AJ

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Concrete poetry

A béton brut house by Adrian James
PLUS Maggie's Centre Swansea

£4.95 / THE ARCHITECTS' JOURNAL / THEAJ.CO.UK

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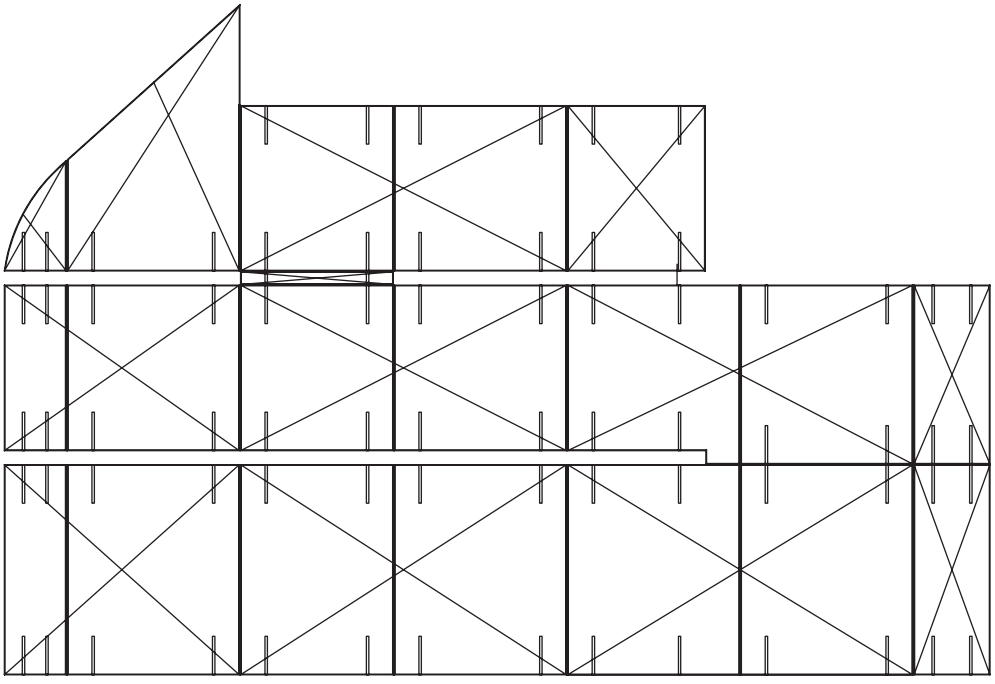


Béton beauty

Why we chose a precast concrete prefabricated system for Hill Top House in Oxford, by *Adrian James of Adrian James Architects*. Photography by *David Fisher*

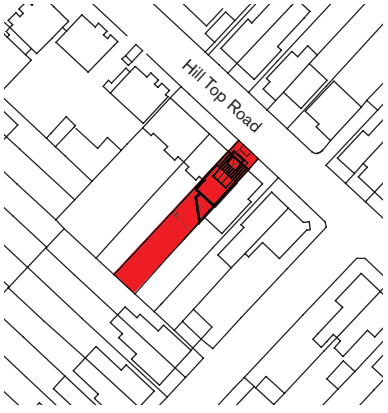
Hill Top House was conceived as an essay in concrete for clients who appreciated the uncompromising ascetic quality of the material. We wanted to bring out its poetic qualities; the design is all about expressing its base beauty, the very antithesis of bling. All the main elements of the building – walls, floors, ceilings, stairs, roof – are polished panels of precast concrete, made off-site, delivered, and assembled like a house of cards. The house is organised so these raw panels are unfettered by

fittings, services and clutter. We wanted a disciplined plan with long enfilades down each side so the concrete flank walls run through from front to back, washed by daylight from full-height windows displaying the distant view. We thought of the staircase as a concrete cascade in a sheer-sided canyon, shimmering in sunshine flooding in from above.

The aim was to create a building where the structural fabric was also the interior finish. Raw construction sufficiently honed for living; béton brut without the brut. The crosswall construction system developed by Cornish Concrete achieves this, and more. Its advantages include prefabrication; quality of workmanship and reduction in the length of the programme; panellised construction instead of frames, which have downstands, shear issues and infill messiness; and the comforting solidity and thermal mass that is concrete.

