CONCEPT DESIGN EXHIBIT

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CONCEPT DESIGN FOR A PERMACULTURE INSPIRED HOME DESIGNED FOR HOMESTEADING

DESIGN OBJECTIVES:

- House that encourages homesteading
- Conventionally framed for financing purposes
- Can be built in phases
- Materials can be shipped reasonably off grid
- Permaculture principles used
- Functional design and program
- Function stacked spaces
- Resiliency and longevity in materials, construction and maintenance
- Practical aesthetic
- Improved energy audit for resources used
- Option to age in place for home owner
- Designed in security measures
- Designed to include a tornado shelter
- House can produce a yield – shop space, energy efficiency, AirBnb(short term rentals)

CONCEPT DESIGN : HOME FOR HOMESTEADING

Designed for a potential site outside the city limits of Terrell, TX
South facing lot with acreage towards the north of the property
USDA climate zone 8a

Chris Campomanes
Alt-Ark@protonmail.com
www.Alt-Ark.com
PUBLISHED 04.12.2022

NATURAL COOLING

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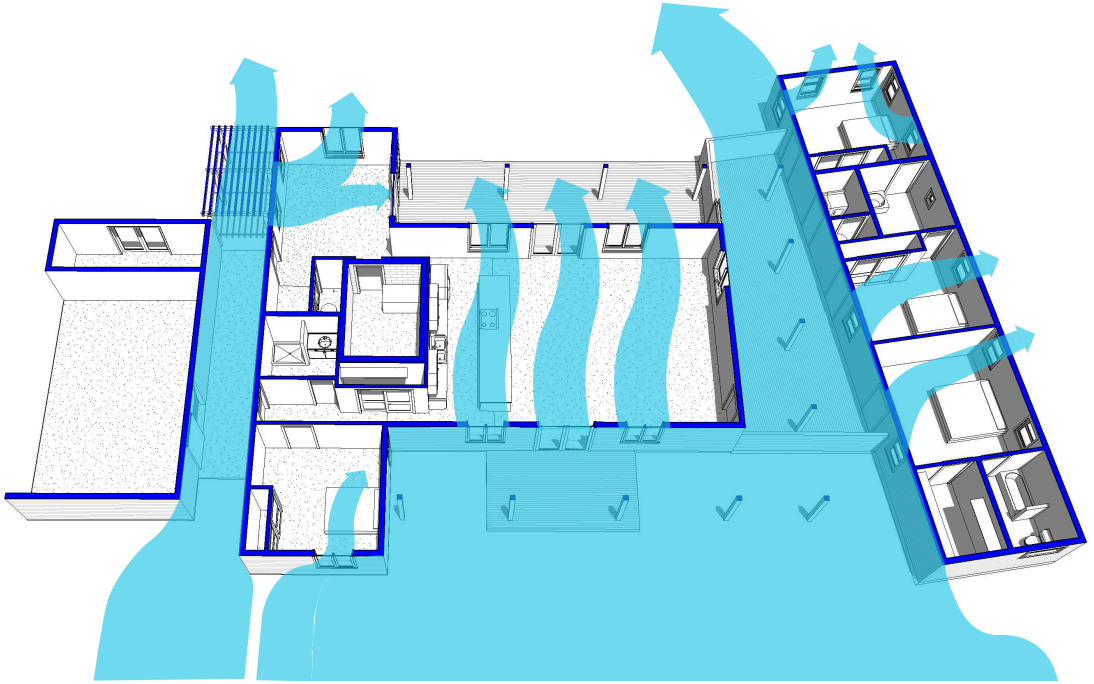
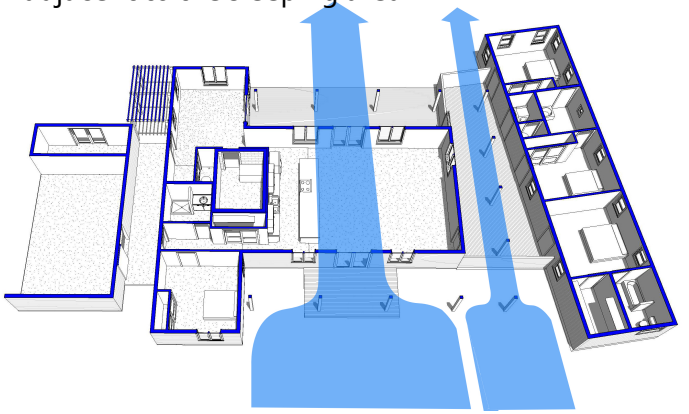
Using the breeze available on the property was a key factor in the shape of the home. This allows less dependence on the HVAC system, which reduces energy needs and allows less exposure to recirculated indoor pollutants.

