



RICHARD DAVIES

SCENE CHANGER

Designing an opera pavilion that can be trucked off to Northampton for the winter demanded a flexible approach – and a delicate acoustic balance

WAND'RING MINSTREL

Words Jan-Carlos Kucharek

GARSINGTON OPERA was famed for its classical summer performances, held under a stretched PVC roof, appended to the flank wall of Garsington Manor in South Oxfordshire. Set up in 1989 by its owner, financier Leonard Ingrams and his wife Rosalind, the opera's events were characterised by their makeshift nature. Atelier One's PVC membrane would cover a motley assemblage of stage and seating; and, if the rain drummed down, a cowering audience would huddle within its confines as the orchestra pit slowly filled with water, in a show of British stiff upper lip. Its burgeoning popularity and reportedly increased noise levels led local residents to mount a Middle Englander revolt in 1997, setting off car alarms, trimming hedges, running lawnmowers and even flying a Cessna plane low over a performance of Haydn's *Le Pescatrici*. But when the opera was forced to find a new home some time after the untimely death of Ingrams, its reputation was such that country houses queued up to continue its founder's legacy.

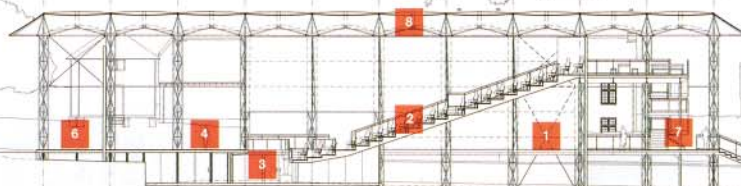
Opening this month, Garsington Opera's handsome new £1.8m demountable home is set

in the idyllic Arcadian landscape of Wormsley Park in Buckinghamshire, the 1,000ha country seat of the Getty family. Garsington's general director Anthony Whitworth-Jones personally appointed Snell Associates as architect, having worked with Robin Snell at Glyndebourne when he was with Hopkins Architects. In the eccentric nature of the event itself, the pavilion is the product of a weird and wonderful collaboration between Snell, the structural, acoustics, theatre and services engineers, and a contractor, Unusual Rigging, more used to managing the stage set-up of Reading Festival and Glastonbury than high-spec opera pavilions. Together, they had to conjure up a high quality acoustic environment for 500 people, out of the thin air of Wormsley Park.

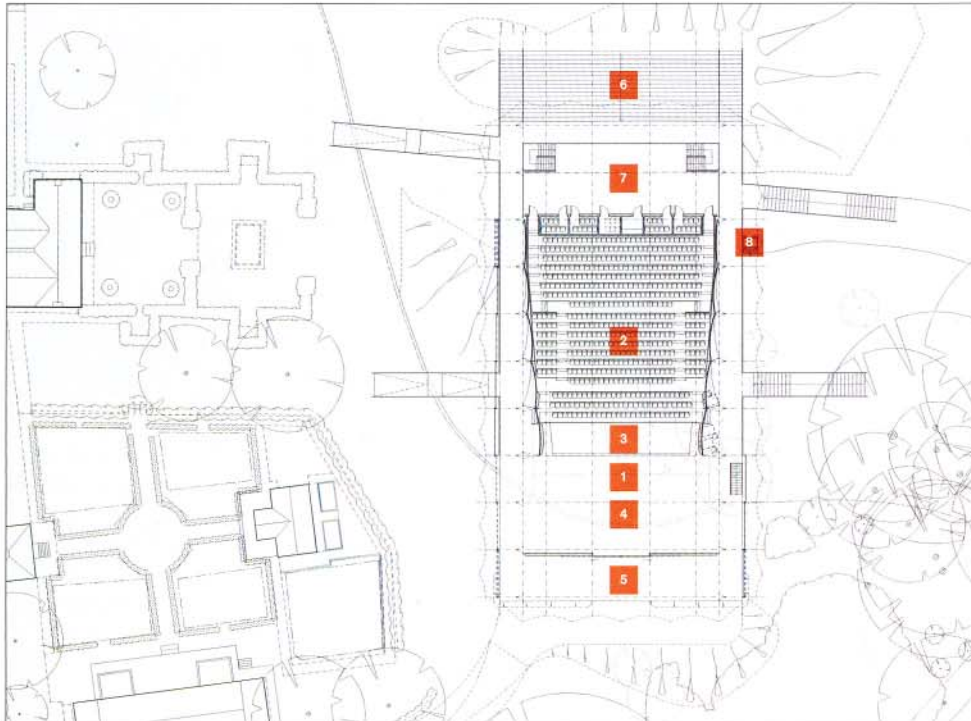
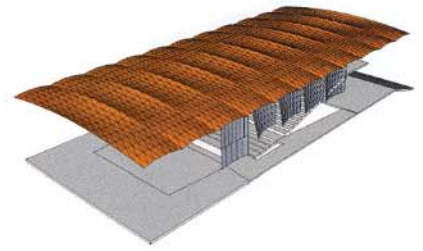
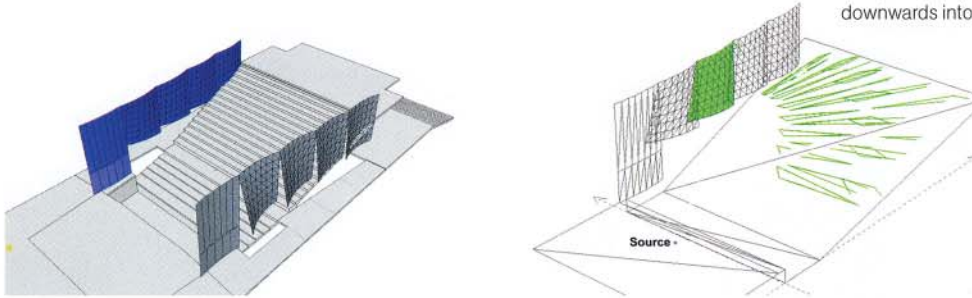
Not only that – the programme was extremely tight and it was clear from the beginning that no permanent building would be allowed. The planning application was submitted to the planners in June 2010, with detail design going ahead before it had even been determined. Consent was received in September 2010, concrete foundation

