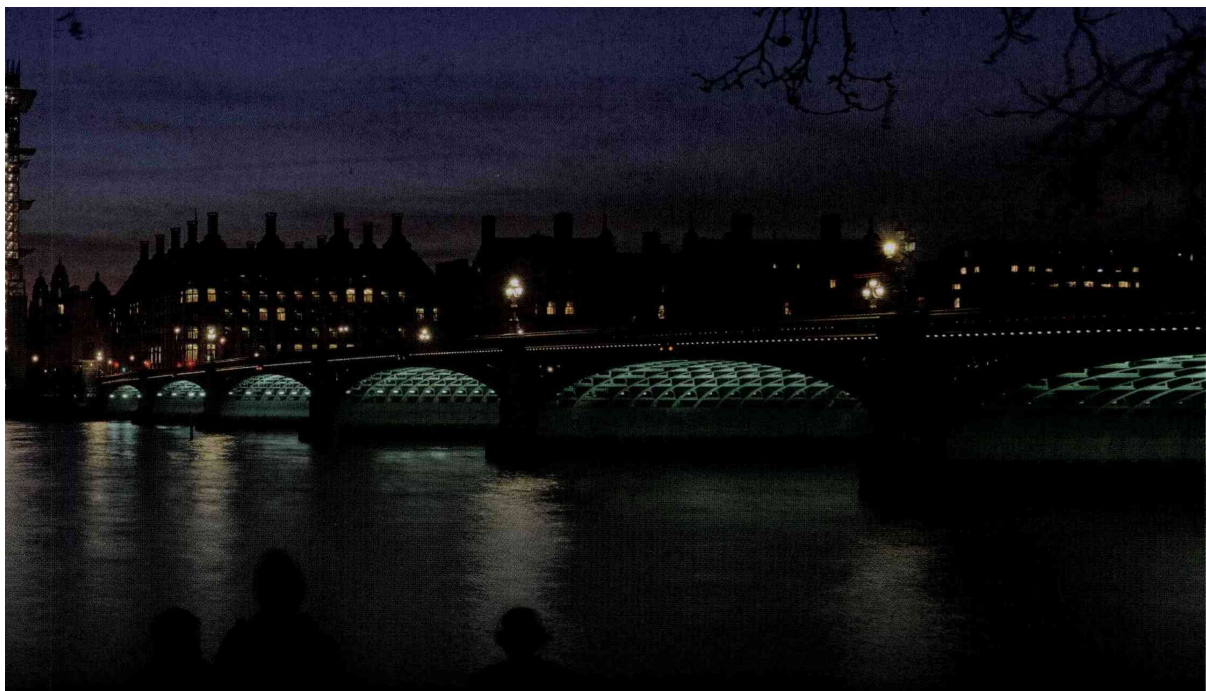


*With nine Thames bridges completed, it was a good moment over the autumn to take stock of the Illuminated River, the hugely ambitious central London public art project. Which is precisely what the ILP did through a fascinating 'How to be brilliant' event*

*By Nic Paton*



Regular readers of *Lighting Journal* will know that we've been following the Illuminated River public artwork closely ever since 'Current', a collaboration between American light artist Leo Villareal and architects Lifschutz Davidson Sandilands, was announced as the winning team for the project back in December 2016 ('*Water born*', January 2017, vol 82, no 1).

The privately funded project, to recap, has illuminated nine central London bridges stretching from Albert Bridge in the west through to Tower Bridge in the City. The first phase of the artwork, encompassing London, Cannon Street Rail, Southwark and Millennium bridges, was completed in the summer of 2019.

The second phase, bringing in Blackfriars, Waterloo, the Golden Jubilee Footbridges, Westminster and Lambeth, then followed, being completed during the spring of last year, despite the various challenges posed by Covid-19 lockdowns.

During the first phase, ILP volunteers played a key part, including providing practical support to Villareal on his digital sequencing work ('*Thames Crossing*', February 2019, vol 84, no 2).

Back at the end of 2020, and just before the beginning of phase two, we also caught up with Jonathan Gittins, associate director, lighting, at atelier ten, which has led on the lighting design for the project ('*I'll be in a boat annoying the abseilers*', November/December 2020, vol 85, no 10).

#### CHANGING HOW WE PERCEIVE LONDON

With so much of Illuminated River now complete, and Londoners and visitors to the capital able once again to get out and about and enjoy the bridges, the ILP revisited the project during the autumn. First, as part of the 'Totally Thames' festival, the ILP held a walking tour of the bridges for members.

