



sustainability

maximum impact with
minimum footprint

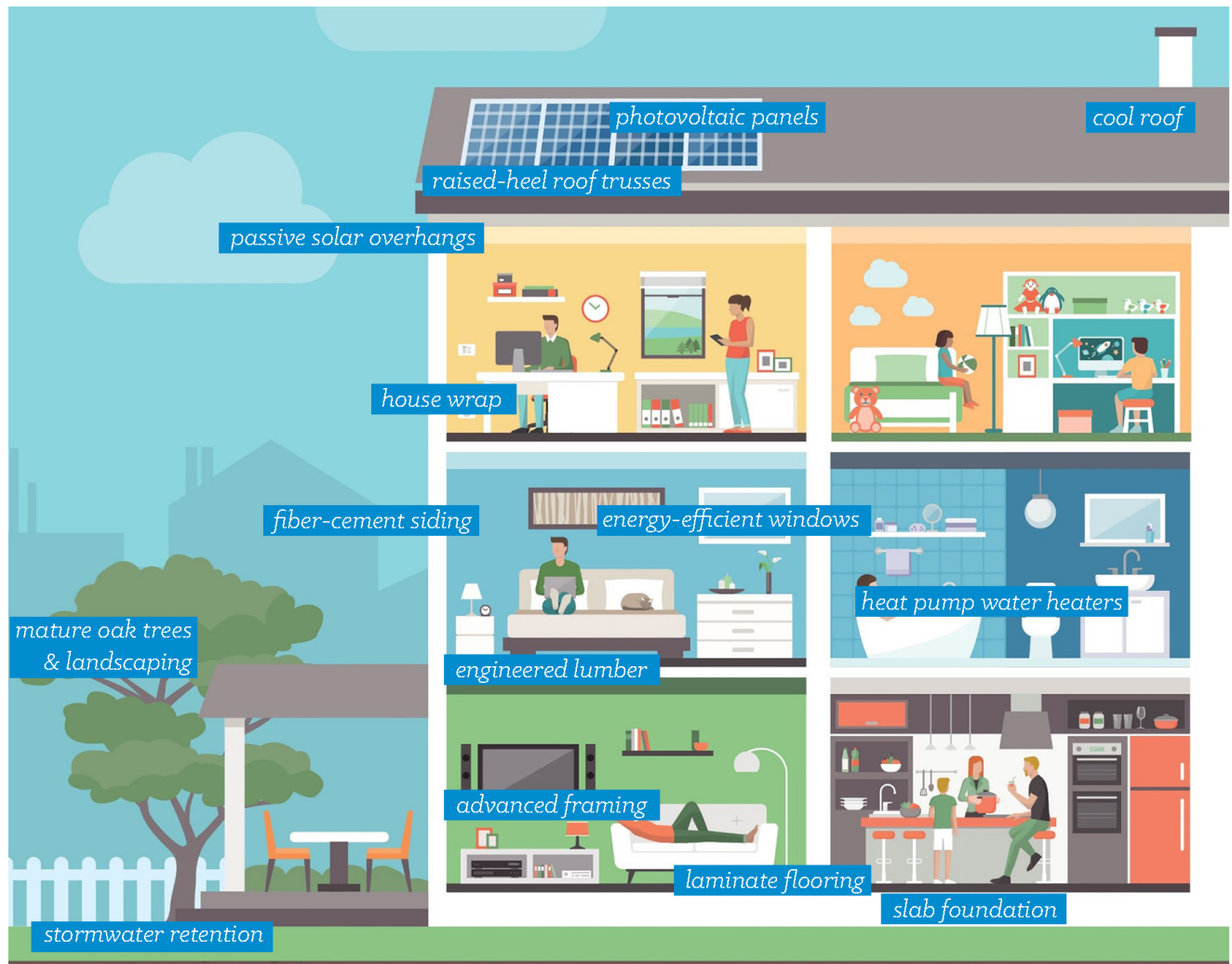
 **Habitat for Humanity**[®]
East Bay/Silicon Valley