KEY TO LONG SECTION

- 1: Auditorium deck level
- 2: Raked seating area
- 3: Orchestra pit
- 4: Stage
- 5: Backstage
- 6: Picnic steps
- 7: Verandah and access to upper level
- 8: Double skin PVC roof on steel trusses



Studies showing how the tensioned PVC side walls direct sound into the centre of the auditorium. Concave in form, the roof also directs sound downwards into the audience.



width. Snell explains that this module was based on the 8ft by 4ft dimensions of Steeldeck, the stage-building profession's module. The triangulated trusses were used vertically as a substitute for circular steel columns to make the whole structure lighter and more manageable. On the deck sits the raked seating immediately in front of the stage area. Behind this is a terrace with stair access to the upper levels of seating. The site drops significantly along the structure's length, which Snell took advantage of to sink the orchestra pit 2.2m below the deck at the lowest point.

Prefabricated walls of green oak are fixed to a lightweight galvanised frame, as are the flatpack walls for the theatre boxes at the back of the seating. For Snell it was all about taking industry technologies and adapting them for the bespoke building. Vertical columns change in dimension to engage with the 45m long by 700 deep by 1m wide reinforced concrete pad foundations. Set into the ground and covered with a steel plate when the pavilion is dismantled, these foundations remain as the only marker of pavilion out of season.

groundworks began in October, and as soon as they were completed in December 2011 steelwork fabrication started. From inception to opening night, it will have been less than a year to fundraise, design and construct the pavilion, procured and delivered using a JCT design and build contract. But it took a lot of concentrated thought and work for a building that will only exist for three months a year.

Oriental influences

Snell's precedents were in Japan. The Japanese landscape tradition, such as at Kyoto's Katsura Imperial Villa, gave him the idea of a clear interplay of the interior with the exterior, and the project references Japan's Kabuki theatre form with its 'hanamichi', or walkways, within the audience areas to act as an extension of the stage and create an intimacy between audience and actors. Rising from the 48.8m by 25.6m steel deck is a portal frame structure of repeating pin-jointed triangulated vertical galvanised steel columns and trusses spaced at 4.88m centres, spanning nearly 21m. From these perimeter trusses the walkway extends a further 2.44m either side to give its overall

KEY TO PLAN

- 1: Auditorium deck level
- 2: Raked seating area
- 3: Orchestra pit
- 4: Stage
- 5: Backstage
- 6: Picnic steps
- 7: Verandah and access to upper level
- 8: Demountable lift

'From inception to opening night, it will have been less than a year to design and construct the pavilion... it took a lot of concentrated thought for a building that will only exist for three months a year'

Perfect performance?