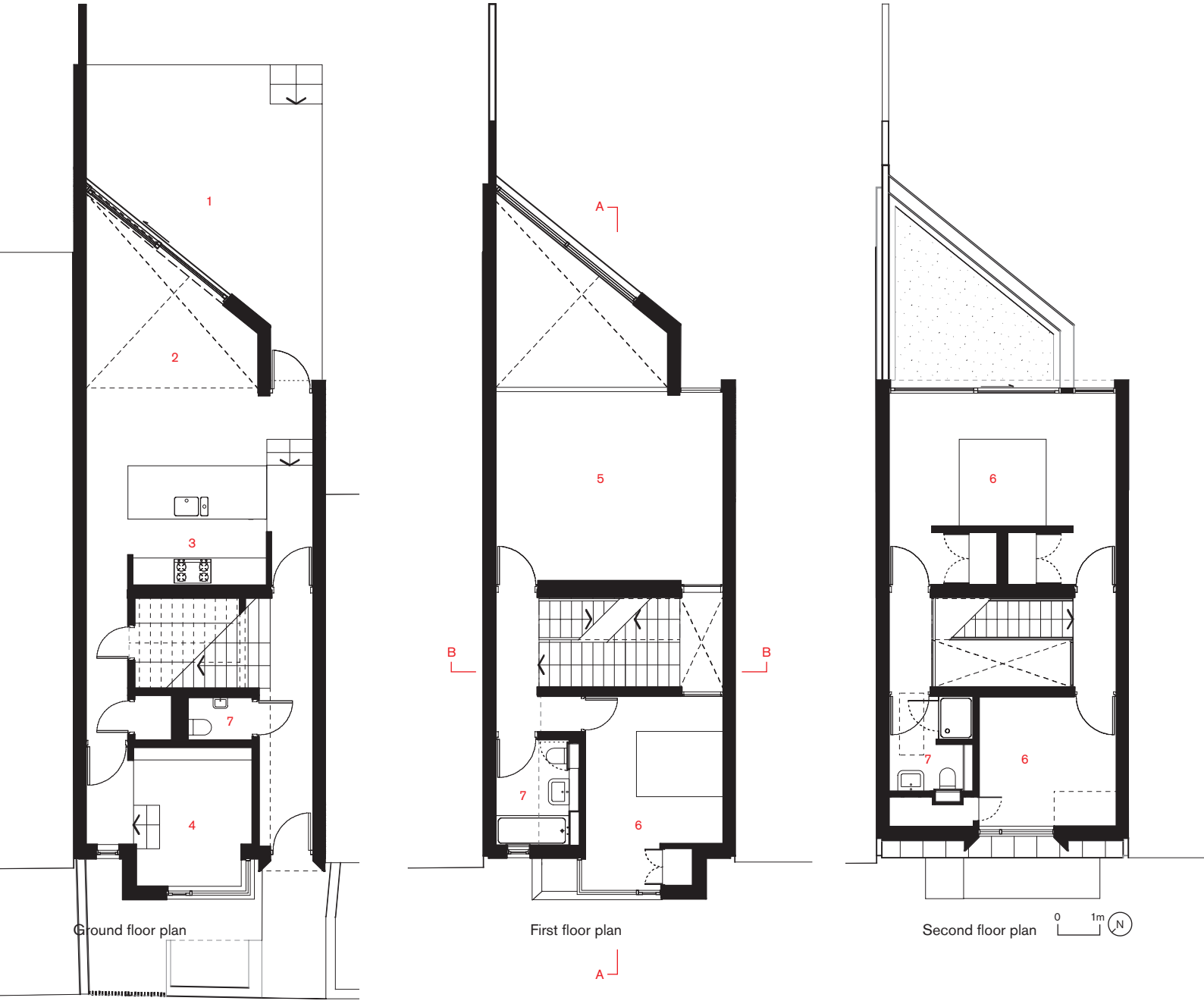
The quality of finish was a high priority. The mix includes Cornish white sand, which lightens the tone, >>

Above All walls, floors and ceilings are precast polished concrete



Location plan

0 5m N



Ground floor plan

First floor plan

Second floor plan

but not so much that it loses its concrete-ness. The finish is smooth but with a variety of colour and texture, which means it can never be mistaken for plaster, because it has a quality of serious weight. We wanted the concrete to have the right balance between raw structure and smooth finish.