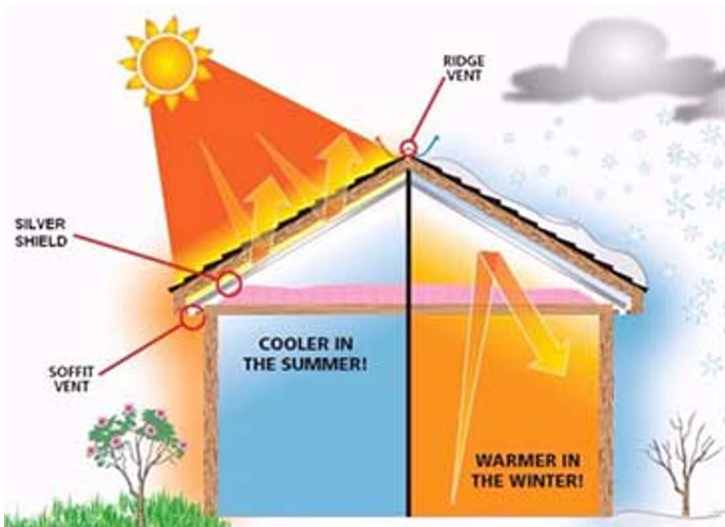
Whole-Systems Sustainability

A Holistic Approach to Sustainable Communities

We installed our first solar panels in 2003 in East Oakland, at a time when affordability and sustainability were not considered compatible. We've spent the last two decades pushing the green-building envelope – proving that it's not only possible, but that it's just. As we increase access to homeownership, we also increase access to homes that are healthy for our homeowners, our communities, our local ecosystem, and our planet. It comes from incorporating climate-smart principles in everything from our site selection and design to our construction materials and techniques.



Cool Roof



From the Top

“Cool Roof” rated asphalt shingles, paired with a radiant barrier, minimize heat transfer. That means a cooler home in the summer and a warmer home in the winter – even without turning up that thermostat or cranking up the AC!

Built to Last

A 50-year warranty means durable materials and a longer lifespan. That’s fewer materials going into landfill, and lower maintenance costs for homeowners.



House Wrap

Under Wraps

Tyvek® HomeWrap® is secured outside the home's wood sheathing, and its unique material protects the home from air and water damage that might get through the exterior cladding. This means that wind and rain are less likely to cause significant damage to the structure.

Not only does it make for a more durable home, it also means a greener home! By mitigating air and water flow, house wrap helps insulation and the HVAC system to do their jobs more efficiently. It means cooler summers, warmer winters, and staying dry year-round – all without increasing the need for energy use.



Photovoltaic Panels

100K

dishwasher loads offset
per year by 142 kW array

Soaking Up the Sun

A 142 kW array of photovoltaic panels will offset approximately 223,300 kilowatt-hours per year. That's not only a lot less reliance on fossil fuels and less load on our community's power grid, it's also a huge reduction in utility costs for Habitat homeowners!

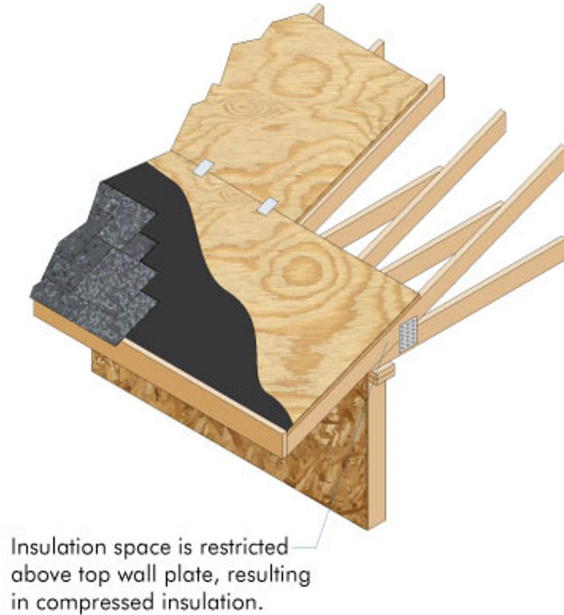
These panels mean lower impact on both our planet and on our homeowners' wallets.



