THE SEMI-CIRCULAR FIGURE LEADS ONE TO WONDER WHICH CAME FIRST – THE IDEA OR THE SITE?

By Birkin Howard. Photography by Paul Riddle

Robin Snell established Snell Associates in 1994, having worked for more than a decade with Michael Hopkins. One strand of the practice’s work is redeveloping listed buildings in historic urban settings, such as the Arnolfini Centre for Contemporary Arts in Bristol – which opened this month. Snell has also completed an art gallery for the Surrey Institute of Art & Design and is working on a new stadium for Fulham Football Club.

The bird has landed. Imagine Concorde touching down at Heathrow and you have some idea of the form of the new Water Activity Centre at Whittingham Country Park, near Norwich. With a backdrop of Carrow Road football ground, the Castle (home of the Norwich School painters) and the many church towers, more than 100ha of gravel workings have been transformed, within a stone’s throw of the city centre.

The water park lies south-east of Norwich at Trowse and offers aquatic activities, including sailing and windsurfing, around two artificial waterways – the Great Broad and Little Broad. Since 1988 the flood plain of the River Yare, immortalised in the works of Arthur Ransome and John Betjeman, has generated nearly four million tonnes of gravel. As gravel-working was finished, the restored Broad was returned to an appropriate water level for use by watersports and fishing and to provide water-edge habitats.

By early 2005 the Great Broad had been completed and was ready for the next phase of development. Land Use Consultants was the masterplanner, working in conjunction with Savills, land agent to the owner, Sir Timothy Colman.

Following competitive interviews, Snell Associates was appointed by the Whittingham Trust as architect for the country park in 2001. This was an interesting choice over more established firms. Snell’s experience was unquestionable, having spent 12 years at Hopkins, his time there culminating as project architect for the Glyndebourne opera house (no small achievement), but he had not built a great deal during his first years on his own.

The masterplanning study anticipated 100,000 people a year would visit the park and the initial project was to convert an existing Norfolk long barn on the south side of the Great Broad, an impressive 1.6km stretch of water, into a visitor centre with an adjacent café/pavilion. Planning permission for this was granted in 2005 and the work is scheduled to finish by the end of this year.

Thanks to some significant funding, particularly from Sport England, this project was overtaken by the separate Water Activities Centre, 300m away, completed this summer. The client for this was now Norfolk County Council (NCC), granted a lease by the Whittingham Trust to run water activities.

At this point there was no defined brief for the project. As Snell puts it: “It gradually emerged through a dialogue between NCC Youth Services, Sport England and the design team”. Snell pays particular tribute to the contributions of Ali Webb from the education department and Dave Holden, the centre manager. Despite lacking the comfort of working within the recognisable building typology, developing the design “made for an exciting process where nobody knew what the outcome was going to be.”
The core idea that began to emerge was a clustering of interrelated and sympathetic activities — workshops, a teaching room, changing rooms, stores and administration. Snell’s inspiration was to group these around a shared all-weather community space, metaphorically and, as it turned out, more literally under (or partly under) one umbrella. Our conversation turned to the influence of Norfolk beach huts and we were also reminded of Will Alsop’s changing tents at his early (1988) Sheringham swimming pool.

The decision on the siting seemed inevitable to both the client and the design team — strategically located as it is in a natural bowl at the head of the Great Broad adjacent to the River Yare, providing stunning views over the water — although the resulting semicircular figure (a familiar figure from the Hopkins stable) leads one to wonder which came first — the idea or the site? Clearly it is a highly prominent site when viewed from the park and surrounding area, and the planners, encouragingly, were prepared to see something ambitious. It also has important links to the Little Broad and the Yare River bus set-down. Existing car parks, slipways and the visitor centre and its location ensure the boat-storage area can be consolidated and screened on the north bank of the Great Broad, masked from the river by the riverbank. But it does seem a bit cramped as a long-term proposition.

Nevertheless, the three-dimensional form of the building responds excitingly to its location. It is designed to float above the ground and nestle within the sloping banks surrounding it — which will be planted with a variety of local grasses and wild flowers.

The semicircular form of the building certainly focuses attention on the communal space and the expanse of water beyond, which also aids supervision of the water users. The structure is elevated 1.1m above the natural ground level, like a raised ship’s deck sitting above the existing low-lying marshy ground (which is prone to flooding) with a flight of steps down to the water’s edge. This makes it clear that it is not the prime intention to pull boats up here — access to the boat launch area is down a timber walkway on the north side. Cabins surround the deck and accommodate the changing rooms, storage, reception, administration, maintenance and teaching facilities.

A PTFE structural fabric canopy forms the ‘bird’s-wings’ sail roof, which stretches out to cover the central space with a span of around 36m. Clearly there must have been a number of options open to the design team at this point. The built solution comprises a large tubular steel truss cantilevered from the ground through the timber walkway at the entrance. This in turn supports curved tubular beams at right angles which disappear down the gaps between the cabins. Is the pay-off — the dramatic uninterrupted view up the Great Broad — worth it? I’m not convinced. It’s all very heavy looking and, frankly, a column or two along the water’s edge seem a reasonable trade-off for an alternative that could have felt more in scale with the lightness of the rest of the scheme.

