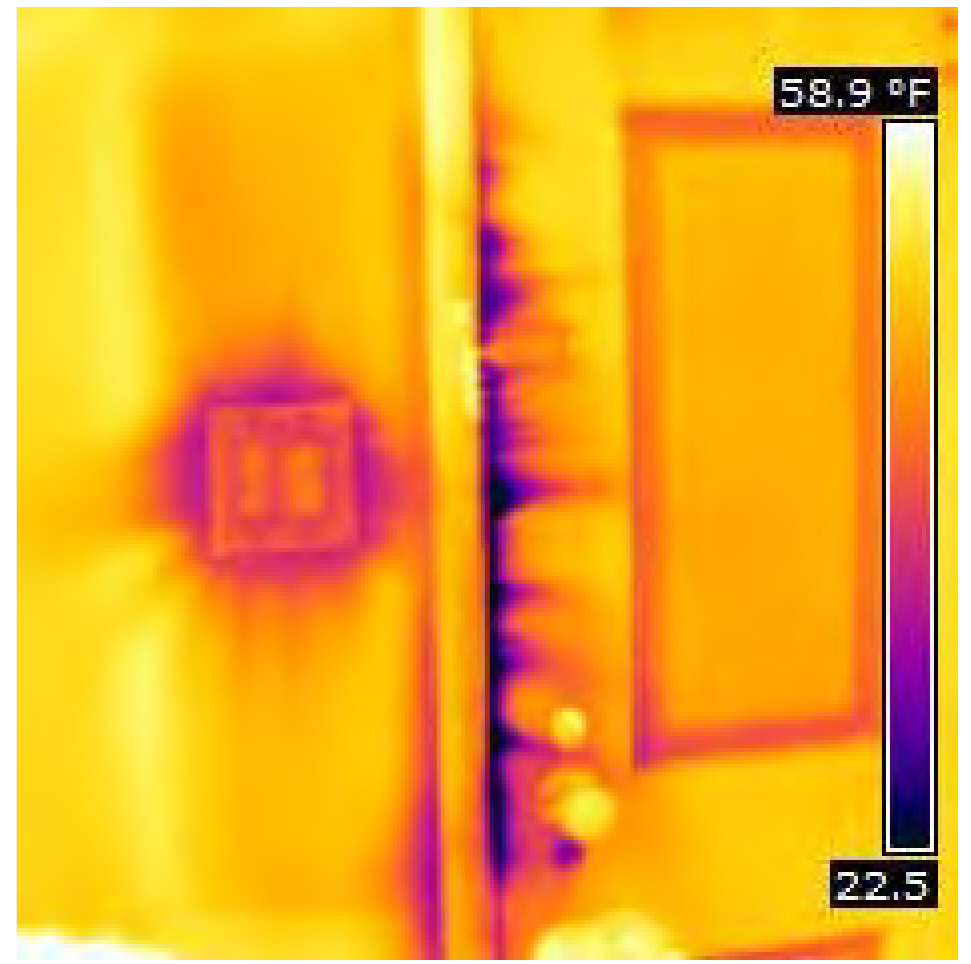
ENERGY FEATURES

Ceiling w/Attic:	R-30 Blown, Attic U=0.033	
Vaulted Ceiling:	R-19, Vaulted U=0.051	R-30, Vaulted U=0.035
Above Grade Walls:	R-11 U=0.092	R-13 U=0.084
Foundation Walls (Cond):	None	
Found. Walls (Uncond):	Uninsulated	
Doors:	R-1.8	
Windows:	u=0.67, shgc=.65 U=0.670	Double/LoE - Vinyl U=0.360
Window Shading:	H: None C: Some	
Frame Floors:	R-19 U=0.049	
Slab Floors:	Uninsulated R-0	
Infiltration:	H: 0.35 C: 0.35 ACHnat	
Infilt. Measure:	Blower door test	
Interior Mass:	None	
Mech Equip List:	Heating: Fuel-fired air distribution, 80.0 kBtuh, 80.0 AFUE.	Heating: Fuel-fired air distribution, 40.0 kBtuh, 92.0 AFUE.
	Cooling: Air conditioner, 48.0 kBtuh, 10.0 SEER.	Cooling: Air conditioner, 48.0 kBtuh, 12.0 SEER.
	Water Heating: Conventional, Gas, 0.56 EF.	Water Heating: Conventional, Gas, 0.63 EF, R-1 wrap.
Programmable Thermostat:	Heat=No; Cool=No	
Ducts:	R-6.0 Attic, exposed	
Duct Leakage:	230.00 CFM @ 25 Pascals	84.00 CFM @ 25 Pascals



HERS FEATURES

Diagnostic Testing



HERS FEATURES

Software Modeling - Simulations

The screenshot shows a software window titled "Quick Analysis - Baseline" with a close button (X) in the top right corner. The window displays energy load and cost data in four main sections, each with a title and a list of categories with corresponding values in input fields.

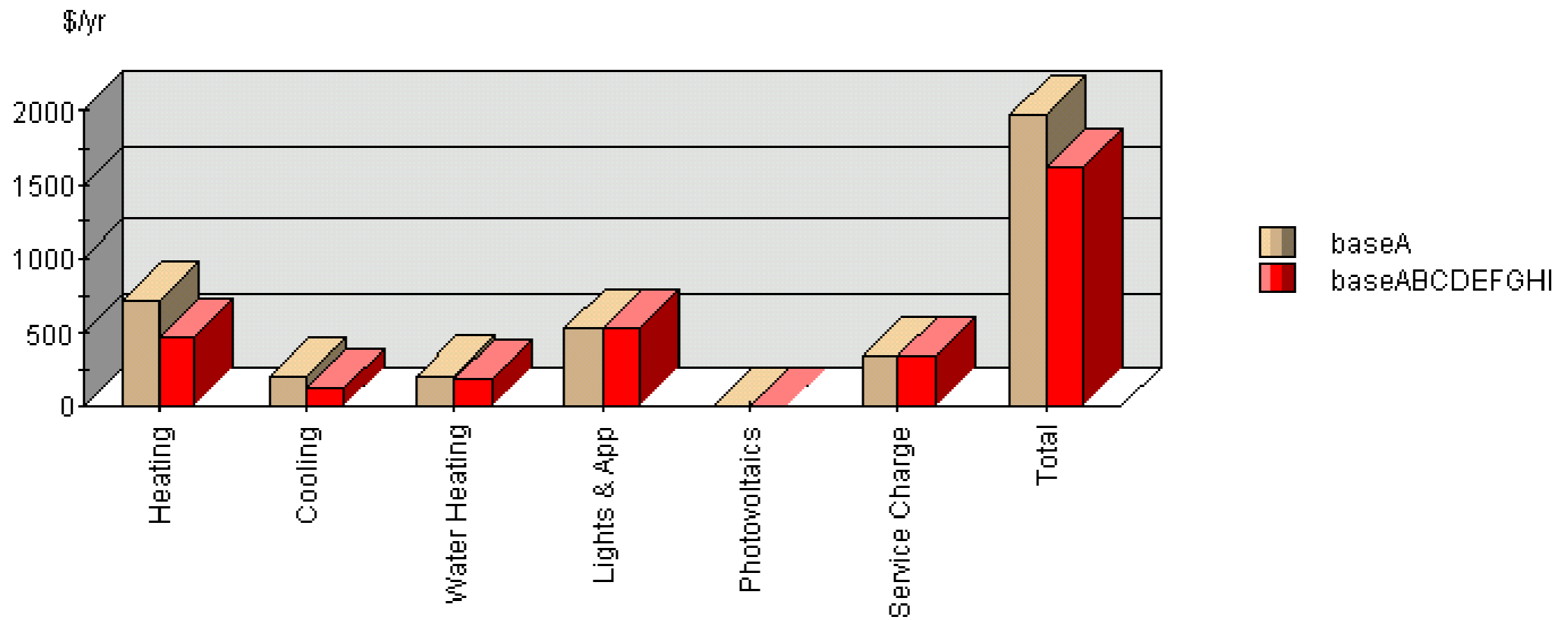
Category	Value
Annual Load (MMBtu/yr)	
Heating:	71.4
Cooling:	20.9
Water Heating:	20.3
Annual Consumption (MMBtu/yr)	
Heating:	89.2
Cooling:	7.1
Water Heating:	26.7
Lights and Appliances:	19.7
Photovoltaics:	0.0
Total:	142.7
Design Load (kBtu/hr)	
Heating:	48.4
Cooling:	26.8
Annual Energy Cost (\$/yr)	
Heating:	712
Cooling:	187
Water Heating:	213
Lights and Appliances:	519
Photovoltaics:	0
Service Charges:	336
Total:	1968
Rating	
	81.2

At the bottom of the window, there are three buttons: "Close" (with a dotted border), "Print", and "Rating" (which is a text field containing the value 81.2).