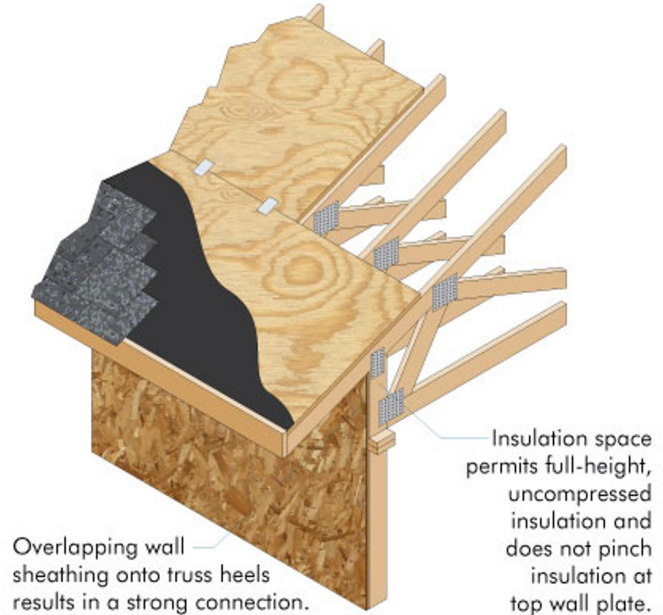
Raised-Heel Roof Trusses

COMPARISON OF CONVENTIONAL TRUSS AND RAISED-HEEL TRUSS

CONVENTIONAL TRUSS



RAISED-HEEL TRUSS



Raising the Roof

We're raising the roof – literally!

Raised-heel roof trusses are a simple, sturdy solution that lets us get insulation, fully expanded, all the way to the junction between the roof and the wall. It reduces heat transfer – which means losing less heat from the home in colder months, while taking on less heat during hotter months – just by letting insulation do its job!

Passive Solar Overhangs

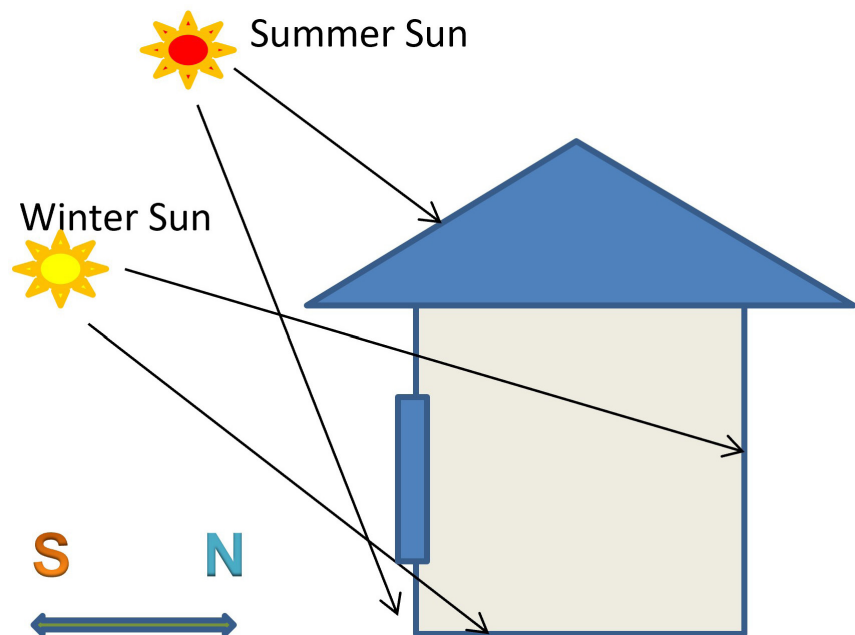
Letting the Sun Do the Work

16"

minimum depth of overhangs for roofs and windows

In the hot summer months, the sun travels higher in the sky. Having a passive solar overhang helps prevent that sunlight from entering through the windows and heating the home's interior.

In the colder months, however, it's just the opposite. The sun travels lower through the sky during winter. At that angle, the sunlight can reach the interior through the windows, and it makes for a warmer home.



That's all to say that we capitalize on the position of the sun to offer a comfortable ambient temperature inside the home – reducing our homeowners' dependence on heating and cooling. It's just another simple way to design homes that are climate-friendly and budget-friendly.

Fiber-Cement Siding

Protection On Many Levels

Made from cement and sawdust, fiber-cement siding is sustainably produced, incorporating recycled materials in a production process that uses few resources.