The cabins are made from prefabricated external plywood skins covering an internal curved glulam structure. Materials and finishes minimise long-term maintenance.
Each cabin is a self-contained and self-sufficient unit allowing flexibility of use during the busy high season and quiet winter periods, when the centre may focus more on land-based teaching activities and courses. Each cabin is about 8.4m long by 5.3m wide, and is insulated, ventilated and heated according to its particular function. The main structure consists of 360 x 90mm glulam beams at 1.2m centres braced together by two layers of 6mm sheathing plywood. This structural shell is clad in plywood sheets on battens with a waterproof membrane, which is ventilated and acts as a rainscreen covering the main stressed-skin structure. The cladding is ‘Bruynzeel BV’ plywood, which is especially suited to the marine environment and is used to build boat hulls.

It is sealed with a Sikkens waterproof sealant with a maintenance period of five years. The cabins sit on glulam skids raised off the ground by galvanised steel brackets to ensure natural ventilation and a free flow of air around and through the buildings.

The structural shell construction allows the internal walls to be easily removable to suit future user requirements. The fronts of the cabins are fully glazed to maximise the amount of natural light. Natural ventilation is achieved through glazed vents in the sides of the units. It was originally intended that the cabins would be prefabricated in halves and joined on site. In fact, the first two were built this way but, as is often the case with short-run prefabrication, in the end only the cabin frames were prefabricated.

As built, the cabins sit partly under and partly outside the fabric roof, and one does wonder how they will weather. The full complement of cabins has been built in the first phase, whereas it had been the intention to build fewer initially, which would have headed off the criticism of potential lack of expansion.

If there is a nagging worry, it is that the whole ensemble is a bit too neat and tidy. My own experience of boatyards is of large, cheap sheds with plenty of space inside for all the elements that make up waterside activity and where internal subdivision can be into different shapes and sizes. By choosing this site – with its undeniably dramatic, almost inevitable sense of homecoming and location – some sort of closed or semi-closed form was always going to be on the cards. A more straightforward location might have generated a simpler building and allowed natural expansion or adaptation without any loss of excitement. It remains to be seen how restrictive this siting decision was as the project beds down.

However, on the day I visited the whole park was buzzing and the new addition certainly has a delightful and engaging charm wholly appropriate to its setting and purpose. The water sparkled, the breeze blew and white clouds drifted through a blue Norfolk sky. Life-jacketed kids in their Oppies, Toppers and Lasers scudded across the water. Further up the Broad, groups of canoes were cutting through the spray. The whole picture almost focused on the raised vantage point of the new centre.

I came away grateful for the vision of those who founded the trust and hoping that this team would be given further opportunities to delight the eye in a manner that Cotman and Crome, of the wonderful Norwich School, would have appreciated.
3. The cluster of activities is arranged around a shared community space, overlooking the Great Broad
Section through the water activity centre
KEY
1 ADMINISTRATION
2 WORKSHOP
3 DRY TEACHING
4 RECEPTION/KIT STORE
5 GENERAL PUBLIC CHANGING ROOM
6 FLEXIBLE CHANGING CABIN
7 GENERAL-PURPOSE CABIN
8 EXTERNAL TIMBER DECKING
9 MAIN ENTRANCE GATE
10 PERIMETER GALVANISED-STEEL FENCE
11 RAMPS TO BOAT LAUNCH AREA
12 EXTERNAL SHOWER AREA
13 BOAT STORAGE
14 GRASSED BANK
15 BARE SHRUBS
16 RIVER YARE

5. Plan
STRUCTURAL ENGINEER’S ACCOUNT

Whittingham Water Activities Centre comprises eight cabins that house training rooms, changing rooms and workshops arranged in a horseshoe around a central courtyard. The courtyard and cabins are sheltered and shaded by an open-fronted fabric canopy.

The construction of these large [about 8.5m x 5m] and rigid structures presented Buro Happold with a number of engineering design challenges, due to the site’s very poor ground conditions, limited access and the programme constraints – since the project needed to be complete in time to receive Sport England funding. Prefabrication of smaller transportable modules was considered to be the ideal way of overcoming these issues.

A further challenge was the desire by Snell Associates to design a fabric canopy over the space, which did not have the form or appearance of a traditional doubly curved surface.

The Whittingham Great Broad, where the centre is located, was created through flooding a large gravel-extraction pit and is adjacent to the River Yare. The river has had a significant impact on the site, which is covered by several metres of loose alluvial deposits. Since this layer can only support light applied loads without settlement, the new buildings weigh little and are supported on shallow concrete raft foundations that spread the weight of the buildings over a large area. Point loads from the canopy support structure were taken by proprietary screw anchors.

The curved shape of the fabric canopy was achieved by bending the primary tubular-steel spine truss, which cantilevers 28m, and the arched tubular ribs, which span between the central spine truss and the steel tripods at the perimeter. The fabric used is white, Teflon-coated woven glass fibre. It is prestressed against the curved frame below so that wind uplift forces are carried efficiently back to the tripods by the fabric, and any downward is distributed laterally to the ribs. These ribs transfer the loads in bending back to the tripods and the central spine. A high degree of accuracy was necessary since the fabric was patterned and welded to suit the theoretical geometry prior to the installation of the steel frame. The fabric and steel sub-contractor, Architen Landrell, pre-assembled the steel frame in its South Wales yard prior to transporting the steel in segments and welding the prefabricated components together. The erection of the steel frame and fabric took about three weeks.

