

# LOW IMPACT MATERIALS: CASE STUDIES

## HEMP-LIME

### The Triangle

Code Level 4

Developer: Hab Oakus  
Architect: Glenn Howells  
Contractor: Willmott Dixon  
Completion: Summer 2011  
Location: Swindon, Wiltshire  
Interviewee: Mike Roberts  
Chartered Surveyor and  
Project Director for Hab

The Triangle is located off Northern Road in Swindon, 20 minutes walk north of Swindon central train station. It comprises 16 two-bed houses, 13 three-bed houses, 7 four-bed houses, 4 one-bed apartments, and 2 two-bed apartments. There are homes for Intermediate Rent and Rent To Homebuy, as well as homes for affordable rent to local people registered with Swindon Borough Council.

#### WHY WAS HEMP-LIME CHOSEN?

- Hemp is renewable
- Hemp-lime is relatively much lower in embodied carbon than brick or concrete
- To challenge the view that in order to reduce emissions post occupancy you need to use materials high in embodied carbon
- To support local industry (UK hemp and lime)
- To test the dynamic performance of hemp-lime (as opposed to lab-testing)
- DECC/HCA provided a £20,000 grant/unit for renewable materials

Two other products were considered: clay block and wood fibre-concrete mix. The former was discounted



South and west wings just prior to completion (D Black, BRE)



Hemp-lime wall prior to application of render (Glenn Howells)



Hemp-lime wall with rendered finish (Glenn Howells)

as it was not considered renewable under the funding agreement, and the latter because of its higher embodied carbon.

#### WHAT ISSUES WERE FACED AND OVERCOME?

Though relatively minor, the two most significant challenges were lack of familiarity with the product and the cold/wet weather: there was a skills and training gap at all levels, from those applying the product on site to those managing the programme and costs; while drying time during the colder months created substantial delays. Despite these issues the project has come in ahead of schedule.

#### WHAT ARE THE PROS AND CONS?

Contractors reported that significant benefits were the ease of inclusion of services within the structure, and the 'off-grid' application of the hemp-lime, which could be cast without the need for power cables.

As with all materials it is limited in terms of its application in certain locations (areas either wholly or predominantly brick, for example, where render would appear out of context); and brick-faced hemp-lime structures are currently unviable.

There is a 'portfolio risk' too in that investors may want to see how hemp-lime performs at scale before investing seriously.

#### WOULD YOU USE IT AGAIN AND, IF SO, WHAT CHANGES WOULD YOU MAKE?

The development partnership would use it again, particularly with the team that are now more familiar with the product and certainly on smaller projects that can be carried out in the warmer/dryer months. For larger projects (that will need to go through the colder months) they would look into the use of hemp-lime panels manufactured off-site.

#### WHAT WAS THE ELEMENTAL COST?

It's difficult to put an exact unit price on the material due to the variables of time and training, but overall the scheme has been developed to Code Level 4 at a price broadly comparable to standard materials, even without the grant.



Temporary support for hemp-lime while being cast (Glenn Howells)



Hemp-lime at window corner (Glenn Howells)

This case study was produced as part of the University of Bath's EPSRC funded Knowledge Transfer Account, a working partnership between BRE and the University of Bath. Further information on hemp-lime is provided in a BRE Information Paper that can be purchased in hard copy from [www.brebookshop.com](http://www.brebookshop.com) and downloaded free from [www.bre.co.uk](http://www.bre.co.uk). Four other case studies and Information Papers are also available on unfired clay block, straw bale, natural fibre insulation and cross-laminated timber.

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