HERS FEATURES

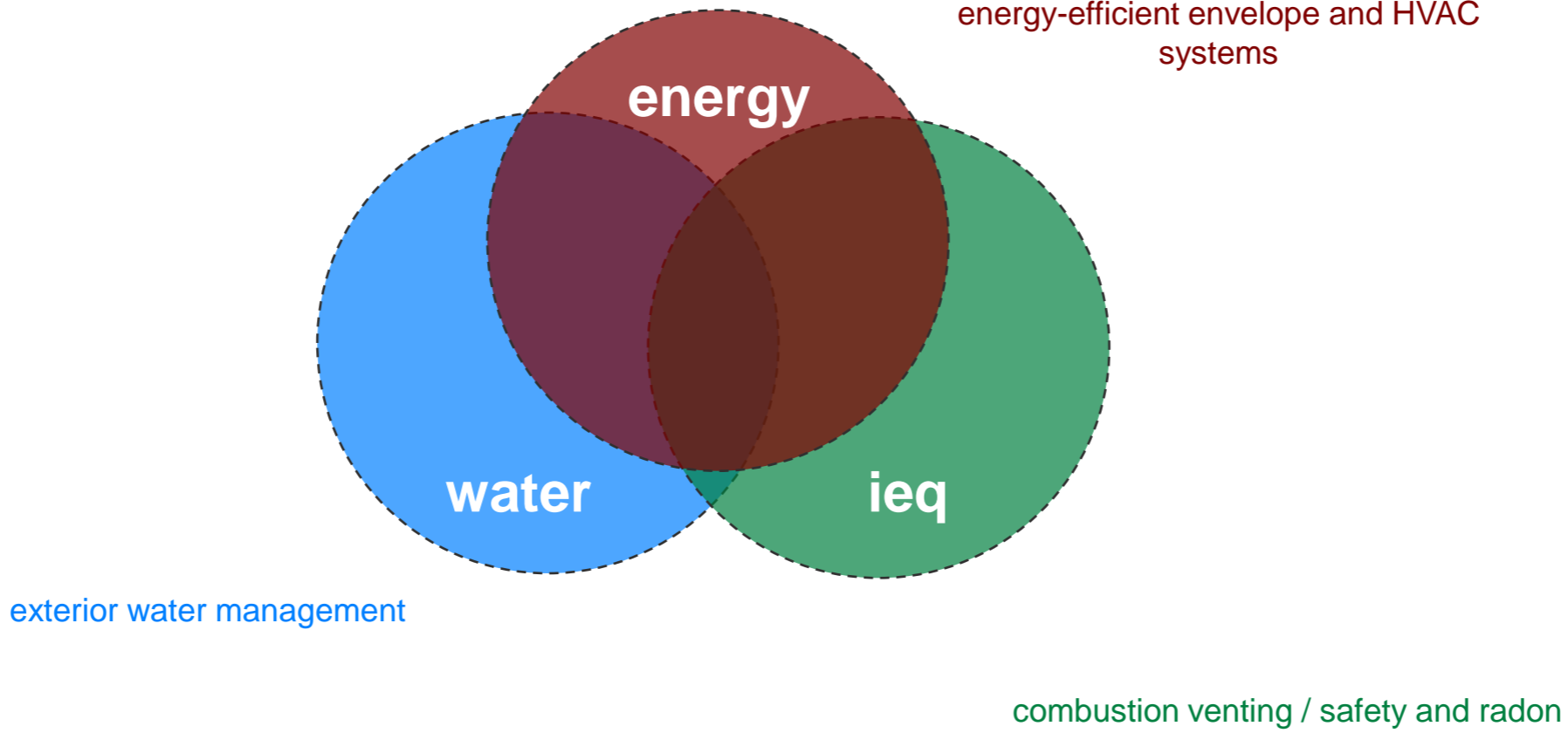
Software Modeling - Simulations

Annual Energy Cost



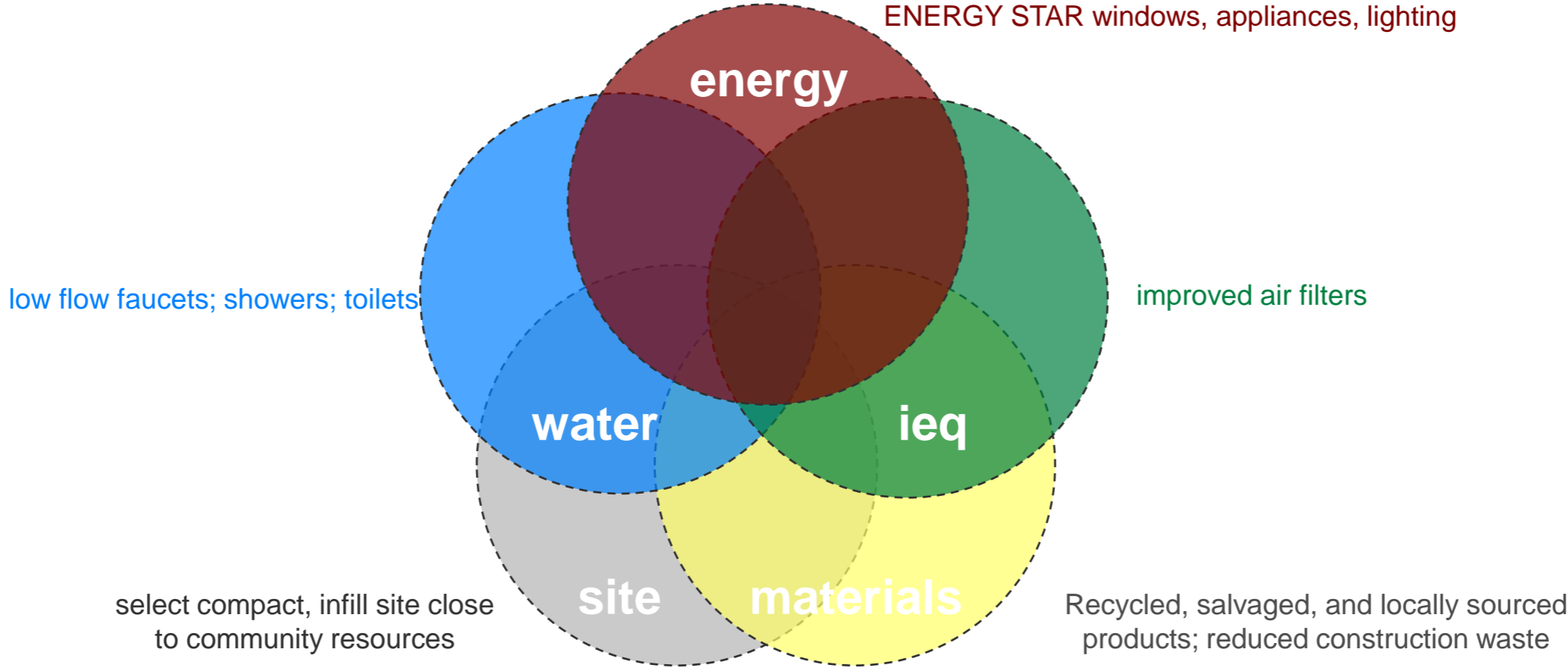


COMMON EMPHASIS ITEMS - INTEGRATED DESIGN WITH PRODUCTS AND PRACTICES

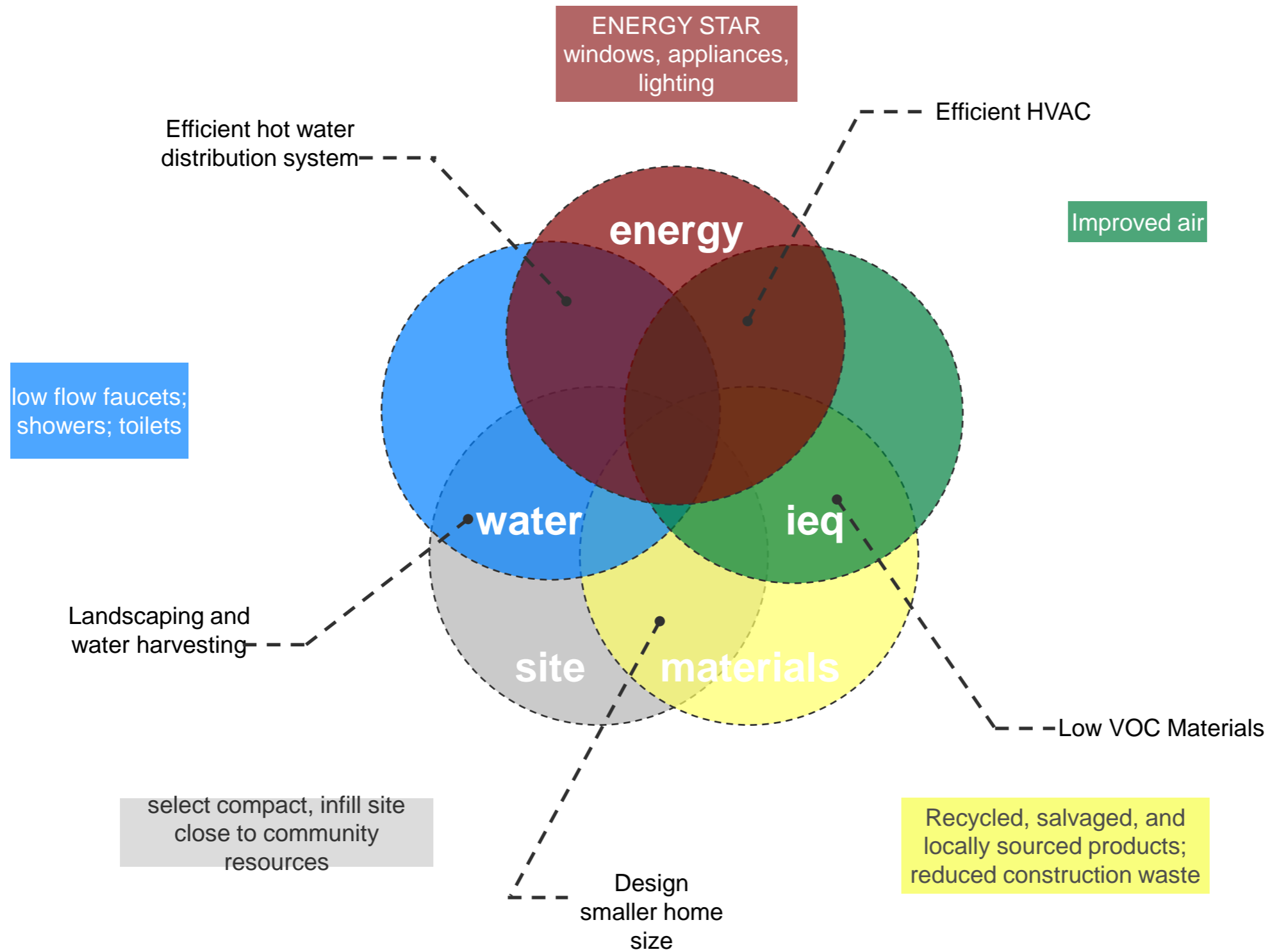




COMMON EMPHASIS ITEMS - INTEGRATED DESIGN WITH PRODUCTS AND PRACTICES



