

# AGENDA DRAFT

## Meeting Transport Committee

**Date** Wednesday 11 September 2019

**Time** 10.00 am

**Place** Chamber, City Hall, The Queen's Walk, London, SE1 2AA

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### Members of the Committee

Florence Eshalomi AM (Chair)  
Caroline Pidgeon MBE AM (Deputy Chair)  
Gareth Bacon AM  
Shaun Bailey AM  
Tom Copley AM

David Kurten AM  
Joanne McCartney AM  
Keith Prince AM  
Caroline Russell AM  
Navin Shah AM

A meeting of the Committee has been called by the Chair of the Committee to deal with the business listed below.

Ed Williams, Executive Director of Secretariat  
Tuesday 3 September 2019

### Further Information

If you have questions, would like further information about the meeting or require special facilities please contact: David Pealing, Principal Committee Manager; Telephone: 020 7983 5525;  
Email: [david.pealing@london.gov.uk](mailto:david.pealing@london.gov.uk)

For media enquiries please contact Alison Bell, Head of Assembly Communications;  
Telephone: 020 7983 4228; Email: [alison.bell@london.gov.uk](mailto:alison.bell@london.gov.uk). If you have any questions about individual items please contact the author whose details are at the end of the report.

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Certificate Number: FS 80233

**Agenda**  
**Transport Committee**  
**Wednesday 11 September 2019**

**1 Apologies for Absence and Chair's Announcements**

To receive any apologies for absence and any announcements from the Chair.

**2 Declarations of Interests** (Pages 1 - 4)

Report of the Executive Director of Secretariat

Contact: David Pealing, [david.pealing@london.gov.uk](mailto:david.pealing@london.gov.uk), 020 7983 5525

**The Committee is recommended to:**

- (a) Note the offices held by Assembly Members, as set out in the table at Agenda Item 2, as disclosable pecuniary interests;**
- (b) Note the declaration by any Member(s) of any disclosable pecuniary interests in specific items listed on the agenda and the necessary action taken by the Member(s) regarding withdrawal following such declaration(s); and**
- (c) Note the declaration by any Member(s) of any other interests deemed to be relevant (including any interests arising from gifts and hospitality received which are not at the time of the meeting reflected on the Authority's register of gifts and hospitality, and noting also the advice from the GLA's Monitoring Officer set out at Agenda Item 2) and to note any necessary action taken by the Member(s) following such declaration(s).**

**3 Minutes** (Pages 5 - 84)

**The Committee is recommended to confirm the minutes of the meetings of the Transport Committee held on 10 and 19 July 2019 to be signed by the Chair as correct records.**

The appendices to the minutes set out on pages 11 to 56 and 61 to 84 are attached for Members and officers only but are available from the following area of the GLA's website:  
[www.london.gov.uk/mayor-assembly/london-assembly/transport](http://www.london.gov.uk/mayor-assembly/london-assembly/transport)

## **4 Summary List of Actions** (Pages 85 - 344)

Report of the Executive Director of Secretariat

Contact: David Pealing, [david.pealing@london.gov.uk](mailto:david.pealing@london.gov.uk), 020 7983 5525

**The Committee is recommended to note the completed and outstanding actions arising from previous meetings of the Committee.**

The appendix to the report set out on pages 91 to 344 is attached for Members and officers only but are available from the following area of the GLA's website:

[www.london.gov.uk/mayor-assembly/london-assembly/transport](http://www.london.gov.uk/mayor-assembly/london-assembly/transport)

## **5 London's Transport Now and in the Future** (Pages 345 - 346)

Report of the Executive Director of Secretariat

Contact: Grace Pollard, [grace.pollard@london.gov.uk](mailto:grace.pollard@london.gov.uk), 020 7084 2850

**The Committee is recommended to note the report, put questions on London's transport now and in the future to the invited guests and note the subsequent discussion.**

## **6 Tram and Bus Safety** (Pages 347 - 348)

Report of the Executive Director of Secretariat

Contact: Daniella Dávila Aquije, [Daniella.DavilaAquije@london.gov.uk](mailto:Daniella.DavilaAquije@london.gov.uk), 020 7084 2850

**The Committee is recommended to note the report, put questions on tram and bus safety to the invited guests and note the subsequent discussion.**

## **7 Transport Committee Work Programme** (Pages 349 - 352)

Report of the Executive Director of Secretariat

Contact: Daniella Dávila Aquije, [Daniella.DavilaAquije@london.gov.uk](mailto:Daniella.DavilaAquije@london.gov.uk), 020 7084 2850

**The Committee is recommended to note its work programme, as set out in the report.**

## **8 Date of Next Meeting**

The next meeting of the Committee is scheduled for Wednesday, 9 October 2019 at 10.00am in the Chamber.



**9 Any Other Business the Chair Considers Urgent**

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# Subject: Declarations of Interests

**Report to: Transport Committee**

**Report of: Executive Director of Secretariat**

**Date: 11 September 2019**

**This report will be considered in public**

## 1. Summary

- 1.1 This report sets out details of offices held by Assembly Members for noting as disclosable pecuniary interests and requires additional relevant declarations relating to disclosable pecuniary interests, and gifts and hospitality to be made.

## 2. Recommendations

- 2.1 **That the list of offices held by Assembly Members, as set out in the table below, be noted as disclosable pecuniary interests<sup>1</sup>;**
- 2.2 **That the declaration by any Member(s) of any disclosable pecuniary interests in specific items listed on the agenda and the necessary action taken by the Member(s) regarding withdrawal following such declaration(s) be noted; and**
- 2.3 **That the declaration by any Member(s) of any other interests deemed to be relevant (including any interests arising from gifts and hospitality received which are not at the time of the meeting reflected on the Authority's register of gifts and hospitality, and noting also the advice from the GLA's Monitoring Officer set out at below) and any necessary action taken by the Member(s) following such declaration(s) be noted.**

## 3. Issues for Consideration

- 3.1 Relevant offices held by Assembly Members are listed in the table overleaf:

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<sup>1</sup> The Monitoring Officer advises that: Paragraph 10 of the Code of Conduct will only preclude a Member from participating in any matter to be considered or being considered at, for example, a meeting of the Assembly, where the Member has a direct Disclosable Pecuniary Interest in that particular matter. The effect of this is that the 'matter to be considered, or being considered' must be about the Member's interest. So, by way of example, if an Assembly Member is also a councillor of London Borough X, that Assembly Member will be precluded from participating in an Assembly meeting where the Assembly is to consider a matter about the Member's role / employment as a councillor of London Borough X; the Member will not be precluded from participating in a meeting where the Assembly is to consider a matter about an activity or decision of London Borough X.

<b>Member</b>	<b>Interest</b>
Tony Arbour AM	
Jennette Arnold OBE AM	European Committee of the Regions
Gareth Bacon AM	Member, LB Bexley
Shaun Bailey AM	
Sian Berry AM	Member, LB Camden
Andrew Boff AM	Congress of Local and Regional Authorities (Council of Europe)
Leonie Cooper AM	Member, LB Wandsworth
Tom Copley AM	Member, LB Lewisham
Unmesh Desai AM	
Tony Devenish AM	Member, City of Westminster
Andrew Dismore AM	
Len Duvall AM	
Florence Eshalomi AM	
Nicky Gavron AM	
Susan Hall AM	Member, LB Harrow
David Kurten AM	
Joanne McCartney AM	Deputy Mayor
Steve O'Connell AM	Member, LB Croydon
Caroline Pidgeon MBE AM	
Keith Prince AM	Alternate Member, European Committee of the Regions
Caroline Russell AM	Member, LB Islington
Dr Onkar Sahota AM	
Navin Shah AM	
Fiona Twycross AM	Deputy Mayor for Fire and Resilience; Chair of the London Local Resilience Forum
Peter Whittle AM	

[Note: LB - London Borough]

3.2 Paragraph 10 of the GLA's Code of Conduct, which reflects the relevant provisions of the Localism Act 2011, provides that:

- where an Assembly Member has a Disclosable Pecuniary Interest in any matter to be considered or being considered or at
  - (i) a meeting of the Assembly and any of its committees or sub-committees; or
  - (ii) any formal meeting held by the Mayor in connection with the exercise of the Authority's functions
- they must disclose that interest to the meeting (or, if it is a sensitive interest, disclose the fact that they have a sensitive interest to the meeting); and
- must not (i) participate, or participate any further, in any discussion of the matter at the meeting; or (ii) participate in any vote, or further vote, taken on the matter at the meeting

UNLESS

- they have obtained a dispensation from the GLA's Monitoring Officer (in accordance with section 2 of the Procedure for registration and declarations of interests, gifts and hospitality – Appendix 5 to the Code).

3.3 Failure to comply with the above requirements, without reasonable excuse, is a criminal offence; as is knowingly or recklessly providing information about your interests that is false or misleading.

- 3.4 In addition, the Monitoring Officer has advised Assembly Members to continue to apply the test that was previously applied to help determine whether a pecuniary / prejudicial interest was arising - namely, that Members rely on a reasonable estimation of whether a member of the public, with knowledge of the relevant facts, could, with justification, regard the matter as so significant that it would be likely to prejudice the Member's judgement of the public interest.
- 3.5 Members should then exercise their judgement as to whether or not, in view of their interests and the interests of others close to them, they should participate in any given discussions and/or decisions business of within and by the GLA. It remains the responsibility of individual Members to make further declarations about their actual or apparent interests at formal meetings noting also that a Member's failure to disclose relevant interest(s) has become a potential criminal offence.
- 3.6 Members are also required, where considering a matter which relates to or is likely to affect a person from whom they have received a gift or hospitality with an estimated value of at least £25 within the previous three years or from the date of election to the London Assembly, whichever is the later, to disclose the existence and nature of that interest at any meeting of the Authority which they attend at which that business is considered.
- 3.7 The obligation to declare any gift or hospitality at a meeting is discharged, subject to the proviso set out below, by registering gifts and hospitality received on the Authority's on-line database. The on-line database may be viewed here:  
<https://www.london.gov.uk/mayor-assembly/gifts-and-hospitality>.
- 3.8 If any gift or hospitality received by a Member is not set out on the on-line database at the time of the meeting, and under consideration is a matter which relates to or is likely to affect a person from whom a Member has received a gift or hospitality with an estimated value of at least £25, Members are asked to disclose these at the meeting, either at the declarations of interest agenda item or when the interest becomes apparent.
- 3.9 It is for Members to decide, in light of the particular circumstances, whether their receipt of a gift or hospitality, could, on a reasonable estimation of a member of the public with knowledge of the relevant facts, with justification, be regarded as so significant that it would be likely to prejudice the Member's judgement of the public interest. Where receipt of a gift or hospitality could be so regarded, the Member must exercise their judgement as to whether or not, they should participate in any given discussions and/or decisions business of within and by the GLA.

## **4. Legal Implications**

- 4.1 The legal implications are as set out in the body of this report.

## **5. Financial Implications**

- 5.1 There are no financial implications arising directly from this report.

<b>Local Government (Access to Information) Act 1985</b>	
List of Background Papers: None	
Contact Officer:	David Pealing, Principal Committee Manager
Telephone:	020 7983 5525
E-mail:	<a href="mailto:david.pealing@london.gov.uk">david.pealing@london.gov.uk</a>

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# MINUTES

**Meeting: Transport Committee**

**Date: Wednesday 10 July 2019**

**Time: 10.00 am**

**Place: Chamber, City Hall, The Queen's Walk, London, SE1 2AA**

Copies of the minutes may be found at:

[www.london.gov.uk/mayor-assembly/london-assembly/transport](http://www.london.gov.uk/mayor-assembly/london-assembly/transport)

**Present:**

Florence Eshalomi AM (Chair)

Caroline Pidgeon MBE AM (Deputy Chair)

Gareth Bacon AM

Shaun Bailey AM

Tom Copley AM

David Kurten AM

Keith Prince AM

Caroline Russell AM

Navin Shah AM

## **1 Apologies for Absence and Chair's Announcements (Item 1)**

1.1 An apology for absence was received from Joanne McCartney AM.

## **2 Declarations of Interests (Item 2)**

2.1 The Committee received the report of the Executive Director of Secretariat.

### **2.2 Resolved:**

**That the list of offices held by Assembly Members, as set out in the table at Agenda Item 2, be noted as disclosable pecuniary interests.**



### **3 Minutes (Item 3)**

#### **3.1 Resolved:**

**That the minutes of the meeting of the Transport Committee held on 15 May 2019 be signed by the Chair as a correct record.**

### **4 Standing Delegation (Item 4)**

#### **4.1 Resolved:**

**That the following standing delegation of authority to the Chairman of the Committee, as agreed by the London Assembly at its Plenary Meeting on 6 June 2019, be noted:**

**To delegate authority to Chairs of ordinary committees, sub-committees and working groups to agree, in consultation with the relevant party Group Lead Members and Deputy Chairs;**

- a) The detailed terms of reference for any investigation to be undertaken by the relevant committee, sub-committee or working group within its work programme as agreed by the GLA Oversight Committee, and any related project plans and arrangements for related site visits or informal meetings; and**
- b) The topic and scope for any additional projects to be added to its work programme, where it is not practicable to secure prior approval from the GLA Oversight Committee and subject also to subsequent ratification by the GLA Oversight Committee.**

### **5 Summary List of Actions (Item 5)**

**5.1** The Committee received the report of the Executive Director of Secretariat.

#### **5.2 Resolved:**

- a) That the completed and outstanding actions arising from previous meetings of the Committee, and additional correspondence received, be noted; and**
- b) That authority be delegated to the Chair, in consultation with the Deputy Chair and party Group Lead Members, to agree any follow-up work with the Financial Conduct Authority in respect of Crossrail and its delayed opening.**

## **6 Action Taken Under Delegated Authority (Item 6)**

6.1 The Committee received the report of the Executive Director of Secretariat.

6.2 **Resolved:**

**That the action taken by the Chair under delegated authority be noted, namely that the scope of the Committee's investigation into tram and bus safety was agreed.**

## **7 London's Transport Now and in the Future (Item 7)**

7.1 The Committee received the report of the Executive Director of Secretariat as background to putting questions on London's transport now and in the future to the following invited guests:

- John Dickie, Director of Policy and Strategy, London First;
- Lucinda Turner, Director of Spatial Planning, Transport for London (TfL)
- Nicole Badstuber, Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge
- Silviya Barrett, Research Manager, Centre for London; and
- Simon Nielsen, Head of Strategic Analysis, TfL.

7.2 A transcript of the discussion is attached at **Appendix 1**.

7.3 During the course of the discussion, the Committee requested the following further information in writing:

- Accident rates for motorcyclists in London on roads where they may use bus lanes, against roads where they cannot;
- What is being done to reduce public subsidy in electric vehicle infrastructure;
- Detail of the work being done to make TfL's energy use more sustainable;
- Explain the approach taken, and future details, on outer London bus reviews;
- A breakdown of London's bus usage by area, to show where in London bus use is dropping and by how much;
- Detail of any work being done to introduce annual capping to Oyster and contactless payments;
- TfL's submission to the financial review of approaches to fund the construction of Crossrail 2;

- An explanation as to why Mobileye has not been rolled out more widely on London's bus network; and
- An outline of the work being done between TfL, High Speed 2 and Old Oak and Park Royal Development Corporation.

7.4 **Resolved:**

**That the report and discussion be noted.**

## **8 London TravelWatch Progress Report (Item 8)**

8.1 The Committee received the report of the Executive Director of Secretariat and welcomed the following to introduce the report:

- Joanna Simons, Interim Chief Executive, London TravelWatch (LTW); and
- Arthur Leathley, Chair, LTW.

8.2 The Chief Executive explained that she would be soon contacting Committee Members on the proposed joint working between the Chief Executive of LTW and Transport Focus with a view to implementing those proposals, subject to a decision of the Transport Committee towards the end of the financial year.

8.3 **Resolved:**

- (a) **That the action taken so far by London TravelWatch to respond to the Committee's comments on its previous draft Business Plan, the current work programme, and the direction of travel (as set out at Appendix 1 to the report), be noted;**
- (b) **That the grant funding for London TravelWatch for the second half of this financial year be confirmed and released;**
- (c) **That it be noted that following further consultation over the summer, the Committee will receive an updated and refocused Business Plan for the period 2020 to 2024 in the autumn, to be considered as part of the 2020/21 budget process; and**
- (d) **That it be noted that the Memorandum of Understanding between the Greater London Authority and London TravelWatch is to be reviewed and updated to ensure that current expectations are fully covered.**

## **9 Transport Committee Work Programme (Item 9)**

9.1 The Committee received the report of the Executive Director of Secretariat.

9.2 **Resolved:**

**That the Committee's work programme be noted.**

## **10 Date of Next Meeting (Item 10)**

10.1 The next meeting of the Committee was scheduled for Friday, 19 July 2019 at 11.00am, in the Chamber, City Hall.

## **11 Any Other Business the Chair Considers Urgent (Item 11)**

11.1 There was no other business.

## **12 Close of Meeting**

12.1 The meeting ended at 1.15pm.

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Chair

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Date

**Contact Officer:** David Pealing, Principal Committee Manager; Telephone: 020 7983 5525;  
Email: david.pealing@london.gov.uk

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**London Assembly Transport Committee – 10 July 2019****Transcript of Item 7 – London's Transport Now and in the Future**

**Florence Eshalomi AM (Chair):** I will welcome our guests. We have before us Lucinda Turner, Director of Spatial Planning at Transport for London (TfL); Simon Nielsen, Head of Strategic Analysis at TfL; Silviya Barrett, Research Manager at the Centre for London; and Nicole Badstuber, Research Associate in Urban Infrastructure Policy and Governance at the University of Cambridge.

One thing we have been looking at on the Transport Committee is the growing nature of transport infrastructure in London, the fact that London's population continues to grow and we want more and more people using public transport. We know that TfL does recognise the different scope of the changes, technology and how that plays, and so this morning we are going to be looking at how we make sure we have the right transport infrastructure for Londoners and people commuting.

We have a range of questions looking at those different areas and I will start off with the first section. This is a broad question to all of you as our guests this morning. How do you think London's transport system will need to develop to keep pace with the growing population in London? I will come to you, Lucinda.

**Lucinda Turner (Director of Strategic Planning, Transport for London):** Clearly, the growth of London poses some significant challenges for us as TfL and in terms of delivering the transport system we need. There is a whole host of issues around the environment and health that we need to address. We need to make sure that we mitigate the impacts of transport on carbon dioxide (CO<sub>2</sub>) and climate change more broadly and deliver improvements in air quality. That is a huge focus for the Mayor.

There is also the growing challenges of health. This generation of children in London is the first that will live more time in chronic illness than their parents. That is a huge challenge for us. Active travel is one of the crucial mechanisms for delivering greater levels of activity. Currently, only one in five children gets the levels of exercise and active travel they need each day. We need to make sure our transport system responds to that.

More widely, in terms of the nature of the population and the demographics, we have an increasing population of older people. Our transport system needs to develop further in terms of delivering step-free access and solutions for people with a range of mobility challenges and other challenges to make sure London is an inclusive city.

In terms of the growth of London in population and the number of trips that that puts on our system, by 2041 we are expecting at least 5 million extra trips each day that we will have to cope with on our transport system across the different modes. To make sure that they are as efficient as possible and that we can cope with that, we need to shift as many people to public transport and walking and cycling. The Mayor's Transport Strategy (MTS) set out a really clear vision and an ambition for 80% of trips to be done by public transport, walking or cycling. That is the only way we will be able to make sure that the growth in London is sustainable.

There is also a whole host of challenges that are not linked to transport *per se* but transport is a means to an end. Delivering new homes and jobs in our city to support that growth in population is critical. Transport plays a fundamental role in that. We know that housing delivery is more viable and sustainable if we can deliver it in areas that are well connected to the public transport system. We know that we need to embed walking and

cycling environments from the outset. We know that there is a very clear relationship between density of development and good public transport and sustainable transport outcomes. There are some win-wins and there are some real opportunities here as well as challenges.

There was a lot of evidence done for the development of the MTS that considered all the different swathes of challenges, including changing technology, which again offers both opportunities and challenges. Disruptive technology has delivered many benefits for Londoners, but it also increases the challenges in terms of making us able to have a coherent and integrated transport system in the capital that does not have adverse incentives for people to switch back to cars. There are all those aspects.

Can I hand over to Simon perhaps to give a bit more of a flavour on some of the challenges?

**Florence Eshalomi AM (Chair):** Is there anything you wanted to add to that?

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** Yes, to give a little bit more detail maybe on some of the key parameters that we need to take into account in the future, which are quite important. One of the things London has been experiencing for a number of years now, which is set to continue, is the growth of London and trying to cater for that growth. We have a population now of 8.9 million. New population figures were released two weeks ago, which show that London is still growing. The population between 2017 and 2018, despite the almost unprecedented levels of uncertainty in the economy at the moment, increased from about 8.8 million to 8.9 million people, which makes it still the fastest growing region in the United Kingdom.

We are expecting to see that increase to about 10.8 million people in 2041, which is two million more people. That is the equivalent of adding Glasgow and Birmingham to what is already a very large conurbation. We also know the distribution of that growth is not going to be evenly spread. We are expecting something like 40% of the growth to occur in east London.

As Lucinda mentioned, we are also expecting the population to age, which is important in terms of what we need to plan for in the future. Even between 2017 and 2018, the most recent data we have on population, we saw that the population of people over 60 increased by 2% compared to a 0.9% overall increase. You can see that starting to happen.

It is not just population; it is also jobs. We are expecting jobs to increase by over one million by 2041. The population growth combined with this employment growth is likely to result in five million to six million extra journeys every day on London's transport network. That is an enormous challenge for us to be able to cater with and we already have the crowding challenges, congestion challenges, air quality challenges and climate change challenges, but this is going to put a further burden on the system. We need to plan very effectively to do it. That is just a little bit more flavour on the growth.

I wanted to add a little bit more also on health, environment and safety, which are two very important aspects of the challenge we are facing. We know that there is over-reliance on cars and we know that the over-reliance on cars has important consequences because it results in inactivity. Inactivity is linked to heart disease; it is linked to cancer. If everybody in London was physically active every day, it would reduce the risk of things like type 2 diabetes by 35% to 50%, breast cancer by 20% and heart disease by 20% to 35%. I could keep going. There are lots of statistics like that. Activity is very important from a health point of view. We need to increase activity through travel and that is one of the things the MTS focuses on very clearly.



Traffic has lots of other consequences. For example, traffic leads to pollution and has a big impact on global warming as well. We know that roads result in something like half of the main pollutants that we see in London. Cars can contribute 14% of nitrogen oxides (NOx) and 56% of the smaller particulate matter (PM), which are harmful to health. We need to reduce traffic and we need to clean up London's vehicles.

The third area related to this general point is around road danger because traffic also leads to road danger. We have seen over the last 20 years a big reduction in people who have been killed or seriously injured on our streets, but most of that reduction has happened for people who were in cars. Much of the reason for that has been because vehicle safety measures have been brought in and because we have put a big emphasis on 20-mile-an-hour limits and on junction schemes at accident locations, but we are now left with a big issue for vulnerable road users. We know, for example, that motorcyclists per kilometre travelled are 25 times more likely than average to be killed or seriously injured travelling on London's roads. The focus now needs to move towards vulnerable road users. We have seen the risk for cyclists, for example, reduce very significantly, but with the growth in cycling we need to continue to emphasise that.

That was the detail I just wanted to add to Lucinda's points to give you a bit more context.

**Florence Eshalomi AM (Chair):** Thank you.

**Shaun Bailey AM:** You said 56% of particulates come from cars. Where do the rest come from?

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** From a wide range of other sources. They come from other vehicles. They come from a construction. They come from boilers. They come from a wide range of other things. Those things are covered in the Greater London Authority (GLA) and the Mayor's approach to dealing with pollutants through the London Environment Strategy.

**Shaun Bailey AM:** Thank you.

**Keith Prince AM:** You mentioned the vulnerability of motorcyclists and as a motorcyclist I am fully aware of that vulnerability. What I do not see is anything whatsoever being done to help motorcyclists. In fact, it is quite the opposite.

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** It is a key feature of the Vision Zero Action Plan that we are developing. We are very aware that we need to have a safe system approach that takes into account the unpredictable behaviours that can sometimes happen on our roads to reduce the impact of collisions when they occur and to make sure that all the people who have a responsibility for managing roads in London feel that they have a responsibility for reducing road dangers. That is very important.

There are five pillars of action set out in the Vision Zero Action Plan. The first is around safe speeds. The second is around safe streets and junctions, which I am sure is an important issue here. Then there are safer vehicles and then safer behaviours. That involves things like targeted marketing. There are --

**Keith Prince AM:** Sorry. With respect, none of that helps motorcyclists *per se*. I would be interested to see if you have any --

**Florence Eshalomi AM (Chair):** We will move on. Maybe you can take this up offline, Keith, because we have quite a lot to get through this morning.

**Keith Prince AM:** -- statistics on the accident figures for areas where motorcyclists are allowed to use bus lanes and where they are not allowed to use bus lanes. That is somewhere the Mayor has not made any progress at all.

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** We might have to come back to you on that.

**Keith Prince AM:** Yes, that is fine. Thank you.

**Florence Eshalomi AM (Chair):**

I welcome our additional member of the panel, John Dickie. He is Director of Policy and Strategy at London First. Welcome, John.

Moving on, the other area I wanted to focus on, maybe coming to you, Nicole - and Lucinda has touched on it - is the fact that, yes, London's population is growing but also people's work-life pattern and commuting is changing as well. How do you think the transport service is going to respond to that change? We are seeing more people doing flexible working, setting up their own businesses and not having to commute.

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** Yes. Since around 2014 we have seen that travel behaviour has changed. The number of trips the average Londoner is making has gone down quite significantly. In 2014 it was around 2.6 trips a day and we are down to 2.1.

Generally, the wisdom was that population growth would lead to more transport demand because everyone had a general basic travel budget. That seems to be changing. The reasons for that are not particularly clear. Some of that has to do with the flexibility around work arrangements. We have seen that people are switching more to four days a week in the office from a five-days-a-week schedule, but of course that varies a lot between what sorts of jobs people are doing.

We have seen the biggest drop in trips for leisure and shopping. Some of that may have shifted and so we may see some substitution of that with more people shopping online and getting deliveries. That is putting quite a different strain on the transport network than people going out, for instance, to Stratford Westfield or Oxford Street because, instead of the person going by public transport, we have freight delivery. Often they are not successful the first time and so we are seeing that there are more trips being made by freight. If you look at light goods vehicles, the percentage that they are making up of the traffic mix is also going up.

Looking ahead, what we know for certain is that most of the infrastructure we have today is also going to be there in the future and so, yes, we may get an extra Tube line and we may get Crossrail 2 but, overall, we are still going to have the same infrastructure network that we have today. If we are expecting growth, then we need to think hard about how we are going to make more efficient use of the infrastructure we have today. Of course there are competing demands on, for instance, road space, but if we want to make this growth happen and we want to enable people to get to work and have those agglomeration benefits of working nearby to other people in their profession, then we need to think about who is using the roads and maybe switch to high-capacity mode - buses, for instance - and prioritising those.

**Florence Eshalomi AM (Chair):** That is good. John, Silviya, one of the things that we have also been looking at is the technology and the role that plays in transport in terms of how people use a transport system. Are there any key technological changes that you think TfL should be looking at to respond to that?

