

# Ralph Allen Yard, Bath

A case study of Ralph Allen Yard, Combe down, Bath –  
An exemplar for sustainable construction.



Image 1: Graphic displaying elevation from the top of Rock Hall Lane.

## Introduction.

The redevelopment, of Ralph Allen Yard, is situated in the heart of Combe Down – a village suburb of Bath. The site lies in the City of Bath Conservation Area and the wider World Heritage site. The project consists of 9 dwellings, dedicated to low carbon living, and a mining interpretation centre; which will become integral to the village. The centre will provide a hub for community events, it will house an archive of mining history, and be part of Bath’s museum and stone quarries trail. The brownfield site was formerly a 19th century maltings, for the Combe Down brewery. More recently, it has served as a TV repair shop, and a commercial plant and vehicle yard. The property is currently unoccupied, however, it is in the final stages of completion. The dwellings are currently advertised for sale, by Savills, for spring 2014.

Ralph Allen Yard won the highly commended award in the low & zero carbon energy category, at the house builder awards 2013. Housebuilder are a leading information provider for the house building industry, they provide a magazine, prestigious awards and leading business conferences.

The project is also Secure by design approved.

## Construction and built system.

The project materials were carefully selected to reduce environmental impact, whilst sensitively reflecting the architectural character of the local surroundings. The development’s upper/lower ground floors were constructed using recycled roughly sawn Bath stone- from the demolition of redundant site buildings. Smooth sawn ashlar was used for the first floor; these sit under a single grey ply membrane (hidden from view), and they are clad using lightweight cedar timber. The apartment building was constructed to hold a sedum roof; the external wall, of the interpretation centre, Rock Hall Lane, has been preserved- maintaining local character and history.

A large percentage of the construction was prefabricated; this helped to minimise any on-site disruptions, waste and other environmental impacts.



Table 1: A brief outline.

CfSH level:	5
BREEAM:	Very Good
Development Type:	Combination of residential and commercial. Erection of a Mining Interpretation Centre. 8 Eco-Homes and 1 Apartment building.
Construction type:	Bath Stone, Cedar Cladding.
Key sustainability features:	Photovoltaic panels, roof lanterns, Rainwater harvesting, green roof, passive heating, energy efficient appliances, bicycle storage, super insulated high performance building fabric– triple glazing.
Procurement method:	Design- led approach.

## Sustainability Features.

Ralph Allen Yard marries passive and active design, to produce features that make it an exemplar for sustainable construction. The development maximises sustainable design with large, south facing windows, roof lanterns, and optimal roof angle of 22° (amplifying solar energy harvested by the photovoltaic panels). The apartment green roof, rainwater harvesting and grey water recycling aspects provide a significant reduction in surface water run-off and potable water use within the building. This has allowed the scheme to achieve the challenging task of reducing water consumption to less than 80 litres per person, per day. The permeable paving used enables infiltration of water, removing any excess surface water run off. The green roof boosts biodiversity, housing native plant species. The use of energy efficient appliances, LED lighting, bicycle storage and recycling facilities, adds to the project, facilitating low-carbon living.

## Technical performance.

The dynamic, thermal performance is supplied by the use of the Stuart Milne Sigma II Pre-fabricated timber frame build system. The high fabric efficiency provides low levels of thermal bridging (0.035), an air tightness rating of 3 and a u-value of 0.15Kw/m<sup>2</sup>. The unique, hybrid system is exceptionally sustainable, making use of home-grown timber. The system is comprised of large pre-fabricated, pre-insulated panels allowing the scheme to become erected, weather-tight, air-tight and insulated in four weeks. The high thermal performance of the building presents a low demand for heating. This is provided by small, high efficiency gas boilers. Initially, the team were interested in a biomass district heating system. However, due to potential technology resistance, costs and management, the gas boiler became the leading choice.



**Image 2:** Location Plan.

**Table 2:** Breakdown of points achieved.

Category	Percentage score achieved	What is covered in the category
Energy	97	Energy Efficiency and CO2 saving measures.
Water	100	Internal & external water saving measures.
Materials	54	The sourcing & environmental impact of materials used to build the home.
Surface water run-off	100	Measures to reduce the risk of flooding and surface water run-off, which can pollute rivers.
Waste	100	Storage for recyclable waste & compost. Care taken to reduce, reuse/recycle Construction materials.
Pollution	100	The use of insulation materials and heating systems that do not add to global warming.
Health and wellbeing	83	Provision of good daylight quality, sound insulation, private space, accessibility and adaptability.
Management	89	A Home User Guide, designing in security, and reducing the impact of construction.
Ecology	67	Protection and enhancement of the ecology of the area and efficient use of building land.



**Image 4:** Internal side view graphics.

**Architect:** Hewitt Studios LLP

**Property consultants:** Savills

**Address:** Gammon Plant Hire, Rock Hall Lane, Combe Down, Bath,  
Bath and North East Somerset BA2 5JF

## Specification and Scheme detail.

The south facing detail of the property is key to a many of the sustainability features. Extensive glazing on the southern elevation maximises low angle solar gain in winter, whilst zinc canopies provide shade from the high angle summer sun to prevent overheating. The orientation also enhances performance of the solar PV. The PV and roof lights are laid out to create an integrated roof surface. The use of motorised roof lights enables natural stack ventilation throughout the house, via an open stair, while providing natural light.

## Built on the past, designed for the future.

The site aimed for Economic, Social and Environmental sustainability. These three aspects would be instrumental to Ralph Allen Yards success.

The aesthetics of the build, the community building (run by local residents), the historic records, and the education for sustainability and low carbon living ties the development together, delivering the objective– Build on the past, designed for the future. Initially, the public were opposed to the scheme. Various consultations were carried out and once awareness had broadened, and the potential for Ralph Allen Yard was recognised, a group of local people then came forward to volunteer, to help run the new centre. Interest in the environmental and sustainability factors also grew with knowledge. There has been a high level of interest amongst prospective purchasers, in particular the sustainability elements. Attractive factors include; the low maintenance and running costs, the comfort and the ease of use of the technology, the communal rainwater harvesting scheme, PV panels, and the fabrication of the property. Interest of these factors signifies the importance of sustainability to potential buyers. In addition, the simplicity of the solar gain and sunspace aspects ensure benefits for the resident and property for the future- in relation to energy costs and property value.



**Image 3:** Section of photovoltaic panels and preserved existing wall, Rock Hall Lane. Jan 2014.



**Image 5:** Side view of interpretation centre, partial completion. Jan 2014.