COMMON EMPHASIS ITEMS - INTEGRATED DESIGN WITH PRODUCTS AND PRACTICES



DESIGNhabitat 3

BASIC DESIGN STRATEGIES

Design for Durability

Design for Location & Orientation

Design for Daylight

Design for Heating & Cooling by:

providing a continuous building envelope

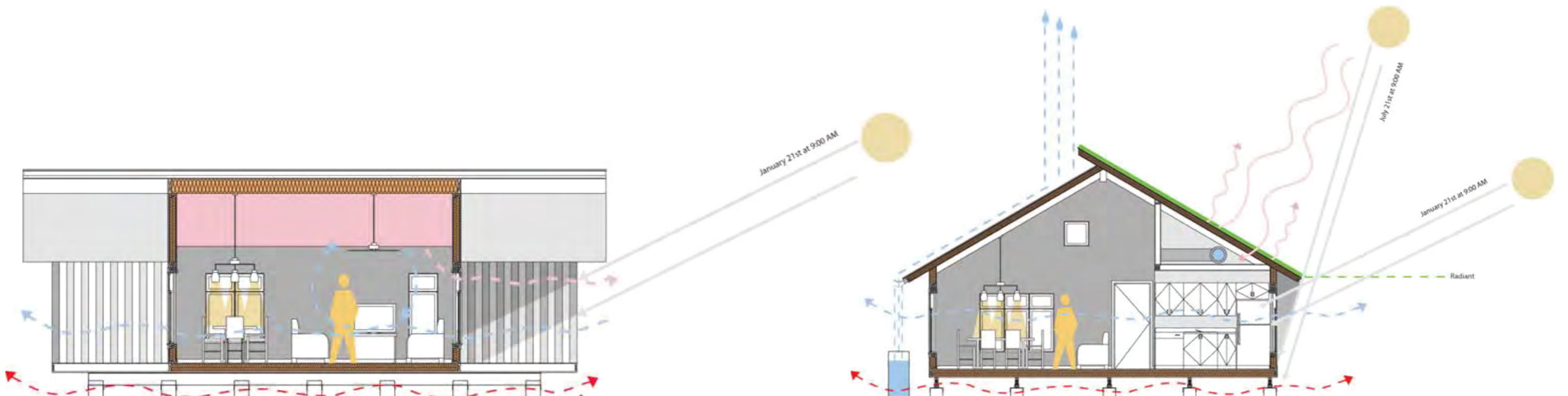
providing a continuous Air Barrier and Complete Insulation coverage