Adjusting to heat is the bigger concern for this concept design due to the climate in Texas.



The floor plan is oriented to scoop and funnel the local prevailing winds-this one for a theoretical site outside the city limits of Terrell, Texas. There are two main sections where breeze is harvested for this – the main living space and the breezeway adjacent to the sleeping area.



Windows are laid out and sized to capture and cross ventilate the interiors. The windward side has casement windows that allow catching more wind, while the leeward side where the wind exits has smaller windows. This encourages the air to circulate and flow instead of just passing thru the home. Depending on the design, the windows are offset from each other for the same purpose.

Dogtrots/breezeways or exterior spaces are designed into the home to let breeze penetrate at different levels and also to provide outdoor working or recreational areas.

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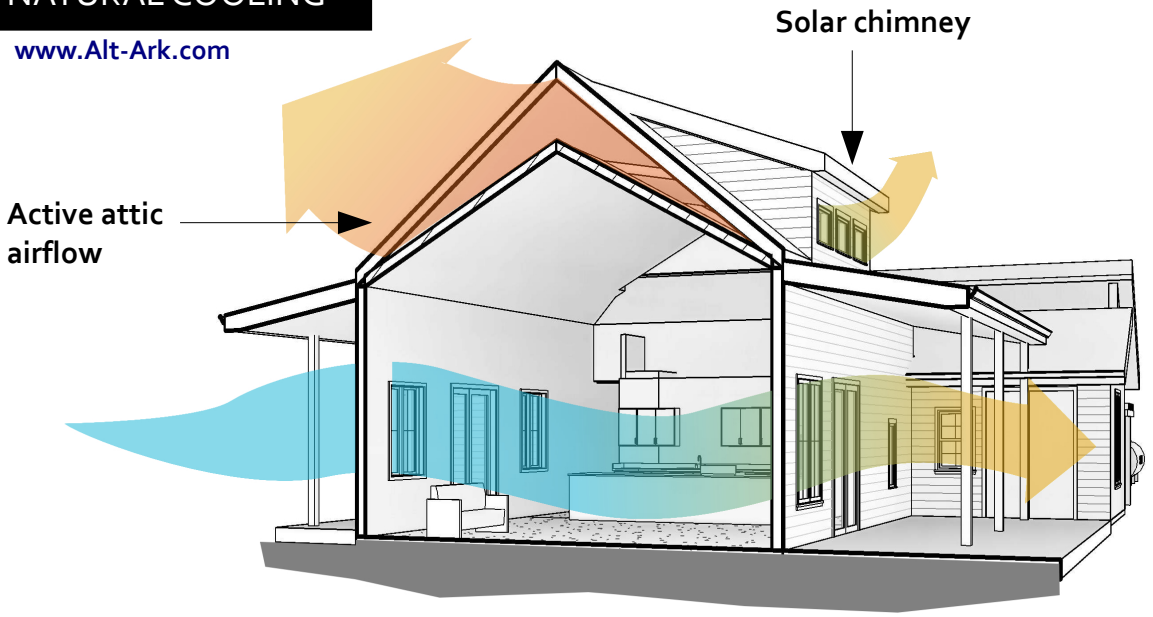
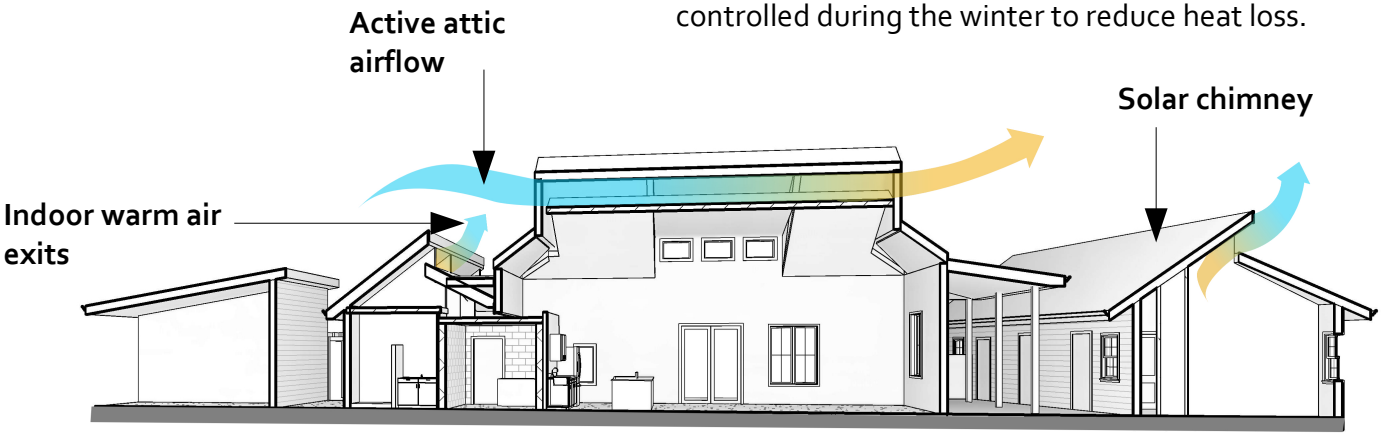


The home has multiple features that help with temperature control. As previously mentioned the breeze is let in to cross ventilate the space.

