

BMW London 2012 Waterworks Pavilion

Ensuring a Legacy



Scope of Works

The structure

The waterworks pavilion consisted of an 800m² rectangular steel platform overlain by a two-storey pavilion. The platform piled into the riverbed supported a floor at approximately bank level. The pavilion itself was comprised of a lower plaza level containing exhibition spaces and interactive features as well as VIP and press areas with accompanying support provision. This level was surrounded by glazing with waterfalls running down the exterior facade. The water was sourced from the canal. Stairs and lifts led to an open first floor open air area which consisted of a series of rooftop colonnaded pavilions and two enclosed glazed areas housing the BMW prototypes.

KLH provided support and guidance to BMW in finding a suitable end-user for part of the Waterworks pavilion to meet their initial aspiration of finding an appropriate legacy for their structure.

Challenges

Ineffective requirements

There were various requirements designed to ensure the London 2012 sponsors facilitate the reuse of their temporary pavilions although in practice there were highly ineffective.

Two of the four key aims of LOCOG sustainability policy were “Zero waste to landfill” and “Leave a positive legacy”. The policy outlines the commitment of working together to maximise the economic, social, health and environmental benefits that the Games will bring to London and ultimately the UK¹. London 2012 aimed to demonstrate exemplary resource management practices to accomplish long-term individual behavioural change. Unfortunately the ambitious reuse and legacy objectives were not substantiated with any SMART targets.

Planning commitment called for the reuse and/or recycle of 90% (by weight) of the building structure as part of the schedule 11 of the section 106 of the planning permission. Unfortunately this combined reuse and recycling target meant that project teams did not have necessarily to tackle the higher level of the waste hierarchy. Furthermore, in most occasions the planning committee did not challenge the reuse strategies put forward as part

of the sustainability statement. Often the solutions prove to be impractical or of limited value from a sustainability prospective.

The Waste Regulations (2011) that came into force on 29 March 2011 apply to the waste producer who has the responsibility to apply the waste hierarchy. Reduction/prevention is at the top of the priority order, as it offers the best outcomes for the environment. This is followed by reuse, recycling, recovery and disposal; the hierarchy represents the order of environmental preference. The law requires that prevention and reuse are investigated as a priority when dealing with waste.

Although the law aims precisely at minimising waste and favouring reuse when it is actually implemented, in this case the responsibility to comply with is generally passed down to the dismantling contractor, which is unfortunately at this stage too late. Indeed the designers and the client commissioning the structure have much more leverage in influencing the end-use of the building by respectively facilitating dismantling through clever engineering and liaising early with the relevant stakeholders.

Client
BskyB

Architect
AL_A

Engineer
Arup

Contractor
Lend Lease

Year
2013/14



BMW Waterworks Pavillion



Groundwork team collecting materials from the BMW pavilion



Polycarbonate cladding being taken away by Groundwork

¹ London 2012 (2012) *Sustainability Policy*. Available at:

<http://www.london2012.com/mm%5CDocument%5CPublications%5CSustainability%5C01%5C24%5C07%5C51%5Clondo>

Challenges continued..

Timing - Conflicting priorities

We started exploring early May 2012 with Smart Associates, Martin Arnold Associates, Clive Sall Architecture, KLH sustainability and BMW the possible relocation of the Waterworks pavilion in its entirety in Thurrock to become classrooms in Manor Primary School. Although there was great interest from the sponsor, the discussions stalled at the time. The legacy of the building was not deemed a priority since the efforts were concentrated around getting the pavilion ready for the opening. The discussions around legacy properly re-initiated post-Games. After several months of negotiations an agreement came close to materialise although this was called off at the last minute, mid-December because of a financing gap. At this stage the dismantling contractor that had already started the soft-strip of the internal building was told that the building would be dismantled for recycling.

Just before Christmas, two proposals for reusing the steel structure from distinct third parties (i.e. Dreamland Trust and Bexley Council) came through unexpectedly. The Dreamland Trust proposed to reuse the steel structure as a visitor centre at the Dreamland amusement park in Margate. Bexley Council wanted to turn the steel structure into a new 6th form centre for pupils with learning difficulties.

Outcomes

Embodied carbon savings

There has been an estimated 300 tonnes reduction in the embodied carbon of the building through increasing cladding recycled content, using low carbon concrete etc... In the substructure alone, 34 tonnes of CO2 have been avoided by incorporating cement replacements above the industry average. Bexley's proposal presented many strengths. A lot of preparatory work had already been undertaken from the Council which proved decisive in choosing their proposal.

Bexley had already consulted with the planners to complete a planning amendment to enable the use of the BMW building and they were fully behind the proposal.