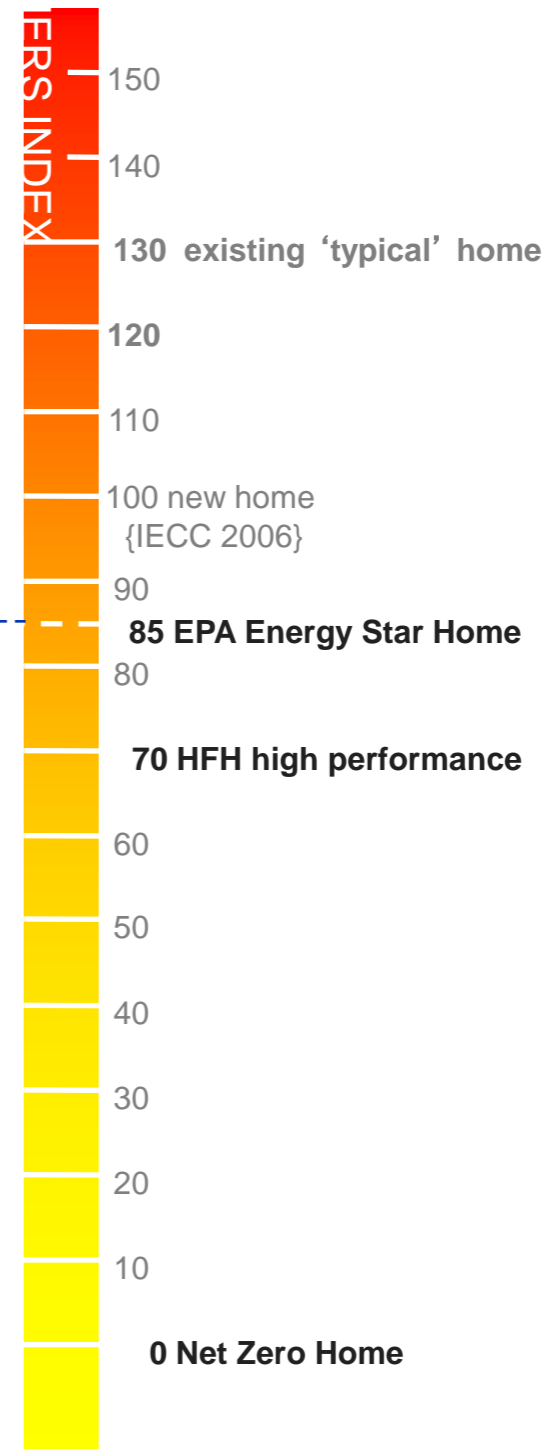
locating ductwork in the conditioned interior.

designing for controlled ventilation

Consider Prefabrication

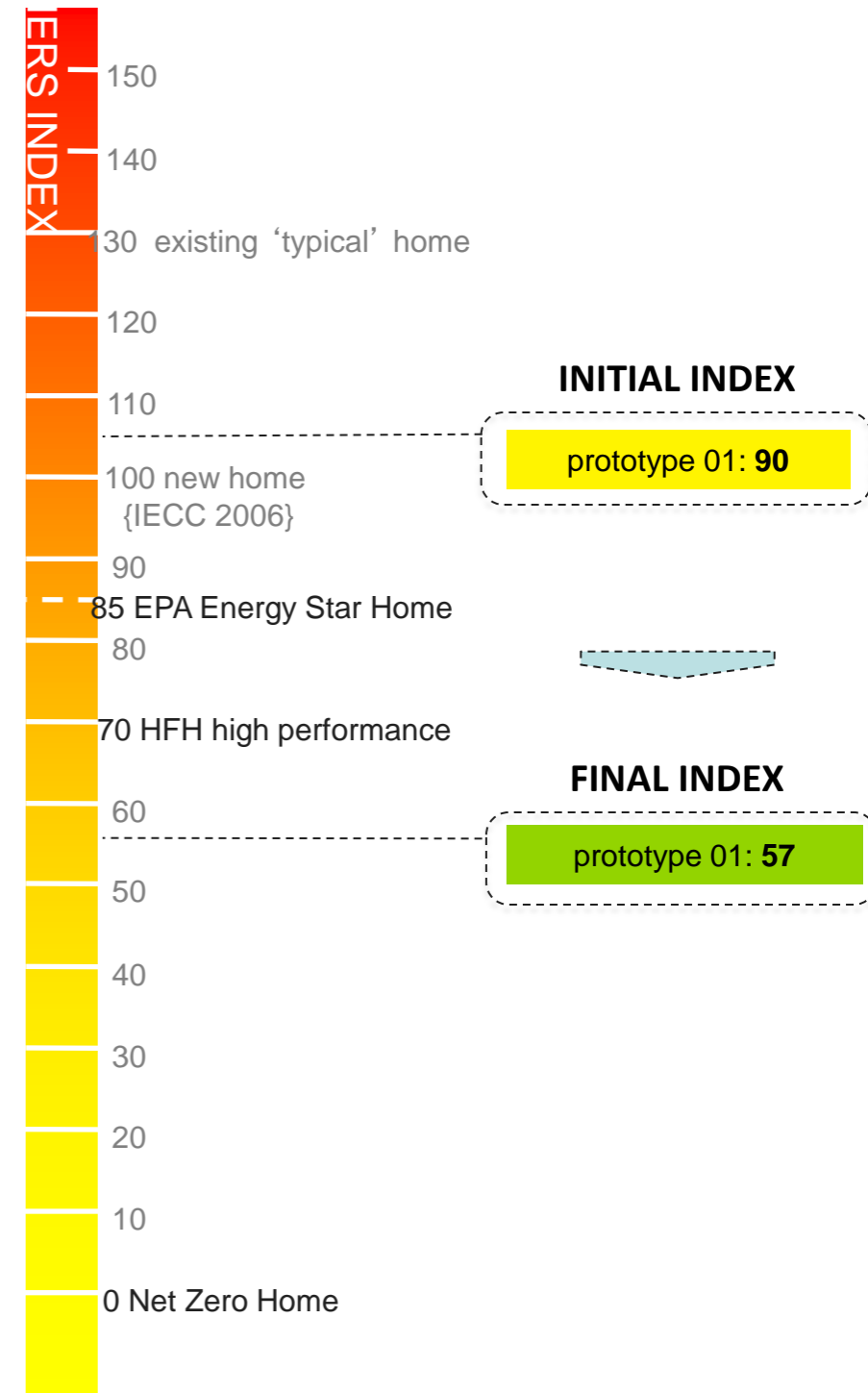
Design for Collection







SIDE CONTEXTUAL PHOTO | OPELIKA, AL



3

1036 SQ.FT.
3 BEDROOM
1 BATH
\$53,155 | SIPS
\$44,506 | TRAD.
56 | HERS
EARTH CRAFT |
PLATINUM



SITE PLAN | 1/8" = 1'
GN



VIEW FROM THE MASTER | A



VIEW OF THE KITCHEN FROM DINING | B



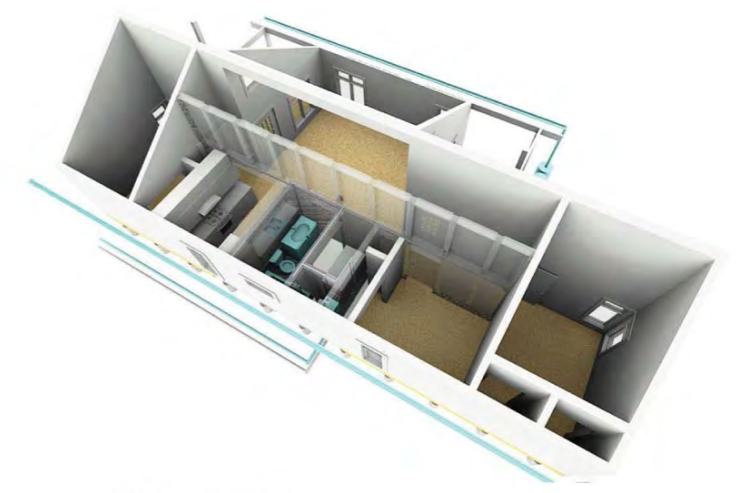
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AIRCULATION |