This was followed by Jonathan and fellow associate designer Elga Niemann drilling down into some of the practical challenges of the project in a fascinating 'How to be brilliant' virtual event,

sponsored by Premier member BEGA and hosted for the ILP by Optelma Lighting at its London studio.

Jonathan opened the event by highlighting that the bridges will be viewed more than 150 million times, with the project dramatically changing how we view and perceive the Thames, and its bridges, at night.

'Other than the quality of the art, one of the main aims of the project was to try and improve and enliven the atmosphere of the river after dark. So, some of the areas where these bridges are were really



The Millennium Bridge and (main image above) Westminster Bridge. All photographs for this article by a combination of James Newton, Jason Hawkes and Jonathan Gittins



## The ILP's How to be brilliant

under-utilised previously. The hope was that, by introducing this lighting scheme, that it would draw people to the river and to use a really under-valued asset,' said Jonathan of the original concept.

'It isn't like an ordinary artwork that you would just view from one perspective. It is viewed from multiple perspectives; there are people crossing other bridges looking at it; there are people on the banks looking at it; there are people on the river. In fact, you have even got planes landing at Heathrow going over it.

'One of the other aspects that was absolutely vital was not to disturb the wildlife in the Thames. This is something that, until we started, we didn't really think there was any wildlife in the Thames. But, actually, there are over 100 types of fish that live in the Thames, including sea horses that are underneath Millennium Bridge. So, it was absolutely key that we didn't do anything to disturb the wildlife with this scheme,' Jonathan explained.

While Villareal's vision and Lifschultz Davidson Sandilands' designs have been key, atelier ten's role has been critical from the lighting design perspective, as has been that of contractor FM Conway on the ground. The project has also brought together marine engineers, structural engineers, ecologists, and planning consultants, among many others.

### LUMINANCE AND SPILL-LIGHT SURVEYS

Jonathan now handed over to Elga Niemann, who talked through some of the practicalities associated with different stages of each phase of the project. This included the initial early modelling but also the extensive luminance and spill-light surveys that were carried out on the river.

'For the luminance survey we used a rated

camera and took photographs all along the banks on both sides, north and south bank, all the way from Tower to Albert. And we then ran those photographs through special calibrated software that could use false colour luminance plots, effectively, of our photographs. We then had an accurate record of what the brightness levels were surrounding each of the bridges,' explained Elga.

'The idea behind it was that we were very keen on not over-lighting, just putting enough light so that the bridges and the artwork could be seen, but they wouldn't overpower important landmarks. For

example, you have St Paul's behind Millennium Bridge. We were keen to make the lighting bright enough so you can appreciate it but not so bright that it becomes more powerful than St Paul's.

'We were also looking at the luminance of our neighbours. On Blackfriars Bridge, for example, immediately next to the bridge is relative darkness. But then we had some very, very bright neighbours, such as Sea Containers House. Its façade lighting was well exceeding what you would ordinarily expect or want for façade lighting. Rather than making our bridge brighter we spoke to the building owners and asked them whether there was chance of them checking down their façade lighting, and they did,' she added.

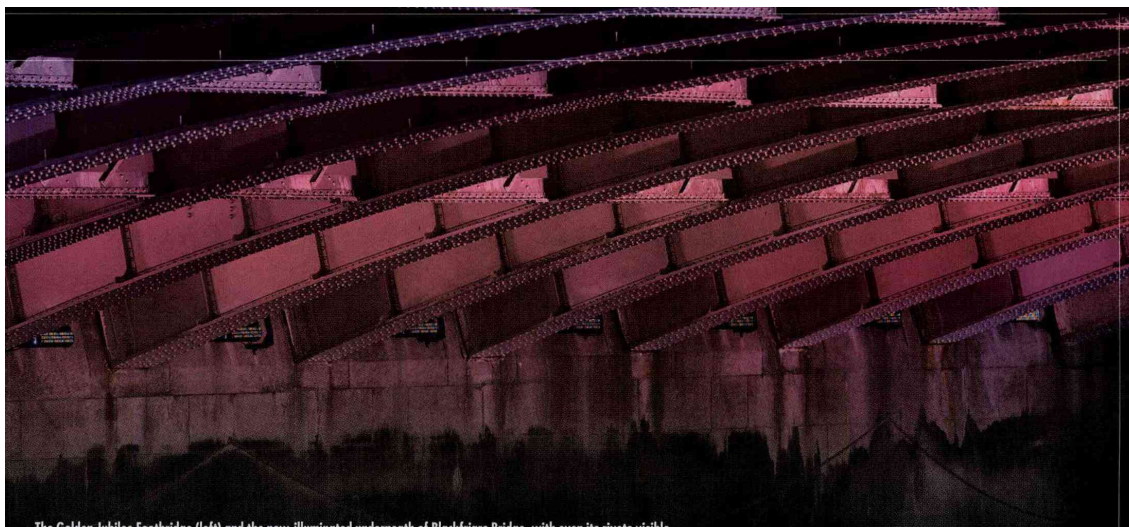
For the spill-light survey it was a case of getting out on the water, in a boat, and measuring the light levels underneath each bridge to see how much light from the bridges was entering the water.

