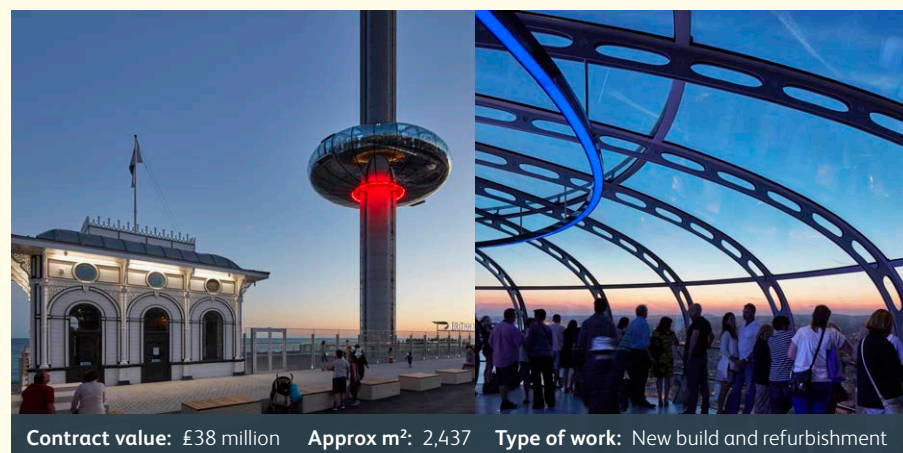


Innovation – Winner 2017

British Airways i360



Contract value: £38 million Approx m²: 2,437 Type of work: New build and refurbishment

Judges' comments

The judges felt this unusual structure was a remarkable showcase for how innovation can meet and overcome challenges. There were 16 different product developments/innovations in the project ranging from funding to using fluid dynamics to ensure the stability of this unique tower which has gained its place in the Guinness Records as the world's most slender tower.

British Airways i360 is a 162 metre tall tower with a fully enclosed glass observation pod that gently lifts 200 passengers to 138 metres, offering 360-degree views of Brighton and the English Channel. The purpose of the attraction is to delight, entertain and inspire whilst acting as a catalyst for regeneration. The British Airways i360 is an engineering feat that breaks new ground in the engineering and construction of tall structures. It uses state-of-the-art cable car technology to drive the pod up and down, with an energy re-capture system that generates electricity as the pod descends.

British Airways i360 is the brainchild of architect-entrepreneurs David Marks and Julia Barfield of Marks Barfield Architects who acted as architect, client, developer as well as securing funding. The funding model is as innovative as the project itself and is an excellent example of an arrangement that allows profit to remain in, and benefit the community. Not only has British Airways i360 given Brighton & Hove an innovative, sustainable 21st century attraction with which to identify itself, it has created new jobs and highlighted Brighton as a fun and rewarding place to visit and invest. **For more information contact: 2017winner@ce-awards.co.uk**

Actions:

- Collaboration with the West Pier Trust, Brighton & Hove City Council, Coast to Capital Local Enterprise Partnership.
- Council secured £36.2 million funding from the Government's Public Works Loans Board (PWLb) to lend on to British Airways i360 at a commercial interest rate.
- Utilised a network of over 20 specialist consultants and drew on lessons learned from the London Eye. Supply chain established early.
- The tower comprises of 17 cans, each of which weigh up to 100 tonnes. A crane cannot lift loads of this magnitude to a height of over 160m, therefore an alternative construction method of 'jacking from the bottom up' was required.
- A top-down erection method – the top section being separated from the foundation and jacked upwards to create a gap to allow the insertion of the next can. Each stage became progressively heavier and longer – at the last jacking stage the lifted weight was approximately 1000 tonnes.
- State-of-the-art measures for windy conditions: the perforated aluminium cladding around the tower diffuses and disrupts the flow of wind; novel sloshing liquid dampers installed inside the tower prevent vibrations; and, dampers are inside the aerodynamically shaped pod.

Results:

- Exemplar collaboration facilitated a unique method of construction and the adaptation of existing technology was used in a different way to solve problems.
- This novel top-down 'jack-up' method enabled the tower to be safely and efficiently erected in just 10 weeks without any deviation and with no recorded delays or accidents.
- The stability of the pod has been assessed as being extremely stable with no perceptible motion during wind speeds up to and including 30m/sec (recorded at the top of the tower on the device anemometer).
- The Council receives a higher rate of interest than it pays the PWLB, thereby earning nearly £1 million per year for the City in a time of cuts.
- British Airways i360 was officially opened by His Royal Highness The Duke of Edinburgh which received widespread positive media coverage. Since then, the attraction has welcomed more than 300,000 visitors, and more than 10,000 city residents have joined the project's local resident membership scheme.

Lessons learned/recommendations:

- British Airways i360's tower is an outstanding example of a completely new way of constructing a tall slender tower. The operation has led to an increase in the overall knowledge of structural engineering operations that will give confidence for similar applications in the future.
- The tower's construction methodology and innovative strategies to mitigate weather conditions have already been widely publicised by way of technical presentations to expert engineering audiences. There is also much to learn from the project's innovative 'design firsts'.
- The project is a real example of what can be achieved when ground-breaking design is combined with innovative funding methods and a committed community engagement programme.