**Silviya Barrett (Research Manager, Centre for London):** Yes, absolutely. Technology provides many opportunities but also many challenges in London's transport. For example, we know that digital technology is revolutionising the way that people move and travel around the city, enabling people to plan their journeys more easily and to personalise their own journeys, but there are also new mobility services that are enabling people to maybe take other modes than they would not have otherwise. For example, ride hailing has enabled people to make some journeys by taxi that they might have otherwise done by public transport, for example.

We are also seeing a shift from mobility as a product with a private car towards mobility as a service. This is a different dynamic for people than owning their own car. In many senses, that is very much a positive development because, when people own a car, it is proven that they are more likely to use it more often. If we move towards mobility as a service and car clubs, for example, there is lots of evidence that this reduces people's reliance on cars and using other modes instead.

However, if we are not careful, technology can produce challenges. For example, if it is much easier to hail a cab, then people might be tempted to use that more frequently. Therefore, we need to look at how we can encourage use of public transport for shorter journeys, look at mitigating some of the impacts of technology and reduce the impact on congestion and pollution in that sense.

Micro-mobility is another trend that can potentially revolutionise the way we move around the city. E-bikes are already on the streets and potentially there will be e-scooters as well introduced soon. That will pose new management and regulatory challenges for how we deal with the vehicles. How do we stop them from cluttering the pavements, for example? There will need to be regulation on where and how the vehicle can be used and parked.

Also, we need more regulation on how different role users behave towards one another because we have the Highway Code but that is a very old regulation that focuses on car users and to some extent pedestrians, but there will be many different types of road users in the near future that we need to consider and putting forward regulations as to how they should behave towards one another.

**Florence Eshalomi AM (Chair):** Regulation is important. All of us will have seen those random bikes slap-bang in the middle of the road. If you add electric scooters to that, it could be a recipe for disaster. John, is there anything you wanted to add on this?

**John Dickie (Director of Policy and Strategy, London First):** I will draw on one of the points that Silviya made, which is that it is uncertain quite what the aggregate impact of new technologies will be. We can make all kinds of forecasts about, for example, the interaction between shared vehicle use, electric vehicles (EVs) and autonomous vehicles, which are all trends we know are coming but we do not quite know when. We do not quite know what the consumer response will be and we do not quite know what that will mean for the transport infrastructure of the city.

However, the one thing we can say with some certainty, which we strongly believe and reflects the views of businesses in London, is that the importance of sustained investment over time in mass transit will remain critical to London remaining both a competitive city and also a liveable city. There are all kinds of very interesting questions around things like homeworking and things like shared use of cars. As you rightly say, if you do not own a car, you are likely to use it less because it is more hassle, but of course if you can share a car and you could not before, you are likely to use it more. How these things will interact is very uncertain, but the thing that is certain is that we do need to continue to invest in mass rapid transit infrastructure for the city.

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** I wanted to reiterate something that Silviya was saying, which is that currently neither the boroughs nor TfL nor the City government has the powers to regulate micro-mobility properly. Looking at, for instance, scooters and dockless bikes, currently neither the boroughs nor TfL has the powers to manage them properly on the public space.

**Lucinda Turner (Director of Strategic Planning, Transport for London):** I will add a few thoughts. Thank you, Chair. I agree absolutely with John that the importance of mass public transport and efficient modes of transport is not going to go away. Road space is inevitably limited and cars, even if autonomous, still take up road space and are inherently inefficient. If they can be used in outer London in some form of sharing to switch people from owning a car, they could have an important role as a complementary measure. That is why the MTS set out a framework within which we were exploring technology and trying to maximise the opportunities it offered but to manage some of the potential impacts.

We sometimes need to remember that technology is great. My goodness, I wish I had a crystal ball. The things that have changed over the last 20 years that we have seen are unprecedented. There is a team in TfL specifically looking at this and Michael Hurwitz [Director of Transport Innovation, TfL] is coming to talk to you later. Some of the solutions we are talking about here and some of the most important solutions are actually pretty low-tech - walking and cycling - but the information revolution with technology can give us to help people make choices and to make those choices even better. Information is becoming ever more critical in our transport offer. With the information we have made available, there are 600 apps now that people can access and make use of. Simon's team has developed new modelling capability to try to understand and to be able to model scenarios with apps. As you say, it is inherently uncertain, but we need to try to understand some of those implications.

**Florence Eshalomi AM (Chair):** That is good. You touched on it briefly, both you and Simon, in terms of how we make sure that the transport system is resilient to climate and environmental change, but what do you think that TfL, the Mayor, Londoners and businesses should be doing to mitigate some of those risks?

**Silviya Barrett (Research Manager, Centre for London):** One of the main shifts that we need to see is cleaning up London's road vehicles as they are the main contributor to both CO<sub>2</sub> emissions and pollution. Transport is a contributor to the majority of CO<sub>2</sub> emissions and road transport accounts for 90% of that. In terms of pollution, the majority of both NO<sub>x</sub> and PM comes from road transport as well. Cleaner vehicles would be very much required to make sure that we live in more sustainable and healthier ways.

EV infrastructure is part of that, providing incentives for people to move towards cleaner vehicles, enabling them to do that more easily. The report of the EV Infrastructure Taskforce was published recently and that was very much welcomed. Interoperability is a key part of that, ensuring that people can very easily charge their vehicles with technologies that are available from different operators.

Another key point in the report was about hubs, i.e. charging hubs, but also there should be wider mobility hubs providing access to some of those alternative solutions and mobility services that are now available, making them public spaces.

Crucially, we need not only cleaner vehicles but fewer vehicles overall. We will not be able to manage the challenges on our finite road space unless we have fewer vehicles. Road pricing can be a key part of delivering that.

**Florence Eshalomi AM (Chair):** Yes, we will come to that a little bit later. I am mindful of time.

We are moving on to our second area, which is looking at the challenges facing the capital. My colleague Assembly Member Copley is going to lead on that, looking at housing and economic growth.

**Tom Copley AM:** Thank you, Chair. My question is focused on how transport can support the growth of housing that we need in London. The first thing that comes to mind is Crossrail 2. In what areas does the transport infrastructure need improving to facilitate housebuilding? Can I start with Lucinda?

**Lucinda Turner (Director of Strategic Planning, Transport for London):** It is important that we look both at connectivity and at capacity in this regard. A lot of the potential areas for development in London are already reasonably well connected. Over half of the large site capacity is identified in Public Transport Accessibility Level 4 to 6 areas and so there is connectivity there.

Some of the challenges where there is connectivity relate to being able to get on the transport system and capacity at stations and on the lines, and so clearly that is an important aspect. We also need to think not only about the strategic but about the local. We need to make places work and we need to make places amenable to walking and cycling and those local journeys so that people feel able to travel sustainably. It is not just access to the public transport system but wider improvements there.

A lot of development on large sites is in Opportunity Areas. As I said, some of those are simply well connected, but some of them where there are the largest opportunities for delivering large-scale housing are not as well connected currently. We clearly do need to look at extending the reach of our transport system as well and we are looking at a number of projects around that including the Bakerloo line extension (BLE), the Docklands Light Railway (DLR) crossing into Thamesmead and all sorts of projects that we know could help deliver thousands of new homes. I guess the challenge there, as ever, we come back to funding.

On a more localised scale, my team specifically looks at supporting the delivery of housing and making sure it is in line with good growth principles. We established some years ago the TfL Growth Fund, which is about £500 million explicitly targeted at unlocking transport constraints on housing and regeneration. These are schemes that under traditional transport appraisal may not necessarily always make it to the top of the priority list because, interestingly, if you deliver a new station the impact on existing users is negative. Their value of time is impacted negatively, but we know it opens up and catalyses that development. The Growth Fund is explicitly targeted on schemes that deliver things like station improvements and enhancements and new stations even in some areas.

**Tom Copley AM:** Can you give an example of one of these projects?

**Lucinda Turner (Director of Strategic Planning, Transport for London):** One example is at Elephant and Castle. We have committed money to upgrading and expanding the capacity there because the growth in the area could not cope. The modelling shows that we would be having to shut eight lines regularly in a few years' time if we do not deliver that. We have White Hart Lane Station. We have a new station committed at Beam Park. We have transformational --

**Tom Copley AM:** Where is Beam Park?

**Lucinda Turner (Director of Strategic Planning, Transport for London):** Beam Park is in the Barking Riverside direction. It is a wholly new station that would be on the c2c line. It would not be on a TfL service. We have Tottenham Hale Station improvements linked to the significant growth in that area.

We also have in the Growth Fund transformational road schemes. Sometimes transport infrastructure is there and is necessary but not in sufficient condition. Sometimes it is about place quality and perceived viability that impacts. Places like Catford and the impact of the road, the Wandsworth gyratory and schemes like that are also in the Growth Fund. It is explicitly targeted on that. The other --

**Tom Copley AM:** Was moving the South Circular through Government funding? Lewisham got £20 million to move the South Circular.

**Lucinda Turner (Director of Strategic Planning, Transport for London):** It got £10 million from the Housing Infrastructure Fund (HIF). The Growth Fund is looking to match-fund and to complete a funding package because the other thing that the Growth Fund is targeted on is making best use of the money by leveraging third-party contributions so that the burden does not all fall on the public sector. There are many examples. At Canada Water's Surrey Quays Station, the major development happening there will be contributing a significant amount. At Thameside West there is a new station planned linked with the new development and, again, we are leveraging funding from the developers themselves to make sure that they bear an appropriate cost. It means that the Growth Fund goes much further. It is designed to do deals, to identify those opportunities and to make the most of that.

We are also bidding for the HIF. Catford is one example of the Marginal Viability Fund. Boroughs bid for that money and it is a maximum of £10 million or £20 million from that fund. We have been working to support boroughs in that, but we have also been working with the GLA to access the forward funding, which is a maximum of around £250 million, although that is a relatively soft cap. We have put together bids that are explicitly focused on supporting growth and unlocking housing. We have been successful, for example, in the DLR HIF bid, whereby we will get £291 million from central Government to direct to extra trains on the DLR system, to a new station at Thameside West, to looking at the opportunities around Poplar and to unlocking the depot site there for housing by investing in Becton Depot expansion.

**Tom Copley AM:** I have heard several complaints recently about how congested the DLR is. It is a number of years before we get the new trains.

**Lucinda Turner (Director of Strategic Planning, Transport for London):** We are working as fast as we can to get them. We appreciate the pressures in the meantime, but with the HIF bid and our business plan programme we will have 57 new trains being delivered there. That will deliver a 67% increase in peak capacity on the DLR, which is much needed but important, and it will deliver improved cross-river connectivity. We will have a train every four minutes from Woolwich and from Lewisham to Stratford directly, for example. It will deliver a significant and important boost.

I know that in transport we always face that. Transport investment has quite long lead times. We accept that.

**Tom Copley AM:** Yes. I am glad you mentioned the Bakerloo line, as a Lewisham resident. You also of course highlighted the funding challenges. Do you know? Is TfL doing any more work on land value capture? It seems ridiculous to me. For Crossrail, for example, so little money was raised from land value uplift. I know that TfL did the development rights auction model and then decided it would not work in London. I know that

KPMG came up with a whole range of ideas for TfL, to a lot of which the Government said, “Absolutely not”. Is any more work going on in this area?

**Lucinda Turner (Director of Strategic Planning, Transport for London):** We are continuing to push. You flagged the work that we have done. We have published two reports on this in the past couple of years and have pushed central Government. It is right, though, that we need movement from central Government to enable us to do it.

It is definitely an area that we should be looking at. One of our studies showed that the estimated value uplift from a set of proposed schemes we looked at was £87 billion over 30 years compared to a cost of around £36 billion. It has to make sense.

I guess the note of caution is that there are no easy options, and particularly I will flag that quite a lot of the value uplift arises to residential properties and so politically that is always quite difficult, but we are continuing to look at it. We are very open to trying to work with central Government but we do need changes to regulation and legislation.

We looked at stamp duty land taxation, for example, as well and whether the Government would ringfence some of the uplift in that from areas from a zone around the transport improvements that were being delivered. As you say, they have not moved on that.

**Tom Copley AM:** Our likely future Prime Minister when he was Mayor [Boris Johnson] was a great advocate of devolving all the property taxes to London. Given his reputation for consistency and principle, I am sure that you will set to that immediately when he gets into office. Thank you very much, Lucinda. That was very comprehensive. I need to move on to some of our other guests and so perhaps if I could go to Nicole --

**Florence Eshalomi AM (Chair):** Are there any other points as well, Tom?

**Tom Copley AM:** -- do have any additional points on the transport infrastructure and supporting housing?

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** Yes, maybe to highlight what Lucinda was touching on as well. When we have sites that we can unlock for new housing, it is so important that we develop them with general practitioners and with schools nearby so that all of those other trips, not necessarily your commute, can be catered for at a more local level and are not adding to the strain of the wider network into central London.

On options for funding some of these schemes, other cities might have some suggestions. Yesterday Berlin suggested that they were going to introduce a €365 annual ticket and some of that was going to be funded by having an employee tax. You would pay as an employer some small amount - I think it is a few euros each month - but that would contribute to the budget for investing in infrastructure for employees.

**Tom Copley AM:** That is interesting, but of course I do not know how congested the Berlin metro system is compared to London but I would imagine that if you did something like that here with vastly more people, we would not have the capacity necessarily on our current transport system. Would you agree?

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** Yes. Of course, we have been talking about more generally capacity as a big issue, but it might encourage some of those smaller trips that you are doing maybe more locally, especially in the outer boroughs



where there is potentially a choice between getting a bus or getting into your own car. That could come under the heading of trying to get to this target of 80%. If you look at some of it, there does not seem to have a big change in the last few years and the modal split of general trips is still around 63%. It is quite an aspirational target and we do need to think of more radical ways of encouraging people to use public transport as the default after they have considered active travel.

Also, thinking about the connections around these new housing developments, do we have bus routes that are taking them to where the schools might be and to where the high street might be? These are important considerations so that we do not develop what I would call 'residential dormitories', where you are just having to leave where you are living all the time.

**Tom Copley AM:** Thank you. Simon, do you have anything to add from the TfL perspective? We had quite a comprehensive answer from Lucinda.

**Lucinda Turner (Director of Strategic Planning, Transport for London):** Sorry, I could talk for days on growth and housing.

**Tom Copley AM:** No, it was very interesting.

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** I have a couple of points because it is Lucinda's specialist area. It is important to be aware that the whole MTS is relevant to this area because the 80% mode share target is about creating an environment where London can grow effectively without too many problems and consequences.

Things like the Healthy Streets approach are very relevant. Buses, particularly in outer London, which are flexible, affordable, accessible and can be scaled up or down quite rapidly, are very relevant to accommodating housing. At the other extreme, things like Crossrail 2 are also very important because they can generate large volumes of housing capacity. We know that Crossrail 2 could support up to 200,000 extra homes as well as increasing the capacity of the rail network and dealing with a number of problems. A very broad answer is required to answer a specific question.

**John Dickie (Director of Policy and Strategy, London First):** First, I suppose I should say how welcome it is that TfL does see its role now as not simply being a transport authority but looking at the role investment can play, not the usual systemic things a transit authority would look at --

**Tom Copley AM:** It is of course a developer now as well.

**John Dickie (Director of Policy and Strategy, London First):** That is exactly right. That is a very important and welcome development for the city.

Rather as Lucinda said, the critical thing around scale housing development is going to be new infrastructure that unlocks new parts of London because vital as, for example, the central section of Crossrail 2 is for capacity relief, it is not really going to unlock a huge amount of development because we are dealing with a very developed part of the city already. It is Crossrail 2 particularly in the Upper Lea Valley. It is the BLE. It is the ability of the DLR to unlock growth in Thamesmead for Peabody. Those are the kinds of developments that will make a big difference. Of course, with the extension of the Gospel Oak line, we are starting to see that happen in practice.

I would add a couple of points. One is of course the importance of TfL as a developer using its own land. TfL is going to provide 10,000 starts as a target. That is not going to solve London's housing crisis, but we need a lot of 10,000 starts to solve London's housing crisis.

The importance of developing at scale in these areas is also really important. We do need much denser development than has traditionally been the approach in most boroughs most of the time. That of course needs to be done well. It needs to be done with concomitant social infrastructure. There is absolutely no argument for building the slums of the future. However, we do need to be looking to see how we deliver the most housing we can particularly in areas that are going to be really well connected.

One of the things we have not got quite right with Crossrail is the scale of development around Crossrail stations in outer London, for example. That neatly segues into value capture. Value capture is not only an important way of financing and funding new infrastructure. It is an equitable way of financing and funding new infrastructure, but it is not a magic bullet. It is not a magic bullet because, exactly as Lucinda said, a great deal of the value uplift created goes to existing homeowners.

I was on the last iteration of the London Finance Commission. There are some very enthusiastic technocrats who want to capture all this and there are some people who run for and hold elected office who are running away from it as fast as they can. The message I would give to the Assembly is that if you want to be pushing this, you are the right people to push it because you are the people who will be facing the electorate and explaining how they will pay for it.

**Tom Copley AM:** I have been, yes. I do very much take your point. You are absolutely right. It is very challenging.

**Florence Eshalomi AM (Chair):** We have to move on, Tom.

**Tom Copley AM:** We have to move on. Can I ask quickly about mayoral devolution?

**Florence Eshalomi AM (Chair):** Yes, please do.

**Tom Copley AM:** Sorry not to come to you. Do you have anything?

**Silviya Barrett (Research Manager, Centre for London):** It was exactly mayoral devolution that I was going to talk about.

**Tom Copley AM:** In that case, could I ask you very quickly then about that and how that can support housing growth?

**Silviya Barrett (Research Manager, Centre for London):** Yes. It is a general point really that we support the Mayor's calls for devolving suburban rail, especially in south London, to TfL and to the Mayor's office. We published a report, which is now a couple of years old, looking at the capacity that this would unlock. Calculations done at the time show that we can achieve that twofold increase in capacity that would be required in 2050 in south London. Not only that, but it would of course unlock thousands of new homes and new jobs in the area. South London is really the area that is very much underserved by rail and existing capacity and so we very much support that. Also, to devolve the control of the infrastructure on rail, we agree, would improve efficiencies and the running of the network as well.

**Tom Copley AM:** Thank you. Very quickly, going to Lucinda, any progress on rail devolution?

**Lucinda Turner (Director of Strategic Planning, Transport for London):** We have submitted a compelling business case. We are feeding into the Williams Rail Review, which will be a key point in this, but we need metroisation. We want to go beyond that devolution.

In terms of the London Plan and housing delivery, suburban intensification is going to have to play an important role and metroisation is fundamental, we believe, to that. The business case outlines some of the improvements that we can deliver. They are very tangible and will help us integrate that land use and transport planning even more.

**Tom Copley AM:** I am going to have to leave it there, I am afraid. Sorry.

**Florence Eshalomi AM (Chair):** Thank you. Leading on to some of the other issues facing the capital, Assembly Member Russell.

**Caroline Russell AM:** Thank you, Chair. The Committee on Climate Change has today said that it does not feel the Government is making enough progress on transport emissions. I am wondering what they can learn from London. Lucinda and Simon, perhaps you could run through what TfL is doing to decarbonise transport?

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** That is a very topical question with the report overnight, which was a little bit focused on the adaptability of the network.

In terms of what we are doing to try to decarbonise and clean up transport in London, first, we have the Ultra Low Emission Zone (ULEZ) and before that its predecessor, the Toxicity Charge. The ULEZ is now in place. The next stage of our plans is the Low Emission Zone with tighter Euro 6 standards, which will be coming into operation in 2020, and then in 2021 an expansion of the ULEZ to the North and South Circulars. Those are key elements of our strategy to reduce emissions and to clean up London's air.

There are plenty of other things that are going on. To give you a flavour of probably not everything that is being done but of the ones I am aware of, there are Low Emission Bus Zones, which are very effective. Seventy-five percent of all --

**Caroline Russell AM:** Are you talking about NOx and PM or are you talking about carbon emissions?

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** I am talking about cleaning the vehicle fleet, which has an effect on both areas.

**Caroline Russell AM:** Of course.

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** That is why it sounds a little bit more general. We have moved on from several years ago when the dieselisation of the fleet to deal with carbon ended up causing an air quality crisis. We are trying to deal with everything together. That is why I am covering these broader issues.

Seventy-five percent of all TfL buses now meet or exceed the ULEZ standard. The cleanest buses, for example, are in the central zone, but the routes cover the whole of London and that creates London-wide benefits.

The Low Emission Bus Zone air quality modelling that has been undertaken has shown that NOx emissions have reduced by 90%. Ten of them have been introduced to date and there are two more coming on stream. For example, in places like Putney High Street in Brixton, there has been a major impact on pollution levels.

There are also things going on to clean up the taxi fleet, which is another thing that is relevant here. We have been phasing out diesel taxis from 2018. There are going to be no new diesel taxis licensed in London and all new taxis are going to be zero-emission capable. There are financial incentives provided and something like 175 rapid-charge points have been put in place, some of which are focused on the trade. Consultation is underway at the moment to reduce the maximum age of some of the older diesel taxis to 12 years. That is happening. The idea behind that is to accelerate the uptake.

There are measures in place to clean up the air around schools, preventing idling, encouraging walking and cycling, cleaning up air pollution hotspots in London boroughs, and improving air quality alerts to help people reduce their exposure. There is information on something like 2,500 countdown sites now at bus stops and direct emails are being sent out to schools and other stakeholders.

We are reducing air pollution from other non-road sources. There are non-road mobile machinery low emission zones. There is the work we are doing on Heathrow, which is a key issue for air quality in London in terms of compliance and also carbon as well. Then there is the low-income scrappage scheme. There is a very wide range of things that are being done to address those issues.

**Caroline Russell AM:** That is a wide range of things. One of the areas is electrification of vehicles and the EV charging. TfL is committed to installing at least 300 rapid-charging points by 2020. Do you think this is enough to convince Londoners to make that switch to EVs and, if not, what else do you think needs to be done?

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** It is something that will have to continue to evolve in line with the take-up of EVs and we need to monitor the take-up and try to put in more electric charging points if they are required to encourage more take-up.

**Caroline Russell AM:** You do not think that you should be trying to get people to do other things than driving cars?

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** The crucial point is that the Strategy we have is about trying to reduce the amount of car travel. The MTS aims to reduce car travel or road traffic by 10% to 15%, which is quite a significant amount. Part of that as well is trying to get to this 80% mode share target, which is having 80% of all travel in London by 2041 done by sustainable modes: walking, cycling and public transport. That is an absolutely key element of the Strategy to address carbon.

**Lucinda Turner (Director of Strategic Planning, Transport for London):** To add to that, as well as those 300 charging points, they will be supported by 1,100 residential charging points. However, you are right. Even with the 80% mode share target, there will still be vehicle kilometres on the roads and so focusing on that technology and making those as clean as possible has to be part of the answer. More widely, it is about that mode shift we have talked about. It is about getting people out of cars and on to public transport, walking and cycling.

**Caroline Russell AM:** The Mayor's EV Infrastructure Delivery Plan looks at how the EV infrastructure is going to be delivered and it says, "With less public subsidy". What exactly does that mean? What is TfL exploring over that?

**Lucinda Turner (Director of Strategic Planning, Transport for London):** I probably do not know. We might have to come back to you on some of the detail. I know we are exploring delivering hubs, which make it more cost efficient to deliver and leverage in partnerships as well to get other people and businesses to deliver some of that charging infrastructure. I could follow up with you in more detail on that.

**Caroline Russell AM:** Yes. The other issue is the use of the pavement for vehicle charging infrastructure. It seems that TfL should presumably have a role in protecting the public interest and the public purpose of the footway, which is for people to walk, use wheelchairs or push buggies. The risk is that the pavements start to become littered with infrastructure that is for the purpose of selling fuel to private car owners. It is infrastructure that is possibly owned by companies other than TfL or the local boroughs, which potentially has problems going into the future. If you think about all those old telephone boxes around on the pavements, they are proving very difficult to get rid of in some cases, despite the fact that they are no longer used.

What public protection is there to make sure that the public interest is protected from all this rush to provide EV infrastructure in the boroughs?

**Lucinda Turner (Director of Strategic Planning, Transport for London):** It is funny you should mention the telephone boxes. My team has had to deal with thousands of applications for the Trojan horse of advertising. The Government has now changed the permitted development rights on those.

You are right to have a note of caution. It is absolutely right that the Healthy Streets approach talks about street clutter and making sure that our pavements and streets are fit for purpose. It is about getting the infrastructure in the right place. It is also about being a bit more imaginative. There are plenty of examples where the infrastructure is integrated into streetlamps or other things that are already there, which helps to reduce clutter.

That is another reason why there is a focus on hubs rather than sporadic dotting and there is a focus and, where possible, looking at where that can be off-street. There are things like retail carparks, for example, where there is space and they do not have those implications. It is inevitably a balance of all these things, but we do see a role in making sure that balance is struck.

**Caroline Russell AM:** There is definitely an awareness of that and protecting the interests of pedestrians?

**Lucinda Turner (Director of Strategic Planning, Transport for London):** Yes.

**Caroline Russell AM:** Thank you. What about the electricity that is being used by TfL to power the network in the first place, the electricity that is used to power the trains and buses? I believe TfL currently uses about 0.01% renewable electricity, which is not great. Do you know what is being done to move that on?

**Lucinda Turner (Director of Strategic Planning, Transport for London):** I know that it is certainly part of the Strategy to improve that. If I may, I do not know the detail and so if I can get back to you --

**Caroline Russell AM:** Could you come back to us on that?

**Florence Eshalomi AM (Chair):** If you come back to us, that would be helpful.

**Lucinda Turner (Director of Strategic Planning, Transport for London):** Yes, I will, certainly.

**Caroline Russell AM:** That would be very useful. We have covered quite a lot on the ULEZ already, but what support is needed from central Government to further improve London's air quality?

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** Probably the main area, if we move into vehicle scrappage, is around supporting that kind of thing because it does need to be a nationally led scheme. Also, central Government needs to recognise that these costs cannot all be borne by regional or local authorities. It is probably around those two areas. It is important that central Government supports these areas.

**Caroline Russell AM:** Anyone else?

**Silviya Barrett (Research Manager, Centre for London):** If I can add to that, I very much support the scrappage scheme that the Mayor introduced at the beginning of the ULEZ. I know there is one for low-income Londoners as well that has not started yet and we are looking forward to getting some more details on that.

Yes, the role of central Government in funding vehicle scrappage would be important because other cities receive funding that London does not, for example, the Clean Air Zone implementation funding, the innovative city funding and various other pots of money that London has no access to. That would be a big area to look into.

There are things that we can do much more locally at the London level and the local authority level. For example, a lot of good work is happening in terms of training and supporting businesses to move to cleaner vehicles such as cargo bikes. Local support is very valuable there. Subsidised bike hire is another way to get people to shift to different modes if they may not otherwise be able to or are thinking about it. Subsidies and grants for EVs more generally play a big role and, again, deferring to central Government on that point.

**Lucinda Turner (Director of Strategic Planning, Transport for London):** More widely, beyond the transport planning system, it is having the right supportive planning policies in place via the National Planning Policy Framework and the London Plan to allow boroughs to deliver development in line with good growth, things around maximum parking standards. There are all sorts of aspects there that we do not often always think about when we think about transport, but that wider planning framework and policy is crucial.

