

PROJECTS

design and construction / technical / project management

HOME AND DRY

Would you build a house on the Norfolk Broads, one of the most flood-prone areas of the UK? LSI Architects did and its sophisticated design meant getting the project through planning was plain sailing. **Ike Ijeh** dons his wellies

For obvious reasons, flood plains are not normally selected for development, let alone for the construction of new-build housing. But the Haven in Horning defies convention by doing just that. Nestling right on the edge of the flat, marshy landscape of the Norfolk Broads and perched on the confluence of three waterways, LSI Architects' residential development combines a three-bedroom property with a boat-house for a local sailing club. But its special claim to fame is its provocative location directly on a flood plain in one of the areas of Britain most vulnerable to regular flooding.

One reason the architect was able to convince the local authority and Environmental Agency that its proposition was viable was that the new development replaces an existing property. The previous private house and boat house dated from the seventies but exhibited problems from the start: poor thermal performance, poor design and contextual insensitivity.

But it was also the sophistication of the flood resilience measures introduced into the new design that validated the proposals and enabled development in an area where it would not normally be permitted. Quite simply, the house is raised 1.2m above the ground to clear the statutory 100-year flood-level below. Ingeniously, this actually increases the flood plain capacity which also helped convince the planners to allow the ground floor area of the new house to be 5%

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PROJECT TEAM

Architect: LSI Architects

Contractor: JS Hay

Structural engineer: Michael Barclay Partnership

Quantity surveyor: Davis Langdon (Norwich)

Flood risk consultant: Evans River and Coastal

larger than that of the previous one.

The house is a steel portal frame supported on concrete piles embedded deep into the peat subsoil below. Above ground these piles turn into slender galvanised steel columns that help form the elevational grid that defines the principal facade. The elevated composition of the house is clearly visible externally by the dark narrow void, intermittently punctuated by columns underneath. It is through this void that flood water would flow, thereby protecting the house above.

Unusually perhaps, the ground floor slab is not made up of lightweight steel deck structure but an in-situ cast concrete slab. As Lee Burgess, LSI Architects associate, explains: "A steel floor would have offered an extremely low tolerance with regard to the accuracy of setting-out holes for the piles. A concrete slab also provided greater

thermal mass, increased waterproof tightness and required no joints and lower maintenance."

Materials are another key factor in the Haven's flood resilience capabilities. The two-storey house is entirely clad in horizontal strips of Accoya timber. Accoya is a high-performance natural wood that resembles pine in colour. But it is in fact a modified softwood that is dipped in vats of vinegar and then rolled. This process tightens its molecular structure, essentially making it more stable and less porous.

The result is a virtual hardwood, but one significantly cheaper and more durable than authentic hardwood products such as teak. Accoya cladding is also well placed to withstand the driving North Sea winds and rain that often pummel East Anglian coastal and inland areas.

As part of the flood resistance strategy, timber is used sparingly below the flood datum level – essentially represented by the raised deck. Below deck more resilient materials are employed, such as pre-cast concrete, flint gambions and galvanised steel. In terms of detailing, galvanised steel often provides subtle relief against





FLOAT MY BOAT

The Haven is not the first housing development to be essentially built on water. Holland knows a thing or two about living on or near water and has been on the forefront of developing innovative floating housing systems for several decades. Maasbommel, by Factor Architects, includes 46 “amphibious” lakeside houses, 12 of which float on water. The land-based houses are separated from the river by a 2m deep sub-grade hollow concrete box which fills up if the river floods. Closer to home the 2007 floods prompted the RIBA to run a competition to design a “flood proof house” from which four joint winners were selected.

the timber cladding and it is also used on the stair, deck and ramp railings to the rear of the house.

Aesthetically, the Haven forms a subtle yet decisive addition to the rich natural landscape that surrounds it. Its horizontal timber cladding and the simple geometry of its robust form easily recall the ship-lap barns and solidly utilitarian structures that comprise local vernacular and often define the Norfolk landscape.

One imagines it also merges with its context more successfully than its stark blue and white painted seventies predecessor

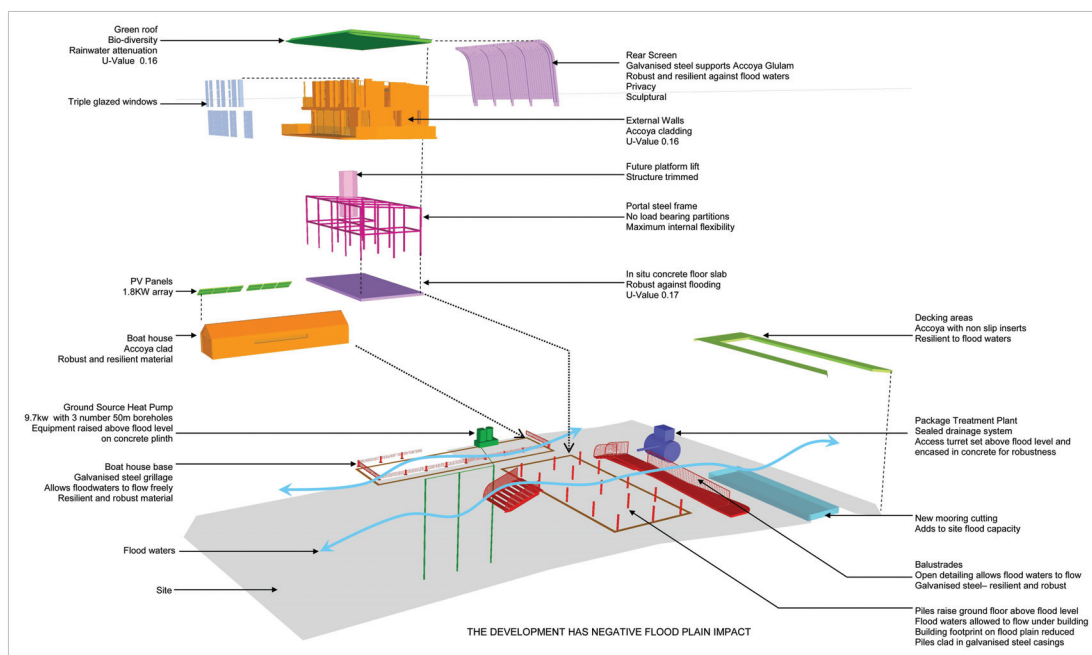
ever did. It takes full advantage of the dramatic visual possibilities offered by its near-peninsula waterside setting by extending its timber panelling right over the full extent of the adjacent moor and thereby resembling a giant wooden barge marooned in the water.

Architecturally the rear facade is the boldest. A screen of curved timber columns which dramatically references the adjacent boat house by recalling a ship’s hull. Its winged form is also reminiscent of the flight of the seagulls that fly overhead from the

nearby coast or the wind-blown reeds scattered across the sprawling fields nearby. All of this, together with the timber, the stilts and the verandas all help the Haven construct a wistful new brand of English prairie architecture.

Burgess summarises the Haven’s design approach and flood strategy as one that prioritises “longevity”. It is a unique building cleverly customised to satisfy the very special environmental conditions that its natural terrain imposes. In so doing, it represents a significant exception to planning policy, but one whose design characteristics could well set a precedent for possible future housing developments in flood risk areas elsewhere.

CONSTRUCTION AND FLOOD DEFENCE STRATEGY



Above: Haven’s principal facade looks out over its surrounding waterways