



View from the upper deck of the ArcelorMittal Orbit



Challenges

- Transporting the materials to the top deck
- The decks were on a slope supported by temporary scaffolding
- Adverse weather conditions



Solution

- Bought an additional fleet of 16 wheelbarrows
- Screed laid to level using string lines instead of rotating laser
- Gas heaters were used



Results

- Successfully delivered the project to high quality standards

CSC overcomes tough challenges to complete the screeding for the prestigious ArcelorMittal Orbit

Overcoming adverse weather conditions and challenging logistic and technical issues, CSC completed the screeding for the two observation decks of the 115m tall ArcelorMittal Orbit for the Olympic Park. The £19.1m spiralling steel sculpture, which is located between the Olympic Stadium and the Aquatic Centre, set new records as the tallest piece of public art in the UK. The sculpture has been designed to serve as an observation tower, with two specially appointed decks at the top capable of carrying 150 people each.

Transporting the materials from the ground to the observation decks alone was a challenge in itself as the lower deck was 85m off the ground – cantilevered off the spiralling red steel structure. In order to avoid any potential damage to the steel structure from screed hoses, the screeding material was hoisted to the working levels, following the instructions of principal contractor, Sir Robert McAlpine (SRM).

CSC’s screeding team worked double shifts, and ensured the screeding for the lower deck was completed in two days, despite heavy snow delaying the team from reaching the site on time. Fast Drying floor screed, **FlexiDry® F3** was installed over underfloor heating for an area of 245 sq. for the lower deck, and 265 sq.m for the upper deck. The screed was installed at a thickness of 75mm.

The upper deck which was scheduled to be completed in 3 days was however delayed by a day

due to extremely low temperatures and adverse weather conditions. An unexpected power failure on the second night further saw the principal contractor, M&E contractors and CSC’s Manager stranded for nearly half an hour. But the issue was resolved quickly, with intervention from SRM, and the hoist was functioning again within a few hours.

Despite plummeting temperatures and snow creating further hurdles on the fourth day, the team decided to get on with the final phase of the screeding, completing the upper deck by 1.00am, early on the fifth day – installing nearly 26 tonnes of screed within a period of 8 hours.

The feat was made possible by the sheer dedication and expertise of the team, and we are proud that our efforts were rewarded with the 2012 FPDC Plaasterers’ Award for screeding.



“The lower deck was 85m off the ground – cantilevered off the spiralling steel structure.”



The lower deck from below



About the client

The project was carried out on behalf of UFH contractors Warmafloor, for principal contractors, Sir Robert McAlpine. Sir Robert McAlpine (SRM) is one of the leading civil engineering firms in the UK, with a portfolio of high profile projects such as the O2 Arena, Emirates Stadium, the Eden project, Cabot Circus and the Olympic Stadium.

**Sir Robert
McALPINE**

Challenges:

- Inability to pump the screed to the top because of concerns of potential damage to the steelwork from the screed hoses
- Transporting the materials to the top deck of the 115m tall, spiralling steel tower
- Laying the screed to level, as the observation decks were on a slope, supported by temporary scaffolding, and would return to level, only once the scaffold was removed.
- Freezing temperatures and adverse weather conditions

Solution:

- Owing to the concern regarding the damage to steelwork, it was decided to lay the screed manually. A total of 84 tons of material which was required for the screeding was raised to the working level using the site hoist.
- As unrestricted access to the hoist was not available during the normal working hours, decision was taken to work outside the regular working hours. An additional fleet of 16 wheelbarrows was purchased to save time, and to transport the screed efficiently from the point of mixing to the deck floor. With the hoist carrying up to 5 wheelbarrows in each trip, a minimum of 36 return trips were taken for each 20 tons of sand used. This took a travel time of two minutes for each trip, plus the loading times.
- Considering the fact that the outside edge of the flooring had dropped 30mm below level due to the weight from the temporary scaffolding erected around the deck, and it would rebalance only once the temporary works were removed, the screed was specially laid in a manner that it would be level on completion. Instead of using the conventional rotating laser and receiver, levels were taken from the glazing sill detail using string lines, to ensure that the floor remained flat and followed the fixed points of the construction.
- As the temperatures dipped to -2°C , gas heaters were used to keep the temperature above 4°C . This was done to prevent delay in the construction progress and to ensure the screed would be ready for foot traffic within 12 hours of screeding.

Results:

With the combined effort and forward planning of our team and the positive attitude and support from our client Sir Robert McAlpine, we were able to overcome the tough challenges and successfully delivered the project to high quality standards.



The Olympic Park under snow and inset, the Stadium from the Orbit.

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