The roof is oriented, sized and framed to let warm air flow thru efficiently. This helps to reduce the need to cool the interior because the ceiling radiates heat and sucks out cooling on your HVAC ducts.

The middle section of the roof has an added feature with the dormer. This is designed as a solar chimney-with less insulation, located high in the structure and has the best potential to catch the warmest indoor air.

From there, the dormer, the ceilings and roofs are designed to all let warm air rise to the top, and openings are provided where this warm air will be allowed to exit the house. These exits can be controlled during the winter to reduce heat loss.



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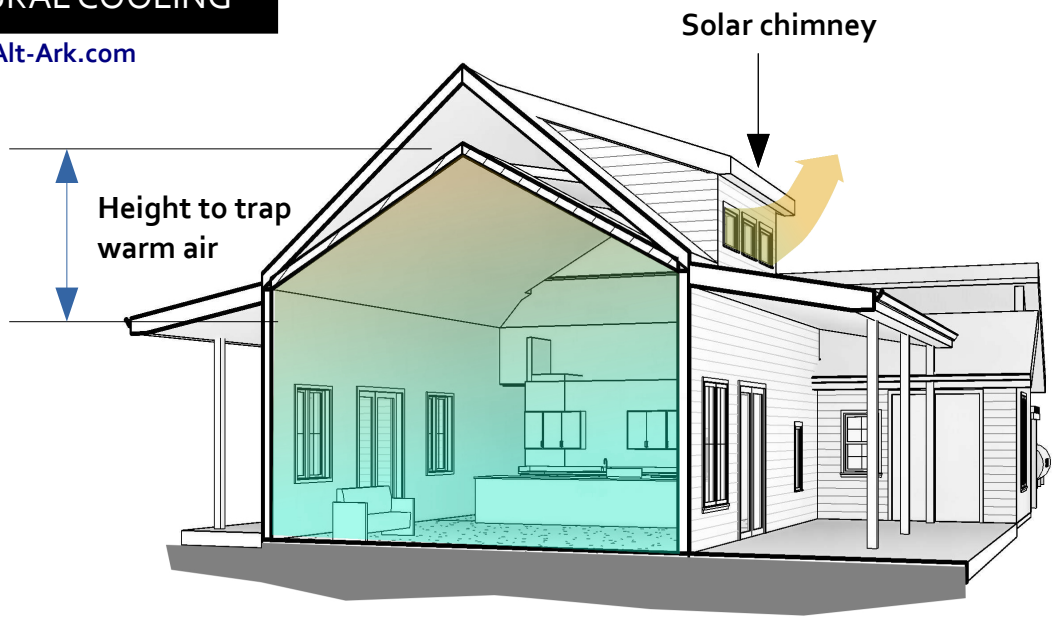
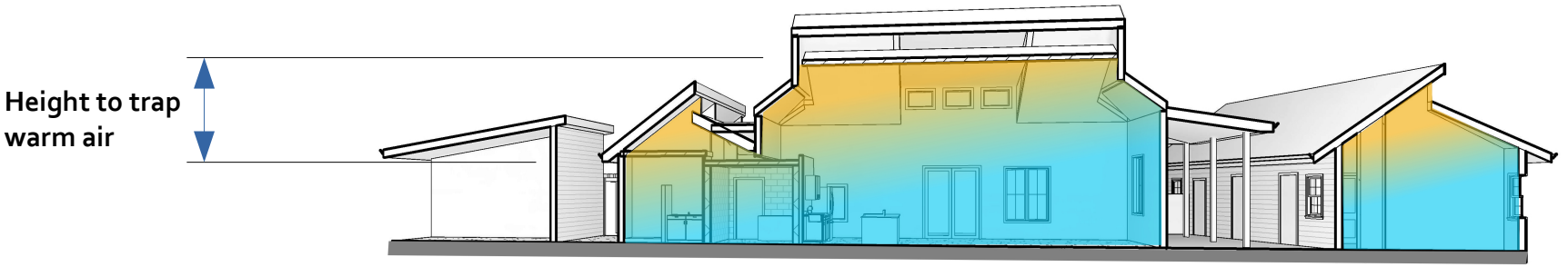


The interior volume has sufficient height to allow a more comfortable distribution of temperature in the mostly warm days here in Texas. The cathedral ceiling offers the most height so that the warm air can be collected farthest from the area where people will be (illustrated in the light blue/green areas).