INSULATION |



SOLAR AND ARTIFICIAL LIGHTING |



WATER COLLECTION |

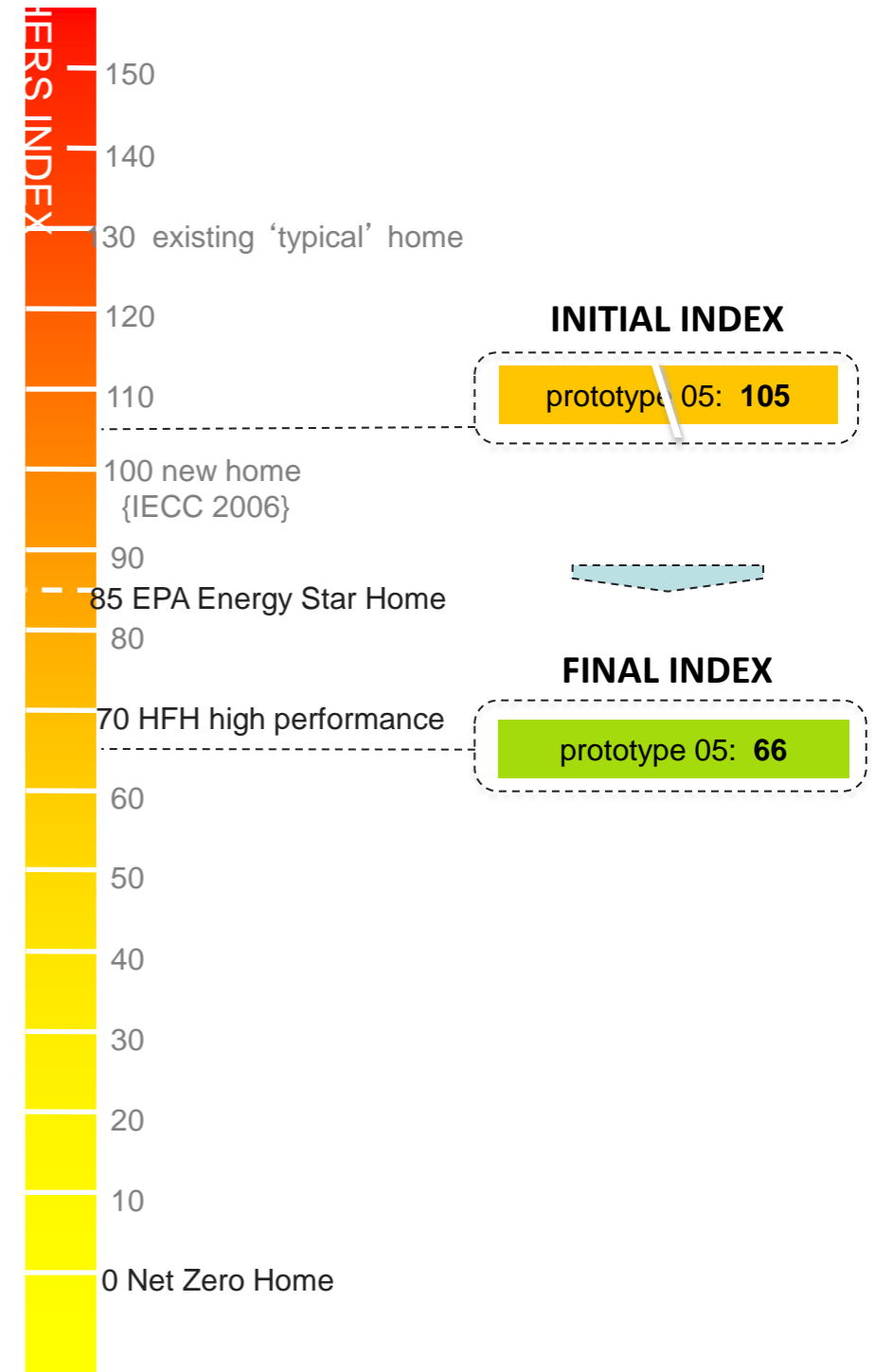


HVAC SYSTEMS LOCATION |



RADIANT BARRIER |

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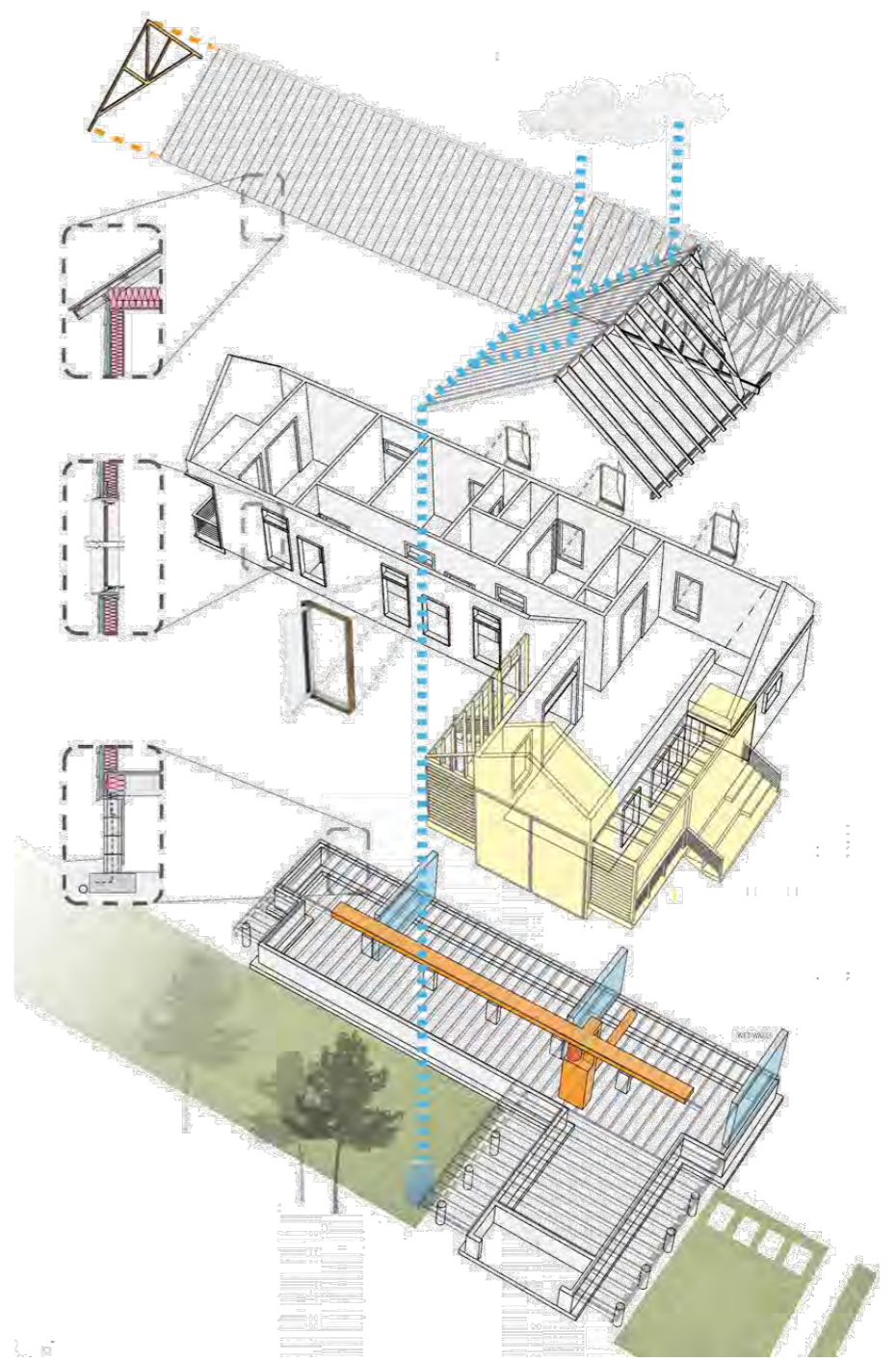
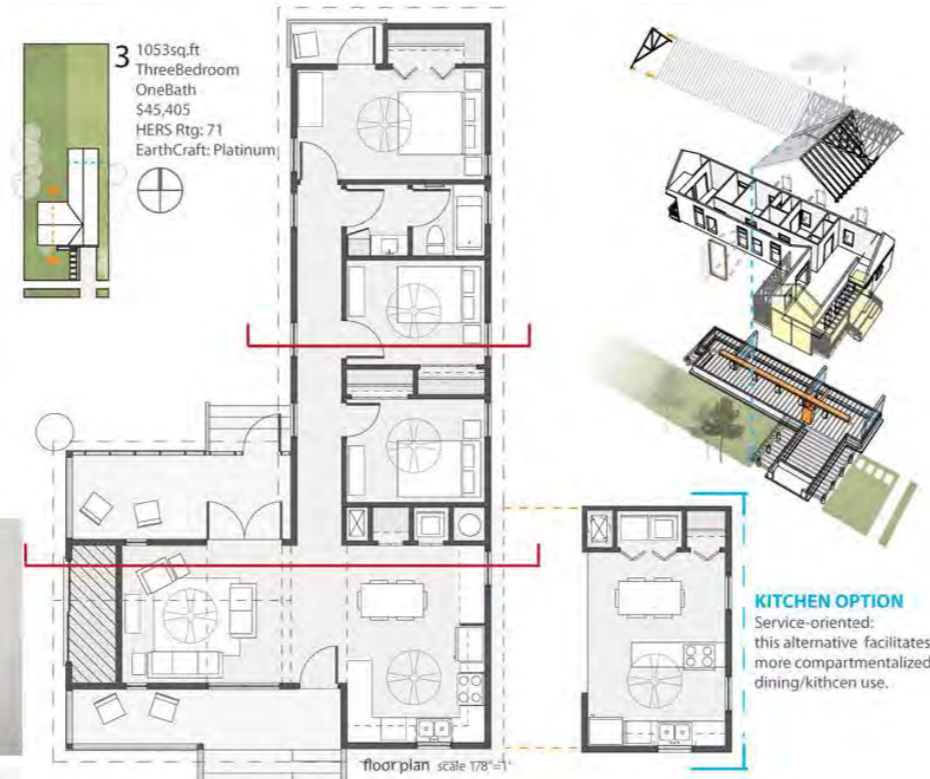
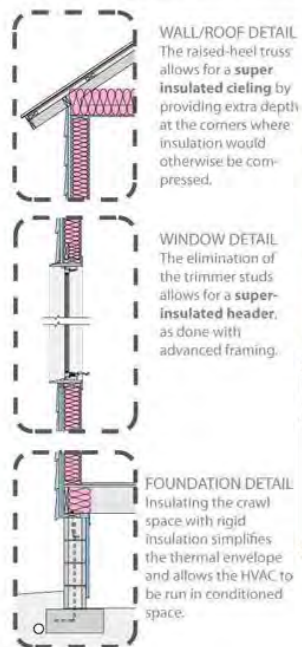
DESIGNhabitat 3.2_ Greensboro, AL