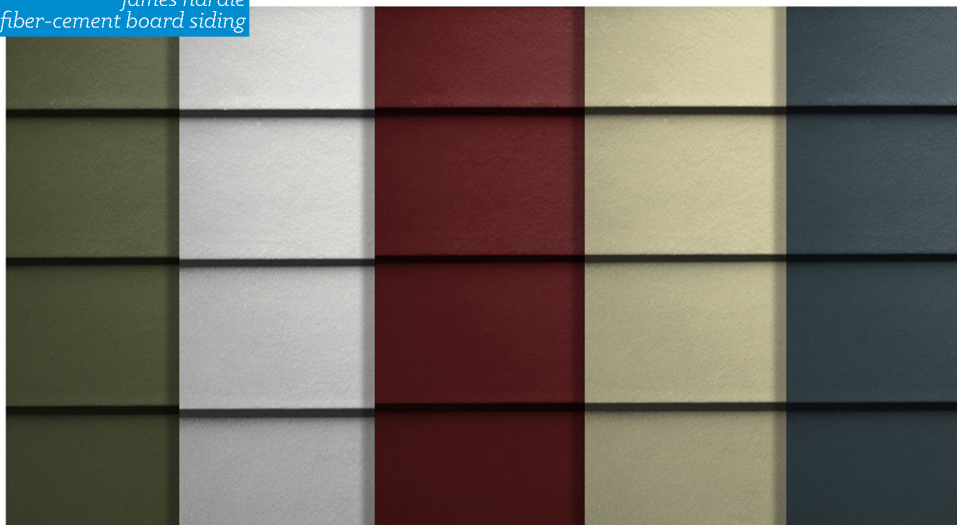
It's also durable, which means fewer repairs and replacements – and fewer materials in landfill. Lower maintenance needs also equal lower maintenance costs to our homeowners, so it's a win-win situation!



It isn't just a sustainable and attractive way to finish the home's exterior, though. Fiber-cement siding is also fire-, moisture-, rot-, and pest-resistant!

And for an organization like Habitat, which runs on volunteerism, it has an added benefit – it's simple and satisfying to install, making it a volunteer-friendly task!

james hardie
fiber-cement board siding



Energy Star Windows

Our windows make the grade.

.32

U-factor

.25

solar heat gain
coefficient

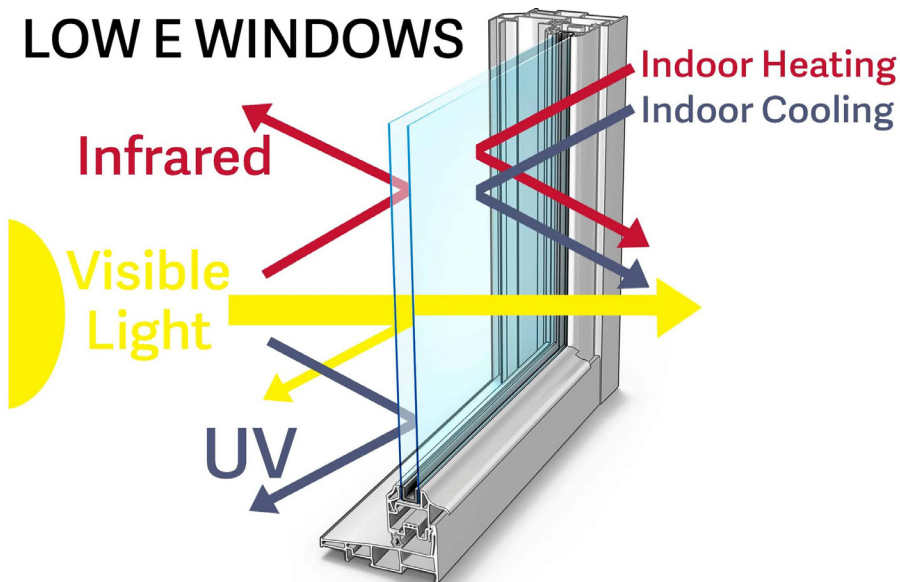
31-38

sound transmission
class rating

Our low-e windows have low U-factors, low solar heat gain coefficients, and higher STC ratings! Great, but what does it all mean?

Low-e glass is coated with a transparent, microscopically thin layer that lets visible light into the home while keeping UV light and much of the solar heat out – while also reflecting interior temperatures back inside, helping keep the home's ambient temperature consistent.

When you're talking windows, a low U-value is good. Heat passes slowly through it – which means it better retains indoor temperatures. And in a climate like ours – especially with the hot summers of Walnut Creek – a low solar heat gain coefficient (SHGC) is also great. It means those windows are blocking unwanted heat gain from outside!



An STC (sound transmission class) rating tells us how well a window keeps unwanted noise outside where it belongs – like passing BART trains. The higher, the better!