**John Dickie (Director of Policy and Strategy, London First):** Can I emphasise the resourcing point before we finish this bit, which Simon touched on? It is of course right that we need a proper national scheme around scrappage. This is particularly an issue for smaller businesses that are relying on the diesel vans they were incentivised to buy to save the planet a few years ago, which of course are now killing everybody. Having a proper scrappage scheme in place that gives them the right incentives is important.

The other thing is the resourcing that TfL has as an operator. If we are going to have zero-emission buses across the whole of London, TfL is going to have to pay a substantial amount to get those zero-emission buses across the whole of London and it does not really have the money to do that now, given the current levels of bus subsidy and the general state of TfL's income. We do need to think, as with so many other things, about

quite how we get ourselves in a position where TfL has the resources both in operating and in investment terms to deliver the services that we need over time.

**Florence Eshalomi AM (Chair):** We are going to come to that section a bit later, John. Thank you.

**Caroline Russell AM:** Are you thinking there about road pricing are you thinking about vehicle excise duty (VED) being devolved?

**John Dickie (Director of Policy and Strategy, London First):** There is a whole range of ways you could give TfL more resources. The ULEZ generates some resource. Extending the Congestion Charging Zone, which we would support, would generate more resource too, as would modernising Congestion Charging Zone, having a system whereby you do not pay just once to come in and drive around all day but you pay per kilometre travelled and so forth. There are things that could be done already by TfL.

There are that transport-specific bits of central Government revenue like VED that could be devolved. There are other things that could be devolved. I am fairly relaxed about quite what particular devolution or charging package we introduce to give TfL greater resources. The importance is that those great resources come.

**Caroline Russell AM:** Thank you. Finally, going back to the Mayor's Healthy Streets approach, which is aiming to take a public health approach to transport planning, looking forward, are there things in particular that TfL should be building on?

Nicole, I was wondering if you could start us off. We have a Healthy Streets approach. When new junction designs come out, they come along with a Healthy Streets spider diagram. In order that Healthy Streets is properly embedded, what are the things that need to be pushed forward on Healthy Streets to help with this overall agenda of reducing carbon emissions, cleaning up the air and keeping our city functional so that the transport system is not grinding to a halt?

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** Instrumental to achieving healthy streets and achieving the 80% target is shifting away from private transport on our roads and freeing up space to make some of these places rather than locations of movement. Also, of course, having funding is important. That funding can be given to the local boroughs to improve their streets. Road pricing is a good way of reducing demand for private vehicle usage in the city.

Another thing would be around freight consolidation. Consolidation is not something that makes financial sense for the companies themselves and so having consolidation centres dotted around the city might be something that really has to be city-led. One idea might be to do something like a franchising arrangement where one distributor or one delivery company bids to operate in a certain borough or in a certain part of the city. Instead of there being a lot of duplication with a lot of different delivery vans going out - and as I mentioned earlier, they are often not successful in the first instance - that would be consolidated into one. Looking on the streets, we also need to think of a loading bay strategy. Often a lot of the delays on the bus network are because people are parking in the bus lane or the bus stops.

What we need is a very holistic view on how we are going to achieve that. Healthy streets and places and good public transport are the goals but we need concrete actions now. This goal is very well articulated in the Mayor's Transport Strategy. What maybe now needs to follow more rapidly than is already in place are actions, and more radical actions, to make that happen.



**Lucinda Turner (Director of Spatial Planning, Transport for London):** Just a few thoughts to add. We are spending £2.3 billion on Healthy Streets over the course of our Business Plan. We take it very seriously. The centrality of health in our planning has definitely increased. The consultation on 20 mph zones, for example, is just coming to a close. A significant proportion of people are telling us that that could help them and encourage them to cycle and walk more. Our Cycling Action Plan indicated that the two biggest deterrents are around safety and too much traffic. We clearly need to tackle those issues. If we look at all car trips at the moment, 50% of all car trips across London could be cycled in ten minutes. There is huge potential here.

Just in terms of something very close to my heart, we have issued new guidance on transport assessments for new developments with a much stronger focus on Healthy Streets, ensuring that they assess not only access to public transport, as I mentioned, but active travel zones, and they look at how they integrate their developments into the cycle and walk networks. There is very specific stuff happening on the ground there and we have been out and offered training to both consultants and boroughs across London to help support them in delivering those new aspects of it. There are some very tangible things we are doing.

**Caroline Russell AM:** Silviya, did you want to add anything on that?

**Silviya Barrett (Research Manager, Centre for London):** Not particularly. The focus on quality public realm and attractive places is important to make people want to spend more time outdoors, as well as the safety aspect and less clutter from cars and vehicles.

**Caroline Russell AM:** Thank you.

**Florence Eshalomi AM (Chair):** Great, thank you. I am just mindful of time. We still have a few more sections. Could we be quite short in our replies and questions, Members? We are moving on to section 3, which is looking at people's experience of moving around the capital. Assembly Member Kurten.

**David Kurten AM:** Thank you. Good morning, everyone. I just want to ask you a few questions about people's experiences of moving around the capital and how you see that changing in the future. My first question is: what do you think, in the coming years, are going to be the big changes in how people move around the city? I know you have already said in your answers a little bit about modal shift and the Mayor's target of 80% public transport, walking and cycling by 2041 and I do not know if you have anything more to say that has not been covered. We are particularly thinking about the differences between inner London and outer London because sometimes there is a very big difference between life in different parts in the city. If you have anything to say about that, please do.

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** I would just reiterate the points Silviya [Barrett] made earlier about new technology becoming available. Think of the ride-hailing apps. Because of the ease of it and the pricing that they have come in at, under the taxis and often very competitive with public transport if you are sharing with one or two people, that will take off and there will be more of them. We have seen that in the last few years on our streets. Obviously that is not the most efficient use of public road space. Generally, technology can be very disruptive. There is the potential of connected, autonomous vehicles. Again, Government needs to think ahead about how we are going to regulate that so that it aligns with wider aspirations and the wider vision for the city of how we get around.

Looking at outer London, there is potential and the opportunity for demand-responsive transport, which might be a good service to feed into the public transport system. It is also an opportunity to provide good access for people with mobility challenges. We have an aging community in London.

A summary would be that technology presents opportunities but also challenges and Government needs to be agile enough to respond to them with regulation.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** We do recognise the differences between inner and outer London. I know some people think we are sometimes focused on central London and so on, but clearly there are differences. I would say also that outer London is far from homogenous and there are significant differences in potential there. If you look at Hillingdon, even 58% of the car trips there by Hillingdon residents could be cycled under our analysis, which already takes account of encumbrance and other factors. The London Plan and other policies do recognise that the context is rather different.

Some of the changes we will also see are around our bus network. We are looking to invest and increase the kilometrage in the outer London but also modernise the offer. We are looking at things like more express services and more modern buses. We will have six wholly new bus routes starting in outer London over the next six months: Kidbrooke; the X180; Harrow to Heathrow; 278, which is Ruislip to Heathrow; and a number of others. They are wholly new routes.

My colleague here mentioned demand-responsive transport. We have launched a trial in Sutton, for example, looking at how that might play a role. That will help our understanding. Will it be able to provide better alternatives to those in outer London who are more car-dependent? We have to recognise that there are fewer alternatives for some of those journeys at the moment. Will that be able to provide a good complement to the traditional bus network? We are due to launch a trial in Ealing as well. There are all sorts of things that will be changing over the coming years.

**John Dickie (Director of Policy and Strategy, London First):** Could I just add a couple of points, if I may? I am a bit like a broken record, Chair, but I will reiterate that in outer London, where densities are less, average costs are higher and cars are relatively more efficient for journeys than they are in central London, if we are going to affect modal shift again we return to the need for investment in new services to support that, particularly if we are going to do innovative demand-related things around the last mile to get people to and from transit nodes.

I just want to make a slightly different point on some of the innovation and technology that is affecting the way people travel in the city. It is of course right that we need to have the capacity of city government to regulate innovation and we need to be agile and forward-thinking, which TfL has not always been in quite how it approaches that legislation, but we do also need to remember the extraordinary benefits this brings. We are too quick, often, to think of the disbenefits, which there are and which do need to be managed. I have teenage children and Uber has transformed their ability to get around the city safely at night when they return from the sorts of parties teenage children go to. This is of course an experience that I imagine most of us have had using ride-hailing apps over the past few years. We absolutely need to think about the holistic impacts on the city and we do need proper oversight and regulation, but equally we do need to remember how a lot of these changes are making a lot of people's lives a lot better.

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** Just going back to what we were talking about earlier about scrappage schemes, it might be good if some of these schemes would also offer the option to trade in your car for an e-bike, which might be a

good solution for the last and first mile and a way to encourage mode shift, and also the challenge of how you get home from the Tube or bus station late at night in a less densely residential area.

**Silviya Barrett (Research Manager, Centre for London):** I have a couple of points to add here, if I may. On the scrappage point, what was suggested in our recent report was that we provide mobility credits that can be used across a wide range of services including public transport, bike hire and car clubs, whatever the person chooses, as opposed to purchasing a new vehicle. That provides a much wider choice of options that people would have then in how they move around the city.

Related to that, on John's [Dickie] point about mobility services, we have a proliferation of private sector apps, of course. If we had a TfL alternative that provides multi-modal journey planning services, that integrates public transport, private car hire, car clubs, bike hire and so on from a variety of operators, then that would make things much easier for customers and perhaps incentivise greater usage of those options. It would be able to compare the impact of that journey as well as the costs. For example, you would be able to see journey times and compare journey times, compare journey costs, but also perhaps the emission impacts that you might be able to make or not make by having a certain choice of mode. Perhaps there is a role for TfL there as well.

**David Kurten AM:** Thanks. Another question, following on from some of your answers. Buses obviously are a very important way for people to travel around, particularly in outer London, but bus usage is falling at the moment. What do you think is the reason for that and how should TfL respond to that? We can ask TfL to start with.

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** Do you want me to start? It is a really interesting question and something that obviously we are doing a lot of thinking about at the moment. Bus usage increased very rapidly in the 2000s. The expansion of the network resulted in a very large increase in ridership. However, over the last two or three years bus ridership has been reducing. We also saw a flattening of Underground demand more recently, though there may now be a return to growth on the Underground.

There are diversions between those two modes of travel and our analysis suggests there are different sets of drivers affecting the demand in those areas. We think, for example, that Underground demand is affected by central London employment and we know from our other work that employment in London has continued to grow and jobs have continued to increase. Things like tourism and spending in higher-income households also affect the Underground, whereas bus demand tends to be affected by employment not just in central London but more spread across greater London and is also affected by consumer spending in lower-income households.

We know that there has been a squeeze on incomes with the uncertainty in the economy. We know that housing prices are high at the moment. We think those are the kinds of things that affect bus versus Underground demand. We also know that National Rail has been growing quite substantially. In 2018 we saw something like a 4.5% increase in National Rail in London and the southeast area, which has a little bit of a knock-on effect on the Underground. It was partly because of the massive amount of disruption that took place the year before so it is a bit of a rebound effect as well. We are carefully monitoring these trends. It is definitely linked to the uncertainty in the economy.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** Just to add to that, we have also had challenges with regard to bus speeds and congestion. That goes back to needing that mode shift to

enable us to manage the network efficiently and help those essential journeys by freight and servicing on buses. We are also working closely with the boroughs to try to deliver enhanced bus priority to try to tackle that and ensure that bus users can have those reliable journeys with good journey times.

**David Kurten AM:** What journeys in London are particularly challenging for people to make? Also, are there any particular places that you think are really bad for people to travel between that need improvement?

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** In the context of our strategy, which is trying to move people onto walking, cycling and public transport, the challenge is quite firmly or squarely placed around outer London, where the density of public transport networks is not the same as inner London. On the question I believe you asked a minute ago about the differences between different areas, that is very apparent in terms of the density of public transport. That is one of the key features really, from my point of view.

**David Kurten AM:** Yes. You mentioned obviously that the plan is to reduce the number of people driving cars and taking private vehicles but you need to offer choice for people to do that. You have mentioned that, and John [Dickie] and others of you have mentioned that. Are there any specific transport projects that TfL have that you think you need to prioritise in order to make that happen, to reach your targets?

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** It is just worth reiterating a point Lucinda [Turner] made earlier about the opportunity to mode-shift, which is not necessarily entirely dependent on public transport density and availability. You mentioned the figure that 70% of car trips by London residents could potentially and realistically be walked, cycled or taken by public transport. If you break that down you find that more than half of car trips could be cycled in less than 10 minutes and more than a third could be walked in less than 25 minutes. This demonstrates this huge potential for mode-shift that is there. Some of that is not dependent on public transport services but on walking, cycling and active travel.

**David Kurten AM:** Are you talking about car journeys below a certain length? Are you talking below 2 miles or something? Is that your criteria for making that statement?

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** We look at all car trips but we then try to look at the switchability of those car trips by trying to work out whether the journey was made carrying luggage or equipment, in large groups or late at night. We have something called the switchable trips analysis that enables us to make these assertions and calculate these sorts of figures.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** Length is clearly an issue in that but if you look at just car trips in outer London, over one third of those are less than two kilometres. There is significant potential here.

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** We are aiming in the Strategy to get 70% of people living within 400 metres of the London cycle network, for example. These sorts of things can have a very big impact.

**David Kurten AM:** When you talk about modal shift in terms of percentages, is that to some extent irrelevant because what is really important is the total number of vehicle journeys that are made? You have an increasing population so there will be more journeys made in total. You are talking about London's population increasing from nine million to 11 million, approximately. You mentioned modal shift and taking the number of private car journeys down to about 20%. You say 80% public transport, cycling and walking, which means 20% with

other modes of travel. What is that in absolute numbers of journeys? If you reduce the percentage but the actual total number of journeys by those modes does not change, you are not going to relieve congestion. You are not going to reduce the absolute number. What are your figures in terms of absolute numbers of car journeys or journeys that are not via public transport, walking or cycling?

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** When we produced the Mayor's Transport Strategy we did produce an extensive evidence base where that information is. I cannot give you the specific numbers right now but just to give you some comfort about the sorts of figures that were coming out of that in terms of traffic, which is one of the key focuses of the Strategy because of the climate change, air quality, safety and health aspects of it, with the full Strategy in place traffic reduced by 10% to 15%. That is something that is being considered and tracked as part of the Strategy.

Clearly there is an increase in cycling. We need to accommodate that and we want to accommodate that because of active travel. There is an increase in walking for the same reason and an increase in public transport, which also has active travel benefits because for every public transport trip there is often a journey to the stop and a journey back from the stop. It creates active travel and it is a much more efficient way of travelling. We want to accommodate that but we do not want to accommodate car travel and that is why we have a target of a 10% to 15% reduction in traffic.

It is a really good point to make, actually. It is not just about percentages, which is what we say all the time; it is about absolutes. In planning for a city you need to plan on the basis of those absolutes. My team is responsible for building multi-modal models of London and forecasting what those demands are in the future. All the work we do has the absolute numbers in it and we are planning and looking at the crowding impacts using those absolute numbers, but for the Strategy it is sometimes easier to talk about the percentages.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** It hits the nail on the head as to why it is even more of a challenge in a growing city.

**David Kurten AM:** OK. Thank you.

**Navin Shah AM:** This is a comment to our TfL colleagues on the panel. I am deeply disappointed that TfL has no plans to undertake a root-and-branch review of the outer London bus network in the way that a central London review was carried out only recently. Given the unprecedented level of development that there is in outer London and that there is going to be for years to come, there is no justification whatsoever for a strategic approach not being taken by TfL. Would you like to comment on this, please?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** Yes, I can comment on that. The absence of a complete root-and-branch across outer London as a totality does not mean there are not strategic reviews going on. What we are doing is taking areas that are tractable and that make sense in journey patterns in terms of catchment areas to town centres and so on, and we have committed to doing a series of those reviews. We have started in Croydon, Brent and a few other places and we are committing to doing more.

My team also works on Opportunity Areas and master-planning those, and bus strategies are a core element of that. At Old Oak Common, for example, or Wembley, we have developed a bus strategy and we are also securing contributions from the development in that area to pay for those bus enhancements. There is strategic work going on and we are committed to continuing that.

**Navin Shah AM:** I see where you are coming from but I am still not convinced that the key linkages in terms of people's movement, which are not quite what they should be in outer London areas, are being considered in a strategic, comprehensive manner. It is something that needs to be developed. You mentioned Old Oak Common. You mentioned Wembley. Then you have Opportunity Areas in, for example, Harrow, Barnet, Brent Cross and so on. Those linkages are very important. Talking about other social infrastructure in terms of connectivity with hospitals, high streets and so on, those are not easy. They are complex at normal times. When you are looking at large developments, that is where I believe that sense of strategic planning for outer London is lacking.

I will pick this up with the Deputy Mayor for Transport [Heidi Alexander]. I am not convinced that you are looking at it in the way that it needs to be. I will leave it at that because this is unsatisfactory, in my view.

**Caroline Pidgeon MBE AM (Deputy Chair):** Just picking it up, as a Committee we had a briefing on the central London bus changes and we were then promised a strategic, borough by borough outer London bus review. When I met the Deputy Mayor for Transport last week I was almost told that that was not ever in the plan. We were told by Gareth Powell [Managing Director of Surface Transport, TfL], who is in charge of this, that that was going to happen, which we were happy about. Our report, now two years ago, about reviewing how you do bus planning and trying a new approach based on the evidence of people likely involved, was to feed into that, and it seems you are rowing back on that now.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** We are committed to area planning. We did not necessarily say "borough by borough" because the network does not marry absolutely to borough boundaries but we have been looking at Croydon and other places. I can take that back and get somebody to follow up.

**Florence Eshalomi AM (Chair):** If you could. We will pick it up on our side as well.

**Caroline Pidgeon MBE AM (Deputy Chair):** We were told it would be borough by borough. We accept buses go beyond borough boundaries but that was how you were going to engage local politicians and communities.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** We will follow up on that.

**Florence Eshalomi AM (Chair):** Thank you.

**Gareth Bacon AM:** A couple of quick points. First, on the statistics around bus usage falling, where is it falling? Do you have that data?

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** Not with me, I am afraid, but we can provide that.

**Gareth Bacon AM:** Fine. The reason for the question - it is obvious, really - is that central London is very congested and journey times are very slow. In outer London, however, feeding into points that other Members have made, there is considerable scope to increase the bus service and if you are looking to displace some from central to outer that would be a bit of a winner. Perhaps if you write back to us afterwards with that information, that would be very useful.

The second point was picking up something Lucinda said a moment ago one third of all car trips being two kilometres or less. Simon mentioned earlier on that when you are doing your modelling that you look at the reason for the journey. Is that right? Within that statistic you have given us about one third of journeys being less than two kilometres, is that a factor you feature in? The reason I am asking is that, for example, I represent an outer London constituency and in outer London people tend to do a weekly family shop at a big supermarket. That is impossible to do on a bike. It is not even worth talking about. It cannot be done. It is not easy to do on a bus either because you have lots of shopping bags or whatever. People in that circumstance would use their car because there are very few public transport options in the constituency that I represent. Does that feature in the analysis that you do?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** The switchable trips analysis takes account of encumbrance, whether you are carrying things, the type of journey and so on. The third of journeys that I quoted were less than two kilometres was purely on the basis of distance. The other figures that have been used have been about switchable trips.

Interestingly, nearly 50% of outer London shopping trips are already made by people walking and cycling. It depends. Clearly there are choices and clearly it varies by context and everything else, but there is still a significant proportion of people who do make those trips by walking and cycling.

For town centre vitality, the work that has been done by TfL and Matthew Carmona [Professor of Planning and Urban Design] at University College London (UCL) has shown that over the course of a month, the average spend in town centres of those arriving by walking, cycling or public transport is 40% higher than by those travelling by car, which is interesting.

**Gareth Bacon AM:** Do you look at topography as well in making your assessments? Again, outer London, particularly my constituency, is extremely hilly. When I was a teenager I used to go and have to have orthodontic treatment in Beckenham. My family lived in Sidcup and I would frequently cycle there. It was about ten miles and the hills were absolutely monstrous but in those days I was young and fit and I used to see them as a challenge. Now, I can tell you right now the outcome would be slightly different.

The other thing about outer London is that often you get non-transient populations. You get older people, lots more retired people, and you get people with young families. Public transport is useful if you are coming into central London because you have the radial option -- sorry, you have the -- I have used the wrong word. It is good at getting straight in but you cannot get around.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** Yes, radial into --

**Gareth Bacon AM:** Yes.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** Yes, and the orbital --

**Gareth Bacon AM:** Yes, "orbital" is the word I was searching for. Again, if I wanted to go from Bexley Village, which is in the middle of my constituency, to Orpington, which is a journey of less than six miles, I could drive it and it would take me 12 minutes. If I tried to do it by public transport it would either be two buses and take me an hour or I would have to get the train into central London and back out again. Those are the only options we have. It is either bus, train, or drive.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** That is right. That is why I said that clearly outer London is not homogenous. There are different factors and different contexts that we need to be cognisant of. Even with the 80% mode share target, that still leaves journeys that will inevitably be done by private car. We do recognise that not all journeys can be switched. There are more that can be switched than we sometimes recognise, though, and there are a significant percentage of journeys that can be switched from private car in outer London to public transport without a time penalty. People may not be aware of them or they may be in a segment of the population that does not particularly want to take public transport but there is still some potential, even in areas where we think it is quite difficult. I do recognise that there are differences across and our transport planning and modelling do try to take as much account of those as possible.

**Gareth Bacon AM:** Thank you. Thank you, Chair.

**Florence Eshalomi AM (Chair):** Thank you. I am just mindful of time. We are going to move on to the next section. Assembly Member Pidgeon.

**Caroline Pidgeon MBE AM (Deputy Chair):** Yes. I am going to pick up the experience of using the transport network and I am going to come to TfL right at the end. I really want to hear from our other guests to get their views. What do you think would improve people's experience of moving around the capital? What things need to be done? John.

**John Dickie (Director of Policy and Strategy, London First):** Gosh. The thing in the conversation we have just had that springs first to mind is basically making buses work in the central zone of the city. I spend my entire life going around the central activity zone and there are very few times that I would think getting on a bus was a rational decision.

**Caroline Pidgeon MBE AM (Deputy Chair):** Yes, quite.

**John Dickie (Director of Policy and Strategy, London First):** I walk or I use the Tube but I do not use buses. Making the network work for the centre would be good. Of course, that would have very substantial implications for those people coming from outer London into the centre on the bus, doing a long journey.

In terms of the quality of journeys, there are two or three big things that could be done. The first big thing is of course air conditioning on those parts of the Underground that do not have it. Anybody who came in on the Northern line this morning will know exactly what I mean.

Secondly, the obvious point in terms of the quality of journey - it is one we have touched on before - which is capacity. It is seldom the case these days that you get on, say, the Northern line at pretty much any time of the day and it is quiet, but it is often almost impossible to get on the Northern line in some zone 2 or even zone 3 stations. That is a pretty poor way to start your day or indeed to finish your day but certainly to start it. Similarly, interchanging. Anybody who tries to change from the Northern line at Euston station to the Victoria line knows the meaning of pain. Capacity is a really important part of improving people's quality of journey.

The third thing I would add to that is improving connectivity and digital access on the Underground. There are understandable and different views about people being able to talk on the phone on the Underground, though in my experience in other cities where it happens it is not terribly intrusive and does not really cause a problem. The ability to have data would be fantastic and of course it ties in with the earlier discussion about being able to check your journey as you are going. That is helpful. I am sure we have all found ourselves in a situation



where that interchange you were going to make is not quite going to plan, and of course how do you know? Those are the ones that spring to mind.

The other one I would touch on is the point Silviya [Barrett] made earlier about greater synthesis of modal options. I am not sure this has to be provided by TfL. TfL being a wayfarer is great but equally TfL deserve credit for the amount of data they have put into the public domain, which allows innovation and others to come up with things. You can pick and choose whether you like Google Maps to tell you how to get through, or you like Citymapper, or you like Journey Planner. You can compare and contrast the often strangely different routes they suggest you take and that is great for choice. Being able to use data, being able to access it when travelling but also having a greater choice of apps that synthesise different data sets would be very powerful too.

**Caroline Pidgeon MBE AM (Deputy Chair):** Very helpful, thank you. Silviya?

**Silviya Barrett (Research Manager, Centre for London):** I absolutely agree with that point. Being able to make a seamless journey plan, amend your planning as you are going along and paying for that journey on a single platform would be really valuable for many customers. I do think there is a value to having a TfL planner in that way that integrates other operators, precisely for the point of keeping up-to-date with that journey as you go along and being able to pay on a single platform for all the different modes that you want to choose. Few people among us are just Tube users, just cyclists or just drivers. Many people choose to mix and match many modes as they go along. Having that seamless transition between modes would be really valuable.

Another point I want to make is about accessibility and improving access to Tube stations and public transport. There is still a long way to go. Thinking about people with different mobility needs and impairments, disabled people, there is a lot that can be done not only on public transport but also providing some integrated solutions. The Taxicard platform, the different subsidies and incentives that people have or discounts attached to certain underprivileged groups could do with more integration, thinking about it in more consistent ways. We have a project now on transport and equity thinking exactly about how we can integrate and improve the offer to those in underprivileged groups.

**Caroline Pidgeon MBE AM (Deputy Chair):** It is interesting, the single platform point, because Oyster kind of is that and now contactless cards, but for the new on-demand bus trial in Sutton you pay £3.50 and have to give your bank card. I cannot use my Travelcard on it. It is an interesting point because it might put people off using it if it is not part of one package. Nicole, what are your thoughts?

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** Dockless or docked bikeshare also is not available on your Oyster card. That is also something that would be good.

I want to echo most of the points that my colleagues have made but I would like to focus on buses. There is quite a large correlation between bus speeds going down and bus usage on those routes going down. The data I have seen from last year would suggest that. This is a huge lost opportunity. Buses present an easy way of improving connectivity on routes and capacity relief on the Tube for central London. We may need to rethink the short-routing of some of the buses in central London. A lot of them no longer come into central London. In particular, in transport equity terms this is not good for people on low incomes who are reliant on buses to travel quite long distances.

What we need to do is revamp bus priority and look at bus frequency, which has been affected by congestion and slower bus speeds because you need more buses to run the same frequency if those buses take longer to take the route. It also has been affecting journey reliability and journey times and it is important to make buses competitive to other routes. We may have seen those people who can afford to switch to London Underground because there is higher journey reliability and quicker journey times, but of course those who cannot afford to do so or those who are living in areas where there is no rail-based alternative are stuck with buses that are running slower, less reliably and also less frequently.

Multi-modal transport interchanges are important to focus on to provide greater connectivity because of course if you can easily connect at any station there are many more places you can go to much more easily.

There was some new research out from UCL just two weeks ago on mental health and travel. In England, 25% of people have a mental health condition and 18% have one but it is probably not registered. That is a large percentage - nearly half of people have them - and anxiety is related to travel. Just to pick out one issue, the availability of toilets. Thinking of Crossrail, for example, which will be traveling quite long distances if you travel a large part of that route, it will not have access to toilets. This is important for people who are ageing, for women in particular and also those who have anxiety because of that. The availability of staff to help is an important one, especially at interchanges but also throughout the network for those who are new to the system, those who have problems with their card or their bank card not working or just need a guiding hand on where to go.

Air conditioning, capacity, these are all big issues but I just wanted to add those few to the discussion.