Chris Campomanes Alt-Ark@protonmail.com
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The garage is located to the west and shields the shop, guestroom, kitchen area from the steep afternoon sun. It also adds a shaded pathway between the garage and the main house structure

The 2 areas highlighted in green act as breezeways for a pleasant outdoor space to hang out in. The west may be more intensive work being closer to the shop and garage. The eastern being more mild, closer to the sleeping areas and allowing eastern sun to dip thru the angled roof.

Chris Campomanes Alt-Ark@protonmail.com **www.Alt-Ark.com**

ATTACHED SHOP – EXTEND HOMESTEAD ACTIVITY INDOORS

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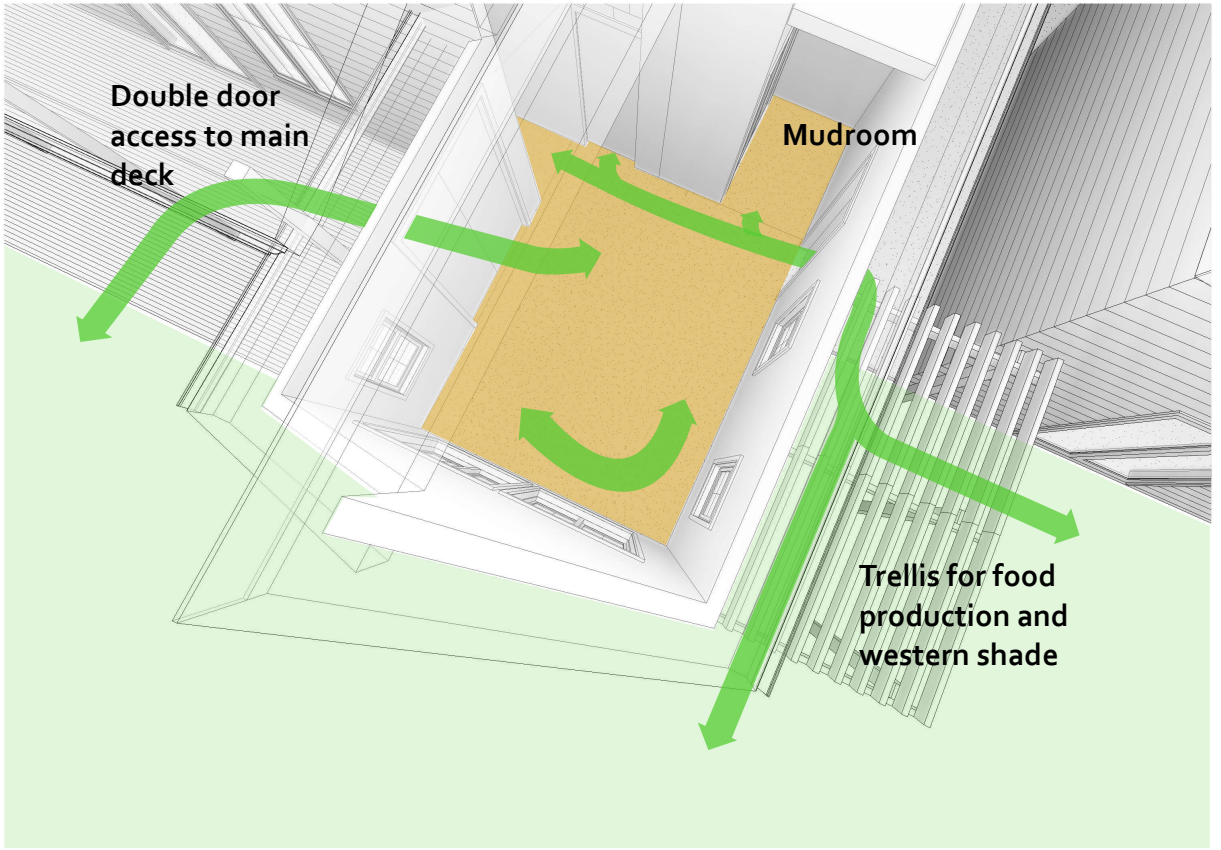
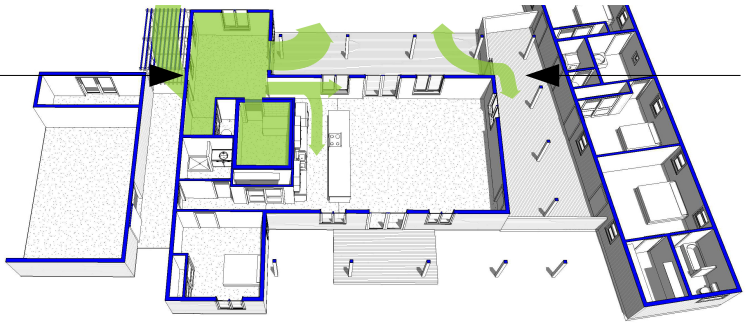
The shop is integrated to the main house. Other detached shops can be had in abundance on the property, but this one is meant to support homesteading activities that tend to get closer into the living spaces.