Abigail Mathews, Group Manager, Buro Happold
6. The cabins accommodate the changing rooms, storage and other facilities and have great flexibility of use
7. Initial concept sketch from February 2003
8. Site strategy of Whitlingham Country Park shows how the centre fits in with Great Broad, Little Broad and River Yare, with views over the Yare
Costs

PRELIMINARIES
Total £128,763.85

SUBSTRUCTURES
Reinforced in situ concrete raft bed including ground screw anchors average 12m long and associated tie bases/plinths for canopy steelwork
£260.36/m² Total £224,434.31
£/m² calculated by using cabin and decking area

JOINERY CABINS INCLUDING FIT-OUT
Eight timber cabins comprising curved glulam rib beams clad with Brugneseel plywood on two layers of 6mm plywood and exposed Redwood frames externally, plywood finish internally. Plywood floor on timber joists. Glazed screens to fronts. Including fit-out as per architects’ specification
£1,139.50/m² Total £47,256
£/m² calculated by using cabin area only

EXTERNAL DECKING
Baltic hardwood timber decking or similar approved, including timber joists and edging blocks
£85.92/m² Total £47,256
£/m² calculated by using decking area only

CANOPY AND STEELWORK
Comprising fabric canopy and steelwork, cables and connections
£451.28/m² Total £278,183.98

EXTERNAL WORKS AND SERVICES
Comprising footpaths and surfacings, fencing and gates and external services
Total £159,627.71

DRAINAGE
Comprising building and surface water drainage, including sewage treatment plant, pumps and headwall
£385.23/m² Total £95,232.59
£/m² calculated by using canopy area on plan

TOTAL CONTRACT SUM
Total £1,855,023.57
£/m² calculated by using cabin and decking area

Cost data provided by Davis Langdon, Norwich
Credits

Tender date
June 2004

Start on site date
October 2004

Contract Duration
20 weeks

Gross internal floor area of cabins
312m² (eight 39m² cabins)

Gross floor area of decking
550m²

Area of canopy (on plan)
612m²

Form of contract
JCT 1998 Standard Form of Building Contract with
Quantities incorporating amendments 1-5 and CDPS

Total Cost
£1,599,293.57

The Water Activity Centre Project is funded by Sport England,
The Big Lottery Fund and Norfolk County Council

Client
Norfolk County Council Education Department,
Trustees of Whittingham Charity in association with
the Broads Authority.

Mineral Gravel Company
Lafarge

Land Agent on behalf of the landowner
Savills

Masterplanner and Landscape Architect
Land Use Consultants

Architect
Snell Associates: Robin Snell, Helena Cameron, Wolfgang
Hochmuth, Chris Crombie, Maitena Minou, Manfred Cheng

Engineer
Buro Happold

Cost consultant
Davis Langdon

Access consultant
Andrew Walker Architects

Project manager
Norfolk Property Services

Planning supervisor
Davis Langdon Planning Supervisors

Main contractor
Jackson Building Services

Specialist contractors
Fabric canopy and steel structure Architen Landrell; timber cabins
Constructional Timbers; glazed screens Glasswall UK; M&E
services Egyle Electrical; secondary metalwork High Cross
Structures; timber decking/cabin fit-out M&S Contractors;
screw anchors Screwfast Foundations; groundworks Glen Bishop
Builders; engineering Billam Contracts; floor finishes Town &
Country Flooring; PVC sheet piling Cofra UK; sewage treatment
plant Binder; water main May Gurney; external works Visco;
fencing Gunnebo Elkosta; lockers and benches Link Lockers
AN ARCHED PREFABRICATED CABIN WITH A PLY RAINSCREEN

The eight cabins have different uses – changing room, storage, administration – but are identical in size (approximately 4,800 x 9,400mm) and structure. Each cabin is formed of a series of 360 x 90mm glulam arches at 1,200mm centres braced by a double layer of 6mm marine-ply sheathing which acts as a diaphragm. It is lined with breather paper on the outside and insulated studwork on the inside. The arches are exposed internally and the internal lining is of birch-faced ply.

Weather protection is provided by a rainscreen of 6mm Bruynzeel ply panels on a sub-frame of 50 x 50mm vertical and horizontal battens which allow airflow. The vertical edges of the rainscreen panels have 10mm shadow gap joints to allow edge coating of the panels. The horizontal edges are overlapped with ply strips within the joint to create airflow which is extracted, together with mechanically extracted internal air, through the roof ridge vent.

The front walls of the cabins are all fully glazed, some with etched glass to obscure views into the spaces. The frameless panels have curved edges, following the shape of the gable glulam arch and fixed just behind it. At the top, the glass panels are fixed to a pair of tapered steel fins suspended from brackets bolted to the back of the arch.

Susan Dawson