**Caroline Pidgeon MBE AM (Deputy Chair):** That is helpful, thank you.

**Florence Eshalomi AM (Chair):** I just want to welcome to our audience students from Dorothy Barley Junior Academy from Barking and Dagenham. Hello. How are you? This is a Transport Committee so we are looking at how people get around London. From Barking and Dagenham, I am sure you had a nice journey coming in to London Bridge, to City Hall. Welcome.

**Caroline Pidgeon MBE AM (Deputy Chair):** Fantastic. What I want to ask now - perhaps I can go back to you, John - is what changes you think, if any, need to be made to fares and ticketing to better reflect how people use the transport system. Can we use fares to try to deal with that overcrowding at peak times, to try to shift people?

**John Dickie (Director of Policy and Strategy, London First):** The answer to that last specific question is that there is more that could be done on the use of fares than TfL currently does, but it is quite difficult to see in practice how you would make a dramatic change. If you have to be in work at 9.00am, you have to be in work at 9.00am. We can make you pay a greater share of the cost of using the transport network than someone who does not have to be in work at a set time or has a bit more flexibility, but you are not going to price that many people off the market other than at the margin. That does not matter and there is more that could be done but I do not think it is likely to be a game-changer in terms of the pressures we face around capacity in aggregate.

More to be done but it is not going to solve the problem.

**Caroline Pidgeon MBE AM (Deputy Chair):** Are there any other things that you think need to change in terms of fares and ticketing to reflect businesses you represent, modern-day working and life?

**John Dickie (Director of Policy and Strategy, London First):** I suppose the other thing on fares and ticketing is around season tickets and the nature of the pattern people have. It is a while since I have thought it wise to invest in a season ticket. I know plenty of people in the same position.

There are twin challenges for TfL around this. One is whether the model we are used to around the discount you get for buying a season ticket – which favours those people who do routinely, five days a week, traipse in and out of their work but also, of course, favours those people who can afford to pay it and does not give the cash upfront benefits, in a world of 1% and 2% interest rates, that it used to – is still fit for purpose, both from the demand side and from the supply side.

While we are on this, I do think we could do well to question, from a range of perspectives, whether the range of concessions offered by TfL remains truly fit for purpose. I have never really understood the transport logic of giving people who are 60 and two months a free journey in to work, because that is what people who are 60 and two months old are doing on the network at 8.30am. We have had our discussions about the quality of that journey experience. That is what they are going to do. Quite why we give it to them for free and make other people in different ways pay for it, I am not certain.

There are a range of issues about quite how we run children, buses, school and fares, which get you into a whole range of interesting transport policy questions but also public health questions. Perhaps we ought to be encouraging children to walk to school rather than giving them free bus fares and so forth. That is an area, in a time of straitened circumstances, we might look at, not necessarily simply to reduce it. There are good arguments around things like, for example, job-seekers, giving people the ability to get to interviews. I am not suggesting we should not have concessions; I just wonder whether – I think it is £300 million, the cost of concessions now on the network – that money is optimally targeted.

**Florence Eshalomi AM (Chair):** It is about £330 million.

**Caroline Pidgeon MBE AM (Deputy Chair):** It is a brave politician who tries to get rid of things like the 60+ card now.

**John Dickie (Director of Policy and Strategy, London First):** That is what we need at this hour.

**Caroline Pidgeon MBE AM (Deputy Chair):** That is what you need, a brave politician who is going to do that. That is for next year's elections. Silviya, do you want to come in on the issue of fares, ticketing and so on?

**Silviya Barrett (Research Manager, Centre for London):** I do not have much to add on that. Looking at concessions will be part of our project on equity and that will be an important issue to consider.

**Caroline Pidgeon MBE AM (Deputy Chair):** Nicole?

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** On the point around the 60+ pass, the costs of providing that are going to escalate quickly. We have an ageing population and some of the figures I have looked at suggest that around 85% of those 60+ pass holders are using it to travel to work, in particular the male population. There are questions around if this is targeting the right people and achieving what it set out to do. Of course, for those who are retired, the idea behind giving them free public transport access is that it will help encourage them to be part of the

community, get them out and also discourage car use. The bracket just below that, 60+, is still going to work and maybe it is not correctly targeted there. On the student pass, the free pupil passes, they might be good to keep because it will encourage people not to use the car to get to work and those who are independent.

What I would also like to pick up on is fare capping. The audience may be aware that if you use your bank card or even your Oyster card that can give you a daily, a weekly and even a monthly cap. Moving towards also offering a yearly or season cap would be a way of overcoming the challenge for those who cannot pay the upfront costs of a season pass so that they can also reap the benefits. It also avoids having to make that decision at the beginning of the year. If you are changing your job or you are changing the location of that job you may not be able to anticipate that, and the benefits again are only to those who are in the position to anticipate that and have the upfront cost.

Just looking at other cities, I mentioned Berlin but also Vienna was a trailblazer. They offered a season ticket for only €365, only €1 per day, to use public transport. It has really encouraged people to take up public transport and encouraged people to buy a season ticket even if they are not using public transport that much. In particular, they have seen increases in the night public transport offered to residents in the city. Thinking of how radical the steps need to be to get to this 80% goal, this might be something to do around fares.

**Caroline Pidgeon MBE AM (Deputy Chair):** The annualised cap is really important, actually, and to have it available on Oyster as well because not everyone wants to use their bank card. It is important to start recognising that people work annualised hours, term times only, two days one week and three the next. The ticketing possibly needs to reflect that. Is that something, Lucinda, TfL is looking at?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** I have to say I do not know. I will come back to you on that.

**Caroline Pidgeon MBE AM (Deputy Chair):** Shashi [Verma, Chief Technology Officer and Director of Customer Experience, TfL] I am sure can answer that. I am going to leave that section there. Thank you, Chair.

**Florence Eshalomi AM (Chair):** Thank you. Just moving along, we will bring forward section 5. We are looking at how we pay for all these improvements we would like to see. Assembly Member Bacon.

**Gareth Bacon AM:** Thank you very much, Chair. Yes, there has been lots of talk about how London's roads should be funded. I will throw it open to all of you but leave TfL colleagues to the end because you will be the ones making the decisions, apart from the Mayor, of course. I do not know who wants to start on this. Silviya, would you like to start?

**Silviya Barrett (Research Manager, Centre for London):** Yes, of course. We recently published a report on road user charging or road pricing in London. It is looking at moving towards a more distance-based system of charging as the next logical progression from the Congestion Charge, which is now 16 years old and desperately needs reforming in order to be more responsive to the ways that we travel around the city these days, as well as the ULEZ, which of course is very welcome in addressing pollution.

We think that with the proliferation of charges - you have not only those two schemes but potential tolling on the Silvertown tunnel, the Blackwall tunnel and at Heathrow, and the Londonwide Low Emission Zone - if we were to replace all those schemes with a single scheme based on distance we believe that would be the next

logical progression, not from a revenue-raising perspective but more as a way to address local congestion and pollution pressures.

The scheme that we are suggesting would be a staged scheme. It would not be covering the whole city from day one but focusing on the most congested and polluted areas of the city. We are suggesting that as well as distance the charge can be variable by many other factors including vehicle size, vehicle emissions and the local congestion and pollution levels of where the journey is. For example, if you are travelling at peak times on a very congested road then you would naturally be charged more than if you were travelling at night or in places in outer London where there are no alternatives. The availability of alternative ways to make that journey and whether that journey is switchable the modelling would be another factor, and you would be able to vary the price accordingly.

As I said, the Mayor has the power to introduce charging but for congestion and pollution purposes only, though it will help towards making roads funding more sustainable. The issue that we have now is that roads funding is not sufficient. The income and the revenue we receive from roads is obviously not sufficient to maintain our roads and having a scheme such as that would make sure that every journey is priced according to the impact it is having in terms of network wear and tear but also in terms of the people and the environment around it.

**Gareth Bacon AM:** OK. John, your thoughts?

**John Dickie (Director of Policy and Strategy, London First):** I am just going to add a couple of points to that. My start point would be that there is simply something wrong with the way in which we do transport funding that TfL receives no money for roads. That just makes no sense. In terms of quite how that should be fixed there are a variety of ways that one could do it, but it is simply a ridiculous situation and we should all take every opportunity we get to make that point to central Government.

It is important we are clear about quite why we are doing things with Londoners. It is very important that a Congestion Charge is run to reduce congestion and that people can see the benefits of more reliable and shorter journey times where the Congestion Charge is introduced. Ideally, it would command legitimacy before it was introduced because people would believe it will work. The lesson of not quite doing that is Manchester a few years ago, where people did not think there was congestion so why should they have a congestion charging system? That demonstrates that point.

A similar point is the case with the ULEZ. It is very important that is focused on reducing emissions and it is not focused on other things. Again, that is how you command public legitimacy and trust with those people paying it.

That said, there is a case for further charging to provide revenue to pay for the upkeep of London's roads. My start point would be that the first and best way of providing revenue to pay for the upkeep of London's roads is that the existing, substantial tax paid by Londoners should be in part channelled to this. That could be through the devolution of some of the vehicle excise duty or it could simply be by some kind of grant, I am not precious about it, but my first thought would be that it should be central Government returning some of the tax revenues that London pays already to pay for roads.

**Gareth Bacon AM:** I personally would not disagree with a word of that. Nicole?

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** Yes, it is important that TfL and the Mayor make a strong case to central Government that they need some level of grant. Without that, it looks like we are heading toward an unsustainable funding future.

As Silviya [Barrett] has already summarised, the current Congestion Charge is very simple and it is maybe not fit for purpose anymore. The only thing I would have to add there is that we also look at charging based on road damage. For instance, heavier vehicles and lorries would pay more because they are requiring a more frequent maintenance schedule.

With any expansion of road pricing or congestion charging we need to make sure that there are good public transport alternatives or cycling alternatives there because without that obviously we are giving people a disadvantage and no alternative.

I would be strongly in support of expanding the coverage of road pricing and also making it, rather than just a daily charge, something that captures the impact on the road network, is either distance-based or time-based and also reflects the congestion levels where you are currently driving and the availability of alternatives.

**Gareth Bacon AM:** Would you be in favour of doing that in the absence of any other changes?

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** As I said, we need to invest in public transport. The success of the Congestion Charge here in London has only been because more buses were run, more bus routes were run and there was bus priority. They need to come hand in hand.

**Gareth Bacon AM:** So, more public transport provision. Going back to something that John [Dickie] said a moment ago, motorists do not travel around for free. London has 2.6 million motorists and they contribute £1.9 billion in taxes through using their vehicles. The vehicle excise duty is around £500 million that is paid to central London and not a penny of it is spent on London's roads. If that were not to change, if there was no change to vehicle excise duty, there was no lowering of fuel taxes and road pricing was introduced on top of that, do you think that would be a fair approach?

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** It should be reflecting the impact on the road network that your car has. You taking a bus or you cycling has a much lower impact. Your footprint is smaller in emissions but also literally how much space you are taking up. Therefore it should reflect that if we have congested roads in London.

I am fully in support of the idea that central Government should be devolving vehicle excise duty to London but we also need to think ahead. We will need to think how we are going to be charging for that. A lot of the taxes paid for your cars are based on the emissions and if we move to a future where cars are emitting less, how are we going to be funding our roads? National Government is also looking at road pricing so London should step ahead and think about how they are going to do that.

**Silviya Barrett (Research Manager, Centre for London):** Can I add something on that point? The way that I say that central Government can be using road pricing for revenue-raising purposes. Obviously Her Majesty's Treasury has the power to tax vehicles and drivers in order to pay for the network, whereas from a city perspective it is very different and focused on managing the negative impacts of driving, congestion and pollution. The Mayor has the power to charge drivers in order to address those impacts and not to raise revenue. To me, those things should be separate in a sense.

In London a new distance-based scheme would replace the existing Congestion Charge and ULEZ charges, at least in the proposal that we have put forward. Therefore, it will not be an additional burden and cost on many drivers. In many cases it will be fairer on drivers because they might be paying less for a journey which may be shorter. Rather than paying the set daily fixed charge you would be paying for the journey you are making, mitigating those impacts and capturing the impacts that you are having.

**Gareth Bacon AM:** Your report is based on a pan-London introduction of road pricing, is it not?

**Silviya Barrett (Research Manager, Centre for London):** Pan-London as a long-term ambition. It should not necessarily be boundary-based, as the Congestion Charge and ULEZ currently are. It is possible to cover a wider area but only charge for journeys that enter certain congestion and pollution hot spots, for example town centres or main commuting routes and motorways.

In terms of technology, yes, that would be more complex than a cordon-based scheme but the technology is there. We have new technology that enables that distance-based charging through GPS in vehicle devices, even through your smartphone. You would not even need cameras to cover locations very densely because they would just be used to capture those people who have not registered for the scheme.

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** Just something I want to underline is that the scheme that you design depends on your objective. I may not have made that clear earlier on. If your objective is to tackle congestion, you design a scheme in a certain way. If your objective is to generate funds, you design it in a different way. London may decide that they want a composite of that but the two components will be different. Yes, a congestion charge to tackle congestion will generate funds but that is not its main objective, and a road pricing scheme designed to generate funds will have congestion benefits but that is not its main objective.

**Gareth Bacon AM:** In terms of a legitimate policy decision, I am quite struck by what John [Dickie] said earlier on about people needing to believe things are being done for a particular reason. In your report, if I am correct, you proposed as an example a price of £0.08 a mile. Is that right?

**Silviya Barrett (Research Manager, Centre for London):** I do not think we set a specific price.

Arup did some modelling for us for the report. Basically we devised a scheme where you have your base charge, which is your distance-based charge depending on your vehicle size and vehicle type. Then you have a multiplier on that depending on what type your vehicle is in terms of emission levels. You would have a separate multiplier for where that journey takes place, the geographical aspect to it, whether it is in central, inner or outer London. It might be based on Travelcard zones, for example. Then you would add on for congestion. That would be based on recent observed levels of congestion on that specific route as opposed to having a charge that is ticking like a meter, and it would be predictable and transparent. You would have a multiplier for, for example, whether or not there are alternative options for that journey.

It is a complex way of setting a charge, which is why we cannot say a certain journey would cost X. The amount of charging would obviously be a call for the Mayor and for more complex TfL modelling, but to the customer it would be a simple set charge. You would be able to enter your start and end point and you would be given a set price that you would then be able to compare to other modes to make an informed decision as to what choice you want to make for that journey.

**Gareth Bacon AM:** You talked about the customer as well. One of the problems with the Congestion Charge is that the legal definition of a charge is a fee that you pay in exchange for a service. A great number of the embassies in London have refused to pay it. They say, “We are not getting a service. This is a tax”, and because they have diplomatic immunity they can get away with that. How would you package this in such a way that people believe they are receiving a service?

**Silviya Barrett (Research Manager, Centre for London):** A scheme like that can deliver many benefits. One of those is providing a level of service on the roads. For example, you will be ensuring that road maintenance is captured within the charge. You would be able to say, “For the money that you pay, we are delivering a good quality network”. At the moment there is a --

**Gareth Bacon AM:** I am sorry to interrupt you but the pushback on that will be, to go back to the point I made earlier on, that London’s motorists are paying the best part of £2 billion in taxes already and what are those taxes for if they are not for maintaining the roads?

**Silviya Barrett (Research Manager, Centre for London):** Not much of that goes to the London level.

**Gareth Bacon AM:** Indeed, but this is the problem that you have. This is why I asked Nicole [Badstuber] the question earlier on. In the absence of any changes, would she be happy to support road pricing being introduced on top of all the taxation that motorists already pay? The answer was broadly yes. Are you in the same position?

**Silviya Barrett (Research Manager, Centre for London):** Ideally, yes, we would like to see some money devolved from Government. It does not necessarily have to be VED devolution. It could be having access to other, broader funding pots. For example, other cities receive Clean Air Zone implementation funding in order to implement schemes in city centres. They could be charging or non-charging. That is an example where central Government is supporting cities in that sense.

You could argue that London should receive similar types of funding to implement the ULEZ or whatever the next stage of that is. It does not necessarily have to be VED or VED devolution. There is still a case to be made that the current system does not capture the impact that driving has in terms of negative impacts on the wider population. It would be a fair system where you are paying for the impacts that you are having but you would also have the benefit of improved traffic flow, reduced congestion, and drivers benefiting from increased efficiency and productivity in that sense.

**Gareth Bacon AM:** That would only apply if they could still afford to use the road, of course, would it not? OK.

Turning to TfL fares then, Lucinda, how do you think the roads should be funded?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** Firstly, a broader point on the importance of stability and sufficiency of funding to enable us to invest across the system, including roads. I am grateful to John [Dickie] for reiterating that point, and the business community has been key in helping us make that case. VED devolution would be eminently appropriate. We have made the case for that and we will continue to do so, and we would welcome other people --



**Gareth Bacon AM:** Yes. On that subject, it is one of the very few issues on which you will get unanimity from just about everybody in this building and all of the GLA family groups, so you are on to a winner with that one.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** Yes. We need to persuade the Government.

**Gareth Bacon AM:** Yes, indeed.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** We are also targeting particular sources of funding like the Major Road Network funding. We welcome the fact that some of London's roads were included in that. We have made bids. We are looking at trying to progress Gallows Corner, for example, and a number of other schemes. I would say that, welcome as it is, it is *ad hoc*, and we actually need that sustained investment and stability of it.

In terms of road user charging, proposal 21 in the MTS does have the policy framework for that. At the moment the focus in London is on the expansion of ULEZ and using pricing in that context to tackle the imperatives around air quality.

**Silviya Barrett (Research Manager, Centre for London):** May I add a quick point on the attractiveness of a system like that? What we have said in the report is that you would accompany road pricing with that multi-modal system and journey planning application that I talked about earlier, and that would have benefits not only for drivers in terms of making their journeys fairer, easier to pay and simpler, so replacing the current scheme where we have separate payments for congestion, for pollution and potentially tolling. The experience of the driver would be simpler and easier. You could integrate parking as part of that, for example. The potential is quite large.

A scheme like that can have benefits to other users as well, and it is important to offer mitigation to that point. Obviously you would not be paying for journeys where you would have little alternative than driving, but secondly, with an individual account you can offer targeted discounts, targeted exemptions, a scrappage scheme or alternatives and rewards in the form of mobility credits, so offering incentives to people to make a journey in different ways. Having that comparability within a single platform where you can compare the different costs, the journey times and the impacts of a single journey would have lots of benefits so that you can then have an informed choice of how to make that journey.

**Gareth Bacon AM:** I am trying to translate that into my own life experience. People are busy: they get home from work, they have things they have to do. I drive less than 6,000 miles a year. I would not dream of driving in central London, not least because it is the most inefficient way to get to central London from where I live. Most of my car journeys are around the locality that I live in. I might be taking my daughter to training or doing the family shopping, whatever it is.

Most of the time, do you think it is realistic that people would sit there and look at an app to work out the various different journeys that they could do when they have a car on the drive?

**Silviya Barrett (Research Manager, Centre for London):** The option would be there if you need it, but the technology can be such that it can recognise when you are getting in the car, so you would not need to input your details every time you get into the car in order to use the system in order to be charged for it. Yes, the option would be there.

In terms of affecting poorer people that might not have other options, there is also the point that poorer people drive less, proportionately, and they tend to use buses more. If you were to charge accordingly, and investment that you put into public transport and buses, so poorer people would benefit disproportionately as well. In terms of the impacts of driving, there is evidence that poorer people are more affected by pollution and road danger. The scheme that would --

**Gareth Bacon AM:** That is an average, though, isn't it? That is a bit of a sweeping generalisation because a lot of that is based on where people live. That assumes that poor people live exclusively in inner-city areas where there is high congestion, and of course poor people live everywhere. There are lots of poor people living in my constituency in outer London. Many of those people do have cars, contrary to a lot of what the averages tell people. This would make their lives very much worse.

**Silviya Barrett (Research Manager, Centre for London):** My point is that any intervention that improves congestion and pollution would benefit poorer people disproportionately, so the benefits of that would outweigh any disbenefits to people that might not be able to --

**Gareth Bacon AM:** Yes, but again that is an average, because large parts of my constituency do not have huge amounts of pollution. It is not in central London. It is not in the Congestion Charging Zone. It is not where we know most of the air pollution is. It is in outer London and the borders of Kent, and the air there is generally quite good. There are still poorer people living there and, as we discussed earlier on, there are a very limited range of public transport options. If road pricing were introduced on a pan-London basis, this would make their lives much worse.

**Silviya Barrett (Research Manager, Centre for London):** No, but in that case, in the scheme we are suggesting, the charge would be variable depending on real congestion and pollution levels as well as availability of alternatives. The journeys that you are describing would not be charged at all, or very little if at all in the scheme that we are suggesting. If it is on a pan-London basis, then you would not be capturing areas like that that are not affected by congestion and pollution.

**Gareth Bacon AM:** OK. I am slightly conscious of time, Chair, and this is one of those subjects where you could probably spend an entire morning doing a seminar on it.

I will move on to the next section, which is around the spending review so it is a sweep-all question for everyone. The Mayor has sent his Christmas list in to the two candidates, one of whom is going to be Prime Minister in two weeks' time, and his transport asks were to restore TfL's operating grant of around about £700 million a year, committing to funding Crossrail 2, funding infrastructure such as the Piccadilly line upgrade and the BLE, and transferring suburban rail services to TfL. I will start with you, John. Do you think those are the right asks? If you do, what should be the priority order?

**John Dickie (Director of Policy and Strategy, London First):** Those are pretty much the right asks. The priority we have organisationally is around the National Infrastructure Commission's plan for infrastructure for the country as a whole based on the current Government's 1.2% planned public expenditure on infrastructure. That would be enough money to both deliver the Northern Powerhouse Rail Programme and the associated investment needs of the Northern Powerhouse and Transport for the North and to deliver High Speed 2 (HS2), assuming HS2 stays roughly where it is, which is an assumption. Critically, from the point of view of London, to provide both the resources to deliver Crossrail 2 and also what one might describe as the routine capital

programme for TfL around things like signalling, network enhancements, rolling stock and so forth. That is our top ask of Government and I would certainly put that right at the top.

In terms of other transport asks, it would of course be a good thing to see a return of some subsidy from the taxes Londoners pay to deal with the charges Londoners pay. It is extraordinary if you look at comparatively the performance of TfL that it is getting close to making not only an operating surplus on the Underground, but an operating surplus that would cover its financing costs. There must be no network in the world, certainly no network in the world of the age and complexity of the London Underground, that is coming close to that. That is of course one of the reasons why charges in London are high for those of us using the network. Some shift in the balance of that is right. We are not going to get it in the near future, but it is right. I would probably, if I was prioritising, put that behind the further devolution of rail services.

The further devolution of rail services is a difficult issue to think about in isolation. There are two levels of complexity on this that I might touch on. One is devolving rail services to TfL without devolving resourcing to TfL. There is a risk that people will think this new bit of the Overground is going to be like the North London Line, and the North London Line was transformed by TfL taking over and £1 billion or £2 billion of investment in both rolling stock and the track. I do think we need to be a little bit careful how we position this as a city. I am in favour of greater devolution but I do worry a bit about setting expectations and not being able to resource them.

The other thing we always need to be conscious of and clear about is that we devolve services in a way that does not disadvantage those people commuting from a bit outside of the London travel zone. It is as important to business that people who are commuting from Brighton or Leicester or wherever are able to get into London just as easily as people living in outer London or people living in inner London. That is perfectly doable. This is not a barrier, but it is a sensitivity that when we talk about rail devolution we always need to be very mindful of. I know it is something that does, perfectly understandably, worry, for example, Members of Parliament from the home counties because they see the great might of TfL and they see its accountability to the Mayor and to the Assembly, and what do they have? We need to be mindful of that.

**Gareth Bacon AM:** Lucinda, what would be the key ask for TfL?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** Fundamentally, sufficiency and stability of funding. We have to be able to make long-term committed investments. We need to make them in a sensible way that delivers efficiencies through our supply chains. We cannot do that at the moment.

**Gareth Bacon AM:** Are you talking about capital funding or revenue funding or both?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** Both. We have had since 2011 a 46% cut in our sources of external funding. It is very difficult. We have taken a lot of action to prepare for that and to respond to it in terms of making savings, so £111 million of recurring savings each year. We have reduced the operating deficit, as John [Dickie] said. John has put much of it very eloquently. I absolutely agree with most of what he has said. It also combines with the difficult macroeconomic circumstances where we have seen a softening in revenues as well and we are more exposed to that. We need that sufficiency and stability. For example, on the Piccadilly line, we have ordered the new trains. We have been able to do that. We have not been able to commit to the procurement of the signalling upgrade, which would deliver that 60% uplift. Without that sufficient ongoing investment, we cannot do so. I absolutely agree. That National Infrastructure Commission was established by this Government, and it recognised that investment in London made sense economically and in many different ways. As you say, its recommendation would equate to about

£4.8 billion a year shared between us. To deliver the MTS in its entirety we have estimated would cost about £3.3 billion plus some for renewals. That would be manageable within that context.

**Shaun Bailey AM:** To Lucinda and Simon initially, what options did TfL submit to the financial review to pay for Crossrail 2 during the construction phase?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** In terms of Crossrail 2, we have identified a number of different sources. There was the original discussion and the 50% London, 50% central Government. That is very challenging, but we have assumed the use of Mayoral Community Infrastructure Levy (CIL) when it is finished being used for Crossrail 1. We have assumed the continuation of the business rate supplement but also a potential uplift in that ahead of the construction period to enable us to fund that. I am trying to think what other sources.

There is a critical challenge not only in the scale of investment we are talking about but also the timing of it. A lot of the sources that are identified tend to come on-stream or ramp up most after construction and after opening, so there is a financing challenge as well. I can follow up with you in more detail if you would like to go into the specifics of the different sources identified, but definitely those are some of the sources.

**Shaun Bailey AM:** I would really like to follow up because I want to understand how optimistic you are being about this uplift and how tight the timing is because cash flow in these things is all -- what would be the impact of the delay on our ability to deliver Crossrail 2?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** It is something we are looking at at the moment. Most tangibly the use of mayoral CIL has moved backwards because we now have had to make an assumption that that will not become available for, say, around eight years from when we were expecting to be able to transfer it to Crossrail 2. There is a job for all of us to do to continue to make the case for that investment and to show that we are capable of delivery. We are getting our hands around Crossrail and that will be delivered and open as soon as possible, but that has made people ask, are we able to deliver? I absolutely believe we are, and if you look across the rest of our investment programme, we are. It is a hugely complex project.

For business to support us, fundamentally, Crossrail would not be happening if the business community had not backed that case for investment, etc. Continuing to have that lobby, that joint working, is going to be fundamental to it.

**John Dickie (Director of Policy and Strategy, London First):** We have done a fair amount of work over the years on how we might pay for Crossrail 2, looking both at the 50% funding target the Government set and then the 50% financing target, which of course is providing money upfront, which is an even greater challenge than paying for it over the course of its life, the 50% funding challenge. It is certainly the case that the delay around Crossrail has hurt us in two ways. It has hurt us firstly in terms of credibility around delivery, and there is no point claiming otherwise. Equally, we can be confident that, bad as the delay in Crossrail 1 is and bad as the cost overruns around Crossrail 1 are, it is still the case that when Crossrail 1 opens it will have a transformative impact on the city. It will be a great addition to our infrastructure. Nobody will be quibbling about the extra cost in ten or 20 years' time, a little bit like the way the Jubilee line has been received once constructed. We do need to remember that, as I say, as bad as those things are, it will be a great transformative benefit to the city.

