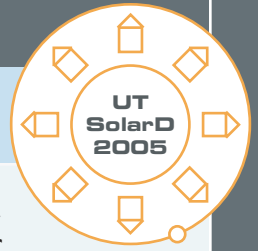


thermal comfort



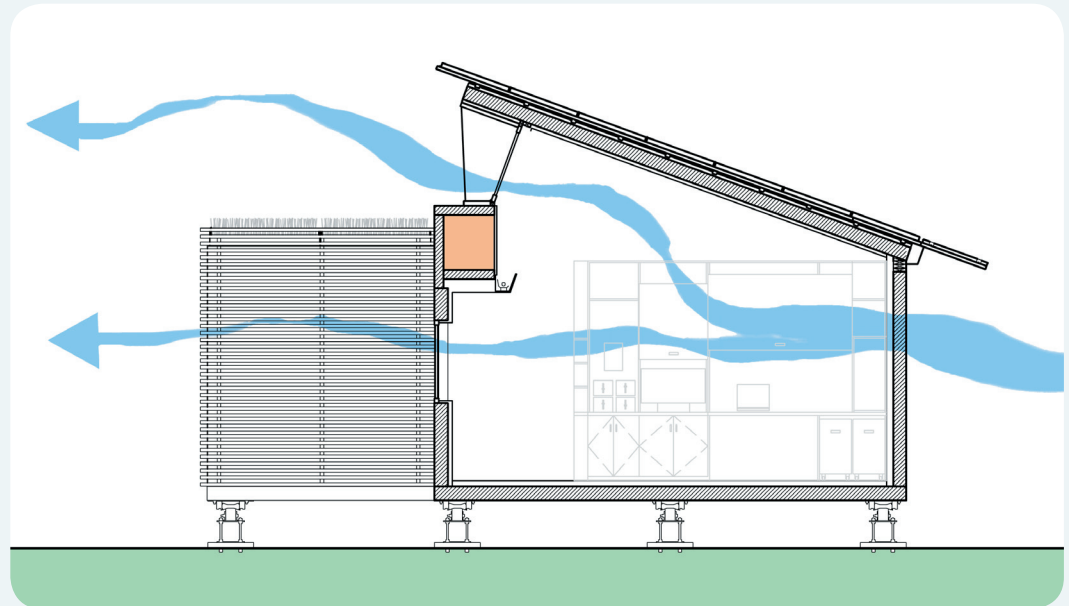
the SNAP House

Too often, the systems in our houses are both physically and intellectually inaccessible. In the SNAP House, HVAC components are integrated into the overall structure, and act as an experiential threshold between public and private spaces. They are located in a central, structural chase that supports the clerestory and gives the systems a functional presence within the interior. Each individual component is contained within a single chase unit, detachable along the lines of the larger SNAP connections. This strategy complements the modular nature of the house, while reducing energy costs by minimizing duct lengths and locating the components within the conditioned space.

We have overlapped multiple means of thermal and moisture control to make our system totally dependable – when the sun is not shining, or even in the unlikely event of one element’s malfunction. Our choice of tools for energy efficiency reflects a balance between the house’s energy needs during the competition and in its future life as a residence in Austin, Texas.

Passive Cooling

Our glazing and shading choices provide excellent passive ventilation and minimize solar heat gain, both vital aspects of energy-efficient design for Austin’s climate. Most of our windows are operable, providing maximum potential cross-ventilation, particularly across the kitchen and through the main space. Nearly all are triple-glazed, krypton-filled, and warm edge-spaced with double low-e coatings, buffering against both the conductive and direct solar heat gain experienced in Austin. In addition, we have designed our house without windows on the east or west walls to mitigate the intense mid-morning and mid-afternoon sun. Finally, ceiling fans broaden the perceived comfort zone by increasing air movement.



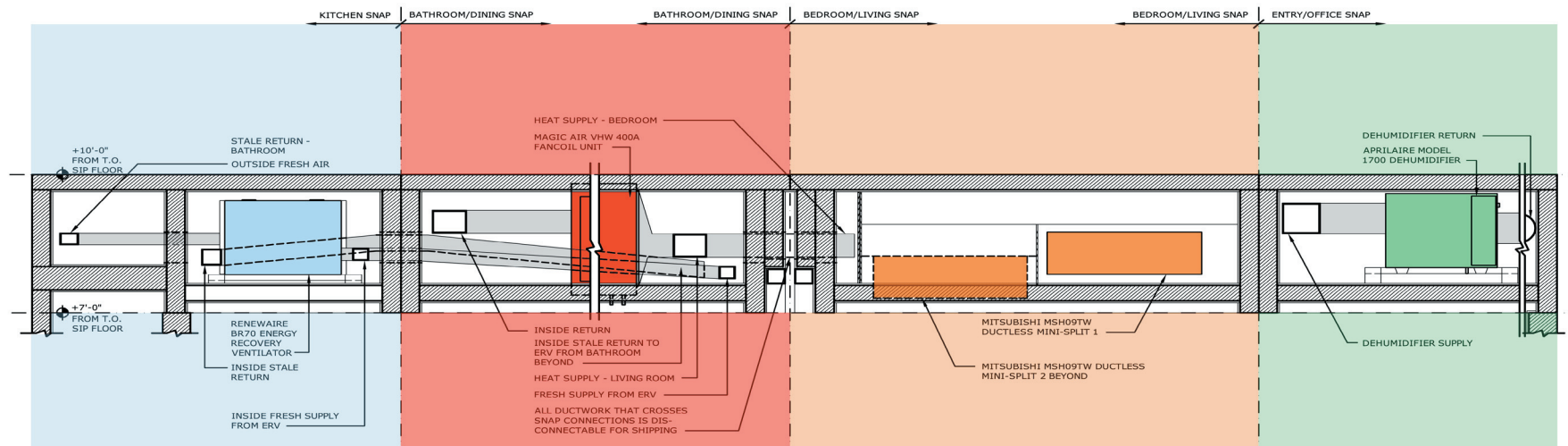
Active Heating and Cooling

Hot Water Fan Coil Unit – Using the sun’s thermal energy to heat the space was a natural choice. We have chosen to use evacuated tubes, which average 60% efficiency, at harvesting solar energy, as compared to the 15% efficiency of a photovoltaic panel. In selecting a fan coil unit rather than radiant hydronic heating, we minimize the lag time in ramping heat up and down, an important strategy in Austin’s climate.

Ductless Mini-Split Inverter-Driven Heat Pump – The compressor’s variable frequency drive adapts to cooling and heating needs by cycling as low as 20 Hz. Each indoor unit can provide 5,750 to 15,000 BTU/h of heating and 4,500 to 9,200 BTU/h of cooling, eliminating unnecessary cycling and providing maximal occupancy flexibility. This system eliminates duct losses, is easily zoned for most efficient cooling, and serves as a backup heating source.

Energy Recovery Ventilator – The ERV provides ample fresh air with minimal energy loss, and quietly vents the bathroom and kitchen of unwanted moisture and odor. By separating ventilation from heating and cooling, we increase these systems’ efficiency while also improving the indoor air quality of the SNAP House.

Dehumidifier – The dedicated dehumidifier removes latent energy from the interior environment more efficiently than an AC unit. If the latent load outweighs the sensible load (as is often the case in Austin), the dehumidifier will improve thermal comfort more efficiently by removing excess moisture and allowing the ductless mini-split to simply cool the air.



Mechanical chase elevation.