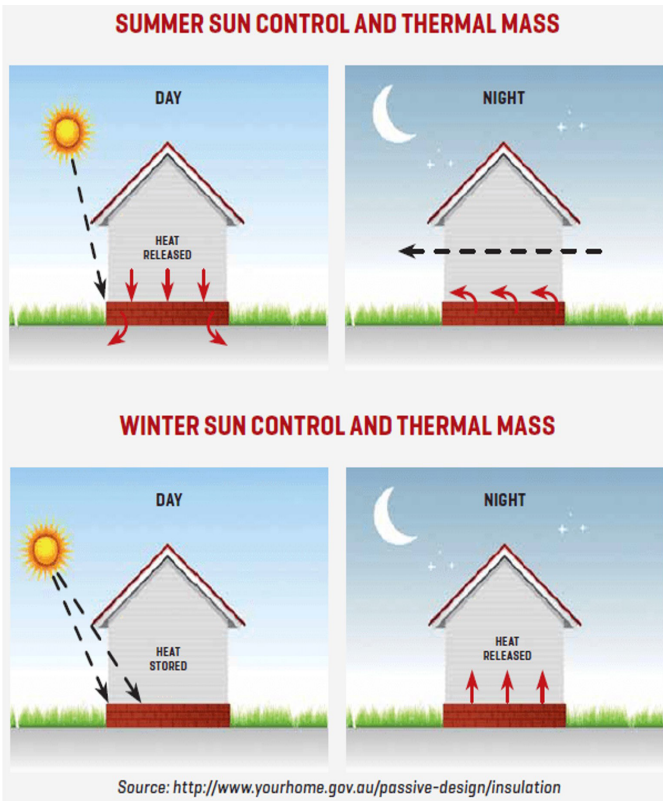
Thermal Mass Slabs

A Mass With Massive Benefits

Our homes are built atop a thick, insulated concrete slab foundation. What's the point?

The insulated slab acts as a thermal mass. So, in the winter when the days are colder but the sun is low in the sky, all that sunlight can pour in through the windows. The thermal mass foundation then stores heat from all that sunlight and releases it into the home throughout the day.

What about those hot summer days, though? That's when those deep, 16" overhangs on roofs and windows come in handy. The high summer sun beats down from a sharper angle, and those overhangs keep the sunlight from heating the home's interior. That way, the thick foundation stays nice and cool. Think of the way stone tile



feels under your bare feet on a hot day. Now, imagine a nice, thick, insulated slab of it!

In other words, a thermal mass slab moderates the temperature inside the home regardless of the weather outside. So, homeowners rely less on heating in the winter – insulated slabs have been shown in some areas to reduce winter heating bills by 10-20%! – and less on air conditioning in the summer. And that, of course, means less reliance on energy and on the bills it comes with.



Laminate Flooring

Earth-Friendly Floors

Laminate flooring is manufactured from the waste byproduct of fast-growing renewable species like pine, so this material doesn't contribute to deforestation of old-growth forests.

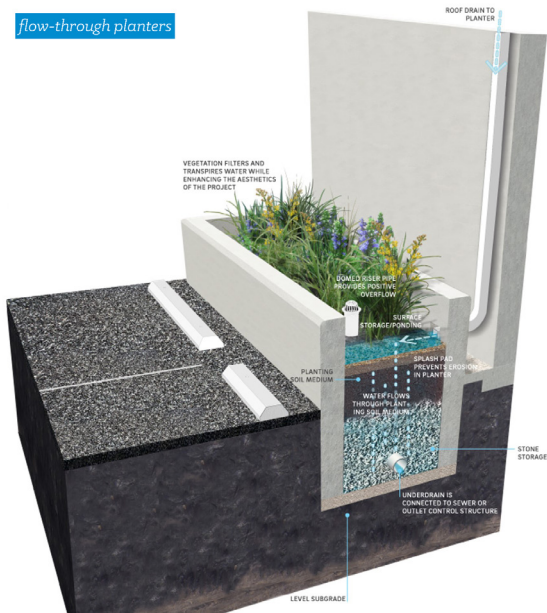
Plus, it's durable! So, it needs repair and replacement less often – keeping more materials out of landfill (while being budget-friendly in the process)!



Of course, we're mindful of the fact that home and health are inextricably connected. Laminate flooring is a great option when it comes to indoor air quality. While other flooring types commonly trap particles, laminate flooring keeps this to a minimum, limiting particulate matter, dirt, dander, and dust. So, our homeowners can breathe easier along with our planet.

Stormwater Retention

flow-through planters



A Strategy that Holds Water

Why do we retain stormwater?

It prevents water pollution. Soaking up rainwater on-site reduces polluted runoff that makes it back out to our waterways. At the same time, preventing runoff helps reduce flooding in the event of heavy rain.