There is a double door access to the main outdoor deck that faces the majority of the property. There is close access to the mudroom when coming in from the breezeway.

The shop has a trellis on the west. This lets you stay active in the shop in the winter while letting in the sun. In the summer, the trellis spacing (modeled in 3D with solar path studies) is optimized to keep out the angled summer sun at dusk. This would also have vines on it to increase cooling to the shop.

The main outdoor deck also has access to the deck along the sleeping areas. This east deck is anticipated to have a cooler environment and so plants, animals, projects can shuffle from the main deck to the east deck depending on season and activity.





Chris Campomanes Alt-Ark@protonmail.com www.Alt-Ark.com

PANTRY UPGRADES FOR STORM SHELTER

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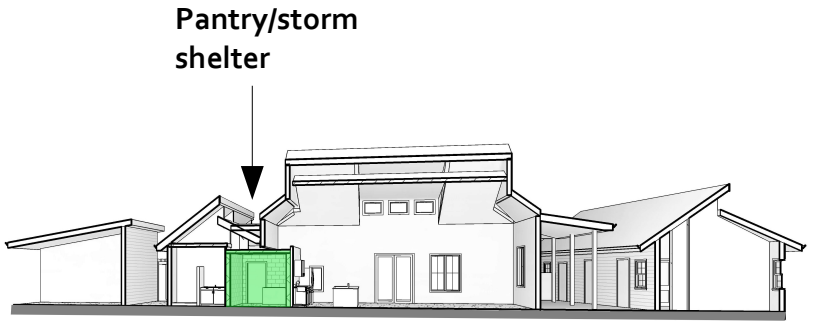
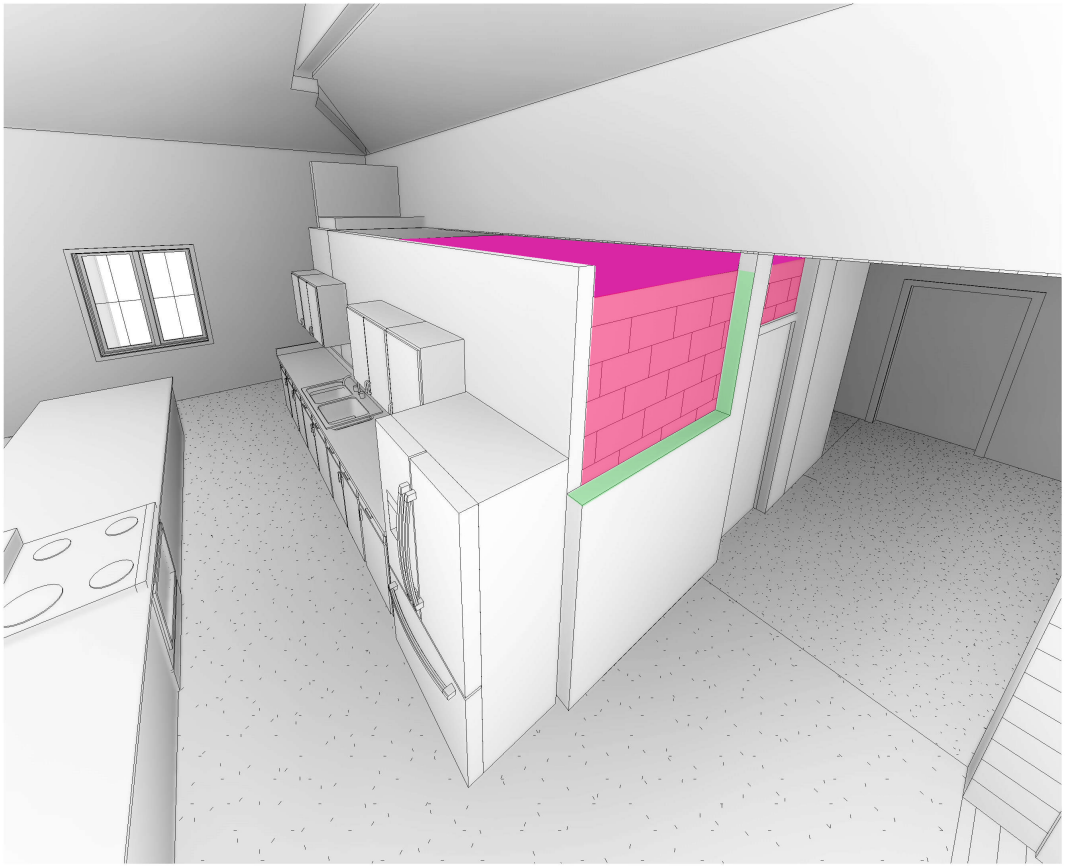
The pantry is located closest to the kitchen, the backyard and the garage – all areas where food comes in or needs to get processed.

