

Makings of a Green Home



What Makes a Home Green?

The Five Pillars of Green

Energy

Health

Water

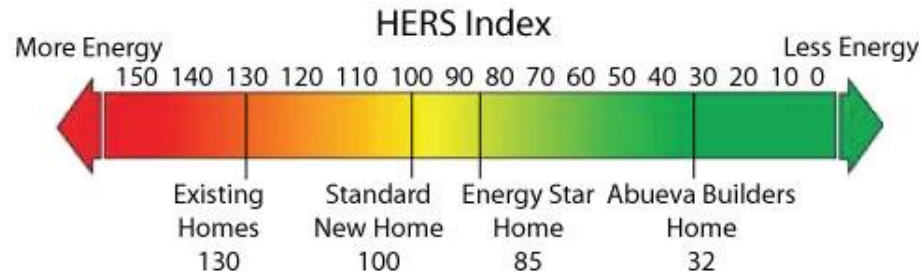
Materials

Place

Green Certification Programs



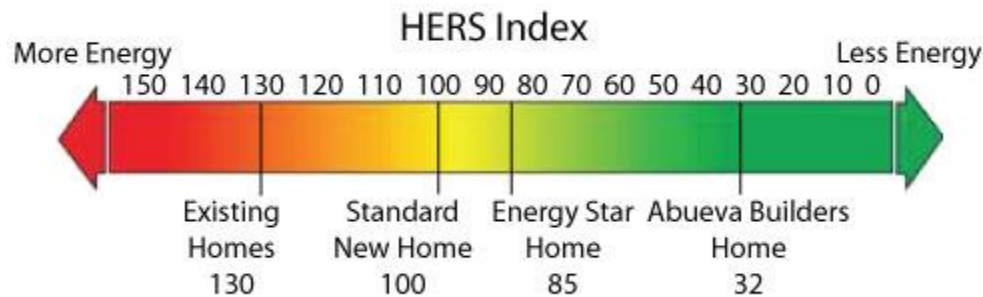
How My Company Looks at Green?



- Energy Efficient Features
- Environmentally Conscious Methods and Materials
- Universal Design

Defining Energy Efficiency

The HERS Score



- Industry standard for measuring a homes energy efficiency
- An empirical way to compare homes
- Based on complex calculation that accurately estimate a homes energy consumption

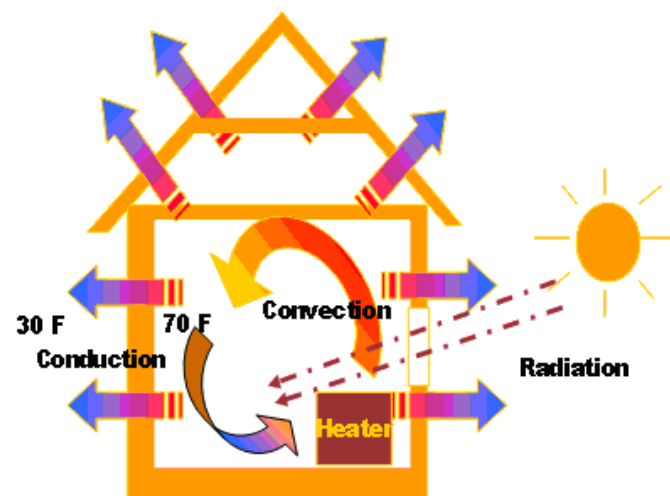
What Makes Our Homes So Energy Efficient? It's Mostly About The Shell!

- Insulation previously required by code
0-10-20-38-0.35
- Insulation currently required by code (as of 2016)
0-15-20-49-0.32
- Insulation in our homes 20-30-40-60-0.18

Our homes have double the required levels

- Air sealing previously required by code 5
ach50
- Air sealing currently required by code 3 ach50
- Air sealing in our homes <0.60 ach50

Our homes have over 8.5 times the required level



Benefits of a Good Shell

- More consistent temperature throughout the home
- Greatly improved air quality
- Significant reduction of sound attenuation