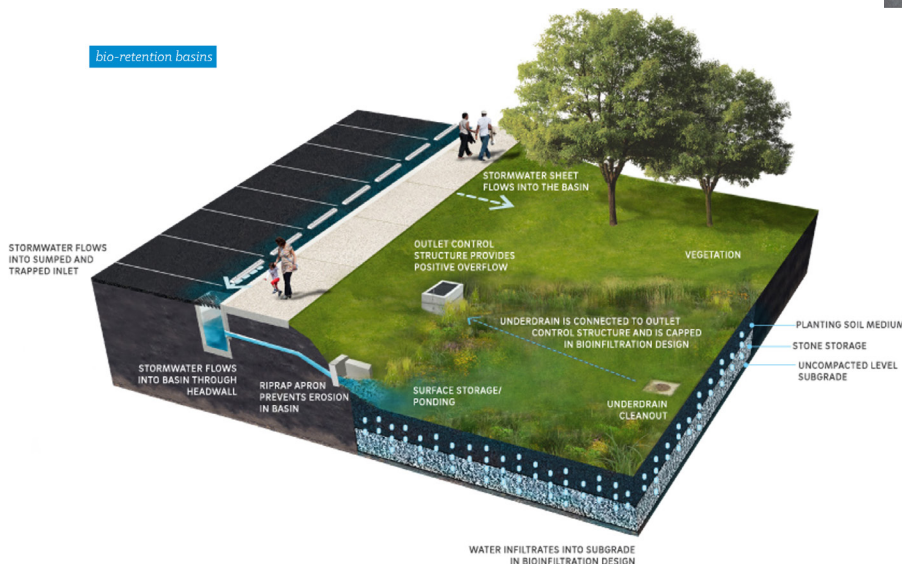
It also protects water resources. By letting the water soak into the earth, we help keep our waterways robust and reduce soil erosion.

permeable pavers



Water that falls on rooftops and the pavement will be routed through flow-through planters or bio-retention basins, which allow it time to infiltrate the ground – and filter out stormwater pollutants – rather than directing it into a storm drain. Water that falls on permeable pavers and landscaped areas will be absorbed directly into the ground.

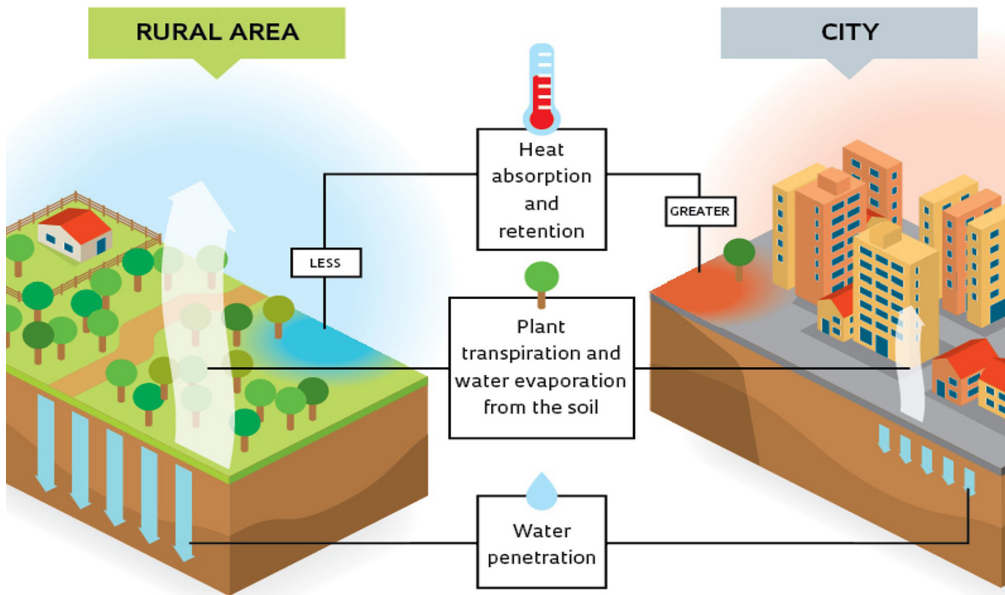
bio-retention basins



What's the impact?

Well, just look at Esperanza Place! With an annual precipitation of 18" and a site size of 2.0579 acres, we're looking at over 1 million gallons of water!

