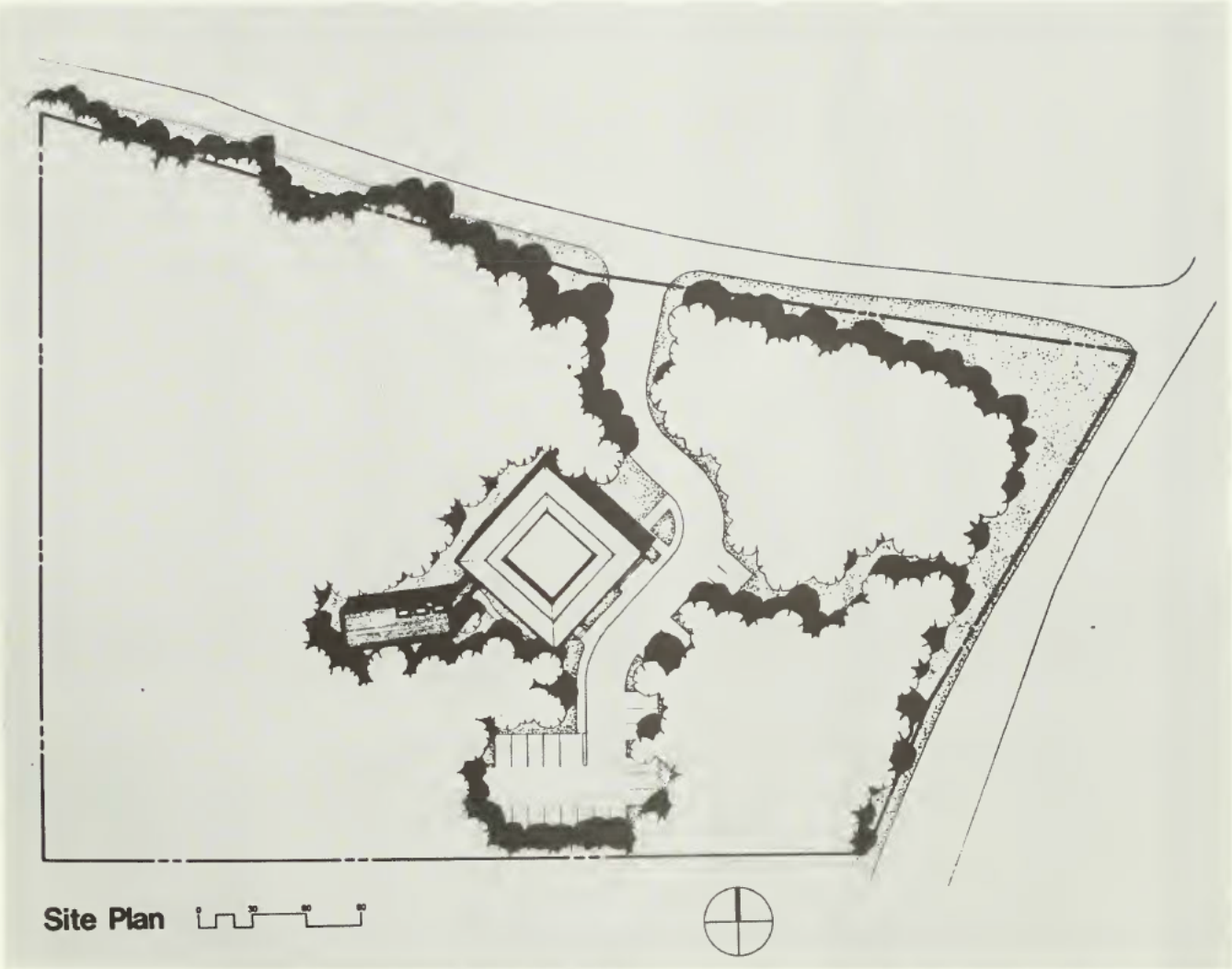
Headquarter's Addition

Northern Virginia Regional Park Authority



The Northern Virginia Regional Park Authority commissioned Lawrence Cook AIA and Associates of Falls Church, Virginia to design an energy efficient 1,500 square foot office addition to an existing 5,000 square foot administration building. The building is located outside of Washington, D.C. on a three-acre, heavily wooded site.