For London Bridge, for example, the conclusion was 'a lot', she highlighted. 'We measured something like 25 lux on the surface of the water, so that's kind of motorway-type lighting levels. We then produced a record of what the existing condition was so that at the end of the project we could go back, measure our bridges again, and see how they compared.

'Once we had done the initial information-gathering exercise we were able to start on the actual design work,' said Elga. 'Going back to Leo's concept, his inspiration came from impressionist paintings of the Thames and the bridges on the Thames, which take the colours and movement of the river and the sky and everything surrounding the bridges. The idea really was to create a digital version of that, where we would create a lighting canvas for him on every bridge, and he could







The Golden Jubilee Footbridge (left) and the now-illuminated underneath of Blackfriars Bridge, with even its rivets visible

then come along with his laptop and software and live paint on to the bridges.

'All the bridges are vastly different from each other. Each has their own character. But globally we identified three types of bridges – concrete-faced bridges where we are washing colour down the face of the bridge. We've got steel lattice bridges, and these are all about lighting within the steelwork, picking up on the structure. And then we've got our suspension bridges.

'All the fittings are LED, everything is DMX controlled. Some of the bridges are lit in colour using RGBA and some of them are monochromatic using tuneable white. At the very early stages of the project we tendered the supply of the light fittings to a number of manufacturers, and Signify was selected as the supplier,' Elga highlighted.

#### FITTINGS AND BRACKETS

Broadly, linear grazes were used to wash solid faces, floodlights were then used to underlight solid arches, on London Bridge especially. For steel-lattice bridges, two sets of floodlights were used, a primary set at the base to underlight arches and then a secondary set to shine through the lattice work and pick up details. Finally, direct-view products were used on the suspension bridges. 'It was about keeping the palette as small as possible, keep it simple but of course it is more complicated than that,' said Elga.

'Although we were able to keep the fitting selection to a minimum, because the bridges are all so different, we needed lots and lots of different ways of mounting these fittings; we had to come up with lots of different brackets,' she explained.

'In an ideal world, you'd have every bracket adjustable and every possible dimension so you could get to site and get

around every eventuality. But adjustability costs money, just in the manufacture of the bracket. But, more importantly, on this job, every light fitting had to be installed by an abseiler and so the time it would take to adjust something and the cost of that was really important. Wherever we could we used fixed brackets and just packed them out with washers, effectively, one side or the other, to make sure we had some adjustment to keep the light within its lane and not shooting off to the side. That was a way we were able to get some adjustability but without the same cost implications,' she added.

Apart from brackets, the project saw atelier ten designing a number of bespoke shields and louvres. For one section through London Bridge, for example, the graze fitting is tucked up behind the concrete lip, washing down the face, Elga explained. 'But the face is not going in a straight line, it is arched. So, we wanted to avoid that spill-light scenario. We needed to be able to cut off exactly where the face ended. We needed an individual cut-off on every single fitting to create that arch and

to make sure we were not shooting past the edge. We came up with a very simple shield that could be adjusted up and down to give us that cut off.'

Glare was another concern that had to be managed and mitigated, particularly, again for London Bridge. The Signify floodlights came with a standard louvre. 'Because these bridges are being viewed from really quite close up by people



Top: the completed 'nemesis' of Lambeth Bridge with (above), London Bridge with its shield and (left image too) abseilers at work →



walking along the Embankment and going under the bridges, we tested the louvres in the initial mock-ups and did not think they really cut it,' said Elga.

'So, we came up with a custom, deeper louvre and used that during phase one. We found it worked really well but, having seen it installed in phase one we thought, actually, there was still more that could be done. So, we added a secondary louvre, a tab louvre on to the front. Vertical tabs on to the outside fittings make sure that no spill light comes out of the side of the bridges. Then there are horizontal louvres on to the bottom portion of the floodlights that underlit the arch. So we would only get the lighting that actually lit the arch, and not the portion that might hit a pedestrian in the eye,' she added.