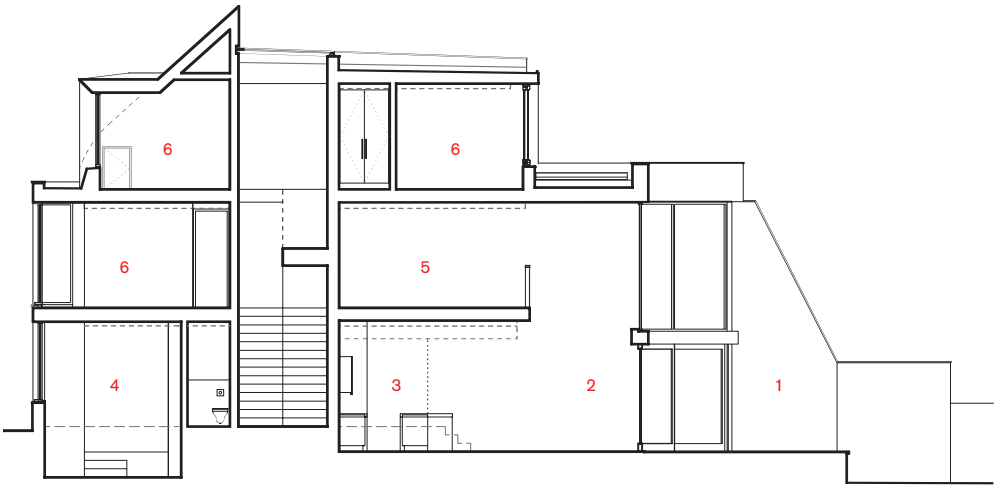
The jointing systems between the concrete panels are invisible

Making sure the design was not compromised by poor detailing, fat joints, exposed or poorly masked service runs and so on required serious forethought and design coordination. At the macro level the house plan is very ordered, with services contained in central duct zones and dropped ceiling planes clearly segregated from the concrete walls and floors. At the micro level, the party walls and crosswalls around the stair chasm are kept completely clear of all clutter – no sockets or switches. The enfilades down both party walls allow light to fall on uncluttered concrete throughout the house.

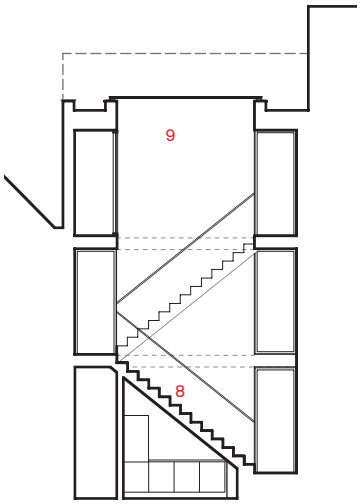
Legend

1. Terrace
2. Dining
3. Kitchen
4. Study
5. Living
6. Bedroom
7. Bathroom/WC
8. Store
9. Stair atrium

The concrete isn't unblemished; it has whorls, rougher chamfered edges and grouted lifting eyes, all of which hint at béton brut, but the jointing mechanisms between the panels are invisible and the joints themselves are as tight as practical constraints allow. Cornish Concrete's crosswall system has been refined over the years in the construction of hotels, student residences, flats and prisons, >>



Section A-A



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Section B-B

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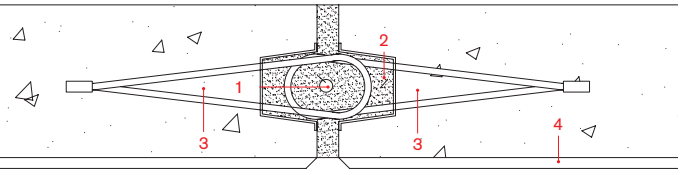
AJBuildingsLibrary.co.uk
Search 'Hill Top House' for more drawings and data

Above Entrance elevation
Right The staircase was conceived as a concrete cascade in a sheer-sided canyon