The structure is designed so that the pantry can be upgraded to a storm shelter. Should the main roof of the house sustain wind damage, it is designed to not transfer the damage to the pantry/shelter.

The 3D image shows a portion of the wall removed, revealing block wall inside. The pantry/shelter would also have it's own roof. The upgrade can be designed to meet FEMA rating depending on the goals of the homeowner.





Chris Campomanes Alt-Ark@protonmail.com
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SOLAR STUDIES

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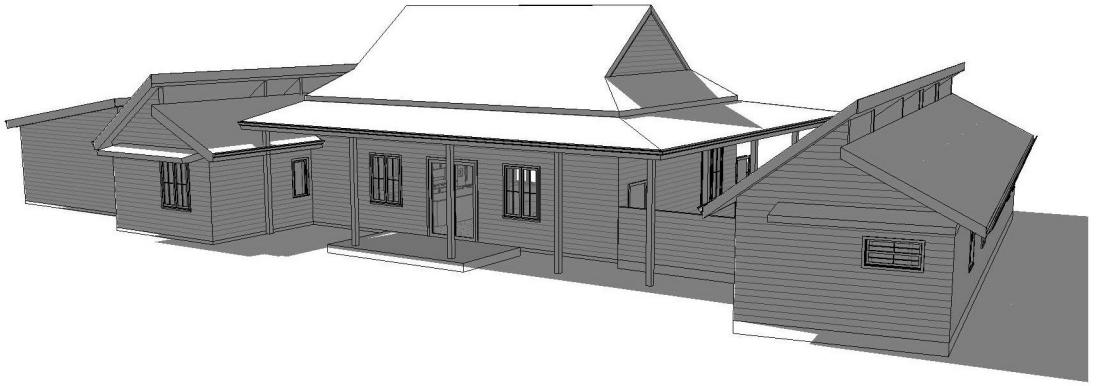
The house is designed to shade out the Texas sun. Images here show the deep eaves, sloped roofs all designed to best shade for summer solstice.



All solar studies are showing shadows for summer dusk sun path. I did this because the house is already covered well for the noon sun-the next challenge was for the steeper sun angle we get at dusk.

This view is taken from the south east corner looking north west. The bedrooms are on the right side, shaded by the main structure. The roof lets in softer light as it approaches the evening. The rest of the house is also shaded.

"...the house is already covered well for the noon sun-the next challenge was for the steeper sun angle we get at dusk..."

This view is taken from the north west corner. Shade is seen here provided to the most of the house. The shop uses a trellis to shade the western windows (which are needed for indoor breeze). The trellis gets planted with vines.

The north most bedroom (seen here on the left most part) does get western sun at dusk. This is not ideal, but the window is useful to pick up breeze from that adjacent breezeway. I am hoping to design a better solution to have shade into this bedroom.