#### RECORD PLANNING SUBMISSION

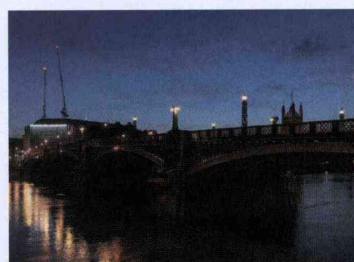
Of course, nothing could actually happen on the ground before a massive obstacle had been overcome: planning. As Jonathan explained: 'The culmination of all this design work was the planning submission, which was a record breaker. I think it was one of the biggest planning submissions submitted.'

'There were 30 different submissions because of all the different local authorities involved and different bridges. And because of all the listed structures, there were 18 consents we had to get. So overall it was tens of thousands of pages. But eventually we got planning.'

With planning now on side, installation could crack on, which brought with it its own very specific headaches, as Jonathan made clear. 'Because of these structures, everything had to be installed by abseilers, which just makes it much more challenging to do things. The other problem was that, because they are in the centre of London, there was no real space to store anything or keep anything by the bridges. So, everything was delivered by boat and had to be winched up and then the abseilers installed it off of the boat. It was quite an interesting installation process,' he said.

'FM Conway came up with all sorts of novel ways of installing things. For example, they put a basket on London Bridge and so, because the guys were protected, we were able to keep the arch underneath open during the day, which sped up the work considerably.'

'Then, as well as the installing of the lights on the outside of the bridges, there was the infrastructure. Inside London Bridge, for example, it is completely hollow and so they were able to install cables through there, and it was the same with Waterloo. But even that wasn't easy because it is confined spaces, and so you



Before (left) and after images showing, from top, Blackfriars, Westminster and Lambeth bridges

have to have people with the right training and equipment to do it. Pretty much everything on the project was difficult in terms of installation!

'A lot of it had to be done at night as well because it is the only time you are allowed to shut arches on the river for river traffic. So we found that a very large proportion of work was being done at night, which obviously, again, made it more difficult,' Jonathan added.

#### COMMISSIONING AND AIMING

The next element was commissioning. 'Over three months we were pretty much every single night aiming lights on bridges or multiple bridges; it was really quite a big undertaking,' said Jonathan.

'The way we did the aiming was in a similar way to the install; abseilers did all the physical aiming because we just couldn't get to these locations. They aimed it on the end of a radio with one of our guys on a boat. We found that, actually, that wasn't enough eyes on the bridge. We had to also look from the riverbank because you have got very different perspectives of the coverage of the lighting from different angles,

so we ended up with a couple of people looking from different positions.'

Covid-19 restrictions added to the complexities of aiming and focusing during phase two. 'We actually ended up doing a lot of it on Microsoft Teams, which we didn't think was going to work but was actually very successful. We had someone on the boat with a camera and talking to the abseilers, who were doing the aiming. We had someone else in the plant room controlling the lighting.'

'And then someone else at home directing it. It did work remarkably well. And I think we should do that in future because it meant I could sit at home while they were out in the cold, so it did have some advantages!' Jonathan joked.

Jonathan also highlighted the sensitivity of the aiming process, showing an image of Westminster Bridge with the lighting angled at 14 degrees and then 15 degrees.

'At 15 degrees angled down, you had a hot spot and almost no light on the top at all. But, by tipping that fitting up just one degree you were able completely to fill the underside of the bridge. We were



surprised just how sensitive it was. It also meant we had to go to every fitting and individually aim them to get the perfect finish,' he said.

### 'NEMESIS' OF LAMBETH BRIDGE

Jonathan then turned to Lambeth Bridge, which he described as the team's 'nemesis'. 'It just was a pig of a bridge to aim!' he said. 'We on paper had a theory of how we were going to light it; we had an angle that we thought would give us lovely coverage of the face. On the first night we sent out the five abseilers and they were there aiming it all as per our instructions. When we got to the middle we realised it just looked terrible.

'We had a quick rethink and for the rest of that night we re-aimed the other side in a different manner, trying this time to aim at the bottom of the arch, just to see whether that would work. It was better, but it still really wasn't what we wanted; we still had some hotspots and areas of darkness. It would have been easy at this point just to say it was the best we were going to get, especially as we had five tired, grumpy abseilers. From their perspective, hanging from the bridge everything looked the same; they really couldn't understand why we were upset and worried about it; they just thought we were divas really!