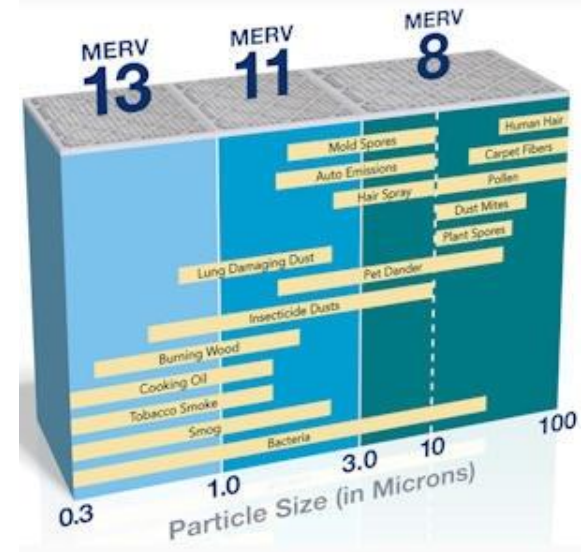
Ductless Mini-Split Heat Pumps

- New technologies make these units capable of providing heat down to -13 degrees
- Among the highest cooling rating efficiency (SEER=21) on the market
- Provide better dehumidification than tradition A/C units to reduce cooling demands in the summer
- Typical forced air systems suffer from up to 40% duct loss
- Heat pumps *move* heat rather than *generate* heat resulting in space conditioning costs of as little as one quarter that of traditional systems



ERV(Energy Recovery Ventilator)

- Delivers continuous, fresh, healthy air
- Recovers up to 98% of building heat energy
- Maintains consistent indoor humidity
- **EconoCool™** – Brings in cool filtered air in the summer – A/C required less often
- **MERV 12** filtration – removes particles as small as 1.8 microns



Condensing Water Heater

- A 97% efficiency tank system, one of the highest efficiencies on the market
- Can be retrofit into existing homes more easily than a tankless system
- Provides limitless hot water supply
- Does not suffer from problems associated with tankless systems such as low flow activation and “cold sandwiches”
- Allows for simpler installation of recirculation systems to reduce water usage



The Second Measure of a Green Home: Environmentally Conscious Construction

- Make a commitment to reduce environmental impact
- Manage resources (material, energy and water) efficiently
- Create a healthy living environment
- Produce a durable product that is designed to last

Our bigger-and-better society is now like a hypochondriac, so obsessed with its own economic health as to have lost the capacity to remain healthy. The whole world is so greedy for more bathtubs that it has lost the stability necessary to build them, or even turn off the tap.

Foreward, A Sand County Almanac, Aldo Leopold, 1948

Reduce, Reuse, Recycle

Reduction comes first!

- Thoughtful home sizing
- Design around dimensions that maximize material efficiency and eliminate waste
- Design building systems with energy and water conservation in mind

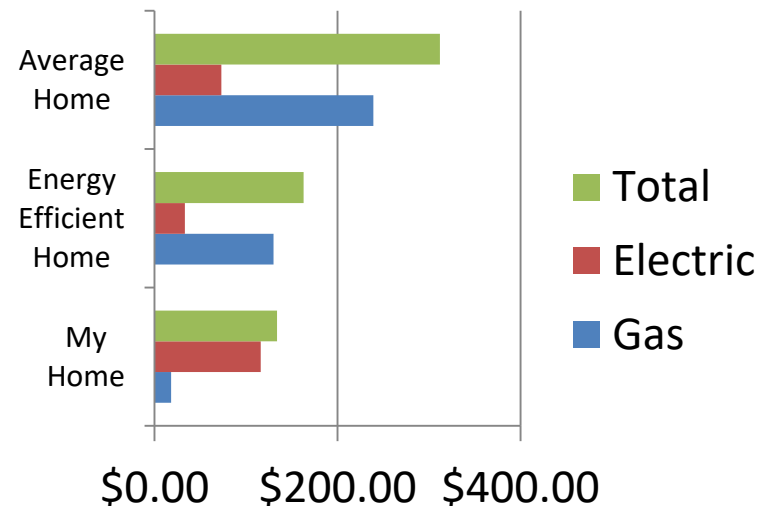


How much of an impact can we make?

- Our entire projects generate only 12 cubic yards of waste
- The houses uses approximately 50% of the energy of comparably sized homes
- The houses uses approximately 40% less water than average



February Consumers Energy Costs



Passive House Standards Met

- Annual heating and cooling demand of not more than 15 kWh/m²
- Actual 2017 annual heating and cooling demand of the house = 13.78 kWh/m²
- Total primary energy consumption of not more than 60 kWh/m²
- Actual 2017 total primary energy consumption of the house = 52.56 kWh/m²
- Building must not leak more than 0.6 ACH50
- Actual house test result = 0.58 ACH50

Creating a Healthy Living Environment

- Tight shell and ERV provide exceptional air quality
- Careful selection of materials reduces VOC's
- Other design elements reduce the introduction of contaminants into the home



Durable, Future Proof Products are Green Products

- The despicable practice of “planned obsolescence” and understanding material life cycles



CLEARING A PATH FOR PEOPLE WITH SPECIAL NEEDS CLEARS THE PATH FOR EVERYONE!



