

A Pier Appears To Be Art

The *Milbank Pier*, the fifth and final new London pier being built with funding from the *Millennium Commission*, opens this month.

Located adjacent to the Tate Britain art gallery, one of its functions is to enable a London River Services riverbus linkage with the Tate Modern gallery at Bankside and the Saatchi gallery at Waterloo. With the Tate Galleries as one of the project's promoters, aesthetic expectations for this pier were high even though passenger piers are not generally known for their beauty.

To meet these high expectations London River Services appointed marine consulting engineers Beckett Rankine Partnership (BRP) as lead designer and project manager. BRP brought in Marks Barfield Architects, creators of the London Eye, to assist them together with the artist Angela Bulloch, who was shortlisted for the 1997 Turner Prize.

The pier has been built by Mowlem assisted by their subcontractors Kelly Norman Engineering which carried out the steel fabrication. Phillipson Contracts carried out the electrical and lighting installation.

The design developed by BRP and MBA is a significant departure from conventional pier design. The pier pontoon and superstructure is conceived as a single entity which incorporates

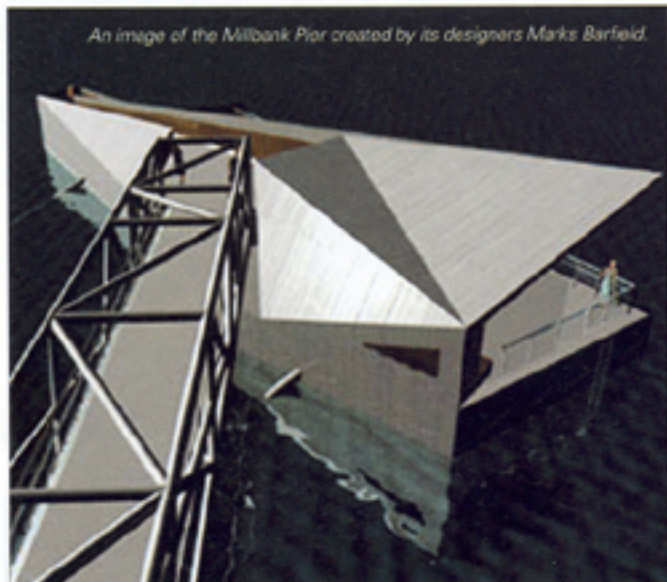


Smit's floating showlegs 'Taklift 1' lowers the pier into the Thames. Photo by Graham Carlow

the berthing face, deck ramp for disabled access and waiting room structure all in a faceted sculptural form. Externally the pier is faced with flat plate steel but the finish is relieved by timber cladding to the waiting rooms and walkways. The resulting shape is bold and dramatic and provides a different appearance from every viewpoint.

In order to allow uninterrupted views of the pier, MBA asked BRP to avoid the use of the usual dolphins or monopiles >>

An image of the Milbank Pier created by its designers Marks Barfield.



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>> to hold the pontoon in position. In response, BRP developed a restraint system using three radial arm struts. The pontoon is held laterally by two radial arms anchored to short cantilevered piles on the beach. On top of each of these piles at mid-tide level is a water lubricated rubber radial arm bearing. BRP have used this system previously on temporary piers and claim that it produces a virtually maintenance free bearing.

To hold the pontoon longitudinally the brow operates as a third radial arm. This is made possible because the site geometry requires the brow to be at an angle of 35° to the pontoon axis. The brow is supported upon three bearings; two at the bankseat and a single spherical bearing on the pontoon. This arrangement enables a long brow to be supported upon a relatively small and lively pontoon without transferring any torsional loads back to the brow.

The Millbank Pier brow is 60m long and weighs in at 86



The Millbank Pier in position. Photo courtesy of Beckett Rankine.

tonnes. This length was necessary in order to provide disabled access to the pier with gradients never exceeding 1 in 12. The brow has the appearance of a randomly braced truss. This form was developed at the request of the City of Westminster's planners who thought the original proposal

for brow with regular spaced bracing lacked excitement. While the brow is unconventional it does complement the angular form of the pontoon. The random bracing also gives a sense of progression for users as they walk along the brow.

The pontoon and brow were

fabricated on the quayside at Kelly Norman's Engineering yard at Rochester. On completion, the pontoon, weighing 380 tonnes with its ballast in place, was lifted into the water by Smit's floating sheerlegs *Taklift 1*.

In building the pontoon, the fabricator's main difficulties related to the complex geometry of the intersecting planes forming the superstructure. The geometry could only be interpreted by using a 3D CAD package.

To achieve the architect's vision, the steel plating to the superstructure had to be flat without any visible weld distortion while the intersection of the planes had to be straight. This was an onerous requirement for a marine structure but one which the fabricator has successfully achieved.

While omitting dolphins gives a neat appearance, it does not make the pier easy to install. Until all three radial arms are connected to the pontoon it is not securely fixed and there are no secure points to which the pontoon can be attached. >> Page 21

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The new Millbank Millennium Pier during construction at Rochester

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>> Mowlem approached the problem with a meticulous plan of action. First the brow was installed between the bankseat and a temporary galleys using a barge and tidal lift. The pontoon was then floated into position and moored to two temporary piles. Over a tide cycle the radial arms were installed and the brow then placed on the pontoon as the tide rose. The whole operation was achieved using only a small floating crane and three tugs.

On board the installed pier there is an impressive scene of space. The waiting room soars high overhead while the timber cladding to the inside faces makes the pier feel intimate. The pier is full of intricate angles while offering new views of some famous London landmarks.

Millbank Pier looks remarkable enough by day but at night it is truly stunning. Built into the pier is Angela Bulloch's 'Flash and Tidal' artwork, consisting of two separate elements. All around the pier fluorescent lighting slowly changes colour in time

The Millbank Pier is towed past another famous Marks Barfield design, The London Eye. Photo: by Nick Wood



with the ebb and flow of the tide. This slow, only barely perceptible rhythm is countered by 63 xenon lights in the pier structure which flash in a

synchronised sequence running for over 150 hours. The effect crowns a rare and literally unmissable marine installation where engineering and art

have met to produce a truly memorable work.

More information can be found at the project website www.millbankpier.co.uk

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