Case Study | The Playing Field, Southampton

Introduction

For 17 magical days in July 2014, a demountable timber theatre occupied Guildhall Square, a public open space in the heart of Southampton’s cultural quarter, hosting plays as part of Southampton’s arts festival ‘Art at the Heart’. The festival was a collaboration between the city’s theatre, film, music and dance organisations and the theatre was commissioned by the Nuffield Theatre, who asked Assemble to design, fabricate and erect it.

Assemble is an 18-strong collective of young people – arts and architecture graduates in their mid-twenties - who started working together in 2010. They aim to address the usual disconnection between the public and the process by which places are made, working interdependently and collaboratively with client and public. They have produced radical and inventive projects, some of which are improvised and temporary. A pop-up theatre in a Sussex field was created from scaffolding, chipboard and geotextile pond liner and hosted a nine-week programme of plays and workshops for the fiftieth celebration of the Chichester Festival Theatre. As the Assemble designers explain: ‘A central tenet of the project was to widen participation and attract new audiences to the theatre. The ambition was to create a dramatic new typology of theatre space, drawing on the architecture, crowd dynamic and match day ritual of football culture. Utilising the aesthetic and architectural language of Britain’s football stadia, the auditorium created a spectacle that occupies an area between theatre and football’.

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The name of the theatre, The Playing Field, refers both to the stage and to the local football club. It was designed with reference to both the construction and spatial layouts of traditional timber frame open-air theatres and to football stadia, calling on the city’s passion for football to attract new audiences to the theatre. One of the plays staged in the theatre during the festival was The Saints, a dramatisation of the highs and lows of being a Southampton Football Club fan. As the Assemble designers explain: ‘A central tenet of the project was to widen participation and attract new audiences to the theatre. The ambition was to create a dramatic new typology of theatre space, drawing on the architecture, crowd dynamic and match day ritual of football culture. Utilising the aesthetic and architectural language of Britain’s football stadia, the auditorium created a spectacle that occupies an area between theatre and football’.

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Key plan and section through theatre

Key

1 Timber frame module
2 First floor
3 SHS bracing to timber frame
4 Proprietary raked timber seats
5 Stage
6 Pair of timber doors
7 Ply roof covering
8 Entranceway
9 Truss supports stage lighting
The Playing Field, Southampton, Hampshire
Temporary theatre

The timber frame at the north and south sides of the stage was designed with large goal-like openings at ground floor level. The openings were fitted with large timber doors which were used at night to close off the stage during performances. The intention was that during the day when performances were not taking place, the doors could be opened on both sides and the stage space once again became part of a public square, with members of the public able to wander through it.

The first floor accommodated a technical gallery, roofed with ply sheets which extended 1.9 metres over the seating areas to give some shelter from rain. Stage lighting was attached to a truss structure suspended overhead.

Timber was the main construction material. The structure, a two storey timber frame like an open colonnade, was set round the four sides of a large rectangular space on the ground which became the stage. Tiers of proprietary raked timber seating were fixed at the east and west sides of the stage and rose up to first floor level.

The structure

The structure itself was a hybrid of traditional post-and-beam construction with bright red steel cross-bracing. Assemble collaborated with engineers Structure Workshop to develop a simple framework that could be built with minimal plant and labour. Engineer Cameron Bailey of Structure Workshop describes the design.

'The structural approach was to create a 1.9 metre x 1.9 metre timber post-and-beam module that could be repeated around the perimeter of the theatre. This module was then adapted to turn the corners. The steel cross-bracing in elevation is stopped short of the ground to allow the free movement of pedestrians between columns and to allow flexible use of the colonnades. Lateral stability is therefore dependent on the stiffness of the columns in bending and is essentially portalised. The high bracing also allows the modules to span the 7.6 metre 'goal openings' at each end without altering the architectural rhythm by forming a truss.

Due to the temporary nature of the structure, ground fixings were not permitted. The lightweight frame was therefore designed to act as a gravity structure when subject to lateral loads, with the full plan and elevation bracing tying the modules together to create a rigid box.

Owing to a tight construction budget the structure was designed to be erected using a single spider crane. Priority was given to simple details with minimum fixings which could accommodate on-site construction tolerances.

Coupled with the suspension masts that support a central lighting truss, the red steel cross-bracing and nodal connections lent a 'Hi-Tech' aesthetic to the theatre, reminiscent of full-scale stadium design and in keeping with the cultural programme.'
Case Study

The Playing Field, Southampton, Hampshire
Temporary theatre

Construction

Assemble was the main contractor; a team of five – mostly trained in 3D design with little joinery experience – set themselves the task of building the theatre themselves in only three weeks. The consideration of assembly in the design of the structure was key to their success; the timber connections were relatively simple and by dividing the timber frame into a series of modules which were braced together, a simple sequence of construction could be repeated around the frame. One member of the team who had completed a training course in crane operation, operated the spider crane that was used to lift the modules into position.

The sawn timber was delivered to site in 6 metre lengths to be cut and notched on site. The steel connector plates were laser-cut. To start, the team built a full-size jig of a module on the ground so that the timber components could be fitted together with relatively tight tolerances.

Each module consisted of a pair of 6 metre high 175 x 175mm C24 sawn Douglas fir columns. They were set apart at 1.9 metre centres by a 175 x 50mm C24 sawn timber bottom rail and first floor rail bolted between them.

At roof level, a 175 x 50mm C24 sawn timber top rail supporting a plywood roof covering; it extended 1.9 metres to give some shelter to the audience and was canted down to the outside of the structure to throw off rainwater.

The steel connector plates were screwed to the columns and beams and the 50 x 50mm SHS rods which brace the modules were then screwed to the plates. Each module was then craned to a vertical position and adjusted by crane; the steel cross-bracing allowed it to be squared up accurately.

Secondary members - cross beams of paired and lapped 175 x 38mm C24 timbers – were bolted to the columns; the upper cross beams also supported an 18mm thick plywood floor on paired 175 x 50mm timber noggins.

The public square site had a considerable slope and no fixings were allowed to penetrate the ground; the base of each Douglas fir column was fitted with a steel stub foot and a series of timber packers were used to adjust the height.
Elevation and section through timber module

Typical bracing details

Key
1. Plywood roof covering
2. 175 x 50mm C24 top rail
3. Paired and lapped 175 x 38mm C24 cross beams
4. Steel bracing plate
5. 50 x 50mm SHS rods as bracing
6. 175 x 175mm C24 sawn timber column
7. 18mm plywood floor on 175 x 38mm C24 cross beams
8. 175 x 50mm C24 first floor rail
9. Paired and lapped 175 x 38mm C24 cross beams
10. 175 x 50mm C24 bottom rail
11. Steel base connector screwed to ply and sw packers
12. 175 x 50mm top rail bolted through column
13. Bracing plate bolted to column with M10 coach screws
14. 175 x 50mm bottom rail bolted through column
Sequence and construction

Diagrams A B and C show the sequence of assembling the modules to form a continuous framework.

Diagrams D E F and G show the sequence of adapting the modules to turn a corner.