Chris Campomanes Alt-Ark@protonmail.com

SOLAR POWER SYSTEM READY

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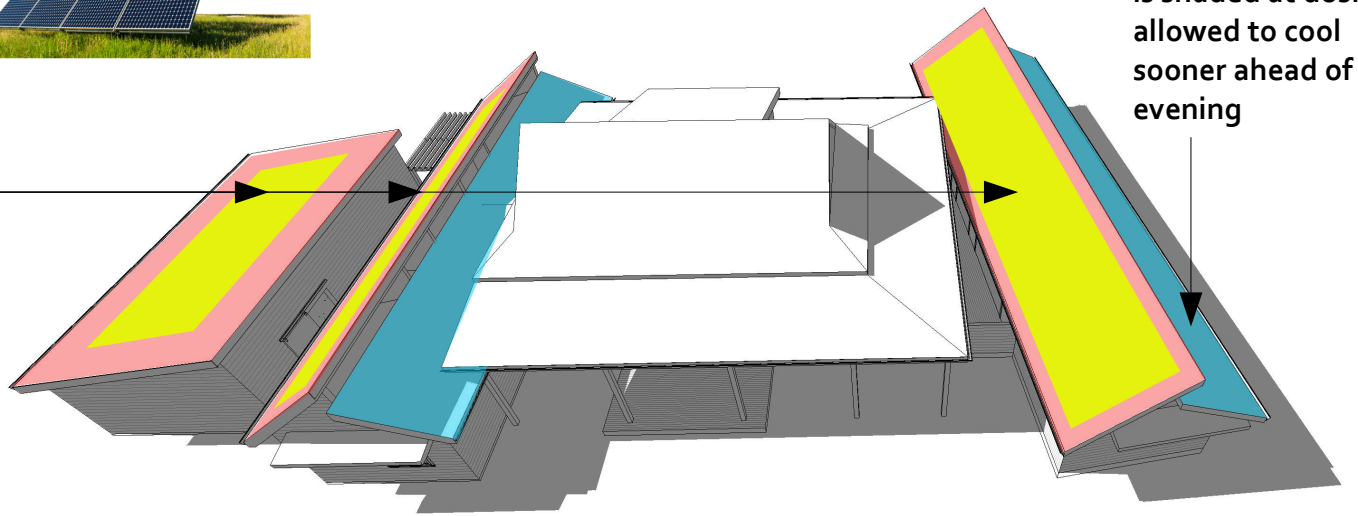
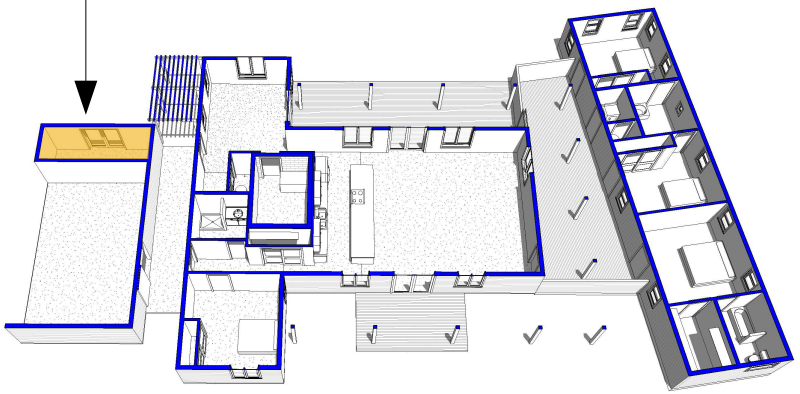
Option for ground mounted solar panels

50% of bedroom roof is shaded at dusk, allowed to cool sooner ahead of the evening

Roof tilt lends well for mounting solar panels



Shed for solar power battery bank



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PLANS DESIGNED FOR EASE OF MAINTENANCE (PLUMBING SHOWN)

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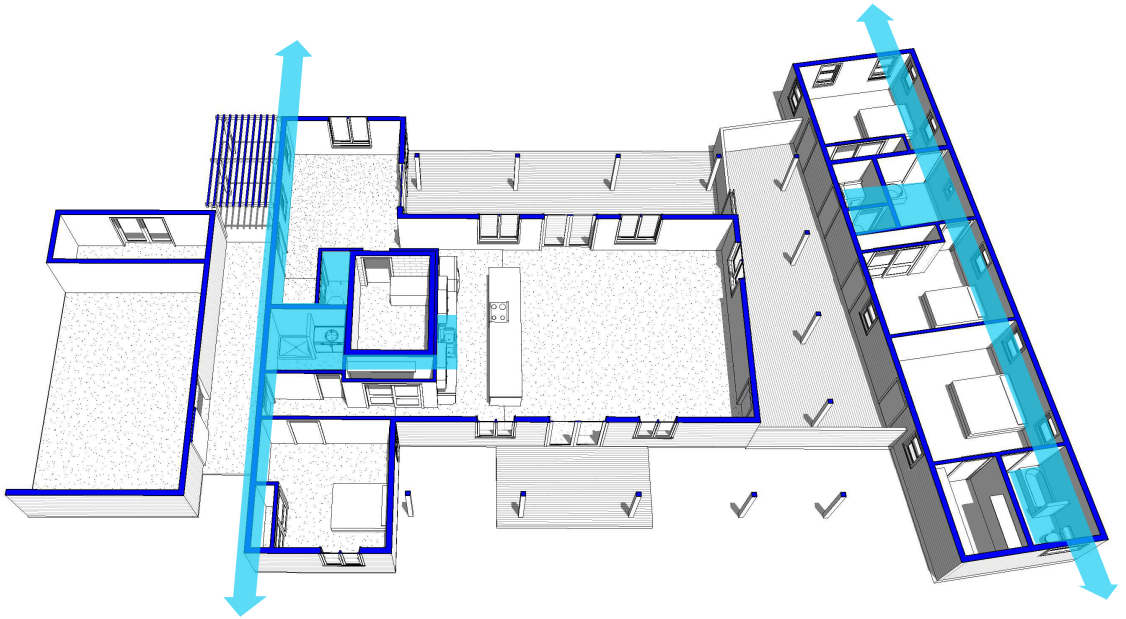
Rooms which have plumbing are located for efficient access, minimal cost for future repair and maintenance.