The fact that it is going to be of the order of £1 billion to £2 billion over has £1 billion to £2 billion taken out of the Crossrail 2 --

**Shaun Bailey AM:** You say £1 billion to £2 billion as if it is a trifling amount, and clearly it is not, and --

**John Dickie (Director of Policy and Strategy, London First):** No. Honestly, £1 billion to £2 billion is real money. I get that.

**Shaun Bailey AM:** Yes. Is there a possibility then that it stops Crossrail 2 because money earmarked for Crossrail 2 is now being used to do other things?

**John Dickie (Director of Policy and Strategy, London First):** It certainly sets a challenge to everybody involved in it. We are awaiting the Government's response to the [Mike] Gerrard review, which has looked at ways in which we might be able to deliver the scheme which may or may not produce either some cost savings, some phasings, some stagings or some ways of making it more affordable, and we will have to see what they have said and how the Government responds. Our view is that the delivery of Crossrail 2 remains an essential need for this city. The question is, if we are going to still have to find that order of magnitude of funding from London's resources, I am afraid we need to look a little bit more widely. We would not rule out using the limited powers the Mayor does have: council tax, the fare box. There are interesting and innovative things one could do around pricing parts of Crossrail 2. There are things one could look at around, for example, its ability to deliver housing and quite how one could use some of the resources generated by housing to pay for it differently. There are a whole suite of things we could do.

There will be no easy way of doing this. I can see no circumstances, much as I would like to, where central Government is going to let, as it were, the people who make decisions about tax and spend in London off the hook by funding Crossrail completely or nearly completely. In the circumstances we are in, if we want it, we are going to have to find ways to pay for it. We will have to find those ways and we will have to do that in a way that is equitable across the people who will use it, the people who will benefit directly and the people who will benefit indirectly.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** If I can add to that, that compelling case for investment in Crossrail 2 and things like the BLE is still absolutely there. The other source of funding that we submitted, the net operating surplus, again, clearly comes later in the day, so the financing issue is still there. Crucially, also income from over-station development. That is a fundamental part of the planning of it but also part of the funding package for it.

**John Dickie (Director of Policy and Strategy, London First):** I should also add that we have been supportive of the notion that the current business rate supplement would extend to part-finance and fund Crossrail 2. We would not rule out other ways in which business might contribute as part of a balanced and sustainable funding package. We are not terribly attracted by the model that the only people who pay extra are businesses in London. Funnily enough, we do not think that is a fair package.

**Shaun Bailey AM:** That is my question, how saleable this is to business, because we made the comment earlier on that this has been a loss of confidence in our ability to deliver. Obviously you will be going back to businesses now, asking for more, and they will point out that you did not deliver last time or, "Will my business even still be here by the time we finish this next one?"

**John Dickie (Director of Policy and Strategy, London First):** There can be no question that the delays in Crossrail have had an effect on the credibility of any funding scheme we put together. That does not diminish the need for the project, and business absolutely gets that. A real challenge for all of us again over the next year or two as we move towards Crossrail opening is to make sure that we have thoroughly learned and embedded in the next project the governance and operational learnings from what went wrong with Crossrail 1 in its later stages.

**Shaun Bailey AM:** Lucinda, you alluded earlier on to new, innovative ways you are looking to find this money, which is a considerable sum of money. As has been said by John, everybody around this arc will agree that Crossrail 2 is imperative and we want that, we need it, and it would be good for London and indeed the country. Can you focus again on what other things you have done to look for this money? Are there any real, cutting-edge ways you are looking at now to finance this project?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** There are no magic bullets on this, unfortunately. We are definitely maximising every bit we can from the over-station development. We have learned in that context from Crossrail and there is much that can be delivered that way. We go back to potential for land value capture and the exploration of that, but at the moment that is not on the table from central Government. We are continuing to work with business and with others to look at the sources that we have identified so far and to maximise what we can get from those. Inevitably, central Government will have to step up and play a part. With Crossrail, London bore a large share of it. There are many places outside London that are benefiting, and that will be the case too for Crossrail 2. A sharing of the burden of this is going to be essential.

**Shaun Bailey AM:** I suppose part of the mood music behind this ability to get Government to step in and help is to explain how damaging the loss of Crossrail 2 would be to London. Have we detailed that anywhere? Have we been able to say to parliamentarians in and outside of London what a damaging prospect it would be not to have Crossrail 2?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** Yes. A lot of that is set out in the strategic outline business case that we have resubmitted to Government following the affordability review, so that reemphasises the compelling nature of the case. It ranges across from dealing with systemic and capacity constraints at places like Clapham Junction, at Euston with HS2, at Waterloo, all sorts of places that Crossrail 2 delivers those benefits. It delivers the agglomeration benefits, that uplift in capacity for extending the job market and access for businesses to employees. It delivers the housing and the growth that we talked about earlier. It also delivers benefits way beyond London's boundaries in terms of access for people. We have set out the case, we think, in a compelling way. If there are any other aspects we should be incorporating --

**John Dickie (Director of Policy and Strategy, London First):** It is a broad national case. You talked about Southeastern trains and train passes going into Waterloo, where Crossrail 2 is really the only viable way of giving Network Rail more capacity, but of course it is also true for a wider part of the country than people might think. If we build HS2 out to Manchester and Leeds, and people from Manchester and Leeds come into Euston Station and they come in in great trains and it is a quick journey and it is a reliable journey, and they find themselves in holding pens at Euston because it is going to take them 45 minutes to get on to the Victoria line, they are not going to think that is such a great transport experience. If we do not get extra capacity at Euston to deal with the full HS2 build, then we are going to have enormous problems about the ability to run an integrated transport network in London.

**Gareth Bacon AM:** One tidying-up point for you, John. You placed great emphasis on the word “just” a moment ago when you said, “Not just business should pay for Crossrail 2”. Government, obviously. Is there anyone else that you had in your sights with that?

**John Dickie (Director of Policy and Strategy, London First):** I was thinking of the percentage of the scheme which is paid for by London. My start point would be that London already pays a large amount of taxation into the British Government and it is only reasonable that some of that taxation is returned to provide the infrastructure that not only supports continued economic growth that supports increased taxation payments to central Government but makes the lives of those people delivering that economic return tolerable within London as they get around. It is clearly the case that Government is not going to provide 100% funding for this project. Some funding will have to be delivered by London.

I would have a broad approach to how that should be provided. As I said earlier, the people who directly benefit should be paying for it, so they will of course pay through the fare box and that will be the fare box surplus. There may be pricing issues that should be thought about and particular parts of the route which could increase revenue. We should be thinking about the network as a whole, because of course the network as a whole benefits from increased capacity and the fare box there. We should be thinking about those people who benefit indirectly. At the moment, pretty much the only way the Mayor can provide resources from London is through the council tax precept. I would not rule out the contribution from the council tax precept as part of paying for this.

Then there are a range of other ways we might be able to raise more revenue. Lucinda [Turner] has talked about greater over-site development revenue, which is possible but sort of baked into the assumptions already. There may be some value capture possibilities. I am more sceptical about the scale of those than some people for the reasons earlier when we talked about quite where value capture occurs, but we should be looking at those. If London is serious about Crossrail 2, it will have to make some uncomfortable choices as to how we pay for it.

**Gareth Bacon AM:** The trouble with value capture is that you can only realise the value when you liquidate the asset, in other words, sell it.

**John Dickie (Director of Policy and Strategy, London First):** I agree. Again, there is more that could be done around new commercial development. There is more that could be done possibly around housing development. One of the difficult decisions that will have to be made is quite what the mix of housing development is going to be and how much revenue we wish to extract from housing delivery to support the infrastructure provision that enables that housing delivery. These are all difficult trade-offs. They will have to be made.

**Gareth Bacon AM:** Thank you very much, Chair.

**Florence Eshalomi AM (Chair):** Thank you. I am mindful that we have one more section, and if Members and our guests could keep comments and responses quite short so we can finish this in about 15 minutes. Looking at developing the transport system for the future, Assembly Member Prince.

**Keith Prince AM:** Thank you. Good afternoon. The first question is, what in the Transport Strategy needs to be prioritised to ensure London’s transport system delivers for Londoners, is resilient to future constraints and plays a role in addressing the challenges facing the capital? John, do you want to kick off?

**John Dickie (Director of Policy and Strategy, London First):** I am going to repeat myself, but the thing that matters most to us is increased capacity. It is increased capacity that creates the context for greater stability, greater certainty, higher-quality journeys and so forth. Maintaining investment, delivering the critical upgrades we need, delivering the extensions to the network that will both unlock housing and support jobs and make it easier for people in different parts of London to get jobs. Those are the critical parts of the Strategy from business's perspective.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** The MTS sets out a whole package of interventions we think are necessary in the timescale to 2041 to deal with the challenges London faces. Inevitably, you can say it is a broad and ambitious package, but necessarily so given the scale of London's growth and given the breadth of the issues that we are facing and the diversity of London. We are looking in this timeframe to 2041 to deliver the MTS as a whole. That is not just us who deliver it, though. It is important to remember that Network Rail, the boroughs and others are crucial partners in delivering what is needed. Then we have the business plan that prioritises in the next five years what will be delivered within that framework.

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** I would reiterate making better use of our infrastructure. On the road, prioritising road users that are high-capacity public transport, looking at taking away residential parking on streets, looking at shifting people away from private car usage and private vehicle usage. On the rail-based network, looking at signalling. How can we increase frequency of services and how can we increase capacity on those services with new rolling stock? We have discussed at length just now the challenges to building new infrastructure. Looking at the short and medium term, we need to make best use of our existing infrastructure.

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** We are quite fortunate in London because we have strong political leadership and we have an integrated planning framework which has the MTS, the London Plan and the London Environment Strategy. Lots of parts of the country do not have that supportive set of conditions to help us deliver it, and we do need that because of the strength of the challenges we face. Really, from our point of view, the most important thing is to transform London through the 80% mode-share target, through tackling health and through implementing the Healthy Streets approach which puts human health and wellbeing at the heart of everything we do. That is a completely different approach to what has been done in the past and it is something which will transform London over the next 20 years.

**Keith Prince AM:** Moving on from that, Simon, in a number of areas on the MTS we have seen slow progress on that. What do you think we need to prioritise? Which projects would you prioritise in the MTS to bring them back up to speed?

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** We do try to review areas where more acceleration is needed. We produce a document called *Travel in London* every year, and *Travel in London* is an assessment of how London is changing and how travel is changing in London and how we are moving towards the MTS in a variety of different areas. Within that we try to identify the areas where acceleration is needed, and that then feeds through into the business plan. The approach which we adopt enables us to identify where acceleration is needed and then to make sure through our business planning work the areas which we need to focus on. The areas within the business plan take that fully into account.

**Keith Prince AM:** Which projects would you prioritise then, Simon?



**Simon Nielsen (Head of Strategic Analysis, Transport for London):** It is the projects which are set out in the business plan. Lucinda, do you have the list of them there?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** Yes.

**Keith Prince AM:** You can pick that up, Lucinda, if you like.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** Some of them we have talked about. Delivering the Tube upgrade, so the 33% frequency uplift on the Circle, District, Hammersmith and Metropolitan lines. We are committed to completing that. Finishing schemes like Bank Station upgrade, tackling pinch-points on our network, completing the Northern line extension to Battersea, for example. Rolling out those new trains on the Piccadilly line but trying to persuade central Government to provide sufficient funding to allow us to do the signalling as well. Continuing the Healthy Streets delivery programme. Accelerating the Safer Junctions programme. We are at about 21 out of the 73. We want to get to having delivered 41 of those schemes by 2020. Continuing all the improvements on bus emissions. There are a whole series of priority schemes which, as Simon says, have been distilled into the business plan. The MTS is relatively unconstrained by finances, as we have discussed. We need further investment to deliver it. The business plan distils that into the priorities for the next five years.

**Keith Prince AM:** Which areas would you say have made good progress on the MTS?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** We have seen good progress across a lot of the areas. We have talked a lot about the delivery of improvements in emissions. We are now at 75% of our bus fleet meeting Euro VI emission standards. I mentioned the Safer Junctions improvement programme. We have completed a significant number of schemes there and are finishing at Highbury Corner, for example. Step-free access: the 78th step-free station on our Underground network opened earlier this year [2019] at South Woodford. We are working on Harrow-on-the-Hill, Mill Hill East and a range of others which we are committed to delivering. I talked about the roll-out of new trains as well. The London Overground trains are being rolled out. We will be seeing the new trains coming on the DLR.

We are making good progress, some of which has already crystallised, some of which will crystallise over the next few years and deliver that step-change. As John [Dickie] said, when Crossrail opens, there will be that step-change in capacity. When the Circle line and other line upgrades happen, that will deliver a further step-change.

**Keith Prince AM:** You mentioned Safer Junctions. Are we seeing any shift at all towards the Mayor's Vision Zero? Recently I saw a report where there had been a number deaths recently on our roads. As Simon [Nielsen] pointed out, we are not tackling the issue around motorcyclists. Are we any nearer Vision Zero?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** We are seeing progress and we are committing to doing more action to deliver Vision Zero. Every single death on our roads in our system is regrettable and we wish we could avoid it. There have been a number of incidents in recent months with cyclists as well, so we are doing everything we can to deliver that in practice. There are definitely improvements, though, and the trends are going in the right direction, but we clearly have more to do.

**Keith Prince AM:** We saw a trial of a system that reduced accidents on buses, which has been very successful. The Mayor has chosen not to roll that out across the rest of the network.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** I am afraid I do not know that specific detail.

**Keith Prince AM:** It is called Mobileye. Perhaps you could look into that.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** I will.

**Keith Prince AM:** Finally then, we see that in 2017/18 30% of Londoners reported that they had less than a ten-minute period of active travel every day. What do you think we could do around that? Are there any quick wins we could do around that?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** It is certainly a challenge, and some things take time to deliver. On that front, I mentioned the consultation that we have had on 20mph zones, for example. Some of the responses to that are clearly indicating that by lowering speeds and making less traffic-dominated environments, people would be willing to walk and cycle more. The Cycle Action Plan sets out significant measures to improve things. I mentioned safety and too much traffic being issues there. Across our programme, rolling out that Healthy Streets investment, that £2.3 billion over the course of the business plan is going to fundamentally shift some of the willingness of people to walk and cycle and the comfort they feel in doing so. We need to deliver the environments that support people to walk and cycle.

**Keith Prince AM:** Nicole [Badstuber] mentioned something earlier – you can come in after Lucinda, if that is all right – about the fact that we are not able to – “legislate” was not the word you used, or “control”. It might have been you as well. Control what is going on. For instance, we have innovation, like we have the electric scooters, we have the guys who go up and down Oxford Street in their pedicabs, electric pushbikes that we have now, and then there is the arrival of the dockless bikes and so on. It seems the main problem we have is that there is no legislation to enable TfL or any other regional body to react to these rapidly changing innovations.

What I would ask is, how can we overcome that? Perhaps a system whereby the Government gave TfL or regional bodies an overarching power to introduce bylaws or other laws to react to these things more quickly, rather than every time something happens we have to go to the Government to get primary legislation which takes so long and clearly most of the time they have other priorities. There is even something ridiculous about black cabs having to carry bales of hay in the backs of their vehicles for the horses. We had no power to overcome that. What do you think around that?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** That is a very interesting proposition and one that I will definitely take back and discuss, because you are absolutely right. We have significant challenges that things develop really quickly and can sometimes catch us on the hop, if we are honest. We have done a lot to try to make sure that we are doing that horizon-scanning and understanding some of the changes potentially impacting, but again you are right that a lot of our levers and regulations are quite old, centuries old some of them. It is a very interesting potential option to tackle this.

At the moment we currently identify particular regulatory changes etc that we think would help us to tackle some of these issues, but something more flexible and quicker would certainly be of interest. I know Paris is struggling particularly with e-scooters. There is a big debate in the city there and they have even fewer regulations to manage that.

**Keith Prince AM:** I can tell you in Brussels it is working very, very well. There are three or four scooter providers, they are all parked up very neatly, and people are really getting around. I use them myself.

Nicole, did you want to come in, and I will come back to you, Simon?

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** Yes. On the topic of dockless bikes or e-scooters, it is really important to give cities the right powers to manage this new mobility or any new tech that comes along. It is really key to the success of those schemes. The idea is really around virtual bays, so places where you can leave these vehicles and not present clutter on the footpaths. If cities can go to the operators and say, "Hey, we are going to give you some space to do that but you have to abide by our rules", then that is a way that you can make a success of them, rather than them being clutter, rather than there being a lot of negative emotions associated with these new innovations.

**Keith Prince AM:** That works within the app, because when you park up the e-scooter in Brussels, if you do not park it in the right place, they penalise you. If you park it in the right place, they will thank you very much for parking it in the right place. It can be done, but again it is the point about the Government giving us overarching powers to make smaller regulations to react more quickly to this stuff.

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** Yes. I know that national Government was probably eight or nine months ago looking into having some legislation on in particular dockless bikes, but that seems to have stalled because of I guess the focus on Brexit.

**Keith Prince AM:** That is about dockless bikes. My point is about giving broader powers. It is not just dockless bikes. It could be e-scooters.

**Nicole Badstuber (Research Associate, Urban Infrastructure Policy and Governance, University of Cambridge):** No, exactly. I am completely in support of your point.

**Keith Prince AM:** Simon, do you want to come in?

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** I wanted to add a point about active travel because we have seen some very strong growth in cycling in 2018 and that is very relevant to this topic. Since 2016 we have had something like 140 extra kilometres of cycle route put in, and the monitoring which my team does is starting to show that there are some very substantial changes happening. We have had 5% growth between 2017 and 2018 in cycling across the whole of London, and that means we have reached 4,000 kilometres cycled, which is the highest level it has ever been. This is quite substantial growth. All of the satisfaction surveys that have been done with the new routes have been positive. Perceptions of safety have been positive. Everywhere that we have monitored where there is a new route has been above that background trend. There are some very positive things coming out about activity in the cycling frame.

**Florence Eshalomi AM (Chair):** Thank you. Assembly Member Shah.

**Navin Shah AM:** Thank you. I have questions on two major development projects. HS2 we will start with. What will be the impact of HS2 on London? Who wants to take that one? Lucinda?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** I can start. There are a number of significant aspects. Clearly, there is a huge focus on Euston and Old Oak Common in terms of stations and interchange and managing those impacts. More widely, there are clearly so many issues about the interaction with our system, about construction traffic, about managing the delivery of that project. Our focus is very much on ensuring that the impacts on London are mitigated and that the opportunities are maximised.

If we take Euston, for example, it is important to bear in mind that Euston is a hugely complex scheme. You have HS2, you have the conventional Network Rail station project, and you have the wider associated development and master-planning. These are three projects that need to be integrated and come together because they all interact with London's transport system and local transport systems. We are working with all partners to ensure that, for example, London Underground infrastructure is improved and enhanced and made adequate to deal with the increased flows, so the tunnels and the station, everything else. HS2 needs to ensure that it provides the funding for that and the mitigation for that.

We are working to ensure that we can maintain a really effective bus interchange there. There is a sense that whenever you get new development in London, they tend to want to move buses and bus stations and bus standing out. We know that it is a fundamental interchange and forms part of the onward distribution for passengers, but also it is hugely important for local communities. We are working with HS2 to design an improved interchange, because I do not think anyone would argue that the environment at Euston Station at the moment is particularly pleasant. We need to get improvements there.

We are looking at Healthy Streets. Euston Road will have closed lanes for quite a few years, so we are looking at the opportunities to improve north-south connectivity and crossings for pedestrians and all sorts of things so that we can take advantage of the opportunities that are presented to that to really transform the area.

For Old Oak Common, similarly, we are looking at provision of walking and cycling connections to the HS2 station. We are doing a bus strategy. There is a lot of master-planning involved in those areas, but the implications for local communities in terms of the levels of disruption and trying to encourage as much material by rail and minimise lorry movements etc is a really important part of our work more widely. Also, persuading and making sure that HS2, for example, implements the Direct Vision Standard in all its contracts and in all the work we do.

We can follow up with you in detail about all the work we are doing with HS2. There is a huge programme of work to make sure that London is not impacted adversely and that on the flipside we can take advantage of the opportunities. As John [Dickie] mentioned, that onward distribution from Euston, for example, that Crossrail 2 delivers to make sure that we have that Tube capacity is key.

**Navin Shah AM:** That would be helpful if you can give us information. Also, how do you work with not only HS2 but in terms of planning preparations, etc, with the mayoral development corporation (MDC) when it comes to Old Oak Common and Park Royal?

**Lucinda Turner (Director of Spatial Planning, Transport for London):** Yes. We can follow up with you on that in detail.

**Navin Shah AM:** Does anybody else want to come in on this? OK. The architect of the MDC and the one who supported HS2, we believe, Mr [Boris] Johnson [former Mayor of London], has said he would prefer investment on infrastructure projects in the north of the country and call for the review of economic benefits of HS2. Indeed, there are a number of reviews being considered from different levels. What will be the impact

to London if HS2 is scrapped? What work is being done on that? That seems to be a realistic risk that we are facing, and that is going to change the whole story in terms of what we are trying to deliver.

**Lucinda Turner (Director of Spatial Planning, Transport for London):** Our work with partners in HS2 at the moment is assuming that the project goes ahead. There is a significant focus on cost reduction and value engineering and trying to ensure that it is within the funding envelope, but at the moment we are working with partners on the assumption that it is being delivered and we need to do everything we can to make sure the impacts on London are managed.

**Navin Shah AM:** I know that the Mayor has said that he will be engaging with the new Prime Minister, whoever it is going to be. More than likely, obviously, as you know, it will be Mr Johnson. The Mayor is hopeful, but again, should you not be working with all partners to look at this plan B, which is risk of HS2 being scrapped? John, do you want to come in?

**John Dickie (Director of Policy and Strategy, London First):** Can I emphasise the importance to which the northern cities attach to HS2? If the Government were to materially change the plans around HS2, that would have a terrible effect on the sense of trust that the northern cities have, particularly Manchester and Leeds but more broadly, and that would play into the whole credibility of the Northern Powerhouse investment suite.

This would have two big implications. The first one is it would be very divisive within England, which would be a very bad thing, obviously. Also it would be very bad for London, because there are no circumstances where the current Government, a new Conservative-led Government, is likely to go ahead with Crossrail 2 and not be investing substantially in other parts of England. This is why we are so strongly in favour of the National Infrastructure Commission's approach because it does provide a suite of funding meeting the needs of different city regions of England. An approach that disrupts that is going to be pretty bad for pretty much every city region.

**Navin Shah AM:** Does anybody else want to come in before I move on? OK. The last question from me is on the matter of Heathrow expansion. If the Heathrow expansion does go ahead, what are the key projects which will need to be delivered to ensure high-quality surface access to the airport? Obviously we need to address issues of severe overcrowding as well as encouraging modal shift, which is so essential for sustainable transport.

**Simon Nielsen (Head of Strategic Analysis, Transport for London):** Do you want me to have a go at that? We are currently at the stage where the National Policy Statement (NPS) has been designated by the Secretary of State. The Mayor has appealed against that with a judicial review. That was turned down. We are now appealing the judicial review outcome. Meanwhile, the Development Consent Order is progressing. There is a statutory consultation that has just been launched by Heathrow. Our concerns are around air quality, noise and surface access. Your question is particularly about surface access but they do link together, particularly the air quality aspect of it.

To explain why we are very concerned about this, you need to understand that Heathrow currently has something like 75 million passengers per annum passing through it. In 2031, after it is opened, it would have something like 132 million passengers passing through it. In terms of surface transport demand, that is something like 130,000 more trips per day going to and from Heathrow, which is already a major, major, major traffic generator.

The NPS has some targets in it, and the targets are to have a 50% passenger mode-share by 2030 and to reduce employee car travel by 25%. Our analysis suggests that if you did that you would still be generating a lot of traffic every day, 30,000 to 40,000 extra vehicles per day. We do not think the NPS goes far enough.

There is another pledge, which is around no more vehicle traffic in the expanded Heathrow. We think that is really important that that is achieved and is achieved in a realistic, sensible way. The problem with that, of course, is that if you do achieve no more car traffic coming to the airport, you end up having a lot of extra public transport journeys. You need the no extra traffic for air quality reasons. At the moment we have 90,000 public transport trips going to Heathrow every day. With no extra traffic, it could be as high as 240,000.

The proposals as they currently stand have absolutely no additional public transport rail-based capacity to accommodate that enormous uplift in demand. That is at the heart of our surface access objection. We think that - and we have been saying for many years - the southern rail link to Heathrow is an essential scheme if you are going to expand Heathrow to this scale.

I was fortunate enough - or misfortunate enough - to be involved in the Heathrow Terminal 5 inquiry a little while ago. All the way through that we were told that we did not need to have a condition that the southern rail link was required to enable the fifth terminal to be built because it would come along anyway and it had a scheduled opening date of 2003, and it is still demonstrating no progress. We are still at the stage of trying to identify objectives with the Department for Transport (DfT). Getting a realistic commitment to a southern rail link is important. Also the western rail link is very important as well.

At the moment what we see is that schemes which were designed to accommodate London's wider growth - things like Crossrail, things like the Piccadilly line extension - are being relied upon to absorb the effects of this expansion. That is not what they were designed to do and it compromises their ability to do what they were designed to do. This is a big issue for us. We want to see improvements to bus corridors. We want to see improvements to walking and cycling access to the airport. None of this is materialising as we speak.

**Navin Shah AM:** I am mindful of time. Unless any other Members want to come in --

**John Dickie (Director of Policy and Strategy, London First):** Being mindful of time, I would emphasise that we support, of course, the expansion of Heathrow, but it does need to be accompanied by improved surface transport access.

There are two obvious things that should be done. The first is we need to increase public investment in connectivity to Heathrow, most obviously in the short term through Piccadilly line signalling, which would increase capacity. The other is the DfT has looked at ways of attracting private investment to fund things like Southern Rail, but it has done so in what one might describe as a not very effective way. The DfT needs to get its act together about providing a framework which will enable the private sector to deliver the kind of increased capacity around Heathrow that can be delivered that we need.

**Navin Shah AM:** Thank you.

**Florence Eshalomi AM (Chair):** Thank you very much, and apologies that we did overrun. Just to thank our guests for a really interesting discussion this morning, John, Lucinda, Nicole, Simon and Silviya, who had to leave early.

# MINUTES

**Meeting: Transport Committee**

**Date: Friday 19 July 2019**

**Time: 11.00 am**

**Place: Chamber, City Hall, The Queen's Walk, London, SE1 2AA**

Copies of the minutes may be found at:

[www.london.gov.uk/mayor-assembly/london-assembly/transport](http://www.london.gov.uk/mayor-assembly/london-assembly/transport)

**Present:**

Florence Eshalomi AM (Chair)

Caroline Pidgeon MBE AM (Deputy Chair)

Tom Copley AM

Unmesh Desai AM

Joanne McCartney AM

Keith Prince AM

Caroline Russell AM

## **1 Apologies for Absence and Chair's Announcements (Item 1)**

- 1.1 Apologies for absence were received from Assembly Members Bacon, Bailey, McCartney, Kurten, and Shah for whom Assembly Member Desai attended as a substitute Member.

## **2 Declarations of Interests (Item 2)**

- 2.1 The Committee received the report of the Executive Director of Secretariat.