DESIGN . . . A publication of the Park Practice Program

Headquarter's Addition		Contributed by
Index A-1909	Winter 1984	Darrell Winslow NVRPA
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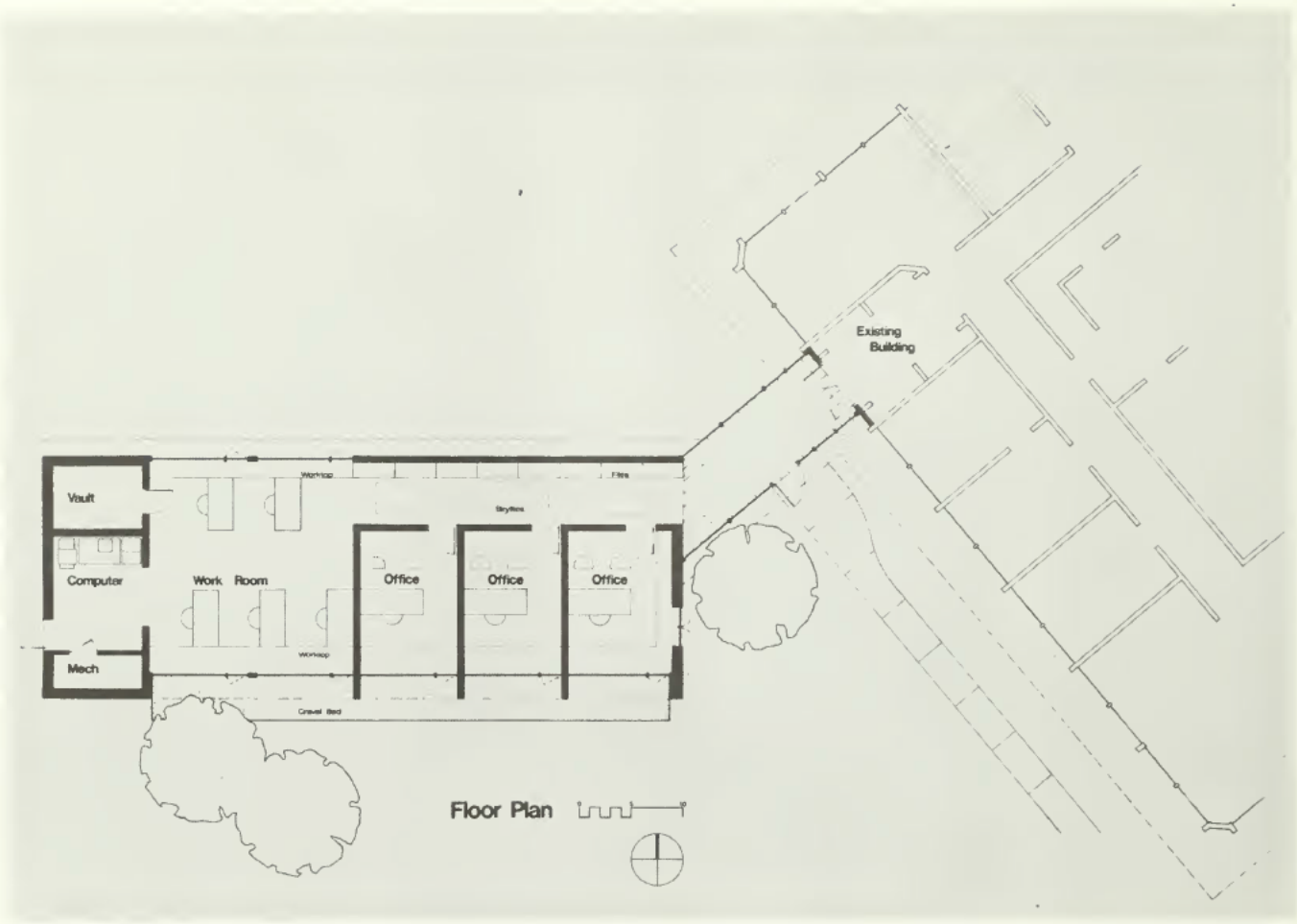
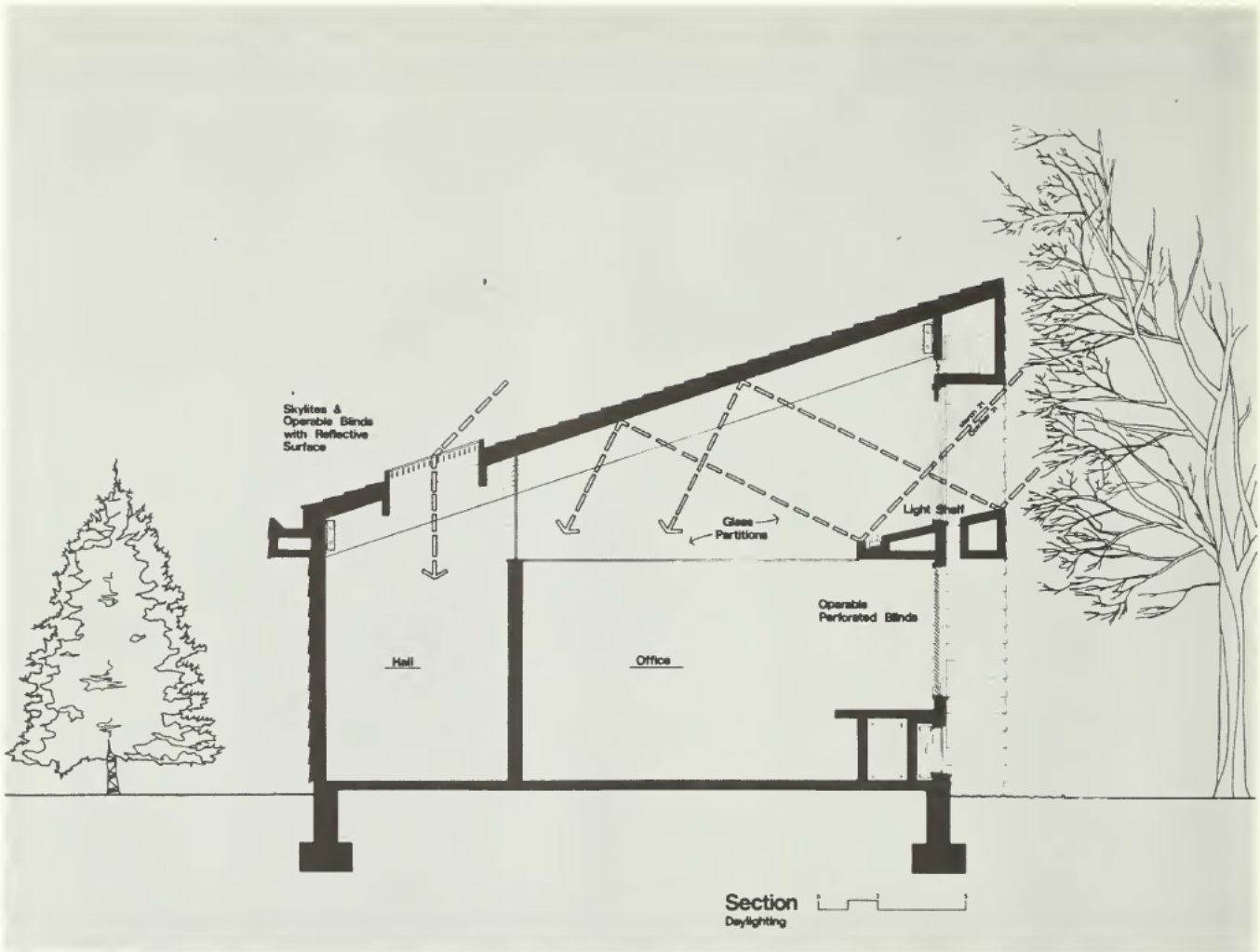


