Ultra-lightweight flooring

An ultra-lightweight flooring solution has been successfully installed in the Battersea Power Station redevelopment project. The system comprises a pourable lightweight aggregate and liquid cementitious screed topping. ***Padraic McGrath*** *of* ***Cemfloor Liquid Screeds*** *reports.*

The iconic Grade II listed Battersea Power Station is at the heart of one of central London's largest new developments. The £9 billion project will see the creation of a vibrant new destination for London, housing a community of homes, shops, cafes, offices, leisure and cultural venues, with over 19 acres of public space.

As part of the redevelopment of the power station, a lightweight floor build-up was required.

An ultra-lightweight solution

B&K Systems, a supplier of specialist floor systems, had a remit to provide a lightweight floor build-up. Based on previous experience of using energystore TLA insulation and Cemfloor screed, B&K designed and proposed a new ultra-lightweight solution for this project.

Cemfloor is a cementitious self-levelling flowing screed flooring system comprising cement, fine aggregate, proprietary binder, high-range water reducer and water. It can be installed as bonded, unbonded or floating screeds and is also suitable for use with underfloor heating. The screeds are produced in accordance with BS EN 13813[(1)] and have BBA certificates.

Energystore TLA is a thermal lightweight aggregate combining EPS beads, which are coated with special additive and cement to create a lightweight screed that has thermal and acoustic properties.

B&K Systems has used these products together on numerous projects; mostly the Cemfloor screed is installed onto a separating membrane, which has been placed on top of the insulating screed. Since both are cement-based products, they can also be installed as a bonded system to allow for further weight reductions.

Battersea

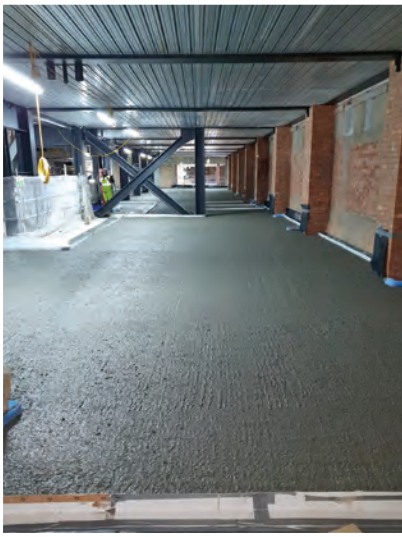
The new proposal for Battersea was for energystore TLA to be installed at various thicknesses to level out the existing un-even substrate with 30mm depth of Cemfloor CT C30 F6 screed then bonded directly onto the insulating screed. This system had the following benefits of the original specification:

- Significant weight reduction: the original specification had a weight of 300kg/m^2 whereas the new proposal had a weight of 120kg/m^2.
- Greatly reduced installation time: the original specification was a semi-dry system, which would have been manually placed and compacted. The proposed products are both flowable systems that are pumped into place and tamped to provide a smooth level surface.
- Vast reduction in deliveries of materials to site and minimal storage on-site.
- Reduced cement content leading to a lower CO_2 footprint.
- Faster turnaround time allowing follow-on trades to progress with works without any delays.
- Lower curing time of the new system

Above: Cemfloor screed after installation.

Installation of Cemfloor screed onto TLA insulated screed.

Bespoke volumetric mixing truck used to produce TLA insulated screed.



TLA insulated screed after installation.

allowed the floor to be loaded with MEWPs faster.
- Significant cost savings were also achieved.

Delivery of the system

The insulating screed was produced on-site by B&K Systems using a bespoke volumetric mixing truck product, which batched the product using accurate, calibrated software, batching 0.5m^3 every few minutes. This method achieved an installation capacity of 15m^3/hour. The insulation was pumped into place and finished to the required level using a tamping bar; it was allowed cure for 48 hours before being topped with the screed.

The screed topping was produced and delivered by Capital Concrete from its Silvertown location. It was produced in accordance with BS EN 13813[(1)]. The flow rate of every load was tested to ensure the product had the correct consistence before being delivered to site. The screed was installed by B&K Systems' on-site team who bonded the screed directly onto the insulation at a minimum depth of 30mm. An installation rate of up to 1000m^2 per day was easily achieved. Since the screed was delivered to site, it eliminated the need to store materials on-site and reduced site congestion significantly. The surface regularity of the finished screed easily achieved SR2 tolerance.

Following the installation of the screed topping the slab could be loaded with the following after the curing times shown:
- light foot traffic – 24–48 hours
- erection of access towers/scaffolding – seven days
- full loading including MEWPs – 21 days.

Performance of the system

Following the installation of the system in-situ crushing resistance testing (ISCR) was carried out throughout the floor area; with each test easily meeting the CAT A requirements. The system was delivered ahead of schedule and a significant time saving was achieved compared with the original specified floor build up. The slab will be covered with various types of flooring all of which are compatible with the screed topping. ■

Reference:

1. BRITISH STANDARDS INSTITUTION, BS EN 13813. *Screed material and floor screeds. Screed material. Properties and requirements*. BSI, London, 2002.

Cemfloor screed being dappled to achieve SR2 tolerance.