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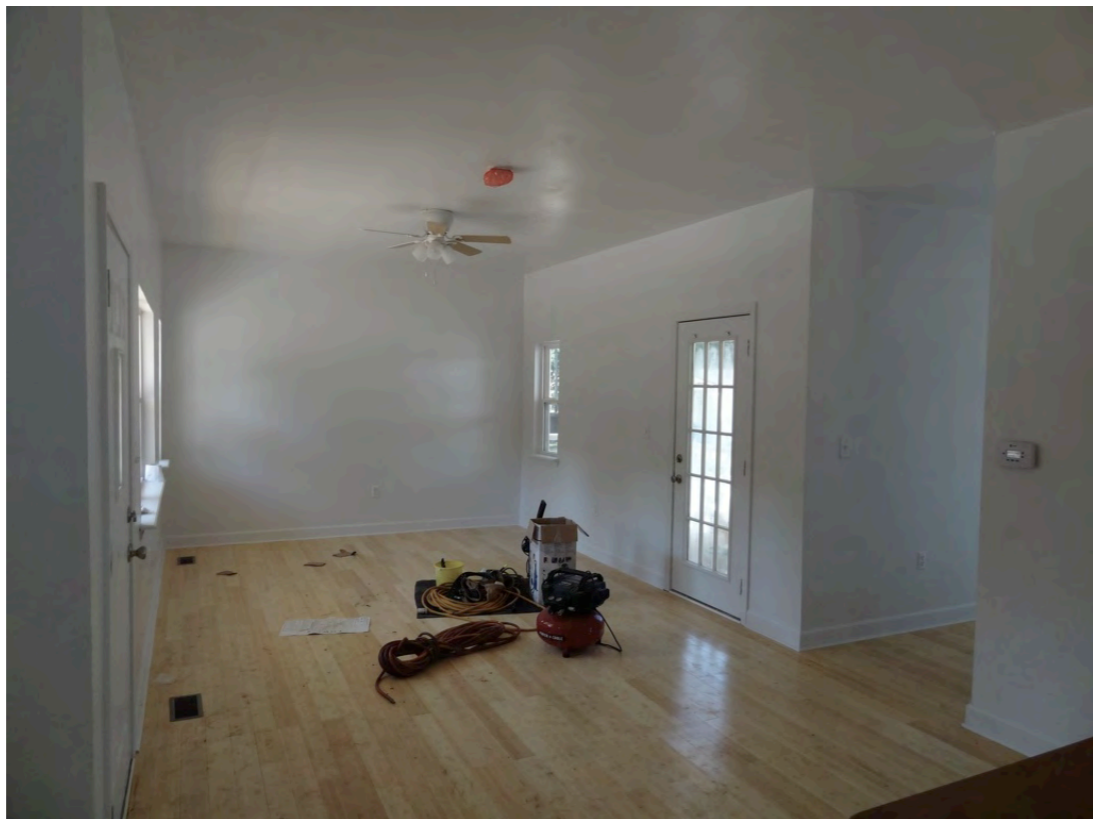
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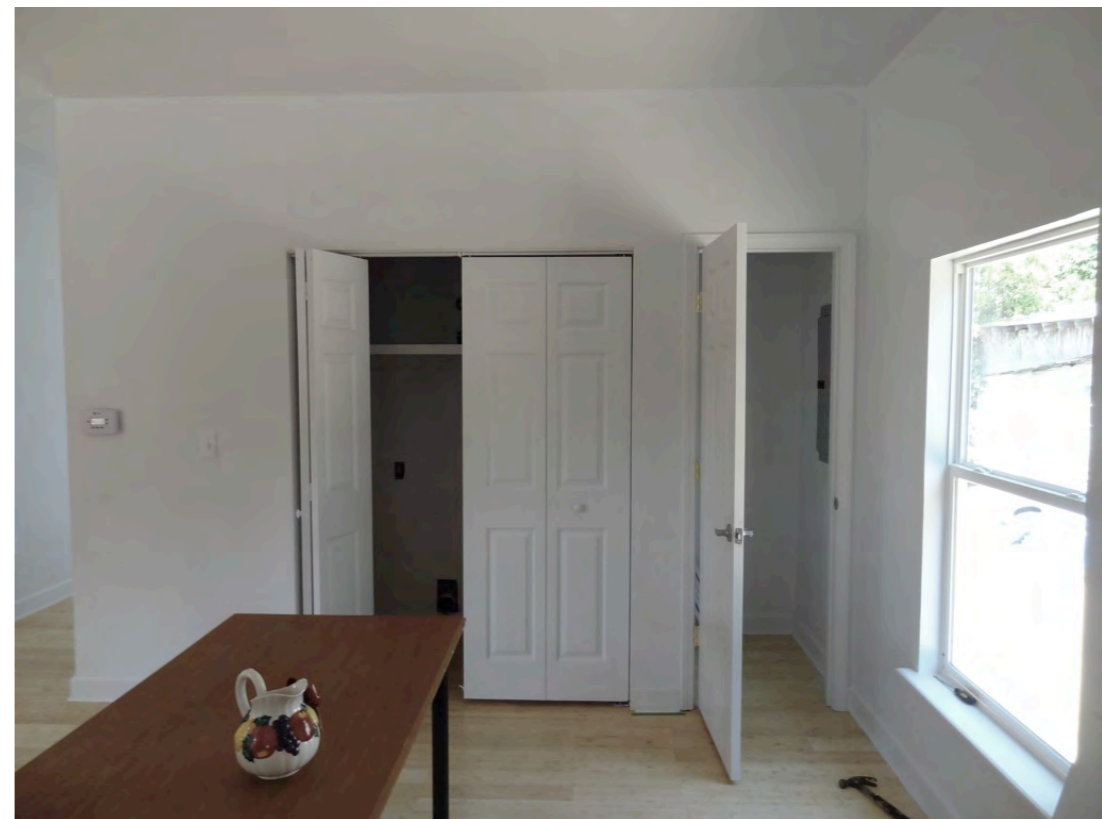
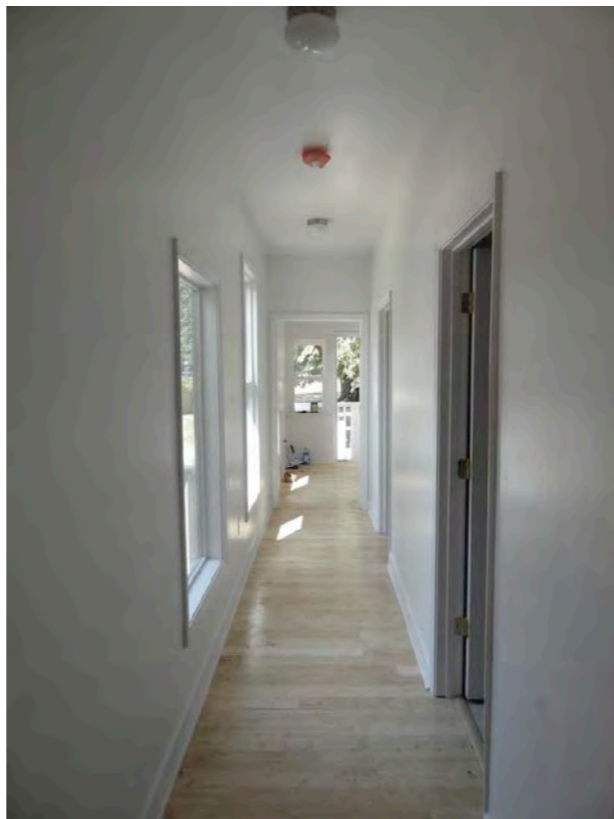