Bexley also had the necessary funding available that had been allocated to the construction of the school. They had a site available for the storage of the structure and more importantly could accommodate the programme of the deconstruction contractor.

As part of the agreement Bexley Council committed to reuse the steel structure, two staircase (including handrails), the external glazing, the rooftop balustrades, four set of external doors corresponding totalling approximately 252 tonnes of materials. As a result approximately 65% (by weight)² of the BMW building (excluding foundations) will be relocated to Bexley school. [Fig 3]

The steel structure and other elements were sold for a symbolic pound to Bexley Council. The transport cost of the elements was covered by BMW. The Bexley Council would fund the re-erection of the structure.

The new site being located approximately 15 miles from the Olympic Park, it was initially thought that the steelwork delivery would take only one day to complete. However, after a more thorough assessment from the deconstruction contractor, it appeared that the temporary storage site was located at the end of a narrow road which could not accommodate the sufficient turning circle for a truck transporting 15m long beams. The one day job turned into a five day operation adding another £20,000 to the transport costs.

Availability of storage, easy accessibility are key factors to take into account when assessing the suitability of a reuse option.



Waste hierarchy - Waste Regulation (2011)

² The percentage does not take into account of the substructure that was installed by Land and Waters.

Outcomes continued..

Groundwork – ad’hoc salvage

In parallel, K LH sustainability and Scudders liaised with Groundwork an environmental regeneration charity operating across the UK which salvaged from the pavilion part of fixtures and fittings (sinks, toilets, internal doors and architraves, disabled handrails etc...) and the Makrolon polycarbonate cladding that required to be cleared from the construction site before an agreement could be finalised with Bexley Council. This arrangement certainly proved very valuable to Groundwork and to Scudders (the dismantling contractor) who saved in disposal costs.

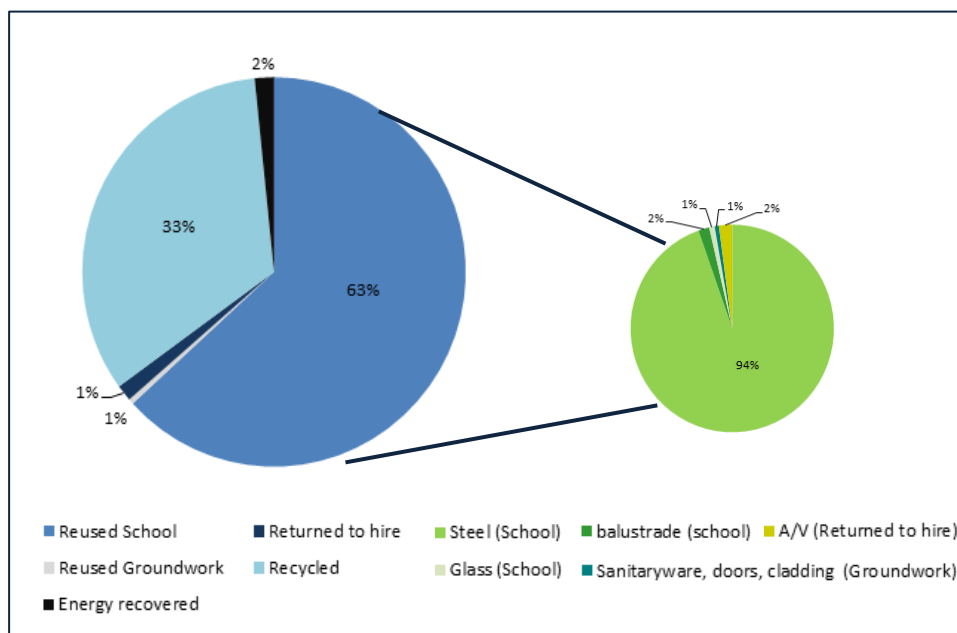
It is worth to point out that overall the elements salvaged by Groundwork only represent approximately 1% of the building weight [Fig 4]; although this is a very valued contribution to Groundwork local community projects, it represents a tiny percentage of the building available materials for reuse.

This highlights this importance of identifying as early as possible potential end-user to find meaningful reuse option, ideally from building inception especially when the building is of temporary nature.

Summary

The structure was not designed with reuse in mind as some of the steel sections were bolted other welded. The reuse agreement established with Bexley Council would not have been possible without the perseverance and flexibility of all the parties involved and also an element of luck with finding a suitable end-user who could accommodate the deconstruction timeframe. When designing temporary structure it is crucial that the client start identifying potential end-users very early and ideally involve them in the design iterations to ensure the temporary building will meet their future needs.

The client must drive the reuse agenda and the waste hierarchy must be applied at the top starting with the designer and engineers and not left to the contractors work as it is too often the case currently.



End of life options and reused element breakdown - Waterworks pavilion