The architect's approach was to examine the staff's working patterns, the various functions of the staff and the size of the addition. This analysis showed that natural daylighting would provide the greatest energy savings while heating and cooling could offer still more savings. By the use of siting, glazing, a light shelf, reflective surfaces, glass partitions and skylites, the architect provided 87% of the required lighting and approximately 38% of the heating from the sun.

The architect's energy concepts cover five basic areas including daylighting, direct solar heat gain, a solar preheater for fresh air, destratification of hot air, and natural ventilation.

Headquarter's addition (cont'd) A-1911

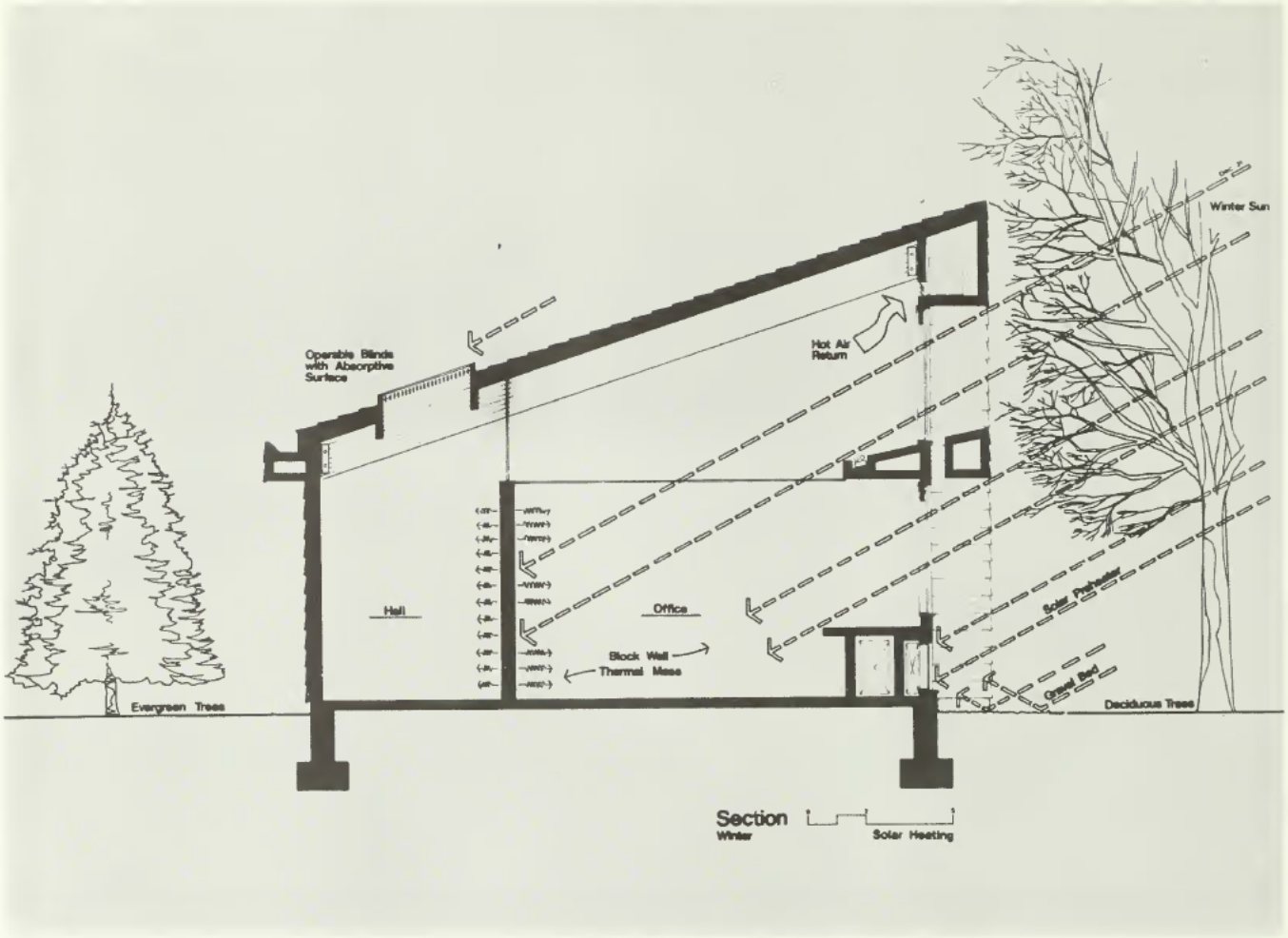


Daylighting

Daylighting is achieved by the use of southern glazing and a light shelf with a reflective top surface that bounces light up to the wood ceiling and back down into the work space. The light shelf also contains a strip of indirect fluorescent light for very overcast days. Individual control of task lighting at desk top, and perforated blinds at each work station increases the user's control of the lighting level. The worktop counters have a neutral surface to eliminate glare.

Direct Solar Heat Gain

Direct solar heat gain is provided in winter by the sun shining all day on the interior masonry partitions. This stored heat is then released slowly to maintain overnight temperature. The night insulation over windows also helps lessen night heat loss. A quick heatup in the morning is again provided by direct solar gain, as well as computer and employee body heat.