- Minimizing necessary maintenance ensures the integrity of the home
- How universal design ensures the greatest usefulness to persons of all abilities

What is Universal Design?



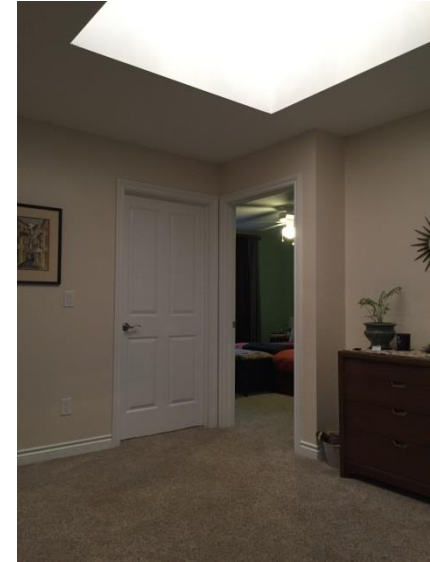
Universal Design (UD) refers to broad-spectrum ideas meant to produce buildings, products and environments that are inherently accessible to all people regardless of age or ability.

The Seven Principles of UD

- **Equitable:** Features should be usable and beneficial to all residents, not just some—older parents or grandparents, for example.
- **Flexible:** UD elements should be flexible to use. For example, right-handed or left-handed persons should be able to use the same feature. A home's spaces should be usable by individuals in wheelchairs, on crutches, or with normal mobility.
- **Simple:** Features should be easy to use without causing confusion or unnecessary complexity.
- **Error-resistant:** Features should have as little potential for hazards or errors as possible. The more frequently used a feature is, the safer, more accessible, and error-tolerant it should be.
- **Physically easy to use:** Features should require little physical effort to use. Residents should be able to activate or use these features from a neutral, unstressed body position.
- **Perceptible:** It should be easy to tell when a task has been completed or when a feature has done its job. Information about the feature should be easily identified and distinct from its surroundings.
- **Easy to approach and use:** There should be plenty of space to approach, reach, and use any feature. Line of sight should be clear and reach comfortable. Personal assistive devices or assistance should be accommodated.

Simple examples of UD

- Levers instead of knobs
- Wider doors and hallways
- Rockers instead of toggles
- Storage located closer to the floor
- Drawers with full extension slides
- Adjustable height/hand held shower heads
- Adequate lighting schemes



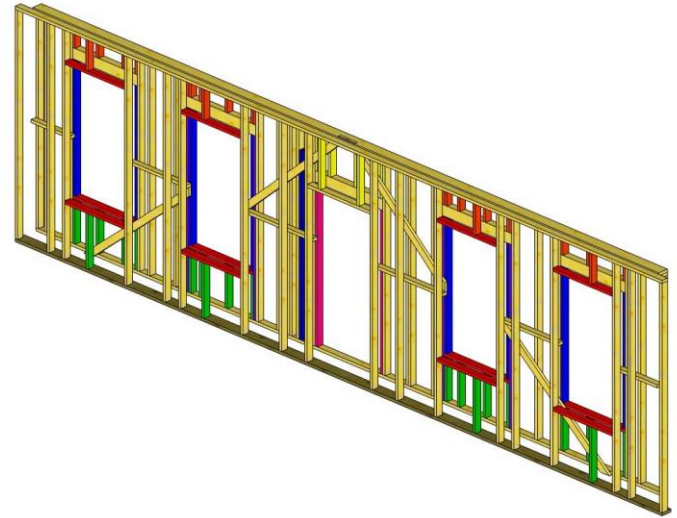
More Extensive UD Features

- Barrier free showers
- Step free home entrances
- Stacked closets to allow for a future elevator
- Open plan design to maximize sight lines
- Blocking in walls around toilets and showers for future grab bars
- Clear space under sinks
- Use of contrasting colors to improve visibility



Building A Green Home Is As Much About the Process As The Product

- The environmental impacts are more a function of the methods and design than they are about materials
- Reducing both the environmental impacts of the initial construction and the necessary ongoing resource consumption is what truly makes a home green



So What Does All This Cost?

- Building green adds about 10% to the cost of construction
- Thoughtful design helps to control costs
- Money spent up front on energy efficiency has a definable cost payback
- May qualify for rebates and/or EEM