

## Project Description and Aims



Black Knap is a large new build private residence in the Cotswolds. It extends to 600 sq/metres over three levels and a basement. The basement and all walls of the property have been constructed using Ziegel fired clay blocks, clad in Cotswold stone for a traditional appearance. All internal plasters will be lime based, with NBT paints. The roof will use the NBT Pavatex Isolair System.

The client wanted a high performance masonry system that was easy and quick to build, whilst also being cost effective. Over the life of the building the client was concerned to achieve maximum energy efficiency and minimise health risks for the occupants.



## NBT role in project

NBT provided design support to the architect from early on in the project and supported the contractor on site with training and technical advice throughout the build period.

## **Black Knap - Cotswolds**

Client: Private Client

Architect: Arbutnott Ladenborg

Contractor: Kinglerlee Ltd

Engineer: James Birdwood

Plan-Ziegel Block with Stone Cladding

### Performance:

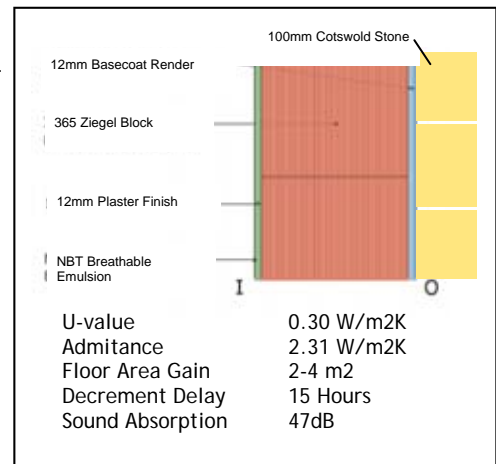
The walls were designed to achieve a U value of 0.30W/m<sup>2</sup>K with solid wall construction using 365mm thick Plan-Ziegel Blocks. The blocks are highly vapour permeable and prevent moisture passing into the building due to their unique honeycomb design. The basecoat render and stone cladding system provide additional airtightness and further weather protection. The solid wall “breathing” construction ensures thermal performance and also thermal storage, making buildings warm in winter and cool in summer. The blocks are fully load bearing and can be used up to four stories without the need for additional support.

### Buildability:

Plan-Ziegel blocks offer a fast method of constructing a masonry shell with robust detailing throughout. The thin bed system means no restriction on height of build per day. The dry interlocking perps mean easy building without risk of acoustic or thermal leakage. All membranes, cold bridging, and damp cavities are eliminated with this form of construction. A concrete floor was used at first floor level which rests directly on the Ziegel blocks. Standard profile blocks were used to create in-situ cast lintols—the concrete slab first floor bears directly onto the blocks.

### Environmental:

NBT Plan-Ziegel blocks using a thin joint system have approximately 50% less embodied energy than traditional masonry (block or brick) for the same thermal performance. The blocks are made of fired clay, are entirely non-toxic and require no special precautions to be taken on final disposal. Construction of the walls and roofs give off no emissions and also require no special treatment on final disposal.



### Design Issues:

From Architect: The use of Ziegel blocks presented few challenges to the designers and many design details were significantly simplified.

### Build Issues:

From Main Contractor: Despite poor weather conditions during the construction of the main above ground structure it was possible to keep the build programme moving. The engineered nature of the blocks, (top & bottom), allowed high standards of tolerances to be maintained. There were concerns about the methods of fixing to the Ziegel blocks, but once appropriate propriety systems were specified these proved reliable and easy to use. The Bayosan MP69 render was easy to apply.

### Cost:

Commentary: A full cost analysis will be undertaken by the client / contractor—although initial indications are that the Ziegel system has been a cost effective solution.

### Performance:

Commentary: Once the build has been completed and inhabited a full performance study is to be undertaken.