Trees and Landscaping



Letting Nature Take its Course

It's called "passive cooling." By building a community with trees and vegetation, we're able to ensure lower surface and air temperatures. That's because the trees and landscaping offer shade.

Also, evapotranspiration occurs when the sun's rays hit the trees and vegetation, causing water to evaporate from leaves. Much like

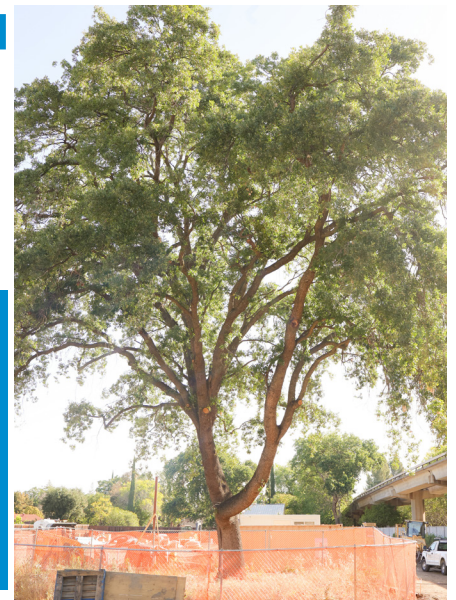
the way sweat cools our skin, the evaporation causes cooling as well and, in turn, reduces the amount of energy left to warm the surrounding air. We also employ a weather-based irrigation system and water-wise landscaping to ensure maximum water conservation.

20-45°F

cooler than peak temperatures of unshaded materials

Case in Point

At Esperanza Place in Walnut Creek, in addition to our typical efforts at water- and temperature-wise landscaping, we're also preserving the site's mature heritage oak trees. All this means that Esperanza Place will use less than 12 gallons per square foot – less than half of the "average" home's use of 25 gallons psf.



Engineered Lumber

ENGINEERED WOOD PRODUCTS



PLYWOOD

Made by peeling veneers from logs, some as small as 10 inches in diameter; these veneers are glued with moisture-resistant adhesives for durability, dimensional stability and excellent strength-to-weight ratio.



I-JOISTS

Engineered component comprised of top and bottom flanges (typically LVL or dimension lumber) which resist bending, combined with vertical webs (plywood or OSB), which provide excellent bending and shear resistance.



ORIENTED STRAND BOARD (OSB)

Strands used to form OSB can be cut from small trees; these rectangular-shaped wood strands are laid down in alternating layers and glued for a panel that resists deflection, delamination and warping.



CROSS-LAMINATED TIMBER (CLT)

Prefabricated, solid wood panel used for long spans in walls, floors and roofs. Layers of kiln-dried boards are stacked in alternating directions, bonded with adhesives, and pressed to form a solid panel.



GLULAM

Made by gluing dimensional lumber together, glulam can be made to specification, or beams can be manufactured in commonly-used dimensions and cut to length when the beam is ordered from a distributor or dealer.



STRUCTURAL COMPOSITE LUMBER (SCL)

Includes laminated veneer lumber (LVL), parallel strand lumber (PSL), laminated strand lumber (LSL) and oriented strand lumber (OSL). All are created from smaller trees by layering dried and graded wood veneers, strands or flakes bonded with moisture-resistant adhesive into blocks of material, which are then re-sawn into specified sizes.

Safeguarding Our Forests

We use engineered wood products for many construction components. But why does it matter?

Engineered lumber is advantageous because it can be manufactured from fast-growing, underutilized, and less-expensive wood species. It means making more efficient use of resources we have, and safeguarding our old-growth forests.

Engineered lumber also utilizes smaller components, so there's no need to rely on large planks of dimensioned lumber.

What's more, engineered lumber is strong, and it eliminates many of the natural defects you might find in wood, improving upon many of the material's structural advantages. So, by using engineered wood in our construction, we're ensuring a sturdy, forest-friendly home!

Advanced Framing

Sustainable From the Inside Out

When you're hanging something on your wall and searching for a sturdy stud to nail into, chances are you're checking every 16 inches or so. Look inside the walls of a Habitat East Bay/Silicon Valley home, and you might notice something a little different.

In our green-built homes, we employ advanced framing. This means that we space our framing elements farther apart and utilize fewer elements, in an intentional design that ensures sturdiness but saves about a third of the lumber we would use in a traditionally framed home.