**2.2 Resolved:**

**That the list of offices held by Assembly Members, as set out in the table at Agenda Item 2, be noted as disclosable pecuniary interests.**

### **3 Rotherhithe to Canary Wharf Crossing (Item 3)**

- 3.1 The Committee received the report of the Executive Director of Secretariat as background to putting questions on the Rotherhithe to Canary Wharf crossing to the following invited guests:
- Heidi Alexander, Deputy Mayor for Transport; and
  - David Rowe, Head of Major Project Sponsorship, Transport for London.
- 3.2 A transcript of the discussion on the Rotherhithe to Canary Wharf crossing is attached at **Appendix 1**.
- 3.3 During the course of the discussion, the Committee requested the following further information in writing:
- The comments and email exchange of the Members of the Programmes and Investment Committee, which directly relate to the paper circulated prior to the Committee's decision to pause the development of the crossing on 21 June;
  - A copy of the independent review produced by the former President of the Institute of Structural Engineers, Ian Firth, on the design of the crossing, compared with alternative designs; and
  - A copy of the briefing prepared for the Mayor outlining the activities of the development, its risks and timescales.
- 3.4 **Resolved:**
- That the report and discussion be noted.**

### **4 Date of Next Meeting (Item 4)**

- 4.1 The next meeting of the Committee was scheduled for 11 September at 10.00am, in the Chamber, City Hall.

### **5 Any Other Business the Chair Considers Urgent (Item 5)**

- 5.1 There was no other business.



## 6 Close of Meeting

6.1 The meeting ended at 12:21pm.

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Chair

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Date

**Contact Officer:** David Pealing, Principal Committee Manager; Telephone: 020 7983 5525;  
Email: david.pealing@london.gov.uk

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## London Assembly Transport Committee – Friday, 19 July 2019

### Transcript of Item 3 – Rotherhithe to Canary Wharf Crossing

**Florence Eshalomi AM (Chair):** Those views we just had in that video were very much echoed at the Southwark Council meeting that I attended on Wednesday, where a number of groups presented a deputation to the Council calling on it to continue to work with me, as their local Assembly Member, to look at why this bridge is paused and if we can bring it back.

Welcome to our guests this morning, we have before us the Deputy Mayor for Transport, Heidi Alexander and David Rowe, Head of Major Project Sponsorship, Transport for London (TfL). Deputy Mayor, from the letter you sent to me on 21 June [2019] outlining the decision to pause the bridge, we wondered if you could go through and set out clearly and clarify the chronology of events that led to the escalation of the cost of this Project?

**Heidi Alexander (Deputy Mayor for Transport):** Thank you for the opportunity to come to speak to you this morning. It might be helpful if I address my involvement in the Project over the last 12 months since I have been in the role and if I ask David Rowe [Head of Major Projects Sponsorship, TfL] to talk about the two years prior to that, 2016 – 2018.

Within weeks of being appointed to this post last summer I was briefed in writing by officers from TfL. They gave me a simple history of what work had been done to date and advised me that the cost estimate for the bridge at that point in time was between £380 million – £430 million, which was substantially more than what the initial cost estimates were. In fact – David may correct me if I am wrong – I think the upper estimate that was taken to the Programmes and Investment Committee (PIC) of TfL back in October 2017 was £260 million. Therefore I knew at that stage the team at TfL were working on the precise designs for the bridge, the alignment of the bridge and how many lifts and ramps and so on would be needed. The Commissioner [of TfL] was very clear with me that the instruction he had given to the TfL team was to try to get those costs down from the £380 million – £430 million estimate. In September the Mayor and I received a further update from TfL that suggested the costs would be between £355 million – £395 million, hence the allocation in the Business Plan that was published in December of last year [2018] for £350 million.

In the early part of this year TfL continued to work on the Project intensively, there was a lot of detailed and really extensive work that was happening and they produced a new design for a vertical lifting bridge. It is important to say this would be a very, very big and complex structure, three times the span of Tower Bridge. The clearance height that would be required is the same as the cable car further down the river. The Institute of Civil Engineers was asked to look at the choice of design because there were a number of options that had previously been considered, and we may get into the detail of what that review showed. Atkins, as I understand it, produced an initial cost estimate for that design, which TfL's internal assurance team reviewed.

As that work progressed, towards the very end of March and beginning of April this year [2019], I got a further update from TfL. They told me that the midpoint estimate for the bridge, having done all of this very intensive and detailed work, was now £455 million. That went up, having done more work, to £463 million in May. That was the point at which I became quite concerned about the short to medium-term deliverability of this Project

because costs were only going one way and all of the substantive value engineering options had been explored. I also knew there was not going to be cash to be thrown around in this year's Business Plan.

The Mayor and I discussed this with TfL in mid-May. The Mayor asked TfL to go away and do some work on reviewing the case for the Scheme and to look again at the ferry option. That resulted in a paper being taken to the PIC of TfL in June. As soon as they took a decision – Chair, as you will know – I wrote you to the day after, when they decided to go back to the earlier stage in the project development process which was looking at the option again of a bridge versus a ferry.

I would like to add that this decision was not one that was taken lightly. I am someone who, when I first moved to London and could not afford a Travel Card, cycled from Balham to Canary Wharf for six months for my first job in London. Having navigated four lanes of traffic on the northern side of Tower Bridge I think there are few people in London who understand the importance of improved river crossings in this part of London more than me. However, in this role I have to think with my head and not my heart. I knew this Project was entering a phase where we would be spending nearly £1 million a month on developing the Scheme further and yet I knew, given the wider financial context of TfL, in the short to medium term there would not be money available realistically in the next five years to be constructing this. Therefore we took the responsible decision, I think, with the PIC of TfL to go back to that earlier stage where we look at what the different options are. As the Mayor said yesterday, this would have been a great project. It would have been wonderful to have constructed a world first but this cannot be at any cost. The cost was only going in one direction, which is what led to the decision back in June.

**Florence Eshalomi AM (Chair):** Is there anything you wanted to bring in, David?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** If it is helpful I can run through the chronology from 2016 in terms of how the costs have built up and what the factors were that have driven those increases.

**Florence Eshalomi AM (Chair):** Very quickly, please.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** I joined the Scheme in spring 2017. Prior to that TfL had already allocated within its Business Plan £100 million towards the crossing. It is important to say at that point we had not confirmed whether it would be a bridge, a tunnel or a ferry; those were our short-listed options that we were looking at. Even at that early stage the estimates we had for a bridge were from £115 million, which excluded land and inflation, through to £200 million.

Those initial estimates were produced for us by a company called Faithful+Gould, a cost and programme management consultancy worldwide. They looked across bridges that had been delivered in other parts of the world – Europe and the United Kingdom (UK) – and different types of bridges – road, rail, pedestrian and cycle bridges – with different types of opening mechanisms. They logged information on the spans, the width, the length and various other factors to produce a cost per metre average that we could then apply at that point in terms of producing that preliminary estimate. We did not at that point have a design for a bridge because we were still building the case to ascertain which the best solution was. That is why we were not able to build what is called a bottom-up estimate, which is where you use a design to then quantify what the cost might be.

We then did further work and went through what is called our Stage Gate 2 in September 2017. At that point the estimate for the bridge was between £150 million – £260 million. That was taken to our PIC. At that time we were also looking at three possible alignments in terms of where the bridge could land.

After we had gone to PIC and they confirmed that they agreed with our recommendation that the bridge was the best of the options we had identified at that point, we then went out to public consultation. We asked people whether they agreed with our recommendation that a bridge was the right crossing solution here. We also asked for their views on the three different crossing alignments and therefore that helped us inform which ones we would be narrowing down going forward.

When we had done that work and had the results of the consultation we then did much more detailed testing around the designs. When that detailed testing took place what became clear quite quickly is that the bridge designs that had been produced were not going to be sufficiently rigid and robust to stand the day-to-day prevailing conditions on this part of the river. Particular challenges were wind resistance, the tides and the amount of opening that was required in relation to this bridge. This bridge has a 120-year design life and we wanted to try to test that in earnest to understand what was necessary. That was the next point where costs increased effectively because what that meant was we had to increase the strength of the structure so we had to add more steel into the structure. That meant we needed stronger mechanical and electrical lifting equipment and we needed larger foundations, all of that was driving up the costs. Therefore even then we were aware there were challenges and we were doing what we could to try to bring that cost back down. For example, with the Port of London Authority (PLA) we had agreed we could reduce the height of the bridge down from 15 metres to 12 metres.

Heidi has spoken about the subsequent cost increases but I am happy to explain why they came about, if that is helpful for the Committee.

**Florence Eshalomi AM (Chair):** To clarify, if we go back to 2016 the original figure in the Business Plan is £100 million.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** Yes.

**Heidi Alexander (Deputy Mayor for Transport):** Yes.

**Florence Eshalomi AM (Chair):** In the briefings, when TfL went out to consultation in November 2017, the capital costs were estimated at between £120 million - £180 million.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** That is correct in terms that that was the figure quoted in the consultation material that we published, which is 2016 prices. What we did as part of the consultation - to ensure people had a fair understanding of the cost of a bridge compared with a ferry compared with the immersed tunnel, which was the other option - was to put everything on the same basis in terms of the year it was analysed as well as putting what are called the whole-life costs, the ongoing operational and maintenance costs that are associated with those different options as well. Where I spoke about the figure of £150 million - £260 million, it includes the inflation allowances that we need to add on for when the Project is actually built.

**Florence Eshalomi AM (Chair):** You are saying that included whole inflation. Did that include the operating and maintenance costs of the bridge?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** No.

**Heidi Alexander (Deputy Mayor for Transport):** No.

**Florence Eshalomi AM (Chair):** What was the figure for that when you went out to consultation in November 2017?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** That is in the same Consultation Report. I think the figures at that time were £2.4 million a year, if I remember rightly off the top of my head; £2.2 million – £2.4 million.

**Florence Eshalomi AM (Chair):** What figures are you looking at now?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** Over the life of the bridge, over that 120 years, the average is £3.5 million per annum. It is important to remember that is the average across the whole of that period so you have to discount that back for the early years. Therefore in today's terms it is about £1 million a year but obviously it gets progressively more expensive as you move through that life-cycle period.

**Florence Eshalomi AM (Chair):** Deputy Mayor, this was before your time. I think, David, you said you started in spring 2017, is that correct? We note that the sponsorship and budget of this Project was transferred to Surface Transport in April 2017.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** That is the point it came across to --

**Florence Eshalomi AM (Chair):** Where was it before that and where were the decisions being made?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** The early feasibility work that is done around our larger strategic schemes is done through our City Planning Department. They do that initial work for us and then that came across to us when it was at the point where we needed to move from looking at the case of the Scheme to what is the right solution.

**Florence Eshalomi AM (Chair):** In terms of the estimates, City Planning would have been happy presenting those figures to the senior leadership team?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** Yes, as I say that was based on the information that was put together.

**Florence Eshalomi AM (Chair):** Coming back to when you then decided to look at pausing the Project, in your letter you stated that £350 million had been allocated in the Business Plan. Can you clarify how much has been allocated for the Project over the five years of the Business Plan?

**Heidi Alexander (Deputy Mayor for Transport):** That £350 million figure relates to the five-year period of the Business Plan, albeit I think I will ask David to pick up on perhaps some of the detail of whether any of that slipped beyond the end of the five-year business planning period.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** There was a residual amount of that £350 million that sat outside the five years. The reason for that is the final year that our forecast shows in terms of the construction of a new bridge was 2024/25, just the start of that year. The approach that we take with projects is that you hold a certain amount back in terms of retention for any

defects or faults that you need corrected by a contractor. Therefore it spans slightly beyond the 2018 Business Plan.

**Florence Eshalomi AM (Chair):** In terms of the different cost escalations we are seeing in this bridge; can you clarify the body that would have been discussing these figures, was it the Independent Investment Programme Advisory Group (IIPAG).

**Heidi Alexander (Deputy Mayor for Transport):** IIPAG reviews a number of the large-scale projects and programmes that TfL is doing. In terms of the governance of this Project, it was reported internally through the Healthy Streets Portfolio Board. When there were significant and important decisions it would come to the PIC, which is why it was the PIC that in June [2019] took the decision to return to the earlier stage in the Project's development.

**Florence Eshalomi AM (Chair):** We are going to come on to Assembly Member Pidgeon, who is going to dig in a bit more detail in terms of the decisions and where those decisions were made.

**Caroline Pidgeon MBE AM (Deputy Chair):** Thank you. I made a note of what you were saying earlier, Deputy Mayor. Could you clarify when you were told the costs had escalated? You said they had gone to £455 million and then it became £463 million in May. When were you told £455 million?

**Heidi Alexander (Deputy Mayor for Transport):** Right at the end of March, the very end of March. I think it would have been one of the last days in March.

**Caroline Pidgeon MBE AM (Deputy Chair):** It was the end of March you were told this is going up and by May it had gone up further. In mid-May you said there was a discussion with the Mayor.

**Heidi Alexander (Deputy Mayor for Transport):** Correct.

**Caroline Pidgeon MBE AM (Deputy Chair):** Was there a briefing paper sent to the Mayor for that meeting?

**Heidi Alexander (Deputy Mayor for Transport):** A briefing paper was prepared for a meeting with the Mayor at the beginning of April, when we had a lengthy discussion at which David was present. There was not a further paper prepared in May but there was a discussion with the Commissioner [of TfL] present when we talked about the ferry option as well. That was the point at which, in the middle of May, the Mayor asked TfL to go and review the case for the bridge and explore the ferry option again in more detail. That was partly because in the six weeks between the first week in April and mid-May when that work had taken place we had said to David and his team we want everything to be explored in terms of bringing these costs down. The Commissioner, David and Gareth Powell [Managing Director of Surface Transport, TfL] had said, "We have done six months of work on this now". There may have been one or two further things to explore and I thought given the significance of this Project it was important that we left no stone unturned.

Between the beginning of April and the middle of May, despite that work being done, the costs were not coming down. That was on the back of three or four months' work at the beginning of the year when absolutely everything was being explored; using concrete instead of steel in the towers, looking at whether we needed lifts and ramps on both sides and looking again at things like the landing points. The truth is in April/May time of this year I felt that TfL had gone through all of the major opportunities for value engineering on this Project, when they had constantly been doing that really detailed and intensive work, and

there was not really any further to go on that. It was at that point we felt it was the responsible thing to do. That was not least because David was advising us there was a need to let some quite big contracts that would have resulted in TfL spending nearly £1 million a month to develop this Project when there was no realistic prospect of finding that additional £100 million, possibly an additional £250 million, in the business planning round that is in front of us and that we are starting in the next couple of months. That was the context in which that decision was taken.

**Caroline Pidgeon MBE AM (Deputy Chair):** I am trying to pick up some process things because obviously I am a huge advocate for this bridge and I think it would be absolutely fantastic. However, I understand you have to make decisions and I am trying to understand the process. My colleague is going to pick up some of the issues with the Mayor in a bit.

David, what were these contracts you were looking to let and how urgent was it to let these contracts? This Project had been going on for some time. In April we were told there was going to be a consultation.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** That is correct.

**Caroline Pidgeon MBE AM (Deputy Chair):** That then got delayed and we were told you were working out further detailed stuff to go out to consult in the autumn. What was it that was so urgent that you were about to sign?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** The next very significant stage of work for us was a series of surveys that we needed to do to ascertain information on things like ground conditions as well as the condition of the riverbed. That was fundamental to ensuring that - in the environment we had selected through our work with the PLA, the boroughs and others - we were not going to find anything untoward in terms of what particular ground conditions we were going to be challenged with. That would have been both very expensive and also quite intrusive in terms of the work. It would have meant, for example, quite significant work in places like Durand's Wharf as well as at Westferry Circus in terms of undertaking those surveys. We really could not move forward any further without having done that work because it is fundamental to be able to ascertain that, "Yes, there is nothing untoward in this part of the river that we have not anticipated". We already had some survey information, the Jubilee line runs quite close to here, but that only gave us a certain amount which is why we had these additional surveys that we needed to do for the next stage.

**Caroline Pidgeon MBE AM (Deputy Chair):** You could have signed that contract within a week, or within a month, or within two months given how the Project had been slightly slipping in any case.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** We already had that contract that we had gone through the procurement process for. It was there and was ready to go. We had to make a decision on it because otherwise those costs effectively become redundant because you have to go through a repricing process with potential for risk.

**Caroline Pidgeon MBE AM (Deputy Chair):** Not if it is a few weeks later, presumably.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** We had a timetable that we had published in terms of when we were looking to let that contract. We had to make a decision as to whether we were going to pursue that or whether we should pause that.



**Caroline Pidgeon MBE AM (Deputy Chair):** When were you looking to let the contract?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** That was part of the timing for the decision in May.

**Caroline Pidgeon MBE AM (Deputy Chair):** When?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** We had already paused that whilst we were doing this additional work during the period of March and April. We were waiting on it for a period but it calls into question as to how long you could wait to do that.

**Caroline Pidgeon MBE AM (Deputy Chair):** The issue I have is that the announcement of this decision was rather bizarre, a letter to the Chair of our Committee that most of us saw on Twitter first before any sort of formal process. It was not actually made by the Committee in a normal way, where there is a discussion at the Committee in public; it was made under a Chair's Action. On Tuesday, 18 June the TfL Chair's Action Short Report went out to the Committee members. They had to feed back by Thursday and the decision was made on Friday. A Chair's Action, according to TfL's Standing Orders, is only in a situation of urgency the Board delegates to each Chair of a Committee or Panel to exercise the functions of TfL on its behalf. Therefore it seems to me, given you had already paused this, a few more weeks could have been allowed so this could have properly gone to a full Committee, which met a couple of days ago, where there would have been a discussion with all the members in front of the press and the public. There was no discussion about this in public this week. It seems it is a very odd use, possibly a misuse, of Standing Orders when it seems to me it was not urgent.

**Heidi Alexander (Deputy Mayor for Transport):** Can I answer that?

**Caroline Pidgeon MBE AM (Deputy Chair):** Yes, please do.

**Heidi Alexander (Deputy Mayor for Transport):** I totally refute that. I think David has explained the reasons why the substantial contract, given it had already been paused once, needed a decision to be taken about whether to let it or not. When you are talking about expenditure that is possibly hundreds of thousands of pounds it is important you do not delay on those decisions. I have been a member of the PIC for the last year. A number of urgent decisions come through - whether it is the PIC, the Finance Committee or some of the other Committees that exist within the TfL Board structure - and a full paper is written. Members of the Committee are able to comment on the contents of it. Often the members will comment to all the other members of the Committee and there will be a discussion about it. I can confirm for you that there was a number of people engaged in response to that paper being circulated. Therefore I think, given the urgency, it was an appropriate route for this decision to be taken. I was absolutely clear that having taken that decision it was imperative that we put it into the public domain, hence my letter to the Chair of the Committee the following day.

**Caroline Pidgeon MBE AM (Deputy Chair):** I personally think it is a strange way to have proceeded with this because I do not see the absolute urgency and that is where this Standing Order is coming in.

What I would ask is, could we see that email exchange so we can see what members of the Committee did say? If we had been at a Committee and heard them we could see what concerns they raised. I think that would help our discussion if we could see that email exchange and comments from the Committee.

**Heidi Alexander (Deputy Mayor for Transport):** I see no reason why that could not be made available.

**Caroline Pidgeon MBE AM (Deputy Chair):** That would be fantastic. Can I move on to these plans? Clearly you came up with this design, a different design. You said the Institute of Civil Engineers had done some sort of review. I asked the Mayor about this yesterday, whether all bridge designs had had an independent review. Can you confirm that?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** When we decided the right solution from our perspective was a central lifting bridge we then asked the Institute to undertake an independent review of that mechanism compared with the other options that we developed. We looked at three essentially, in terms of a short list of possible options for how you could design a bridge on this bit of the river. To very simply explain what those options are; you have something called a central lifting bridge, which is where the opening section goes up and down like that [demonstrates]; you have a possible swing bridge, where the opening sections do that [demonstrates] to allow the boats through; or you have what is called a bascule bridge, which is similar to Tower Bridge so it does that [demonstrates].

The Institute of Civil Engineers appointed somebody called Ian Firth [structural engineer] to lead that review.

**Caroline Pidgeon MBE AM (Deputy Chair):** Ian Firth did the review of all three designs?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** Ian Firth is the former President of the Institute of Structural Engineers. He is a world-renowned expert on bridges. We were very comfortable that he was the right person to bring in, given his experience on bridges. I do have the report in front of me and I am happy to read the conclusion for you, if that is helpful, in terms what they found.

**Caroline Pidgeon MBE AM (Deputy Chair):** We would like to see the report really, please.

**Heidi Alexander (Deputy Mayor for Transport):** I am sure that will be possible too.

**Caroline Pidgeon MBE AM (Deputy Chair):** We would like to see it to really understand the work you have done to get to this point.

**Heidi Alexander (Deputy Mayor for Transport):** That is absolutely fine, we will share it with you. I think it would be helpful though for David to read the conclusions in the report.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** The conclusions are,

*“There are three types of opening bridge mechanisms that are being considered; a double-leaf bascule, a double-leaf swing or a vertical lifting bridge. It is clear that the double-leaf bascule bridge is the least preferred solution and it presents several difficulties, making it doubtful as a viable option for the bridge. It would be approximately twice the size of any double bascule bridge built to date. The swing bridge would be feasible but has a number of undesirable features, such as the added risk of vessel impact on the opening spans. In addition, the bridge would need a locking mechanism between the leaves at mid-span and these can create difficulties in operating leading to risk of delays in opening the bridge with unacceptable consequences to navigation. The preferred operating mechanism is the vertical lifting bridge. It is the simplest and most reliable operating system, presenting the fewest risks and the greatest opportunities.”*

**Caroline Pidgeon MBE AM (Deputy Chair):** Thank you for that, it will be great to see that.

**Florence Eshalomi AM (Chair):** What was the date of that, please?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** The final report was --

**Heidi Alexander (Deputy Mayor for Transport):** I think the final report was provided at the beginning of April.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** Yes, 8 April [2019].

**Heidi Alexander (Deputy Mayor for Transport):** Yes, 8 April the final report was provided. I think an initial draft came a couple of weeks prior to that.

**Caroline Pidgeon MBE AM (Deputy Chair):** Lovely, thank you. Did Ian Firth, working on behalf of the Institute of Civil Engineers, talk to the other architect practice, ReForm Design, which had developed a bascule bridge to understand some of their technical information and drawings or was this just a generic bascule they were working on?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** There are certainly references in the report to the Sustrans commissioned design through ReForm. I do not know if there were conversations directly between Ian and the ReForm team.

**Caroline Pidgeon MBE AM (Deputy Chair):** Would that not have been something you would ask if you were trying to look at a proper independent review of a scheme that was already out there?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** What we wanted was him to look at the different possible solutions that you could come up with here in terms of a bridge, not just focus on what we had done or what ReForm had done, and make a recommendation to us on what was the right solution for this part of the river given the challenges that we had.

**Florence Eshalomi AM (Chair):** Just to clarify, that Sustrans consultation or feasibility study was partly funded by TfL?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** That is correct, yes.

**Caroline Pidgeon MBE AM (Deputy Chair):** Yes, it is strange --

**Florence Eshalomi AM (Chair):** That you would not refer back to it.

**Heidi Alexander (Deputy Mayor for Transport):** Like David said, there are references to it.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** No, as I say it does make reference to it but whether he had a direct conversation with ReForm, I do not know.

**Caroline Pidgeon MBE AM (Deputy Chair):** You would have thought they would want to get behind some of their figures and stuff because certainly their costings that I have seen, which were assessed independently

as well, came in a lot lower than where you have ended up. The Mayor yesterday said if there was a way we could deliver this a lot cheaper he would want to. He is still very keen, if possible, on the bridge idea.

Going forward, should TfL have really consulted key stakeholders perhaps at an earlier stage to understand the complexities and costs of this project, is there more that should have been done earlier?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** We have been engaging with key stakeholders, the London boroughs, landowners, PLA and the Environment Agency, all of the significant parties that you might expect, from the outset in terms of the development of this. I do not think it is the case that we have come to the party late in terms of engaging with anybody.

It is the case that as a design progresses there is more rigorous testing of that design that needs to take place. As I said, when we did the consultation back in 2017 we had three different alignment options that we were looking at, and that had come from a list of something in the order of 30 different alignment options that we had initially investigated. It is only once you begin to refine down and do that more detailed testing that you are able to ascertain whether there are changes that are required.

**Caroline Pidgeon MBE AM (Deputy Chair):** Your conversations with the PLA were obviously important. You have already mentioned earlier that they had reduced the height needed from 15 metres to 12 metres, which would save considerably on your structure in terms of costs. In some ways you would think the price would have started to come down if they were being more flexible with their requirements.

Last week at the Budget [and Performance] Committee your colleague who was there mentioned one of the big things that he could recall that had led to the increase in costs was to do with shipping impact or something.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** Yes.

**Heidi Alexander (Deputy Mayor for Transport):** Yes.

**Caroline Pidgeon MBE AM (Deputy Chair):** Was that a new thing the PLA suddenly put on the table or was it specifically because of this new design?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** We have always had ship impact protection within our designs. However, in the autumn of 2018 the PLA and ourselves agreed some additional detailed testing and they also brought harbourmasters who use this part of the river to really pressure test in terms of what happens if there is an incident on this part of the river. The outcome of that was that the ship impact protection that was previously proposed needed to be enlarged. Ship impact protection, in simple terms, is a sort of buffer that you need to put around the towers that are in the river. When the ship impact protection gets bigger in order to protect the size of the navigable channel you need to move the main spans further out of the navigable channel. The consequence of that is you have a longer middle opening section. That therefore requires strengthening in the amount of steel, you need stronger towers and therefore bigger foundations, and you need heavier mechanical and electrical equipment to lift it. All of that was what was driving up the cost at that point.

**Caroline Pidgeon MBE AM (Deputy Chair):** The PLA - in your discussions once they saw the preferred design that you had come up with, your lifting bridge - felt you needed more around the towers and therefore that ultimately led to increased costs?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** Yes. As I say, that was done in association with harbourmasters. That is not to say the only thing we were looking at is what you would need to do to the bridge. We were also in discussions with them around things like what could we do around speed limits on this part of the river; what we could do around signing, lighting and various other mitigating factors. We did not want to move to an automatic solution being, “Right, this needs to get bigger”. We wanted to try to employ as many methods as possible to try to keep that cost down.

**Caroline Pidgeon MBE AM (Deputy Chair):** One of the things in some of the IIPAG paperwork that we have seen that worried me is in July 2017 IIPAG was concerned that,

*“The normal sequencing of projects is not being followed. Early days but shortcuts seem to have been made and if they continue likely to lead to cost and timescale problems in the future.”*

I am wondering how, David, you reacted to that and put in place measures that would have reassured IIPAG that we were not in the situation we have been in the past where a project, such as the Garden Bridge, saw lots of shortcuts and problems along the way.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** As part of this work we have assembled a really strong team from both within TfL as well as externally in terms of the skills and knowledge that were needed to take this forward.

**Caroline Pidgeon MBE AM (Deputy Chair):** Who externally, could you list them?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** Externally our first engineering and design consultants were Arcadis, they were on board until the end of 2017. Then we went back out to the market and we brought in Atkins at that point to provide that support. We also have Marico, who are marine engineers, and they employ ex-harbourmasters so they are very experienced in terms of works within this part of the river. We have an organisation called Quod, who are planning consultants. We have Mott’s, who are environmental consultants. Then there are some smaller consultancies that we also use in specialist areas, such as legal advice and other things. Where we did not have the right skills in house we have made sure we have supported the team in terms of bringing in that expertise.

