

PAINT BRANCH UNITARIAN UNIVERSALIST CHURCH

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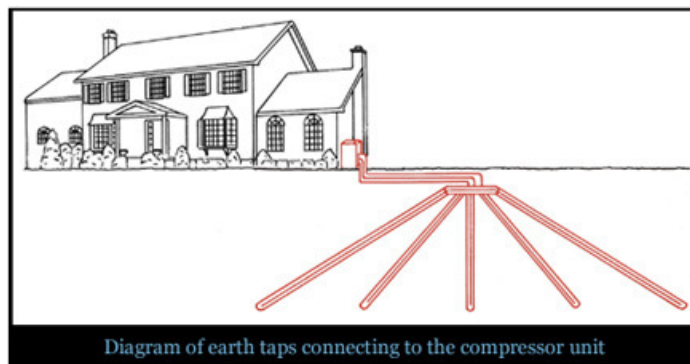
Fact Sheet on the “GREENING” of PBUUC

Paint Branch Unitarian Universalist Church (PBUUC) believes in living the UU principles, one of which is the “respect for the interdependent web of all existence...” After partial destruction of the Religious Education Building by a fire in December 2003, the Congregation raised the funds necessary to add environmentally friendly features – including: sustainable architecture design with a heating and cooling systems fueled by geothermal energy; eco-friendly building materials, insulation and lighting choices.

How does the GEOTHERMAL HEATING/COOLING system work?

The greatest long-term energy conservation feature is the model geothermal heating & cooling system -- consisting of six deep wells drilled 70 feet into the earth at a 30 degree angle. Each well contains a set of six pipe loops, for a total of 36 loops, pumping fluid through the in-ground pipe loops.

In summer, pipes take heat from a heat exchanger built into each “furnace” and discharge the heat into the ground – which maintains a constant temperature of about 55 °F. In winter, the pumps are reversed to remove heat from the ground to provide heat to the building. The only man-made energy used is electricity to operate the pumps and fans. Tempered air is delivered to and returned from rooms by fans through conventional air ducts.



Insulation in the floor:

- ✓ thermal insulation with vapor barriers beneath the floor
- ✓ overhang area of the floor vulnerable to extreme temperatures -- insulation beneath corridors increased to 9 ½ -inches, increasing the R-value to R=30
 - ★ R-value = insulation’s resistance to thermal change: the higher the number, the better the insulation. Exterior insulation in floors, walls or ceilings needs a vapor barrier to prevent moisture from entering or leaving the building.

Insulation in the ceiling:

- ✓ insulation upgraded in ceilings -- 9 ½" thick with R value of 30
- ✓ roof ventilation added to roof overhangs

Insulation in the windows:

- ✓ tempered thermal glass 3'-0" wide, 8'-0" high, dual glazed with a ½" air space
- ✓ low emissivity film reduces the solar energy transfer by 92%
- ✓ dual glazed windows, ½" argon filled space, with an R value of 3.0
- ✓ insulated, wood frame walls with R value of 22
- ✓ central casement window provides natural ventilation

Another way to conserve energy:

- ✓ The roofing membrane which faces the sky was changed to light gray – reflecting much of the solar energy from the sky, reducing air conditioning load.

Extensive humidity in this wooded area required extensive moisture control:

- ✓ vapor barriers consisting of polyethylene sheeting on the earth floor greatly shields the crawl spaces from ground moisture
- ✓ remotely located wall vents added to crawl spaces, encouraging a balance of moisture and air pressure within to that of the surrounding outdoor atmosphere
- ✓ vents' louvers open during hot, humid weather and close during cold days & nights

Sun Tubes and Skylights:

- ✓ Sun tubes were added to provide natural daylight to the windowless bathrooms
 - ★ sun tubes equipped with a ceiling lens to disperse daylight evenly, while preventing mold and mildew.
- ✓ Skylights provide natural day light and solar gain
 - ★ equipped with built-in blinds to reflect solar heat, emit daylight

Efficient Lights:

- ✓ Two types of high-energy-efficient fluorescent fixtures:
 - ★ fixtures with parabolic reflectors surface mounted in classrooms and offices
 - ★ ceiling-recessed fixtures, zero clearance to insulation, stem type lamps in corridors
- ✓ Light emitting diode (LED) lamps in all exit light fixtures

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