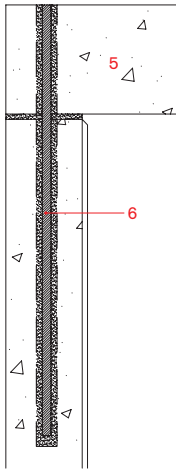
Left Garden elevation
Below Horizontal panel joints have precast pockets for steel dowels

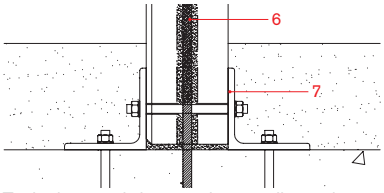
0 100mm

Typical vertical panel-to-panel connection detail



Typical ground floor to panel connection detail





Typical ground-floor to shear wall panel connection detail

ADRIAN JAMES ARCHITECTS

resulting in a product which can be customised to suit one-off buildings like Hill Top House. Panel details are marked up by a robotic plotter to ensure dimensional accuracy, and shutters are held in place with magnets to keep the surfaces intact. Every panel has a run of steel loops cast in the end so a steel bar can be threaded down and the joint then grouted up. Horizontal joints have steel dowels grouted into precast pockets.

The panels were cast in the works in Cornwall and then shipped north and installed swiftly and efficiently on site in a few days: all the walls, floors, stairs, and the curved and trapezoid panels at roof level. The finish is essentially as it comes out of the mould: no acid wash, just a fine grout to fill blowholes and then a clear coat of Keim to seal the concrete. Why this system is good here is not so much its cleverness as the fact that you don't see any of it. All that is there is the concrete itself, enobled in the top light and side light. ■

Legend

1. Overlapping steel loops from each wall unit to receive 1 No continuous H12 bar per joint
2. Wall connection to be fully grouted with Pagel VS grout
3. Pfeiffer VS 50/200 wall connector rail cast into wall panels
4. Inside face
5. Roof
6. 1 No H16 bar fully grouted with cementitious non-shrink grout
7. 2 No 150 x 150 x 15mm RSAs bolted through preformed holes in base of panel with M16 nuts/studding. RSAs to be resin-fixed into ground-floor slab with M16 studding through preformed holes

Project data

START ON SITE
June 2010

COMPLETION
July 2011

GROSS INTERNAL FLOOR AREA
180m²

FORM OF CONTRACT
Competitive tender based on JCT Intermediate Building Contract with Contractor's Design 2005, Revision 2, 2009

TOTAL COST
£554,394

COST PER SQUARE METRE
£3,000

ARCHITECT
Adrian James Architects

CLIENT
Anthony Waite

STRUCTURAL ENGINEER
Price & Myers

QUANTITY SURVEYOR
Baqus Sworn King involved up to tender

PROJECT MANAGER
Adrian James Architects

MAIN CONTRACTOR
Bybridge Construction – up to concrete superstructure; Carter Construction – complete fit-out and finishing

CDM CO-ORDINATOR
Non-notifiable

APPROVED BUILDING INSPECTOR
Oxford City Building Control

ESTIMATED ANNUAL CO_2 EMISSIONS
84kg/m²

AIRTIGHTNESS AT 50PA
3m³/h/m²

ANNUAL HEATING AND HOT WATER LOAD
Heating: 7,874kWh, hot water: 3,045kWh

OVERALL AREA-WEIGHTED U-VALUE
0.88W/m²K

CAD SOFTWARE USED
VectorWorks, SketchUp

PRECAST CONCRETE WALL, FLOOR AND STAIR PANELS
Cornish Concrete

CONCRETE FLOORS
Lazenby

GLASS BALUSTRADES AND HANDRAILS
Sapphire Balustrades

MAIN ROOFLIGHT OVER STAIRWELL
Glazing Vision Flushglaze

WINDOWS AND DOORS
Alu-clad system: Unik Funkis, frameless glazed corners to bay windows: Bicester Glass

INTERNAL JOINERY
D Smith Joinery

BESPOKE FIRE-RATED INTERNAL GLAZED SCREENS
Forster 'Presto' 30/0 steel frames with structurally bonded double-glazed units by Compass Glass

SPRAYED INSULATION TO CURVED FRONT FACADE STUDWORK
Icynene Airseal Insulation

RECLAIMED CABINETS AND IROKO WORKTOPS
Retrouvius, with joinery by D Smith Joinery