What we have also done at various points is ensure that we use external organisations to challenge the way we have done things. We had Costain, for example, who were providing advice to us around constructability as well as some of the design factors. They looked at the design to ensure that we were taking a view on whether there were opportunities where we could further value engineer down some of the aspects of the bridge design.

When we also went through the process of that sort of design finalisation and costing we also brought in other organisations such as Cleveland Bridge, specialist steel bridge contractors, to provide advice on the costing and benchmarking of costs. We brought in the American Bridge Company, moving bridge specialists. We brought in steel specialists, foundation specialists and mechanical and electrical specialists.

**Caroline Pidgeon MBE AM (Deputy Chair):** You do not have any teams in house on those, do you?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** We really tried to ensure that we were not missing anything in terms of what the opportunities were to either think about something

differently or ensure that we were being robust in terms of how we were costing the factors within the bridge design.

**Florence Eshalomi AM (Chair):** On that, you are saying you had everything in place so you did not miss anything but it clearly states in the IIPAG reports they had issues with the size of the Project Board that comprised 13 people. They state it was difficult to get accountability and decision makers. They also stated that,

*“IIPAG recommends that the Project provides a frank and honest assessment of the other options available and a realistic assessment of the cost to the Mayor and Board members.”*

Was all of this happening? We appreciate that, yes, this is a big project. As Assembly Member Pidgeon outlined, I very much want this. However, again, alarm bells and red flags were coming up as early as March 2017.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** All of the key decisions that were taken in terms of moving through the different stages – from the initial case for the Scheme through to whether it should be a bridge or a tunnel – have gone through our governance in terms of the Healthy Streets Portfolio Board and then on to PIC where appropriate. With any project you have a Project Board in place to oversee it on a weekly or monthly basis. We brought together the various people from within TfL to ensure that we had the right representation there. That is not to say we were not using the appropriate governance within TfL in terms of each of the key decision points.

**Caroline Pidgeon MBE AM (Deputy Chair):** In March 2017 they were flagging these issues. You came fresh to it then, David, and you took over this.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** Yes.

**Caroline Pidgeon MBE AM (Deputy Chair):** I do not understand what changes you made to how you were managing the Project as a result of IIPAG’s comments to you.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** That is really where we brought in a much more extensive team with appropriate knowledge, both internally and externally, to ensure we had the right level of capability to be able to take this Project forward.

We were also very conscious around things like the programme that had been developed and challenging whether that was realistic, so we had programmers on board. For example, I know in one of the reports that was produced by IIPAG they said they thought the programme was ambitious. Therefore we ensured that the information that was shared made very clear what the challenges were in relation to each of the activities and what that might mean if that caused a delay. For example, negotiations with landowners can sometimes take longer than you might anticipate and therefore that can change the amount of time you might need in order to reach a satisfactory conclusion in terms of agreement on what the design needs to look like.

**Caroline Pidgeon MBE AM (Deputy Chair):** OK. Obviously one of the issues always has been the funding of the bridge. What other funding sources did you actively explore for the Project? You have British Land on one side and you have Canary Wharf Group on the other; big developers developing lots of home and this will benefit their residents and will benefit their businesses. How much were they going to put in?

**Heidi Alexander (Deputy Mayor for Transport):** Would you like me to start with the answer to that?

**Caroline Pidgeon MBE AM (Deputy Chair):** Yes.

**Heidi Alexander (Deputy Mayor for Transport):** My understanding is that there have been a number of discussions with the boroughs, looking at things such as the use of a Community Infrastructure Levy (CIL) on the Southwark side. Obviously there are competing demands for the CIL. On the northern side of the river, with Tower Hamlets, they have been clear and consistent that they did not want to fund this. I understand that TfL also worked with an organisation that looks at philanthropic donations. Whilst there may have been some opportunity around subsidising the operating costs in the same way there is currently that arrangement with the cable car – I am not necessarily saying the same organisation – there was limited scope around philanthropic contributions in this location with that bridge. I think a number of avenues were explored looking at third party sources of funding.

The point I would make is if that there had been a gap of £5 million – £10 million it may have been something that you could plug. If you were, at the very least, looking at a gap of £100 million – between the £350 million in the Business Plan and the £463 million midpoint estimate that TfL had arrived at – and possibly an additional £250 million, the quantum of funding that you are trying to find is very, very significant. I was also very clear with TfL officers that I wanted them to look at options such as a workplace parking levy and to look at whether there may be a way to implement charges for parking on the TfL road network that over time may provide some revenue, but none of those options were giving us any assurance that you could plug the gap that had emerged once the really detailed design work had been done.

**Caroline Pidgeon MBE AM (Deputy Chair):** What about with those big landowners, British Land and Canary Wharf Group, had you any indication from them that they would contribute to this transport --

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** We had discussions with all of the big landowners, Hilton Hotel and various others as well as the ones you have mentioned. To be clear on how the process works, because the bridge is referenced in Southwark's CIL Register you cannot get a section 106 contribution through planning on top of CIL, which is why we were having discussions around SIL. We also did have discussions with Canary Wharf Group and it was very clear that whilst they were supportive of the principle of a bridge there was not going to be opportunity for them to provide financial support.

**Caroline Pidgeon MBE AM (Deputy Chair):** Thank you very much, I think that I will leave that there for the moment. Thank you. Assembly Member Prince.

**Keith Prince AM:** Thank you very much, thank you. Good morning. I am going to start with the Deputy Mayor for Transport. Could you let us know when the Mayor was actually informed about the increasing complexities and costs associated with the Project?

**Heidi Alexander (Deputy Mayor for Transport):** I think I have already answered that question in response to Assembly Member Pidgeon earlier. I can repeat it if you want me to.

**Keith Prince AM:** Yes, would you mind?

**Heidi Alexander (Deputy Mayor for Transport):** OK, no problem. Since I have been in post I know that on at least three occasions we have briefed the Mayor in person with senior officers from TfL. In September of last year there was a discussion about what the estimated costs were, about the emerging ideas around the

design concept and the alignment. He, and I, were aware at that time that this was a terrifically complicated project and that for any of the estimates that TfL was providing to us at that point in time as more work was done they could go up and we were also being told they might go down. The experience, however, between September and May of this year [2019] is that the costs were only ever going in one direction. Therefore the Mayor was personally briefed in April and May on what the latest position was.

**Keith Prince AM:** Whose decision was it to pause the bridge? I think that is a sensible position to take I hasten to add.

**Heidi Alexander (Deputy Mayor for Transport):** It was the decision of the PIC of TfL, as we have discussed already in this session. As I have also said already, in May we had a discussion with the Mayor where he asked TfL officers to go away and review the case for the bridge alongside the possibility of doing some additional work on getting a fast frequent ferry option in place there. However, it was the decision of the TfL PIC to go back to an early stage of project development around what the options were, bridge versus ferry. The Mayor and I agreed with that decision.

**Keith Prince AM:** The decision was actually a Chair's decision, wasn't it? It was not actually taken by any Committee, it was a Chair's decision.

**Heidi Alexander (Deputy Mayor for Transport):** Yes. As I explained to Assembly Member Pidgeon, the paper is drawn up by TfL officers. When a Chair's Action is taken, either as part of the PIC or Finance Committee, the paper will be circulated to all members of that Committee. They have an opportunity to comment on it. They have an opportunity to speak to the Chair, if they so wish. Then the decision was taken by the Chair through a Chair's Action, but it was a decision of the PIC.

**Keith Prince AM:** Where did the Mayor play a part in this?

**Heidi Alexander (Deputy Mayor for Transport):** As I explained --

**Keith Prince AM:** I know I seem to be making you repeat yourself. I do humbly apologise for that but perhaps I should be a little bit clearer. I am really interested in at what point the Mayor said, "OK, guys, I think we ought to put a halt to this", or did someone like your good self quite wisely say to him, "Mr Mayor, I think actually we need to put a brake on here because we are going to be spending £1 million a week"?

**Heidi Alexander (Deputy Mayor for Transport):** Given the briefings that had been provided to the Mayor in April and May, as I have talked about, and the discussions that we had we were concerned about the deliverability of the bridge in the short to medium term and I will not repeat the reasons for that.

**Keith Prince AM:** No, I have all that here.

**Heidi Alexander (Deputy Mayor for Transport):** At that May meeting the Mayor asked TfL to go away and do some more work and review the case. It culminated in a paper being circulated to members of the PIC, I think on Tuesday, 18 June. I was aware, shortly before that, a paper would be circulated to the PIC and the contents of that paper and you would expect me to brief the Mayor --

**Keith Prince AM:** I would.



**Heidi Alexander (Deputy Mayor for Transport):** -- and his senior team on the contents of a paper such as that going to the PIC. He is, at the end of the day, the Chair of the TfL Board. That was the precise chronology over that period of time.

**Keith Prince AM:** OK. We are saying really around about 18 June then, are we?

**Heidi Alexander (Deputy Mayor for Transport):** Shortly before that.

**Keith Prince AM:** Just before then.

**Heidi Alexander (Deputy Mayor for Transport):** Yes.

**Keith Prince AM:** I have a couple of other questions, if I may? I am sorry, I probably went about it in the wrong way and I apologise for having to make you repeat stuff you have already said.

There were a couple of concerns for the IIPAG. On more than one occasion they refer to the main driver of the Project being the commencement of the construction within the mayoral term and also the drive from the Mayor to get things moving more quickly. I respect that because he wants to get things moving along, and quite often these things do not happen unless you have the drive from the Mayor so I am not criticising him for that. I am wondering - if you read between the lines - whether that sense of urgency and drive to get spades in the ground, so to speak, could potentially add to the costs and if there is an inference that could add to the cost. Perhaps I should ask David, is there any truth in that and had we taken longer could we perhaps have found a cheaper way?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** It is true to say there is an ambition on both TfL's side and the Mayor's side to realise the benefits that a new crossing here could deliver as quickly as possible, undoubtedly. That is not to say that we were holding back on any information in relation to what the challenges were and the significance of those challenges.

As I mentioned before, when we put a programme up - it went into one of the Mayor's briefings - it would have clearly stated against each of the activities what the risks were associated with those activities and what that might mean in terms of the timescale to get a spade in the ground in terms of the start of work before 2020. Whilst 2020 was in our timetable in terms of being achievable, we also recognised that there are challenges along that way, what those might be and therefore what that might mean in terms of extending that timescale out.

**Keith Prince AM:** Either of you can answer this; was there ever a discussion around the fact that you could deliver the ferry a lot quicker if 2020 is the landing date?

**Caroline Pidgeon MBE AM (Deputy Chair):** We are moving on to that a bit later.

**Keith Prince AM:** I will withdraw that question. I do not want to tread on someone else's toes or flippers, or whatever it is. Fine, I will leave it at that. Thank you very much indeed, thank you.

**Caroline Pidgeon MBE AM (Deputy Chair):** I will just pick up from Assembly Member Prince; the mayoral briefing papers, could we see those please?

**Heidi Alexander (Deputy Mayor for Transport):** There will be no problem with that.

**Caroline Pidgeon MBE AM (Deputy Chair):** Thank you.

**Florence Eshalomi AM (Chair):** We are going to move on quickly - mindful of time, colleagues - looking at lessons learnt and the next steps.

As I mentioned, Deputy Mayor and David, there is still a lot of support for this in Southwark with a number of the residents and businesses. Currently there is sheer overcrowding in that part of the borough and trying to navigate your way out of Canada Water Tube Station in the morning is quite a challenge. Therefore we do need some provision around how we can get that part of London to promote active travel and help ease that transport congestion.

I will come over to my colleague, Assembly Member Copley, who will start on this section in terms of the estimates.

**Tom Copley AM:** Does TfL need to improve its initial cost estimates?

**Heidi Alexander (Deputy Mayor for Transport):** I think if you look back to what David Hughes [Investment Delivery Planning Director, TfL] said at the Budget and Performance Committee last week there is a recognition that this is an area we need to get better at. Clearly there is a big difference between whether it is a £150 million cost estimate up to a potential upper limit of £600 million. That is criticism that has been levelled at TfL, I think there is some merit in it and we need to get better at it.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** I mentioned how the initial estimate was produced, which was based on this cost model looking at the out-turn cost for different bridges across the world. Whilst that is extremely helpful in terms of giving us a cost per metre, clearly it was not adequate in terms of understanding the complexities on this part of the river and therefore what was necessary in terms of the challenges to overcome some of those constraints and the design that was appropriate there.

Yes, I would agree that we need to do more about that early stage planning in terms of ensuring there is more local information that is brought to bear alongside that cost benchmarking information from the out-turns from other projects.

**Tom Copley AM:** You mentioned this consultancy that you went to and it came up with a cost per metre because you did not have a particular design in mind. Presumably they look at the local circumstances as well. Is it that as you are going down the line you come across other challenges that you were not aware of at the beginning?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** It is both of those parts really. It is a model that is built, as I said, from bridges that are all over the world; rail bridges, road bridges, pedestrian and cycle bridges and different opening mechanisms, different lengths, different spans in terms of the number of supports in the river and some of these were in bays as well. All of that information is extremely helpful in giving us that range but it did not include enough around those local conditions. TfL is not experienced in terms of delivering these types of projects. It is innovative for us, which is why we tried to bring in the appropriate level of expertise and knowledge from external organisations that have been involved in it. However, it is only when you really go through that process in earnest, develop the design and robustly test it again and again and again that you can fully appreciate some of the challenges and therefore what you need to do in terms of adjusting that design to ensure that it is capable of being delivered.

We are now at a point, I believe, where we have a design that can be built, can be operated and can run for the next 120 years, and we have a construction methodology alongside that. The challenge with it is that, unfortunately, it is just unaffordable.

**Tom Copley AM:** You are saying that will now be on the shelf and can be taken off the shelf should funding become available?

**Heidi Alexander (Deputy Mayor for Transport):** Yes. For complete transparency, we will complete the work that has been done in a logical way, which will mean a little bit more of expenditure. That is to make sure that you can package it up so that if financial circumstances change in four, five or six years' time then we will be able to take that off the shelf, dust it down and take that concept design and the construction methodology, the operational arrangements that have all been prepared. This is not money wasted. This is a really important piece of work that could be dusted off and proceeded with at a future date.

**Tom Copley AM:** Heidi, in terms of other projects, do you have any concerns that cost estimates are wrong for other key Transport Strategy projects and they therefore may become undeliverable?

**Heidi Alexander (Deputy Mayor for Transport):** Sat here today, no, I do not. I think we do need to ask ourselves some tough questions about that initial estimate planning but I am not sat here with a list of schemes where I have those concerns.

I would reiterate the point that David has made though about the very unique nature of this project and that it is one where TfL has not had previous experience of doing these sorts of projects. If you think about some of the work at the big London Underground stations – be that the work at Victoria or Tottenham Court Road – we have seen those schemes come in on budget using exactly the same process that we have been using here in terms of our estimates of cost, our estimates around risk and construction inflation etc. Where we are doing projects that are novel, projects where there is not a comparator anywhere in the world, it is not to say we should not try because I think it would have been an incredible symbol. It would have been wonderful to have built a world first but we also have to be responsible and realistic.

**Florence Eshalomi AM (Chair):** Sorry, Assembly Member Copley. On that, Deputy Mayor, not to abuse my Chair's position but it seems as if a number of transport projects on this side of the borough, in the south, are being scrapped. Obviously we have seen the loss of the RV1 bus and this bridge being paused. The obvious one I am talking about, which I will come to, is the Bakerloo line extension that obviously has an impact on Lewisham. They are really big transport projects that would have made a big difference in helping to alleviate some transport issues. I would like to get your assurance that we will not be getting a letter in a few months to say that is now going to be paused.

**Heidi Alexander (Deputy Mayor for Transport):** You are talking about the Bakerloo Line [Extension]?

**Florence Eshalomi AM (Chair):** The Bakerloo line; I appreciate you do not have a magic pot of funding but just to make sure we continue to work and engage with Southwark and Lewisham on that really important extension.

**Heidi Alexander (Deputy Mayor for Transport):** I understand the level of disappointment and anger that will exist amongst residents and elected representatives around Rotherhithe, and some people on the north side of the river as well will be disappointed by it. What I would say in regard to the letter the Leader of the

Council sent to me, which I think you were a signatory to, is that we plan to be going out to another consultation on the Bakerloo line extension later this year. That is a real concrete sign of our commitment to moving forward with that project. However, as you rightly allude to, the funding and financing package for delivering the Bakerloo line extension is one where significantly more work needs to be done. Nobody should underestimate the scale or complexity of that project either but in terms of the benefits it could bring to that part of South London I am very, very familiar with them.

What I would also say is that we are making significant progress with walking and cycling investments in Southwark and in this part of London. Work has already started on Cycleway 4 that goes from Tower Bridge down to Greenwich and then will be extended to Woolwich. We are also working with Southwark on a new cycle route from Rotherhithe to Peckham. I have asked TfL officers to accelerate their work to expand the Santander Scheme further into Southwark so, when we get this fantastic new cycleway built between Tower Bridge and Greenwich, further along that route you can get Santander docked bikes. I know that is an aspiration that Southwark have. I understand why you make those points but there is a lot of good news for Southwark. There are lots of projects we are working on very well with them.

**Tom Copley AM:** Thank you. Sorry, Unmesh.

**Unmesh Desai AM:** I wanted to mention the Isle of Dogs as well in that context. Whilst the bridge may have been shelved for the time being, they have been very focused on the very necessary transport upgrades needed for the island because they are suffering from massive overdevelopment.

**Heidi Alexander (Deputy Mayor for Transport):** You are completely right to talk about the Isle of Dogs. We have worked very constructively with Hackney and Tower Hamlets Council on a new cycling route to go from Hackney all the way down to the Isle of Dogs. Of course, Canary Wharf will benefit from the new Crossrail station when it is opened. I know the leadership team at Crossrail are moving heaven and earth to get the line open there as soon as possible. There are a number of other transport projects we are working on in relation to the Isle of Dogs. I am happy to come and brief you on those separately.

**Tom Copley AM:** Can I ask about the funding that is allocated to this in the Business Plan, what happens to that now? Does it sit there until a future point where the Project might go ahead or are you going to allocate it to other schemes?

**Heidi Alexander (Deputy Mayor for Transport):** In this year's business planning cycle, which we are starting imminently - it is already underway internally within TfL and we will publish the 2019 Business Plan in December of this year - we will look at all the competing priorities for that money. Clearly we have a lot of money that we, to date, have been able to protect around the wider Healthy Streets Portfolio, investment in safer junctions and cycleways. I am keen that we do all we can to protect that budget but we will have to look at all the priorities in the round. We are not in a position, at this point in time, to say we will take that money and spend it on these projects. It does not work in that way, you have a much more holistic discussion over a number of months about what the priorities are.

**Tom Copley AM:** Will that be a TfL Board discussion?

**Heidi Alexander (Deputy Mayor for Transport):** The TfL Board are involved at an early stage. The Board members in that discussion and, as you would expect, myself and the Mayor are also briefed at various points along the process about what the thinking is. Ultimately, yes, it is the TfL Board that needs to sign off the Business Plan.

**Tom Copley AM:** Finally, do you think TfL needs to make the Mayor more aware of the complexity of flagship projects and the risks associated with them? I do not just mean this Mayor, I mean the mayors overall.

**Heidi Alexander (Deputy Mayor for Transport):** To be fair to the TfL team, since I was first briefed on this project back in July last year the challenges and the complexities have been highlighted to me and we have had a mature and reasoned discussion between City Hall and TfL. To be honest, it is an example of good governance. You can compare this to other projects such as the Garden Bridge where a previous Mayor, in my view, may have been throwing his weight around and not necessarily listening to advice being given to him. This is the exact opposite of that situation.

**Tom Copley AM:** Thank you very much.

**Caroline Russell AM:** I want to move on and look at how to go forward. I want to find out a bit about what the timeline of TfL is for the development and delivery of an alternative river crossing option like an enhanced ferry service.

**Heidi Alexander (Deputy Mayor for Transport):** Shall I start and then perhaps David could pick up the detail?

**Caroline Russell AM:** Yes.

**Heidi Alexander (Deputy Mayor for Transport):** My understanding is TfL would be looking to come back to us with some options by October this year for a fast frequent ferry service across the river between Rotherhithe and the Isle of Dogs. I would like to see, if possible, those ferries be electric but at the very least hybrid so we can gain some of the environmental benefits we have seen down in Woolwich with the new ferries there. Just to reiterate, it will be a quite new and exciting type of ferry service potentially. If you go to Amsterdam you can see huge numbers of roll-on-roll-off ferries with huge numbers of pedestrians and cyclists accessing them easily.

The river in London is obviously a tidal river and therefore we would have to be confident that any vessel could navigate a tidal river. That is the work that David and his team have been tasked with doing; looking at what the options are, looking at whether it would be a charged or an uncharged ferry, a free ferry. We need to do that work over the next couple of months and hope to be in a position in October to say some more.

**Caroline Russell AM:** Do you want to add to that?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** Just to add to, we have seven work streams effectively that we are looking at to help inform that. We are looking at things like re-planning, both in terms of what sort of service is required across the river as well as services that already run up and down the river. Quite a number of them stop at Canary Wharf but they do not stop at Rotherhithe. Is there an opportunity there to think about how you could also service east-west travel along the river rather than just north-south?

The fare strategy; we need to do some further demand modelling around what happens when it is free, which is why the options that we put in the consultation back in 2017 to different options are around who would potentially charge for it. What are the vessels? The Deputy Mayor for Transport has referred to the fact that pure electric would be a preference. What we do not want to do is get it wrong in terms of the tides on this

part of the river and what is required in terms of propulsion here because it is quite a strong tide at this point. We are looking at what is out there.

We are also in discussions with organisations like Thames Clippers around the proposals they have come up with. Then the piers, Canary Wharf pier, Rotherhithe pier; what needs to happen there to ensure they can accommodate pedestrians and cyclists. I am sure with roll-on-roll-off cyclists one of the challenges is the piers go quite a long way up and down so you need to think about those ramp gradients, ensuring it is as seamless a journey as possible.

Then obviously how that ties in with complementary measures, as well as what that means for the demand of usage here and the cost associated with those different options. That work is already happening and the intention is we will complete that by October.

**Caroline Russell AM:** Thank you. Obviously this is instead of a bridge that would presumably have been free to use. Are you modelling this as a free service for pedestrians and cyclists to use?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** That is certainly one of the options we will test. As I am sure you would expect, we need to understand the cost implications of that and report back to our PIC. That would be part of a consideration around what the right solution is going forward.

**Caroline Russell AM:** In that decision-making process you will be thinking about the benefits in terms of delivering the Mayor's Transport Strategy. Presumably, if it is free, then more people will use it, you will enable more trips by walking and cycling and more people to get off the Tube as Florence [Eshalomi AM] was talking about earlier.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** Absolutely. That will be part of what we call the demand sensitivity modelling that we do. You test different graduations of fares as well as different frequencies of service and other factors to help understand what that means in terms of the big picture.

**Caroline Russell AM:** At the moment, if you go by Tube from Canada Water to Canary Wharf it is £1.70 whereas a single crossing on the river bus is £4.40. If you want people to use a ferry service you very likely need to either subsidise it a bit or subsidise it completely, if you want to get those benefits for walking and cycling.

The problem is the gaps in the walking and cycling networks. We saw the video at the beginning where the woman was saying they like cycling, but you have to go all the way back to Tower Bridge to get yourself over the river. If you are looking at ferries at Rotherhithe, are you also thinking about them to fix other unidentified gaps like Canary Wharf to North Greenwich or relieving the Greenwich Foot Tunnel? Are you thinking about ferries not just on this alignment but on other alignments too?

**Heidi Alexander (Deputy Mayor for Transport):** One of the things that David and I have discussed in TfL doing this piece of work is if we are going to be building new piers, for example, whether there is an option for those piers to be movable as well. There is a whole range of different things we are looking at. If we can move forward with this, and it is proven to be a success, I would want TfL to be considering how you can improve connectivity across the river from the southern side to the northern side and back again. We need to get this work done first before we start committing to a whole series of different things. It is going to be an interesting couple of months awaiting this feedback from TfL.

**Caroline Russell AM:** You are expecting to have more information in October.

**Heidi Alexander (Deputy Mayor for Transport):** October, yes.

**Caroline Russell AM:** OK. Do you think TfL would consider revisiting the Bridge Project in the future?

**Heidi Alexander (Deputy Mayor for Transport):** From my perspective - knowing what I know about the various competing priorities there are, whether it is within the Healthy Streets Portfolio of funding or more broadly across the organisation around investment in better public transport - I find it difficult to envisage how in the next five years we will realistically be in a position to spend £0.5 billion on a walking and cycling bridge in this location. Whilst that work has been done and we talked about how it can be packaged up ready to be taken off the shelf and dusted down, at the moment it is difficult to see how you can make an investment of that size within the next five years.

**Caroline Russell AM:** What about the other option that was thought about at the beginning, the idea of the immersed tunnel which was £440 million? In the context of the bridge having gone up so much that starts to be a more interesting and potentially more doable option. Would TfL consider looking at that option again?

**Heidi Alexander (Deputy Mayor for Transport):** That might be one for David to answer in more detail.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** When we published the information back in 2017 on the options that we looked at you are right, the tunnel option was called an immersed tunnel. The reason we went for that solution is because you want to try to minimise the amount of land you require for ramps back up to ensure that is best usable for cyclists. Immersed tunnels have challenges in themselves. You have to effectively dredge a trench in the riverbed and then you are laying a tube in the riverbed. That has significant environmental implications. That is an important consideration, and for that reason we had quite significant concerns around the immersed tunnel option.

The other consideration, which impacts on demand, is it is challenging to create a pleasant and conducive environment within a tunnel for pedestrians and cyclists. Greenwich works quite well because there is a reasonably high level of footfall and activity in there but it is still challenging. We looked at examples from around the world and this was borne out by some research we did of potential users, both existing cyclists and pedestrians as well as potential people who could change their trips. When you ask them what there is their propensity to change, a bridge had a much higher level of attraction than a tunnel because of the concerns of people about personal security and other aspects.

Whilst you are right when you look at it in terms of the cost now compared with the tunnel option when we costed it in 2017, there are those other considerations which are very important in determining if that would be the right solution to take forward. I would suggest that it would not be.

**Caroline Russell AM:** That suggests the ferry option is the thing that seems to be giving the best potential future.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** Yes.

**Heidi Alexander (Deputy Mayor for Transport):** Correct.

**Caroline Russell AM:** Can I just double check, have you ruled out making the ferry option a free ferry service?

**Heidi Alexander (Deputy Mayor for Transport):** No, we have not ruled that out.

**Caroline Russell AM:** Thank you.

**Tom Copley AM:** That point has been covered.

**Florence Eshalomi AM (Chair):** Do you want to come in?

**Unmesh Desai AM:** I was going to say I am glad about what you said about the ferry crossing because the one consultation meeting that I went to on the Isle of Dogs was a very well-attended meeting. The preferred option was a free ferry service. About 200 people were there.

**Florence Eshalomi AM (Chair):** Thank you. Assembly Member Pidgeon.

**Caroline Pidgeon MBE AM (Deputy Chair):** Yes, a couple of questions. Yesterday the Mayor said that you were looking to safeguard the route. I understand today you have talked about getting the package all ready, so you can take it off the shelf in the future. Are you doing work to properly safeguard the route as we think about projects like Crossrail 2?

