

Ice Haus

annual cycle energy system

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SIX acres of land, THREE acres of asphalt, SIXTEEN buildings (twelve to be renovated, four new construction), FIVE major program initiatives, countless public meetings and design charrettes, cold wet winters, hot dry summers, and ONE proposed "Event / Hub" building, the ICE haus—a condenser of energy and culture.

Client: TwispWorks
Location: Twisp, Washington
Project: Master plan proposal for site-wide energy infrastructure

The ICE haus proposal envisions an indoor / outdoor cultural hinge that also serves as the heart of a site-wide water and energy infrastructure system for the six acre campus of a non-profit arts and cultural organization located in central Washington state. Wide swings between cold, snowy winters and hot, dry summers inspire strategies that can bridge extreme seasonal variations. Two are proposed: a cistern for rain and snowmelt collection, and a district heating and cooling plant that uses an Annual Cycle Energy System (ACES) approach. This concept is centered on an ice-maker heat pump that generates ice as a by-product of space and hot water heating in winter and melts the ice for summer cooling.

The ICE haus system is fueled by biomass waste from local timber and agricultural industries. Both ice and water are stored in the cistern for summer use. A system of service trenches carries water to and from the cistern as well as heating and cooling loops to all buildings on the campus. Planted berms made from excavated earth and asphalt shelter the cistern, and create programmed micro-topographies on the otherwise flat site. Boilers and pumps are housed in an engine room that is visible from the Main Hall.

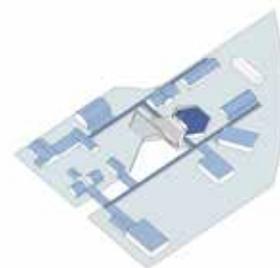
The ICE haus program is simple and robust: a large, acoustically-treated Event Hall with mezzanine, a Cafe and Information Center, kitchen, baths, office and storage. Large sliding glass curtain walls allow for filtered winter light and maximum openness in the summer.



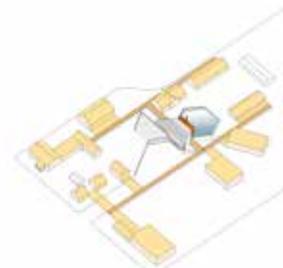
ACES: Annual Cycle Energy System using water's heat of fusion as a heat source in the winter and a heat sink in the summer = effective utilization of inter-seasonal energy transfer

WINTER & SPRING: Water collection and storage

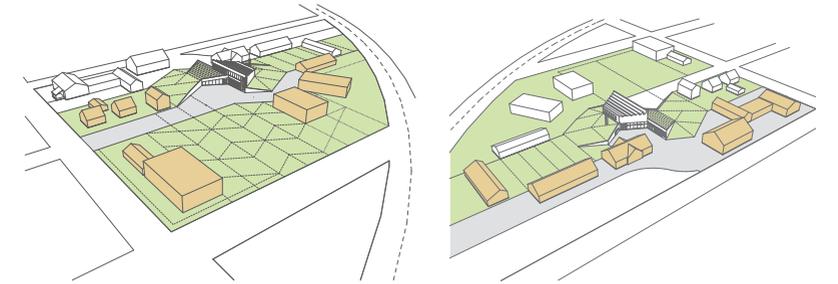
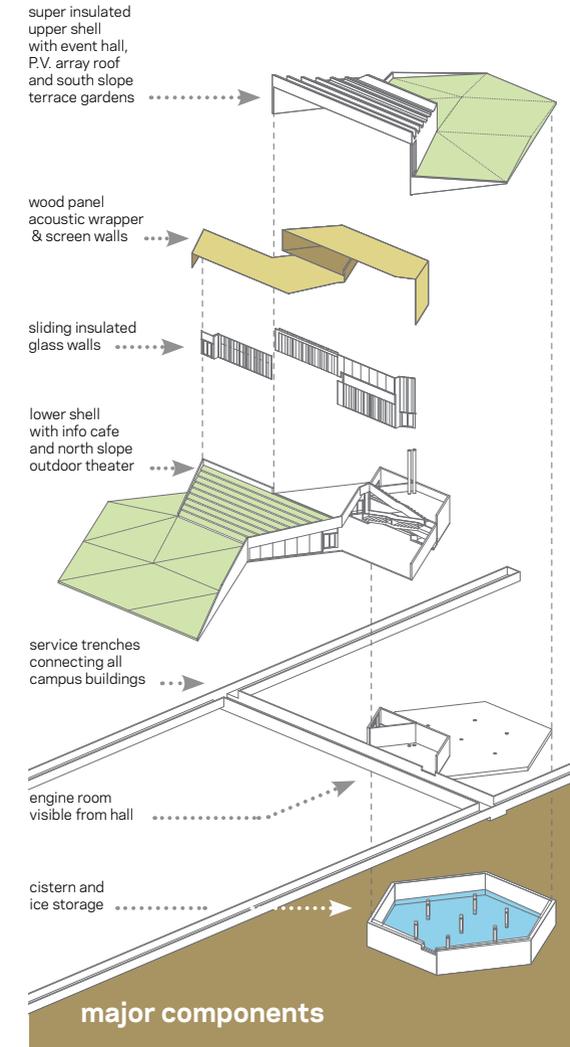
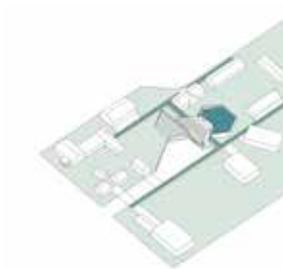
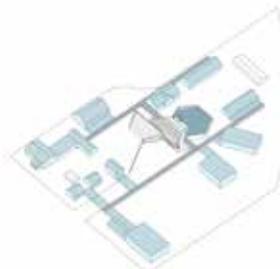
WINTER: Heating, ICE making and storage



SUMMER: Ice melting for cooling

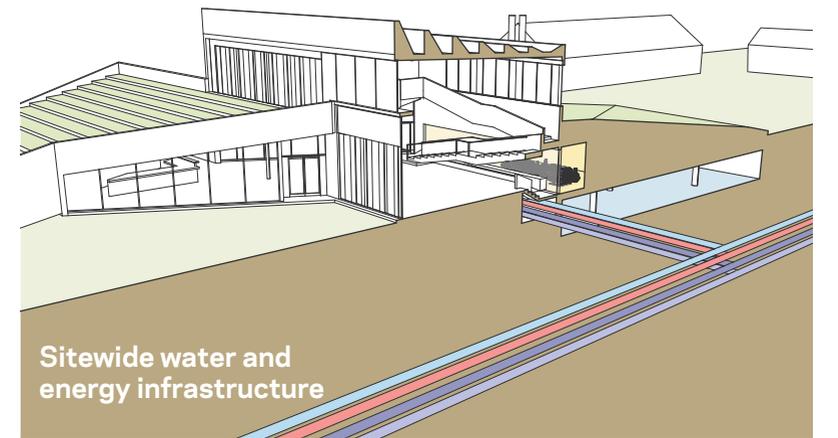


SUMMER & FALL: Water for irrigation



"Front Porch" - view from the northwest gathering and focusing community activities

"Back Porch" - view from the southeast organizing workshop and industrial activities



Thermal Loop: chilled (summer) / heated (winter) Serving 16 buildings

Rain and snow melt collection: filtered Recycled water: for irrigation and toilets

