



Why zHome?



The whole is greater than the sum of it's parts''

Buildings by the numbers – buildings in the US:

- o 38% of carbon dioxide emissions
- o 39% of energy use
- o 72% of electricity consumption
- o 90% - time average American spends indoors
- o 41% of water use
- o 60% of non-industrial waste
- o 40% of all raw materials use

History of Issaquah's Green Building Initiatives

- o 2000 Start of informal program
- o 2003 Fire Station 73 (First LEED Fire Station in the U.S.)
- o 2004 Built Green Idea Home
- o 2004 Sustainable Building Resolution

Results to date:

- o 1750 Built Green 4+5 star homes
- o Eight LEED buildings



How did we get here?

- o BG Idea Home – prototype
- o BedZED & Hockerton
- o March 06 – City creates partnership with King County GreenTools, Built Green, and Washington State University
- o Fall 06 – Property sought
- o Spring 07 – Property negotiated with PBC; initial Council approval
- o Summer 07 – Builder RFQ; PSE joins partnership
- o Sept. 07 – Final Council approval
Fall 07 – David Vandervort selected as architect





Collaborative Goals: Catalyzing Change Replicable Strategies Aggressive Benchmarks

- o Designer, builder, consumer and government education
- o Open book accounting
- o Media
- o Consumer classes
- o Extended open house period
- o 5 year demonstration unit
- o Zero net energy use
- o Zero net carbon emissions
- o 60% water use reduction
- o Deep green materials
- o Low toxic, healthy interiors
- o Low impact storm water mitigation techniques
- o 660 Built Green Points

Timeline

- o Construction Fall '08 – Fall '09
- o Grand Opening Fall '09

Ongoing Education www.z-home.org



Who is Howland Homes?

- oFounded in 1998 – Single Family / Townhomes
- oToday – Full Service Urban Infill Developer, Innovator, Builder
- oSingle Family, Multifamily, and Commercial.
- oNumbers – 42 / 14 / 200 / 50-100 / 1000 / 5 days / 10





Why zHome

- o Urban Infill – Our Passion, Our Market, Our Company, Our Future
- o It is time - Boutique or Production, Complex or Simple
- o Innovation, Education, Healthy Living, and Stewardship

Market Reality - #@%^&*#@!





Our zHome Team:

David Vandervort Architects - Project Architect

Stantec Consulting, Inc - Energy & Mechanical Engineer

Darwin Webb Landscape Architect

Core Design, Inc – Civil Engineering

2020 Engineering - Water/Storm

Harriott Smith Valentine - Structural Engineer

Oversight / Insight: (TAC) City of Issaquah, King County,
MBA, PSE, WSU Energy Office, Port Blakely - ARC



Project Considerations: Builder / Developer View

- o Site, Design, Permitting, Construction, Sales
- o Approval, Inspection, Changes & Final Signoff: Wells, Heat Pump Systems, Solar Electric Systems, Air Heat Exchangers, Advanced Framing, New Materials, Rain Water Systems, Townhome NOT Condo
- o Cost Drivers for Affordable Living: 1) Land / Zoning 2) Time 3) Material / Labor Costs 4) Regulations – Changes, Interpretations (No Maybe Ok)



