

ALEX SCOTT PORTER ARCHITECTURE + DESIGN

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FIRM DESCRIPTION

Alex Scott Porter Architecture + Design PLLC specializes in residential projects of all scales. The main interest of the practice is in creating homes that connect the user to the natural world and to do so in a low-impact manner. The firm seeks out collaboration with artisans and craftspeople in the field to find unconventional solutions. This practice has led to a fluency in reclaiming and repurposing materials and processes. It is the firm's belief that the most sustainable houses are those that age with a natural beauty and serve their functional and aesthetic goals for the long-haul.

The firm's work has appeared in numerous international periodicals including *Shelter* (Australia), *Dwell* (USA) and *Living Etc.* (UK).

With a background in design-build construction, founding principal Alex Scott Porter received a Master of Architecture from Columbia University's GSAPP. She has taught in the Architecture programs of Barnard and Columbia Colleges and at Pratt Institute.

Alex collaborated on this project with builder Josh Howell of JD Howell & Company.

The following links to publications provide further background and descriptions that might be helpful in understanding the project:

http://mini.alexporterdesign.com/alex_porter_new/files/against-the-wind.pdf

<http://www.dwell.com/green/article/worth-wait>

EAGLE CAMP HOUSE

DETAILED EXPLANATION OF ENTRY

On an island 25 miles off the North Atlantic coast, this solar-powered 550-square-foot house was built as a writer's retreat. Designed to sit lightly on the rocky terrain with as little impact as possible, it gets its name from the two bald-headed eagles who nest in the adjacent trees. The site's remote location, extreme weather, difficult topography and orientation created a number of challenges to both design and construction that called for creative solutions. With a tight budget of 200k, it was also imperative that the house be made from inexpensive, commonly available material assemblies.

With no services or electrical grid on the island, it was also deemed important that the structure require almost no maintenance, utilize local and found materials, and above all, that the space should feel comfortable and engaged with the land. Henry David Thoreau's desire to live deliberately and convene with nature, and his mantra to "simplify, simplify" thus found resonance throughout the design and construction process.

DESIGN

The form of the house is derived entirely from the site and its use; Its terrain, sun angles, prevailing winds, view angles and the requirements of off-the-grid living (composting toilets, battery storage, etc.). It balances the need for day-lighting, solar power, storm protection, and rain.

- (1) The structure's unusual geometry is a result of two conflicting environmental conditions: commanding ocean view to the northeast, and vital solar access to the south. The main section of the house is oriented towards the northeast (with a down-sloping roof to protect against wind) while the screen porch is skewed for maximum solar exposure, and angled to maximize panel efficiency during the summer months when the cottage sees the most use. In plan, the torqued angle does not compromise any efficiency.
- (2) With over 90% of the materials being sent out to the island in one shipment, building on this island required extremely detailed advance planning and discipline regarding materials, design, and construction techniques. Thus, the house is planned on a grid system to standardize material sizes and quantities. While use of the grid started as a pragmatic choice, its elegance and simplicity soon became the underlying principle of the project's aesthetic.
- (3) A row of clerestory south-facing windows maximize daylight and capture prevailing South-western breezes.
- (4) The large ocean-facing openings are designed such that exterior panels can slide over and protect them against harsh storms when the house is not in use.
- (5) Built-in furniture throughout the house maximize the use of the space and the comfort. A family of six can sleep comfortably in the one space.

SUSTAINABLE MATERIALS

As many commonly mechanized tasks would have to be done by hand an emphasis was placed on minimizing both the scale of the structure and the materials needed to build the house. The house rests on minimal foundation piers that were dug and mixed by hand, and pinned directly to bedrock. Exposed framing and sheathing, rather than wallboard, reduced finish materials (and the need to store them). Local and found materials were used whenever practical. Nearby beach stones formed the hearth and the concrete countertops were made on site using leftover concrete from the foundation piers. The exposed framing and sheathing are made from locally harvested Eastern White Pine. No chemical finishes, paints or sealants were used on the finish materials. The cabinets are faced with recycled plastic laminate.

ENERGY EFFICIENCY

This cabin is strictly off the grid and in fact, nowhere near any grid. As a result, electricity had to be provided via a stand-alone solar power system. Four 100W solar panels located on the south facing porch roof charge high-capacity batteries wired for 24 volt DC (direct current) power, which maximizes efficiency for the water pump and a high-efficiency Sunfrost refrigerator. The system also has an inverter to convert power to 110V AC (alternating current) that feeds the lights and outlets for common household devices such as computers and appliances.