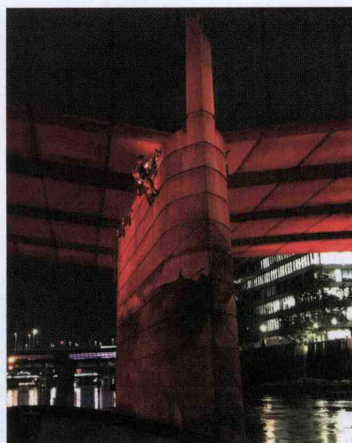
'The next day we got the abseilers to re-aim everything, much to their happiness. This time we had learnt from the mistakes from the night before and we decided to aim to try to fill the beam with light, which was really quite difficult to do. Because we had a linear fitting and we were trying to fill a curved structure. It meant we had to do every fitting individually and flick between adjacent fittings. It was worth it, though, as at the end of that night we had coverage we were happy with. Since then we have also put in a dimming mask that reduces the brightness on the central piece.

'Every one of the faces on the arch took us a night, so we had two weeks aiming the faces, another week doing the arches, and a bit longer for the piers as well. It was getting on to a month of nights to get it together. But we are very pleased with it, it has been worth the aggravation.'

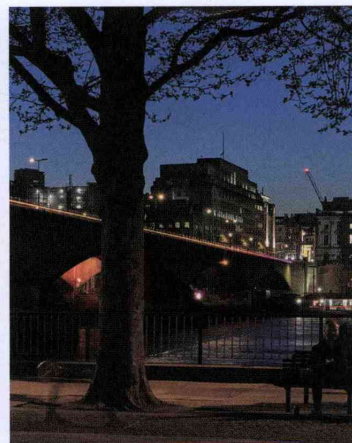
### CONCLUSIONS

As the event came to its conclusion, Jonathan ran through his thoughts on what had been achieved on each bridge. At London Bridge, for example, the spill light had now been 'all but eliminated', he said.

'Cannon Street Rail Bridge was a pretty ugly bridge. It was very foreboding and gloomy at night. This is one of our favourites because it has really created



Left: abseilers working on London Bridge. Right: the completed Waterloo Bridge



something that wasn't there before out of really a not very attractive bridge. It has made this part of the river a lot more welcoming and a nice place to be,' Jonathan added.

'Southwark Bridge previously had lighting on it, but it was lighting the front of the arches and it lost a lot of the definition of the bridge. Our new scheme is lit within, so you really get the depth of the bridge. You have the shadow of the arches, which really defines its form.

'Millennium Bridge was known as "the blade of light" when it was first constructed and over time that blade had faded to a quiver. It really wasn't looking very good anymore. When we put the artwork in we restored that blade of light, but we have the addition of Leo's artwork, so it is now a moving blade of light, it has got really nice dynamic element.

'At the same time, we relit the deck, which again had really started to lose its way. The new deck lighting really makes the bridge more welcoming and a nicer place to cross,' Jonathan added.

For the phase two bridges, Blackfriars Bridge was similar to Southwark in that it had been lit previously, but on the face so that it had lost its shape. 'The new scheme, having the arches in silhouette, really defines the shape of the bridge. The new lighting is really showing off some of the structural details, like the rivets on the arches, which you just didn't see before. It is another one of our favourites.'

For the Golden Jubilee Footbridges (which includes Hungerford Bridge), there had previously been some lighting in the balustrades, but again it was getting tired. 'What we've got here is vertical batons of LED with 16 pixels in each. So Leo is able to move the light across the bridge and also vertically. You get some

really interesting, starry patterns on this bridge; it is really nice,' Jonathan said.

At Waterloo Bridge, the initial concept was to light it in a similar way to London Bridge, with grazed fittings on the face. 'But there were real structural issues with the integrity of the handrails for fixing that and it ended up with the solution where we had to go for a direct-view fitting,' explained Jonathan. 'But I think, actually, it is quite a striking feature. It is different to what was originally envisaged but it has still worked out well.'

The previously dark Westminster Bridge is now lit under the arches. 'There are also little shield details on the edge of the bridge, which we backlit and Leo also plays with movement.'

Finally, Lambeth Bridge now had 'an eerie, ghostly quality about it, which I think is quite nice', Jonathan said. 'You see it from some of the long views and it kind of looms in the distance. I think, after all the pain of this bridge, it has actually worked out really nicely,' he added in conclusion.

### FIND OUT MORE

To watch the full video from of Jonathan and Elga's presentation go to <https://theilp.org.uk/events/how-to-be-brilliant/>

Our huge thanks to Premier member BEGA for sponsoring How to be brilliant during 2021. Watch out, too, for details of the 2022 programme, which will be announced shortly on the same address above.