DESIGNhabitat 3 | prototype 5
student prototype proposal











2. scale-ability

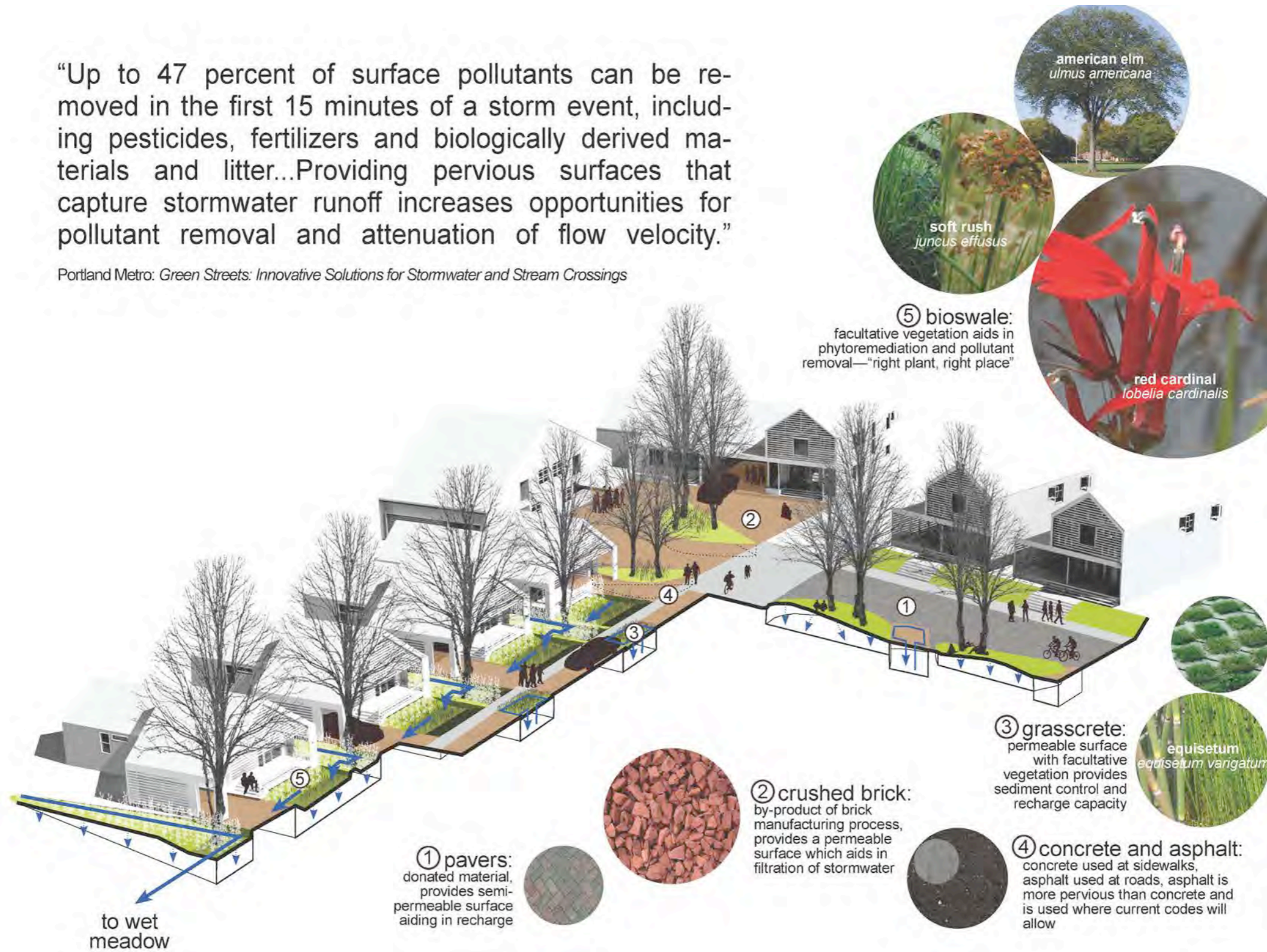
Habitat Trails Rogers, Arkansas

University of Arkansas Community Design Center

Habitat for Humanity Benton County

“Up to 47 percent of surface pollutants can be removed in the first 15 minutes of a storm event, including pesticides, fertilizers and biologically derived materials and litter...Providing pervious surfaces that capture stormwater runoff increases opportunities for pollutant removal and attenuation of flow velocity.”