WATER EFFICIENCY

Given that the closest fresh water source is a well over a quarter mile distant, the challenge was to collect and provide as much clean water as possible. All the water needed is collected from rainwater. A composting toilet further minimizes the need for water supply.

Rainwater falling on the roof is carried by commonly available discreet aluminum gutters to a roof washer. This device allows the first several gallons of collected rainwater to be discarded, cleaning the roof panels of dirt and residue (such as pine sap) before reaching the 550 gallon tank, which is painted opaque to inhibit algae growth.

A floating intake filter in the tank hovers about one foot below the water surface where the water column is cleanest. Water for bathing and washing is distributed by a 24-volt marine grade water pump to the sink or shower. In addition, should the electric pump fail, a mechanical foot pump in the kitchen sink cabinet allows for essential functions such as dish washing. Lastly, the in-line propane water heater requires no electricity or pilot light. The force of the water spins a gyroscope that sparks to light the gas on an as needed basis. A gravity-powered ceramic water filter used by the Red Cross in the developing world is used to provide potable, fresh tasting water.

LAND USE

The siting, form and color of the house were developed to be in concert with the surrounding forest and rocky coasts. Tucked at the edge of a meadow, the monochromatic grey house is designed to be diminutive and unobtrusive against the powerful landscape. Only a grey-water leach field is required as solid waste is treated through the composting toilet.

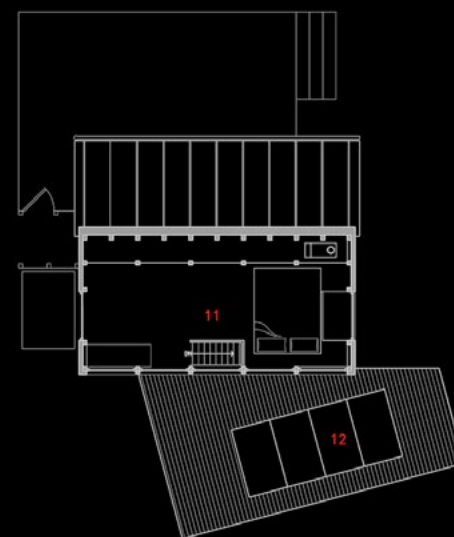
90% of the materials were transported to the site at one time via an amphibious “sea-truck” which landed 50 feet from the footprint of the house, minimizing the impact to the island’s terrain.



GROUND FLOOR



LOFT



- 1 Entry
- 2 Living
- 3 Kitchen
- 4 Eating
- 5 Screened Porch
- 6 Batteries | Storage
- 7 Composting Toilet
- 8 Deck
- 9 Outdoor Shower
- 10 Cistern
- 11 Sleeping Loft
- 12 Photovoltaic P anels





For fail-proof planning and coordination, the entire framing is designed on a regular grid and left exposed without wallboards to save material cost, and in turn, lends an aesthetic simplicity to the interior. The clerestory windows in the sleeping loft face south to maximize daylighting (above right). Simple built-on-site furniture throughout the house minimizes clutter. Cattle fencing and plumbing piping are repurposed here as inexpensive solutions.



ELECTRICAL



The porch roof torques to face due south to maximize the solar absorption of the four 100W photovoltaic panels.



The DC refrigerator by Sunfrost is wired directly to the photovoltaic batteries for maximum efficiency. It was originally designed for chilling medical supplies in remote areas of Africa.



A power inverter is installed to invert most of the battery power to alternating current to accommodate lights and receptacle outlets and other household appliances.

PLUMBING



Off-the-shelf, low-tech assemblies combine to create a rain-water harvesting system; Common aluminum gutter, roof washer; 550-gallon painted PVC tank, floating intake filter, marine grade water pump, mechanical foot pump, and a gravity power ceramic water filter used by the Red Cross.

The composting toilet vents to the outside while reducing the need for water supply and minimizing the impact on the surrounding soils.

DURABILITY



The non-corrosive aluminum cladding helps the house stay maintenance free, while sliding panels protect the North-eastern exposures from harsh storms in the off-season.

Although shuttered in the winter, in milder weather the house opens up to take in the prevailing breezes, ocean views, and soak up the daylight. Care was taken to minimally impact the native plants around the structure.

REMOTENESS



The project had to be planned to the nail as over 90% of the materials were delivered to the site in one trip on an amphibious vehicle called the “Sea Truck.” As seen above, all the framing materials, windows and finish materials were deposited within 50ft of the building footprint. Thus the number of trips to the site was minimized and with it the fuel consumption.



Tucked into the trees at the edge of a meadow, the house was designed to feel diminutive and unobtrusive against the powerful landscape. Seen here lit entirely by captured solar energy, the house can store enough solar energy and rain water for a writer to write at least one good short story.