In this example, plumbing supply and drain lines are accessed from the perimeter or from parts of the house where the floor finish is easy for repairs.



Chris Campomanes Alt-Ark@protonmail.com

OTHER PLAN FEATURES

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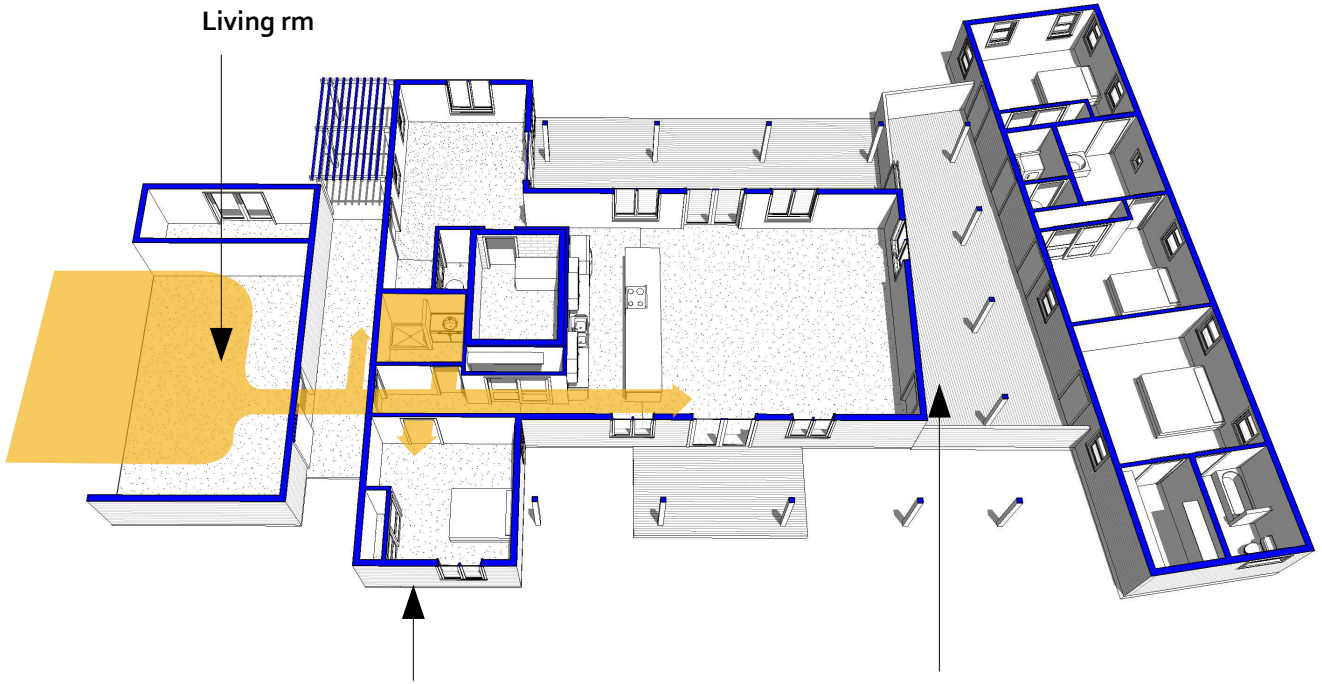
The garage is located on the west, to act as a shield to that part of the main house. This also has a useful flow if you are coming in from work or with groceries. One can head thru the west breezeway to harvest some quick produce, or head thru the bathroom/coat closet/kitchen. There is a guestroom located nearby whose location can be useful as the homeowners age in place. As they grow older, this guest bedroom is ideally located to still be part of the living space, part of the activities in the home, but easy to retreat into.

Workflow from commute to:
Harvest
bathroom
Kitchen
Bedroom
Living rm



Guestrm can be main bedrm as homeowner ages in place

The addition of an outdoor kitchen can make this section independent of main living space

Combined with an outdoor kitchen on the east deck or main deck, the sleeping area can also function independent of the main living space.

Chris Campomanes Alt-Ark@protonmail.com

THANK YOU

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These exhibits illustrate some concepts embedded in the design drawings for this concept home. Other features will be added or revised as this design is an ongoing process. My personal plan is to build this home for myself and family in the approximate area described, which is just outside the city limits of Terrell, Texas. We are looking at this area since from here we can still have relatively easy access to our community and I can commute to Dallas for my current work.

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