Portland Metro: Green Streets: Innovative Solutions for Stormwater and Stream Crossings

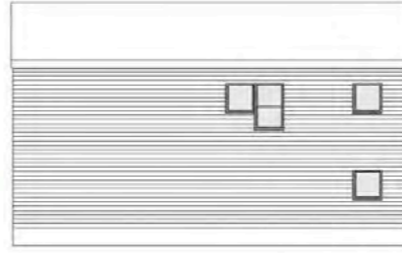




Left Elevation



Front Elevation



Right Elevation

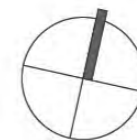
urban vernacular





Key

- | | | |
|-----------------|---------------------------|----------------------------|
| 1 - Common Lawn | 4 - Play Area | 7 - Entry Court Unit |
| 2 - Wet Meadow | 5 - Bungalow Unit | 8 - Meadow Duplex Unit |
| 3 - Bioswales | 6 - Urban Vernacular Unit | 9 - Auto Court Duplex Unit |

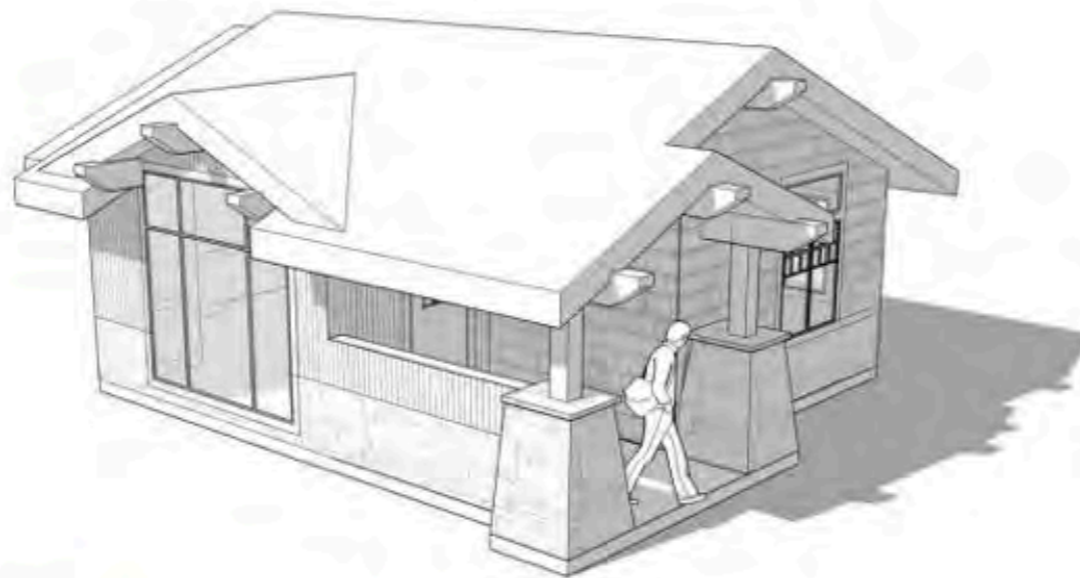








‘Granny Flats’ Seattle, Portland, Austin



**A GUIDE TO BUILDING A BACKYARD COTTAGE
JUNE 2010**



CITY OF SEATTLE
SEATTLE PLANNING COMMISSION www.seattle.gov/planningcommission
DEPARTMENT OF PLANNING AND DEVELOPMENT www.seattle.gov/dpd/backyardcottages



source: [seattle times](http://seattletimes.com)



Josh Brower
Chair, Seattle Planning Commission



Diane Sugimura
Director, Department of Planning and Development

"...a small but important part of what makes Seattle livable and sustainable."

"The Seattle Planning Commission is pleased to provide this guide for creating attractive Backyard Cottages that are designed to fit well in their neighborhoods. The guide addresses the full range of issues associated with building a Backyard Cottage, from land use regulations to site planning to good design features. The guide also offers some examples of good Backyard Cottages, tips for working with building professionals, and ideas on estimating costs and finding financing. The Planning Commission strongly supports this type of housing as one of Seattle's housing choices."

"Backyard Cottages are a small but important part of what makes Seattle livable and sustainable. They offer an option for renters and for homeowners seeking to remain in their present homes. This type of housing can be more affordable and helps reduce sprawl which addresses climate issues. The Department of Planning and Development is pleased to have collaborated with the Seattle Planning Commission in developing this guide for homeowners – supporting good design, promoting neighborhood sensitivity, and offering practical suggestions for developing a Backyard Cottage."

Image courtesy Johnston Architects pllc ©Ben Benschneider



WHO CAN BUILD A BACKYARD COTTAGE?

In December, 2009 Seattle City Council adopted legislation to allow the construction of backyard cottages on eligible lots in single-family zones throughout the city. Prior to the December 2009 legislation, Backyard Cottages were permitted only in Southeast Seattle, where they were authorized by legislation in 2006.



Image courtesy David Wike

Image courtesy PLACE Architects pllc



© www.rosschapin.com



You can build a Backyard Cottage if you meet the following requirements:

- You are a homeowner.
- Your property is located in a single-family residential zone (SF 5000, SF 7200 or SF 9600 zoned area).
- Your lot is not in a Shoreline District.
- Your lot is at least 4,000 square feet in area.
- You or your property co-owner(s) will occupy either the main house or the Backyard Cottage as a permanent and principal residence.
- You or your property co-owner(s) plan to live in the main home or the Backyard Cottage for more than six months of each calendar year.
- You or your property co-owner(s) who live on the property have a 50 percent or greater interest in the property.

If you have any doubt about whether your property is in a zone that allows Backyard Cottages, you can research your property's zoning on the DPD website: www.seattle.gov/dpd.

You may also visit or contact DPD directly at their Public Resource Center (PRC).

City of Seattle
Department of Planning and Development
Seattle Municipal Tower, 20th floor
700 Fifth Ave, Suite 2000
Seattle, WA 98124

206 684-8467
or PRC@seattle.gov



THE
ALLEY FLAT
INITIATIVE

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[resources](#)

[2010 AFI Exhibit](#)



AFI is a collaborative project of:

- The Austin Community Design and Development Center,
- The University of Texas Center for Sustainable Development, and
- The Guadalupe Neighborhood Development Corporation.

Listen to the KUT reporter Mose Buchele's coverage of AFI, 8/3/10. [Listen.](#)

Read about Seattle's approach and progress with "backyard cottages", by Judy Keen USA Today 5/26/10. [Read Article.](#)

Learn more about AF 9 + 10. [Link to a video by Andres Quintero featuring homeowner Lenora Givens.](#)

Read about AFI in the April/May Living edition of Rare Magazine. [Read Article.](#)

Watch Andres Quintero's video coverage of the AFI Exhibition Opening at City Hall. [Link to the video.](#)

Follow the AFI Spring 2010 design studio at UTSOA. [Link to the Blog.](#)

See Sarah Gamble's AFI presentation at Pecha Kucha Austin. [Link to the video.](#)

The Alley Flat Initiative wins the Envision Central Texas Award for Redevelopment! [More information.](#)

opportunities

1. Consider adopting local zoning codes that allow a wide range of housing types
2. Reconsider mandated minimum lot and house sizes.
3. Reconsider restrictions on multifamily housing.
4. Support practices that keep housing affordable.
5. Encourage continual reinvestment in existing communities and organizations that work in those communities.

references

Energy Star

www.energystar.gov

Indoor Air Plus

www.epa.gov/indoorairplus

Green Energy Key

www.greenenergykey.com

Earth Craft House

www.earthcrafthouse.com

National Home Builders Green Building

www.nahbgreen.org

U.S. Green Building Council

www.usgbc.org

EERE Builders Challenge

www1.eere.energy.gov/buildings/challenge/index.html

REMRATE

www.archenergy.com/products/rem

HEED

www2.aud.ucla.edu/heed/

Habitat for Humanity Alabama

www.alabamahabitat.org/

Habitat for Humanity International

www.hfhi.org

DESIGNhabitat

www.cadc.auburn.edu/soa/design-habitat