09.09.09



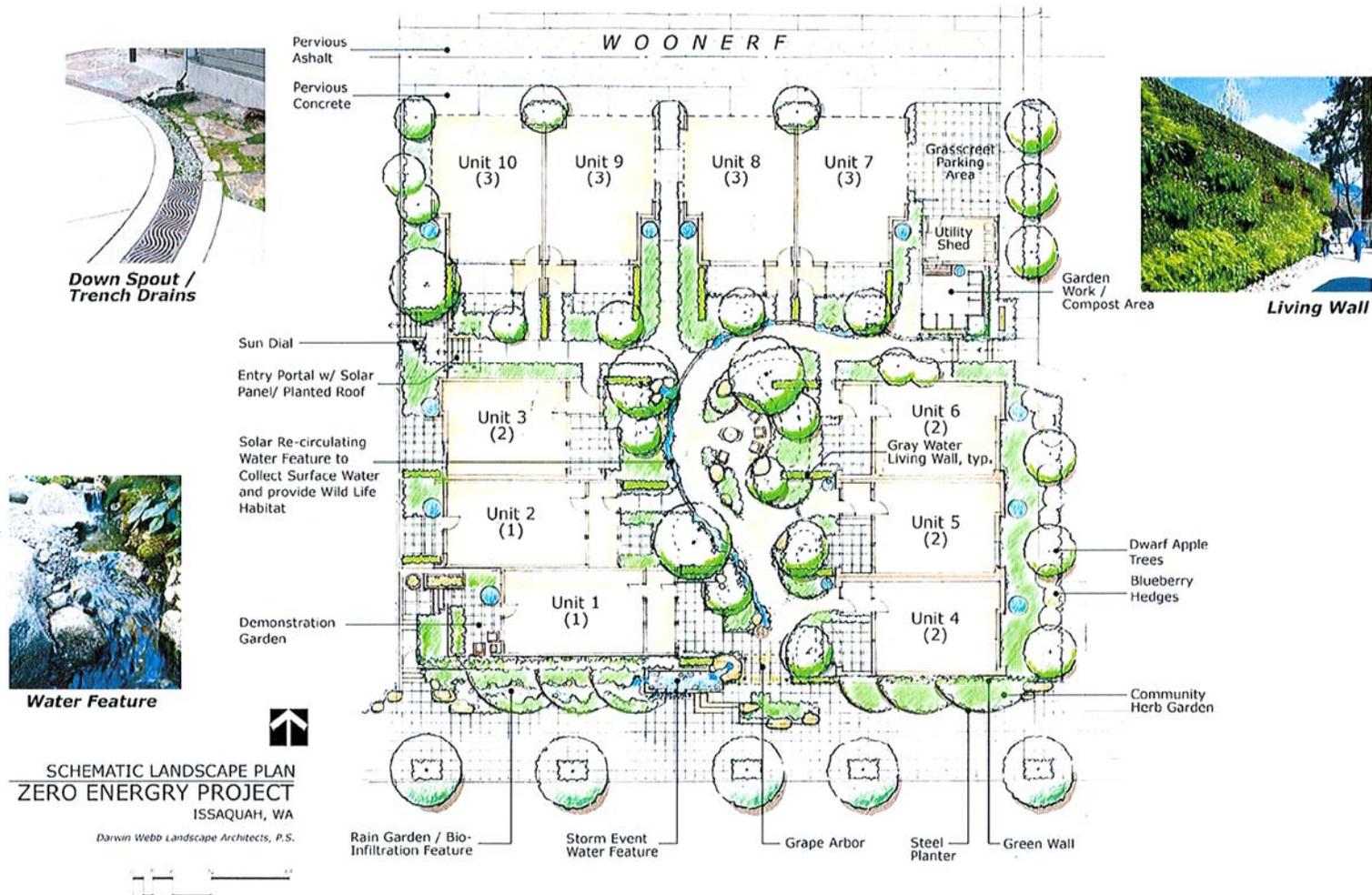
Design Goals

- o Flexible for Modern Living
- o Connected to the Land
- o Replicable
- o Low Tech / High Tech Hybrid



Site Plan Concepts

- o Cultivate Community
- o Integrate Buildings to the Land
- o Solar Courtyard
- o Vertical Gardens
- o Parking + Services off Woonerf
- o Smart Car Parking w/ Electrical Hook Up



Town home Unit Types

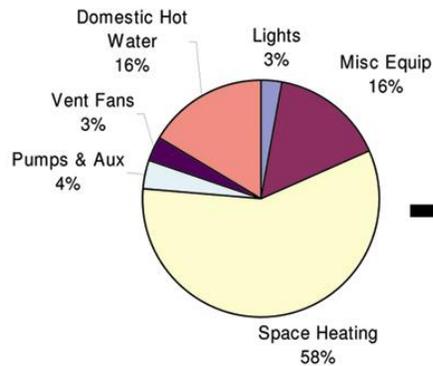
- o (2) 1-Bedroom 791 Conditioned Sq.Ft. (+Garage & Decks)
- o (4) 2- Bedroom 1,344 Conditioned Sq.Ft. (+Garage & Decks)
- o (4) 3 Bedroom 1,537 Conditioned Sq.Ft. (+Garage & Decks)



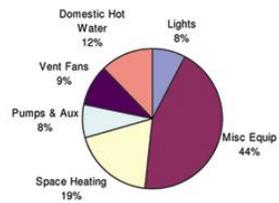
Benchmarks

- o Environmental
- o Water Conservation
- o Materials
- o IAQ
- o Construction Waste Recycling
- o Low Impact Storm Water Runoff

Baseline Energy Breakdown



Optimized Energy Breakdown



Heating Technology Considerations

Heating Technology	Seasonal Efficiency (COP)	lbs CO2 per MMBtu Heating	kWh per MMBtu Heating	PV (ft2) per MMBtu Htg
Condensing Boiler	0.95	123.24	308.42	30.8
Electric Heat	1.00	322.00	293.00	29.3
Ground Source HP	3.5	92.00	83.71	8.4
Air-Cooled HP	2.4	134.17	122.08	12.2



Lessons Learned

- o Passive and Active Energy Strategies Must be Integrated
- o Occupant Behavior Will Ultimately Determine Zero Energy Success

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