



## Forest Holiday

SUSTAINABLE, LUXURY WOODLAND CABINS

Client: Forest Holidays

Location: Various Forests throughout the UK

Project Value: £40M

Forest Holidays Cabins: Architectural Character

Winner of Green Apple Award for Built Environment & Architectural Heritage 2016

The distinctive character of Forest Holiday cabins flows from design principles established in the initial brief and developed during the course of design and prototype development. The same design philosophy runs through each variation of the cabin creating a subtly distinctive family; the identity of Forest Holidays defined by the unique tapered form and stepped pitched roofline.

Each cabin form evokes the archetypal sense of shelter within the forest, appealing to an ancient human emotion reinforced by warm and tactile materials. Their unique form is clearly part of the forest wherever in the country they may be. The design embraces the forest by creating splayed and soaring double height spaces with dramatic glazing taking the eye to the treetops and bringing the forest into the family space. Careful planning maximises the opportunity for families and friends to relax together, enjoying the woodland whatever the weather.



Above all the cabins are designed to be subservient to the forest. Their roofs reach upwards towards the canopy whilst their materials blend into the background of the tree trunks. They are designed to be light of touch, slipped in between the trees on feet that allow the woodland floor to flow underneath. Carefully considered off site manufacture minimises the environmental impact of construction. Exhaustive design development has minimised waste in production and in construction on site. Each cabin is super insulated, minimising energy use, designed to capture and manage solar gain offered by the full height glazing through carefully considered passive ventilation.



## Background & Detailed Description

Holder Mathias was invited by Forest Holidays to develop a unique leisure concept that would define a new brand, and could be provided in Forestry Commission woodlands around the country, offering the luxury of high quality, environmentally-friendly holiday cabins whilst retaining the serenity and natural beauty of the surroundings.

Sustainability informed the design approach from the beginning and this has enabled the delivery of an exemplar of sustainable design with renewable energy sources for heating, and low energy building design equivalent to level 4 of the Code for Sustainable Homes for the Cabins and Breeam Excellent for the site infrastructure and associated ancillary buildings.

Opportunities: playing a key part in the creation of a new leisure brand.

Constraints: ecological and environmental sensitivity, building in a forest.

Challenges: budget and modular construction, rigorous prototyping and evaluation.

Adding Value: creating a product that guests want to return to again and again.

Building within a forest provided many challenges in terms of simple logistics and also in the limited ability to dig without damaging trees and other woodland features. The cabin design lifted the floor slab out of the ground entirely and utilised micro-piles to avoid damaging tree roots below; the micro-pile rig was suitably lightweight and tracked to avoid churning up the forest floor. The cabin above slab was of a modular timber frame construction, constructed off-site in a dedicated factory, delivered and bolted together on site; the design of the frames including lifting positions for a specially adapted hoist to lift the elements into place within the constraints of the surrounding trees.

The development of each site provides valuable feedback, leading to a constantly evolving product as new ideas are formed. Forest Holidays now has locations in 9 different Forestry Commission owned woodland sites in the UK.



## The Design Process

Through discussions with Richard Palmer, Forest Holidays Development Director the team developed an understanding of Forest Holidays' aspirations alongside their functional requirements and parameters of commercial viability. Through an iterative process of inclusive workshops using sketches and working models the distinctive tapered, stepped pitched concept was developed. It was important that this concept should be modular and therefore scale-able to achieve the required combinations of accommodation. This concept formed the basis of the new identity or "DNA" of the new villages.

The concept had to be commercially viable and so Holder Mathias took the unusual step of involving a specialist contractor at an early stage in design development. As a result, the design was rigorously tested and developed to create an efficient construction unit from foundation to roof tiles. A unique cassette floor system was designed in conjunction with short bore pile specialists to provide a perfect working base for flat panel timber framing which could be constructed with minimum preparation, slipped in between trees with minimal damage to the forest floor, and be ready to take the superstructure within hours. The timber frame itself was refined to suit standard panel and plasterboard sizes and the roofs designed to a full tile module avoiding the wastage of cut tiles. These are a handful of examples of the rigour that was brought to the detailed design of each of the cabins.





## Challenges

The main challenge was to ensure that the environment, was respected and the design developed to ensure the natural world took precedent. An environmentally friendly 'light touch' approach was applied. In masterplan terms, extensive ecological studies were carried out defining constraints plans around which the cabins and facilities buildings could be positioned.

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## Accessibility

Each site provides cabins with enhanced accessibility, which allows the use of disabled wheelchair users with their carers, using ramped entrances and paths up to the cabins. Internally the cabins are more spacious to permit wheelchair turning and movement, created using a 3 bed footprint to provide a 2 bed adapted unit.



## Modular Approach

Various types of cabin, the 2 bed, accessible 2 bed, and 3 bed, have been designed as modular to allow the majority of frame fabrication to be performed off site, thereby minimizing the time and disruption during the construction phase. This meant no heavy duty machinery was required onsite, considerably reducing noise pollution. Vehicles delivering the modular parts had little impact on the Forests due to strategic car parking spaces placed at the rear of each Cabin, however, Skips and large waste removal trucks did not enter the site; all waste was disposed of during off site manufacture. This eliminated waste polluting the Forests and gave opportunity to renew unwanted materials for other elements of Forest Holidays.

Construction materials have been selected to be as environmentally-friendly as possible, such as the use of sustainably sourced FSC timber, safe water-based timber stains and preservatives, energy efficient and environmentally-friendly insulation, and low embodied energy clay roof tiles.

## External Materials

The building envelope is predominantly clad in FSC sourced, light oak stained, locally sourced where available, rough sawn softwood arranged vertically with expressed joints, with matching windows and similarly clad doors. All timber is painted in Sadolin Ultra Highly Translucent Woodstain for a durable finishing, only requiring 7 year maintenance cycles. Level differences are dealt with locally using timber staircases with vertical slatted balustrading; similar detailing is applied to the timber terrace which over sails the front of the cabin, stopping rain water discolouring the external timber walls. The roof is covered with an anthracite coloured clay tile.

## Environmental Impact

A core ideal for the design has been sustainability and the notion of 'touching nature lightly', by having minimum effect upon the sensitive and diverse environment in which this design is constructed.





Although not strictly housing, the original design of the cabins was considered against the criteria of Code for Sustainable Homes in order to achieve superior energy efficiency through use of a super insulated envelope, with underfloor heating utilising the thermal mass of the raised concrete deck, itself an energy efficient flooring system incorporating insulated formwork.

## Energy

A number of alternative energy sources were considered and the cabins have been designed to allow for all possible solutions. Sites and cabins have been examined on a case by case basis to identify the most suitable solution based upon existing service provision, availability of renewable resources, cabin location and orientation. Where sites allow the cabins themselves are heated through the use of biomass boilers; carbon neutral burning of woodchip, sourced through the Forestry Commission coppicing programme and brought to the site from local areas.



The Cabin designs minimize environmental impact through natural cross and stack ventilation building using the high volume to promote passive stack effect through the high level opening windows in the corridor, careful orientation and solar shading to avoid overheating with thermally controlled under floor heating system. Energy efficient lighting and appliances have been installed as standard. The thermal performance and air tightness of the cabin has been enhanced over standard requirements to achieve the following U values, walls 0.2W/sqmK, roof 0.15W/sqmK and floor 0.15W/sqmK. The air permeability tests have been recorded as 5 metres cubed per sqm area.

Energy Performance Certificates have been achieved for the built Cabins to date. In England all recent Cabins have achieved a Grade B.