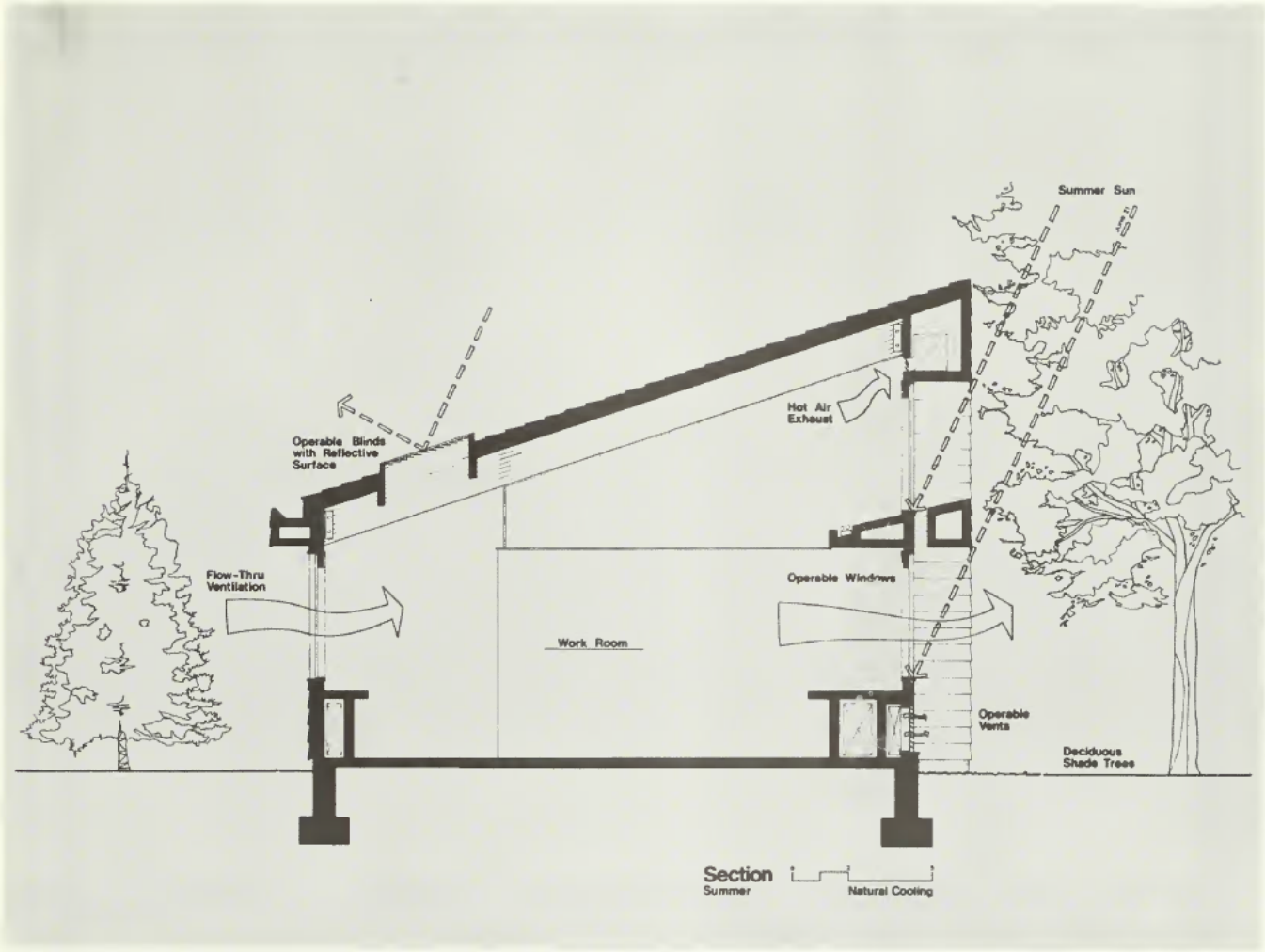
Solar Preheater

A solar preheater runs along the entire southern exposure at the lower windows to preheat the intake of cold fresh air in winter. The preheater also creates positive air pressure within the space to limit air infiltration. In summer this heat is released through small vents at each window.

Destratification

Destratification of hot air is achieved by returns located at the highest possible location above the top windows. They correct hot air stratification by returning the hottest air back through the mechanical system.

During winter this hot air is recirculated through the duct system to provide space heating, and switches to an outside exhaust system to provide space cooling during summer.



Natural Ventilation

Natural ventilation for summer cooling is provided by operable windows located on both sides of the building in the direction of the prevailing breezes. Mechanical air conditioning is provided for the high humidity of late summer. The combined effect of these energy design features will save the owner an estimated 68% of the energy cost that would have been consumed by a conventional office of the same size.

Materials

The structural shell is concrete block wrapped with 2'' exterior insulation board with a nailable outer surface. The exterior is clad with cedar shingles on the walls and cedar shakes on the roof. Inside, laminated wood beams and wood deck form the roof structural system. All partitions are concrete masonry units with wet plaster finish for solar heat storage. The upper part of the partitions is glass to increase daylight distribution. The mechanical back-up heating and cooling system is an electric heat pump.

Award

In recognition of their exceptional design the owner and architect received a Certificate of Achievement from the 1983 Owens-Corning Fiberglass Energy Conservation Awards, the highest recognition in the country for energy conscious design. The Award reads: "Your commitment to energy conservation serves as an example that creative design techniques can significantly lessen the country's dependence on scarce and valuable energy resources."

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