

Learning legacy

Lessons learned from planning and staging the London 2012 Games



Sustainable design of London 2012 Beach Volleyball courts

The underlying concept of the installations at Horse Guards Parade and The Mall was based around maximising the use of hire components, minimising packaging and, where new materials were required, ensuring post-event value could be obtained from these materials through reuse or recycling.

An innovative solution to the Beach Volleyball court design was pursued to ensure the above objectives were delivered.

Challenges

A Beach Volleyball court has an 8-metre x 16-metre playing area with a 5m run-off on each side for international tournaments. Temporary sand courts for one-off tournaments can be set up on almost any level surface which offers adequate drainage. Adequate drainage and sufficient sand coverage are essential elements of constructing Beach Volleyball courts.

Construction is generally through excavating the required area by approximately 0.5m, followed by the installation of drainage and sand.

Excavation was obviously not viable on the Parade Ground and within St James's Park due to the extent of buried archaeology and mature trees. In addition, both have significant slopes and undulations. Arena Group therefore considered two options for construction of the courts that provided a level playing surface while eliminating the need for excavation.

Approach

Initial proposals focused on the construction of above-ground courts along similar design principles recommended by Volleyball England. However, it became apparent that due to a considerable slope on Horse Guards Parade and within St James's Park, a significant additional quantity of fill would be required to provide a level playing surface. This in turn would add complexity and cost to the associated containment and access options.

The estimated quantities of materials for this solution were:

- 2,675 tonnes gravel
- 3,182 tonnes sand
- 66 tonnes timber
- 185 tonnes steelwork
- 6 tonnes of perforated uPVC pipework
- 2 tonnes of porous membranes
- 12 tonnes of protective rubber matting



Court drainage grilles



Staging solution



Court surrounds

Aware that the conventional solution did not support the sustainability objectives set, Arena Group developed an alternative solution utilising existing staging equipment. The staging was easily levelled using adjustable jacks integrated into the footings. Raising the entire field of play off the ground eliminated concerns over damage to the Horse Guards Parade surface and St James's Park during installation and removal.

Court drainage was provided via a membrane used in the construction industry for slope stability. The membrane combines a polyurethane open mesh sandwiched between two permeable polyethylene membranes. The permeable membranes keep the internal mesh free of sand particles, while water is drawn to the edge of the field of play and discharged to ground through capillary action. Drainage was an issue during the test event so grilles were added throughout the sand containment area to provide additional drainage points.

The majority of the staging, including the timber and steelwork, was available from existing stocks. Any additional timber for bespoke carpentry works was obtained from certified Forest Stewardship Council (FSC) and Programme for the Endorsement of Forest Certification (PEFC) sources. The field of play surrounds were overlaid with a high quality sports flooring that was simply 'tucked' into position, eliminating the need for any adhesives or fixings to enable easy removal and reuse.

The quantity of material required for this innovative solution to field of play construction required:

- 70 tonnes existing timber staging
- 41 tonnes new FSC/PEFC timber
- 356 tonnes existing steel
- 15 tonnes new steel
- 4 tonnes drainage HDPE/PP membrane
- 3,978 tonnes sand
- 12 tonnes rubber matting

Arena Group engaged early in the process with Volleyball England and local community groups to identify end users for the products that were not available from the rental market.

Outcomes

After the event all the staging was returned to the hire market. New timber that was deemed reusable by the staging companies was also salvaged. All off-cuts and small lengths of timber were sent for recycling.

Additional initiatives in waste management were delivered by Arena Group including:

- The majority of the drainage membrane was rolled and donated to a community reuse project in Canning Town.
- The rubber matting was donated to a community gym in Crayford.
- All the sand was distributed to build new Beach Volleyball courts around London in collaboration with Volleyball England.

A wide range of benefits were realised through this innovative solution to the Beach Volleyball field of play and practice courts and proactive approach to waste management. The benefits include a 135-tonne reduction in the carbon footprint of the Games, elimination of 160 HGV movements from London's roads and an estimated saving in excess of £84,000.

Learnings

- Involve sustainability considerations early in the design process to deliver maximum benefits.
- Ensure sustainability opportunities are backed up with clear, quantifiable benefits that are communicated in terms of your management team's drivers.
- Understand and evaluate likely 'waste' materials during the design stage and start engaging end-users to explore options of reuse. If options are not considered until after the event, programme constraints will result in conventional waste management solutions.
- Engage those on the construction site in the full sustainability story. Do not simply ask them to do their job differently but explain why. People are much more engaged when they understand how their action is contributing to the wider community and key project goals.

Supplier

Arena Group

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