Traditional Framing



Advanced Framing Techniques

CONVENTIONAL FRAMING	ADVANCED FRAMING
<i>2x4 or 2x6 wood framing spaced 16" on center</i>	<i>2x6 wood framing spaced 24" on center</i>
<i>Double top plates</i>	<i>Single top plate</i>
<i>Three-stud corners</i>	<i>Two-stud corners</i>
<i>Multiple jack studs</i>	<i>Minimal jack studs</i>
<i>Double or triple headers</i>	<i>Single headers</i>
<i>Multiple "cutie" studs</i>	<i>Minimal "cutie" studs</i>

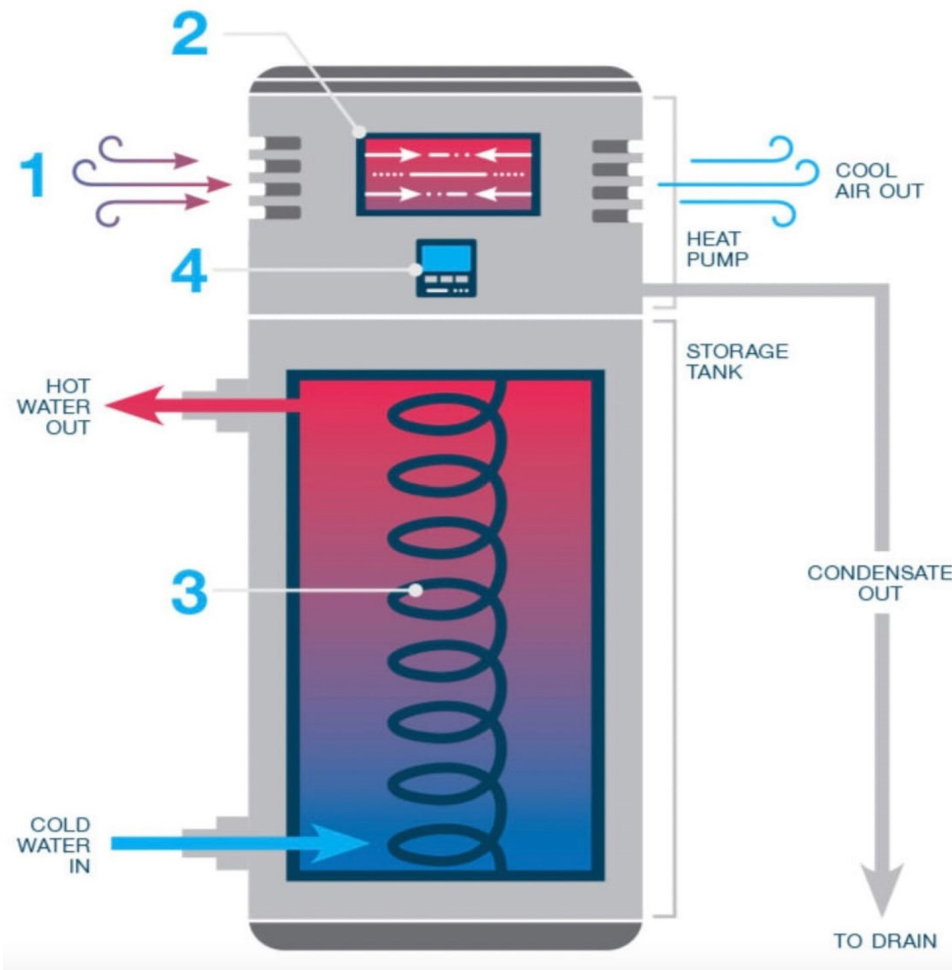
Heat Pump Water Heaters

In Hot Water

What's the deal with heat pump water heaters? Well, in short, they're incredibly efficient!

Heat pump water heaters use electricity to move heat from one place to another instead of generating heat directly. Think of it like a refrigerator in reverse. While a refrigerator pulls heat from inside a box and sends it into the surrounding room, a stand-alone air-source heat pump water heater pulls heat from the surrounding air and transfers it -- at a higher temperature -- to heat water in a storage tank.

Basically, they require a lot less energy to do the job. In fact, they can be two to three times more energy efficient than conventional electric resistance water heaters.



Why It Matters

By using heat pump water heaters in Habitat homes, we're ensuring our homeowners' comfort while looking out for costs -- to the family, and to all of us. Because the water heaters are so much more efficient than conventional models, that's a lot less reliance on fossil fuels or electricity that are typically depended upon. And that's a lot of savings on our homeowners' monthly utility bills, too!