The fabric containment of this structure defines its acoustic performance. For this Snell appointed Robert Issert of Space Sound Consultants to conduct the pavilion's acoustic analysis. To create a reflective sound environment, 10 huge 'sails' made of heavy clear PVC (1kg/m²) were installed running between the vertical trusses from the stage to the rear of the raked seating. The heavy grade of the PVC increases the acoustic reflectivity of the material, while its subtle tilt inwards in section and twist in plan diverts the reflected sound towards the middle of the audience. The combined effect is to increase a sense of 'acoustic immersion'; although because it is not a solid structure there are limitations to the reflectivity that can occur.

Acoustician Issert admits that the designed arrangement is likely to reflect better at mid and high frequencies rather than bass. Acoustics are assisted by the concavity of the PVC on the roof soffit, which, running in line with the curved trusses to the edges, also gives a natural run for water drainage.

It is one thing to keep sound in. But

The opera pavilion in its sylvan setting.



mitigating the noise of driving rain was a major concern. Issert proposed a double skin roof with an upper PVC perforated 'rain suppression layer' separated from the lower rainscreen PVC by a 100mm diameter inflated 'air beam' above the structural trusses. The upper layer is there to absorb the impact of the raindrops and allow them to drip onto the PVC below, where they are channelled away to drain. Issert is pleased that in tests, this approach has reduced audible rain interference by 14dB, or about half. The design for the raked seating, by the architect advised by Issert, was based on the assumption that the pavilion will be full most nights. So the seats are of part-upholstered formed ply rather than being fully absorbent; again, optimising acoustic reflection.

Rigging it up

For Unusual Rigging the bespoke product forced it to think hard about the most cost-effective solution. Director Mark Priestley recalls that, with design development proceeding at an accelerated rate, this involved changing the original employer's requirements, that turned the building into a very different beast. Most of this stemmed from the fact that the architects' original vision was for a truly temporary structure with industry modules. The contractor reasoned that this was not a precondition for a building that was to be placed repeatedly back on the same site in the same form. Priestley saw that this was in fact a demountable building that would require specific rather than generic approaches. His recommendation was to use concrete pad foundations to ensure the building was set out accurately every time.

Modifications were made to the Steeldeck module proposal, with the contractor keen to

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use larger pallets, involving fewer joints and thus reducing interfaces on the large timber deck, making better use of available cranes. The seating, which as originally proposed sat on plywood pads on the ground, was redesigned to span the main deck structure, dispensing with secondary supports. Off-the-shelf aluminium trusses used by the industry, difficult to modify for specific use, and even more difficult to obtain warranties for once done, would finally become galvanised steel, each springing off its specific pad, and designed expressly for its siting and purpose. Strangely, it was through bespoke rather than standard approaches that the contractor could realise its profit margins.

The contractor took on board the acoustic design, but it was tinged with a certain level of ambivalence. The firm is used to dealing with environments using amplified sound outdoors. Priestley makes no distinction between rain falling on a roof and the wind rustling through the nearby trees – to him, both are ambient conditions, both either requiring attention, or to be accepted as a given. He is also unconvinced about the benefits of reducing the

sound from rain drumming on the roof membrane only to drop the runoff from a height to a French pea shingle drain below. There is a sense that Priestley, as contractor, was bemused by consultant's desire to create controlled acoustic qualities for an internal environment within an obviously uncontrolled external one.

New directions

That said, everyone involved in this project has pointed out the high levels of collaboration, and satisfaction gained in making the new Garsington pavilion a reality. Snell sees it as an end point of demountable thinking that his office has spent years developing over several projects. Unusual Rigging, experienced at generic solutions, has built skill sets in project management and CDM, to complete this significant bespoke structure and as a firm it sees further possibilities in main contracting.

Designing a demountable opera pavilion has provided interesting technical challenges. But even if it lasts the projected 25 year design life, questions about the pavilion's sustainability still need to be answered in the contract to rebuild and take it down over the next 15 years. With an estimated 50 trucks required to transport it to Northampton for storage after the season is over, it could be argued that the planet is better served by storing it locally, leaving the structure up all year to sit alongside Home Farm and the cricket ground that Paul Getty built here as his homage to the Oval. Being a temporary structure, the planners may have something to say about that, but you get the feeling that Ingrams, who started the whole Garsington rumpus, honoured with a permanent home for his temporary opera, might maintain a gratified silence. ■