**Heidi Alexander (Deputy Mayor for Transport):** On the southern side of the river at Durand's Wharf, which was the proposed landing point, is public open space. That is a slightly different question to the land on the northern side of the river at Westferry Circus. TfL will need to have some discussions with Tower Hamlets about their planning policies and how they classify that land. David may be able to say something more about whether those discussions have started.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** We are having discussions with Tower Hamlets officers in terms of how you could provide protection for a future bridge. With regard to the Deputy Mayor's point on the Southwark side, because it is metropolitan open land it has very strong protections around it already. It is the Tower Hamlets' side where we are doing a little bit of work to ensure we keep that.

**Caroline Pidgeon MBE AM (Deputy Chair):** You are being positive about that.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** Certainly, the discussions we have had with their officers to date have been very positive. There is a bit of work we need to do with them to take that forward.

**Caroline Pidgeon MBE AM (Deputy Chair):** I was just reflecting on the PLA and their role in all of this because it is a slightly strange body. It is one that the previous Mayor tried to take over but we did not get very far on that. Clearly, right at the start they must have said to you, way back when you started this project, "This is the span we are looking at, this is the loadings and this is the height" and what the requirements were for a bridge. It sounds to me, potentially more recently that has changed. Are you able to provide in the information after this meeting to us what it was right at the start and then what it has become, just to understand whether their position has slightly changed along the route and which may have affected this?



Obviously we are looking at TfL and you have all these experts helping you, but what has the role of the PLA been, have they always been supportive of this or have they been rather more cautious?

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** There were three fundamentals when we started with the PLA. The first one was that there should be a 20 metre height clearance above what is called spring high water levels. We have come down from 20 to 15 to 12 metres. They also made it very clear that the navigable channel should be kept clear because of the way that boats move on this part of the Thames. The other one was that there needs to be absolute certainty when boats are coming down from Tower Bridge for the largest of the boats --

**Caroline Pidgeon MBE AM (Deputy Chair):** That it slows them.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** Exactly, because there is nowhere to stop effectively between Tower Bridge and Rotherhithe. What we did with the PLA is we had vessel surveys that have been running for nearly two years now, gathering data around how vessels move on this part of the Thames and what the size and the other characteristics of those vessels were. That evidence has been absolutely crucial in terms of being able to get agreement of that lower height as well as what the appropriate width of the navigable channel is, what the adverse events are that you also need to be able to plan for and why you need to think about the size of the shipping and about protection and other considerations. They have been very good at taking a data led approach, as we have tried to do as well, in terms of determining, "That is where we started and this is where we are now".

**Caroline Pidgeon MBE AM (Deputy Chair):** It would be helpful if we could have the numbers in writing of the span, the loadings and the height just to understand that process as well. As I say, I know from the past that there have been concerns that the PLA may have been an obstacle rather than a fully engaged partner. That would be helpful. Thank you.

**Keith Prince AM:** Very quickly, I know you are in the very early stage but have you considered, in paying for the ferry, making it part of the bus system? If you are on a journey, like you would be on the Hopper Fare, if you go on it during one hour then it is free but obviously if it is your first journey of the day then it is £1.50, and it also benefits from the capping. Just make it like part of the bus system. I think that would be something most people would find acceptable because if you are coming off the Tube there would not be any extra cost and things like that.

**David Rowe (Head of Major Projects Sponsorship, Transport for London):** Your thinking is very much along the lines of our thinking in terms of one of the scenarios we will test. We will be testing free as well as what is the comparable cheapest alternative you might use on public transport in terms of fares, as well as what the difference is in terms of the fares that are charged today. One of the Assembly Members mentioned the capped fare and comparison of that with a Travel Card. Yes, there are a number of different tests we will do but, absolutely, that is a good one to do.

**Keith Prince AM:** OK, thank you.

**Florence Eshalomi AM (Chair):** All right, thank you for that. This is something we will continue to look at from the Committee and it will be helpful to get regular updates from you. We will look forward to that initial report back in October on the ferry options.

Just to thank our guests and can we note the report?

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# Subject: Summary List of Actions

**Report to: Transport Committee**

**Report of: Executive Director of Secretariat**

**Date: 11 September 2019**

**This report will be considered in public**

## 1. Summary

- 1.1 This report sets out the actions arising from previous meetings of the Transport Committee.

## 2. Recommendation

- 2.1 **That the Committee notes the completed and outstanding actions arising from previous meetings of the Committee, and additional correspondence received.**

### Actions arising from the Committee meeting on 19 July 2019

Item	Topic	Status	For Action by
3	<p><b>Rotherhithe to Canary Wharf Crossing</b></p> <p>During the course of the discussion, the Committee requested the following further information in writing:</p> <ul style="list-style-type: none"> <li>The comments and email exchange of the Members of the Programmes and Investment Committee, which directly relate to the paper circulated prior to the Committee's decision to pause the development of the crossing on 21 June;</li> <li>A copy of the independent review produced by the former President of the Institute of Structural Engineers, Ian Firth, on the design of the crossing, compared with alternative designs; and</li> <li>A copy of the briefing prepared for the Mayor outlining the activities of the development, its risks and timescales.</li> </ul>	<p>In progress. A partial response was received on 6 August and is attached at <b>Appendix 1</b>.</p>	<p>Deputy Mayor for Transport</p>

## Actions arising from the Committee meeting on 10 July 2019

Item	Topic	Status	For Action by
7	<p><b>London's Transport Now and in the Future</b></p> <p>During the course of the discussion, the Committee requested the following further information in writing:</p> <ul style="list-style-type: none"> <li>• Accident rates for motorcyclists in London on roads where they may use bus lanes, against roads where they cannot;</li> <li>• What is being done to reduce public subsidy in electric vehicle infrastructure;</li> <li>• Detail of the work being done to make TfL's energy use more sustainable;</li> <li>• Explain the approach taken, and future details, on outer London bus reviews;</li> <li>• A breakdown of London's bus usage by area, to show where in London bus use is dropping and by how much;</li> <li>• Detail of any work being done to introduce annual capping to Oyster and contactless payments;</li> <li>• TfL's submission to the financial review of approaches to fund the construction of Crossrail 2;</li> <li>• An explanation as to why Mobileye has not been rolled out more widely on London's bus network; and</li> <li>• An outline of the work being done between TfL, High Speed 2 and Old Oak and Park Royal Development Corporation.</li> </ul>	In progress.	Director of Spatial Planning, Transport for London (TfL) and Head of Strategic Analysis, TfL

### **Actions arising from the Committee meeting on 15 May 2019**

Item	Topic	Status	For Action by
9.	<p><b>Tram and Bus Safety in London</b></p> <p>The following further information was requested:</p> <ul style="list-style-type: none"> <li>List of Members of the Sandilands Incident Review Board;</li> <li>Work done by TfL on risk associated with road users, in particular cyclists, and tram tracks; and</li> <li>Detail on the relationship between speed, use of the hazard brake and the effect on passengers in trams.</li> <li>Safety Performance Indicator data for the bus network over the preceding 12 months;</li> <li>What work has been done by TfL to assess whether bus driver toilets being added to those 42 bus routes that did not previously had one, could be made available to members of the public who were disabled;</li> <li>A list of areas identified for improvement in accident reporting; and</li> <li>Progress made towards increasing the remit of the Victims' Commissioner to include victims of road crimes and collisions.</li> </ul>	<p>In progress.</p> <p>In progress.</p>	<p>Director of Health Safety and Environment, Transport for London (TfL)</p> <p>Director of Bus Operations, TfL</p>

## Actions arising from the Committee meeting on 14 March 2019

Item	Topic	Status	For Action by
6.	<p><b>Commissioner of Transport for London</b></p> <p>During the course of the discussion, the Commissioner agreed to the following actions:</p> <ul style="list-style-type: none"> <li>• To provide a written response to the recommendations from the Committee's report, <i>Derailed: Getting Crossrail back on track</i>;</li> <li>• To send the Committee a sample of the daily update emails from the Commissioner to the Mayor;</li> <li>• To arrange a visit with Florence Eshalomi AM to the Tulse Hill Gyratory;</li> <li>• To write on the detail behind recent changes to the TfL scorecards, to include the measures around measuring trip distances and road traffic volumes;</li> <li>• To work with the Committee to arrange a visit to see TfL's bus safety training;</li> <li>• To provide more detail on TfL's work regarding metroisation of rail services into Moorgate station;</li> <li>• To provide detail of any discussions or work undertaken with the Department for Transport on establishing a national database of taxi and public hire vehicle drivers;</li> <li>• To share the analysis undertaken by TfL around the decision to reduce the working life of London taxi cabs, to include equalities assessments, numbers of taxis affected, compensation and air quality impacts;</li> <li>• To arrange a meeting with Members to discuss issues relating to the taxi and private hire vehicle raised at the meeting;</li> <li>• To provide regular updates to Members on progress being made in reviewing bus routes in outer London, including those around hospitals;</li> <li>• To write on the rationale behind allowing the responsive bus trial in Sutton to use Euro 6 'Vito' vehicles; and</li> <li>• To provide detail on work being undertaken on express and orbital bus routes, following a recommendation by the Committee.</li> </ul>	In progress. Officers followed up on 26 June 2019.	Commissioner, TfL

## 4. Legal Implications

4.1 The Committee has the power to do what is recommended in this report.

## 5. Financial Implications

5.1 There are no financial implications to the Greater London Authority arising from this report.

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### List of appendices to this report:

Appendix 1 – Letter from Deputy Mayor for Transport to Chair, 6 August 2019 (annexes to this letter are attached for Members and officers only and can be found on the Committee’s webpages)

<b>Local Government (Access to Information) Act 1985</b>
List of Background Papers: None
Contact Officer: David Pealing, Principal Committee Manager Telephone: 020 7983 5525 E-mail: <a href="mailto:david.pealing@london.gov.uk">david.pealing@london.gov.uk</a>

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**MAYOR OF LONDON**

Florence Eshalomi AM  
Chair of Transport Committee  
City Hall  
The Queen's Walk  
London  
SE1 2AA

Ref:

Date: 6<sup>th</sup> August 2019

Dear Florence

**Rotherhithe to Canary Wharf crossing**

Thank you again for the opportunity to address the Committee on Friday 19 July regarding the decision to pause work on the proposed bridge at Rotherhithe to Canary Wharf.

At the session I promised to send on some further documentation relating to the bridge which I hope the Committee will find helpful. I have enclosed the following:

- The Institution of Civil Engineers independent review of bridge opening options
- Briefing packs for the Mayor on the progress of the project since February 2018
- Minutes of meetings with the Port of London Authority with an explanatory covering note

In addition please find enclosed the value engineering report for the crossing from October 2018.

As I mentioned at the meeting this was a difficult but responsible decision. As Transport for London develops plans for the ferry crossing we will of course update Committee members on progress.

In the meantime if you have any questions about the attachments please do get in touch with my office.

Yours sincerely,



**Heidi Alexander**  
Deputy Mayor for Transport

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| 4 APRIL 2019

# Rotherhithe to Canary Wharf Crossing

## Briefing for the Mayor

Page 93

TFL CONFIDENTIAL AND RESTRICTED: CONTAINS LEGALLY PRIVILEGED ADVICE



EVERY JOURNEY MATTERS

## The Draft London Plan

*“The lack of river crossings in the area is holding back growth and development, and the Mayor has prioritised or is exploring a number of schemes which will help to unlock and/or connect growth areas, including...a new river crossing linking Rotherhithe and Canary Wharf.”*

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## The Mayor's Transport Strategy

*“New crossings for pedestrians and cyclists can help connect local communities and encourage healthier lifestyles....A new crossing for pedestrians and cyclists between Rotherhithe and Canary Wharf can help support growth and encourage more active travel.”*



## Purpose of this briefing

1. To provide an update on our work since our last briefing (September 2018), including information on our preferred alignment, design and operations
2. To discuss the scheme's current forecast costs
3. To discuss the next steps for the project, including the timetable for public consultation and the TWAO application



# Contents

1. Progress since September 2018 briefing
2. Points to discuss:
  - A. Emerging Design
  - B. Operating the Bridge
  - C. Costs and Funding
  - D. Consultation
  - E. Programme
3. Next steps



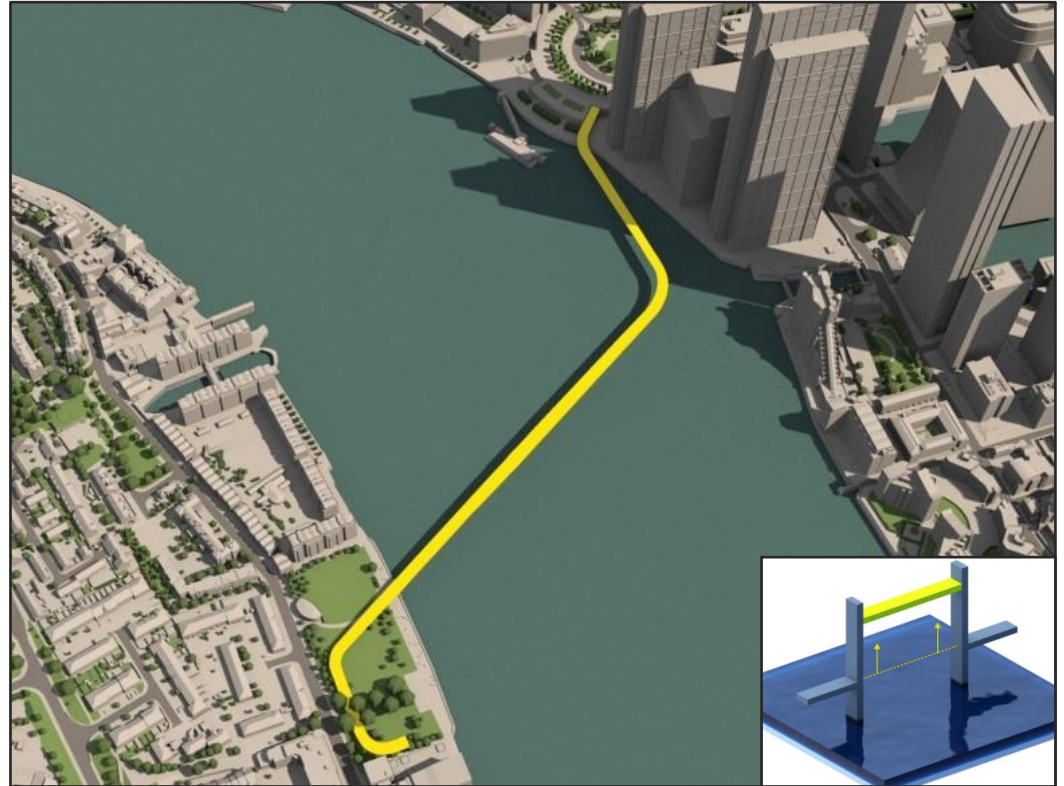
## Progress since September 2018 briefing

- We deferred the public consultation that was planned in October 2018 due to uncertainties over the Business Plan
- We have revised our programme to minimise delays from the deferral of the public consultation
- We have agreed key parameters for the bridge with stakeholders, such as the Port of London Authority and London Boroughs, and completed a concept design for the scheme
- We have updated our demand forecasts that indicate in the years following opening up to 7,000 pedestrians and up to 6,000 cyclists per day could use the new bridge
- We have developed the construction methodology for the scheme, including the main worksites and logistics plans
- We have developed the operating concept for the bridge.



# Emerging Design

- We have selected a preferred alignment between Durand's Wharf (Rotherhithe) and Westferry Circus (Canary Wharf)
- We are continuing to refine the detail of the scheme as we work through navigational simulation with the PLA
- We have agreed with the PLA 12m above mean high water as the bridge height
- We are continuing to work with the local community to develop designs for Durand's Wharf park
- We are working with Canary Wharf Group and Tower Hamlets to develop designs for Westferry Circus – issues remain around connection to Future Cycle Route 5
- We have selected a vertical lifting bridge as the preferred opening mechanism and the Institution of Civil Engineers has undertaken an independent review of our selection process (see Appendix I).





# Emerging Design



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Images of the designs for the landing points at Durland's Wharf and Westferry Circus are provided in Appendix 2



# Operating the Bridge

- The bridge will be operational 24 hours a day
- The bridge will be staffed, although we are still determining the need for 24/7 staffing
- The 12m height allows 98% of river traffic to pass without needing a lift
- For the remaining 2% (c. 2,000 passages) the bridge will need to be lifted. In most cases, lifting the bridge will mean it is not available to pedestrians and cyclists for c. 15 minutes on average\*
- Gates will prevent access during bridge lifts
- We are working with the PLA to agree clear periods between closures (a minimum of 30 mins has been agreed, but we are looking to increase this)
- Bridge users will have a minimum of 24 hours notice of bridge lifts.



*\* On average, the bridge will need to be lifted 5 times per day. However, river traffic is highly seasonal, resulting in more lifts during the Summer months and larger vessels requiring longer lifting periods.*



# Costs

- Following a thorough review of costs the mid point estimate for the bridge is **£455m**, including risk and inflation (breakdown provided on next slide)
- The increased costs are primarily due to design changes to address PLA requirements in respect of positioning of the main towers and ship impact protection, together with a change in indices post Brexit
- Where possible we have revised the design to reduce costs (e.g. use of concrete rather than steel towers and reducing the number of lifts and stairs) and there are potential further opportunities as the concept design matures (e.g. risk allowances)
- The scheme has a strong strategic case (alignment with the MTS, London Plan, etc.), but at £455m the bridge would produce a Benefit-Cost Ratio (BCR) of 1.1:1\*. The alternative of a ferry continues to be promoted by stakeholders such as Canary Wharf Group and whilst it does not achieve the same level of change in cycling or long-term benefits it has a capital cost of £37m, with a BCR of 2.1:1
- As part of the TWAO process, a compelling case in the public interest will need to be made for the compulsory purchase of land. Opponents to the bridge, particularly those whose land may be compulsorily purchased, may try and use the ferry BCR to undermine the case for the bridge.

\*including risk, operating costs and optimism bias at 43 per cent to produce a 60 year appraisal





# Breakdown of cost estimates

Concept design for central lifting bridge @ 12m height	Sept 2018 Estimate	Mar 2019 Estimate	Variance	Comments
Construction	£140 - 150m	£180m	+£30m / + £40m	Changes to the positioning of the towers and ship impact protection design has lengthened the opening section of the bridge increasing the amount of steelwork, foundations and requiring larger mechanical and electrical equipment. Additional allowances also added for works at Durand's Wharf due to ground conditions.
Indirect costs	£40m	£40m	£0m	Design, surveys, supervision and associated costs
Risk	£70 - 75m	£90m	+£15m / +£20m	Allowance on construction, indirect costs and inflation at 40% in accordance with Treasury & TfL guidance
Land costs (inc. risk)	£35 - 55m	£45m	+£10m / -£10m	Change in design so no land is taken from JP Morgan, but instead extinguishment of restaurant at Westferry Circus
Point estimate at current prices	£290 - £320m	£355m	+£35m / +£65m	
Inflation	£65 - 70m	£100m	+£30m / +£35m	Based on the latest BCIS indices that forecast a significant rise in inflation post the Brexit transition period
Point estimate outturn prices	£355 - 395m*	£455m	+£60m / +£100m	
Range	£250 to £595m	£365m to £590m	n/a	A cost range of -20% to +30% has been applied based on design maturity and market sounding (reduced from -30% to +50% at September 2018)

\* In September 2018 two variations (C1 and C2) on the preferred alignment between Durands Wharf in Rotherhithe and Westferry Circus in Isle of Dogs were under consideration resulting in two estimates of £355m and £395m.



## Funding

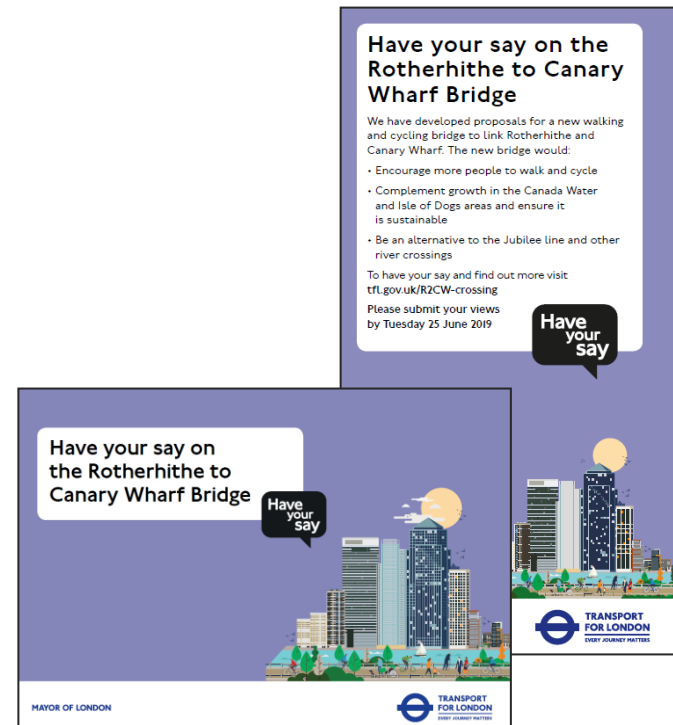
- A Funding Statement will be required as part of the TWAO submission
- We have agreed £355m of funding for the scheme, as part of the Healthy Streets programme in our 2018 Business Plan
- We are currently exploring further funding opportunities, such as Community Infrastructure Levy with the London Borough of Southwark, although the bridge is competing against other transport priorities (e.g. Elephant & Castle Northern Ticket Hall and Bakerloo Line extension)
- We are exploring commercial opportunities, such as retail units and advertising, to fund the ongoing costs of the scheme, such as staffing, maintenance and operations
- There is potential to consider any shortfall as part of the 2019 business planning process.



# Consultation

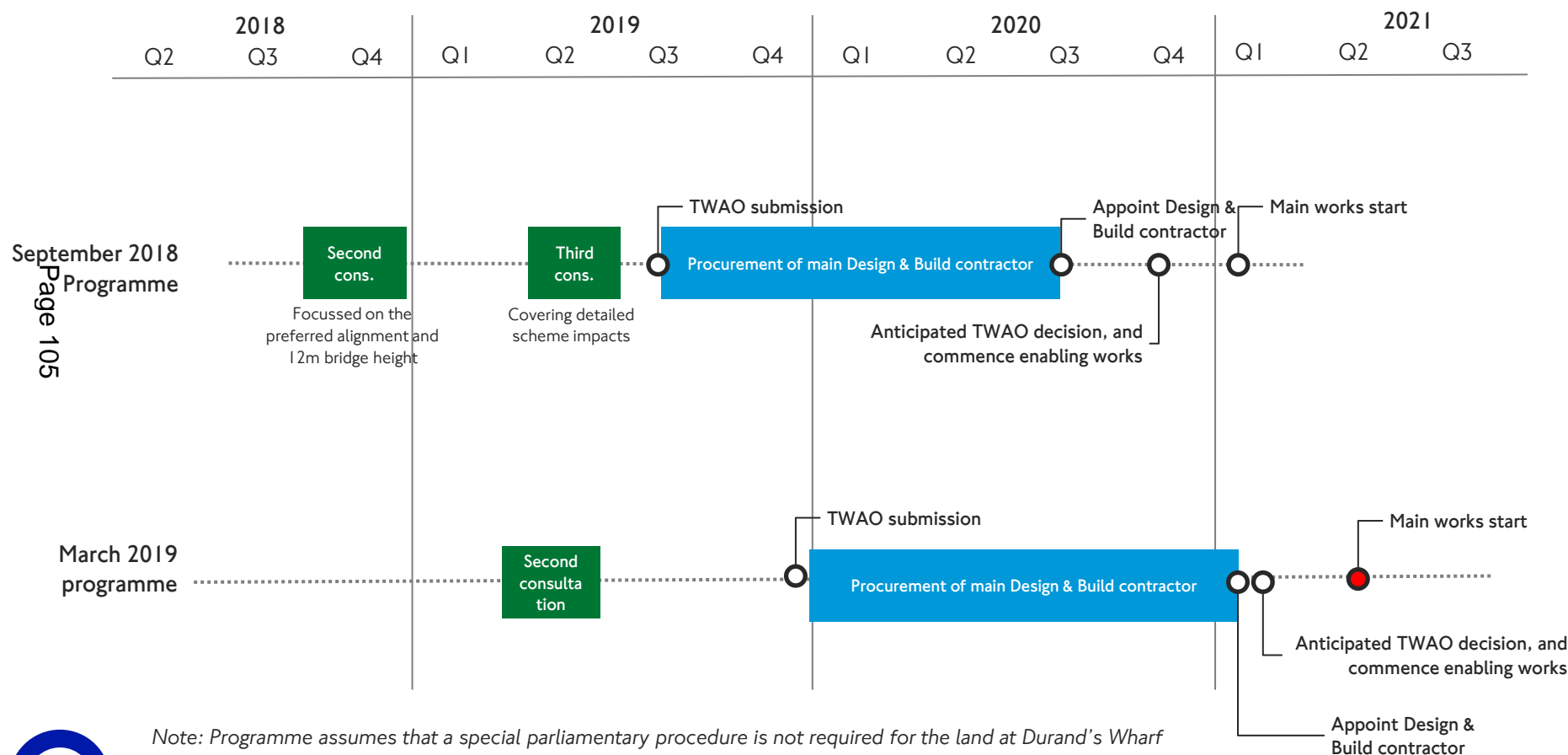
- We have been actively engaging with a wide range of stakeholders in advance of the next public consultation that is planned to commence at the end of April 2019 (summary of stakeholder views in Appendix 3)
- Subject to the feedback received, this will be the final consultation before we make the Transport and Works Act Order (TWAO) submission for the powers to build and operate the new crossing. This final consultation will include full details on:

- Our design
- Our operating concept
- Our construction methodology
- Potential environmental impacts and mitigations
- Costs, funding, benefits and the case for the scheme.



# Programme

- In light of the changes to the consultation strategy, we have revised our programme
- As far as practical we have minimised the delays to the TWAO submission. Through our procurement strategy we are exploring options to accelerate enabling and construction works.



## Next Steps

Subject to the discussion at the meeting, next steps would be to:

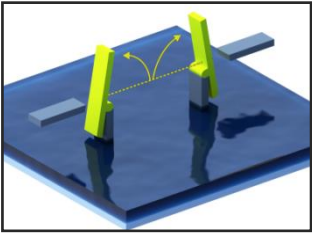
- Review the funding status of this project - the project funding would need to be considered in the context of the Business Plan and in advance of a TWAO including the likely need for a Mayoral Direction and further Delegation given the need to be clear about funding and powers for that process
- Commence second consultation on 30 April 2019 and continue negotiation with key stakeholders (especially PLA, CWG, Tower Hamlets, Southwark and relevant landowners)
- Finalise the designs and refine the costs of the scheme in September 2019
- Publish the results of the consultation in September 2019
- Submit a paper to the 20<sup>th</sup> November TfL Board meeting seeking authority to submit the TWAO application
- Submission of the TWAO application in December 2019.





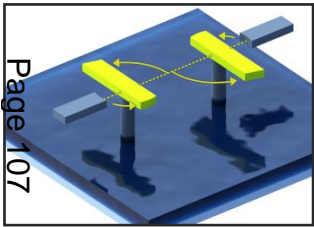
# Appendix 1 – Opening Mechanism

- Three potential opening mechanisms have been considered. A **vertical lifting mechanism** is **preferred**. This solution has been endorsed through an independent review by the Institute of Civil Engineers.



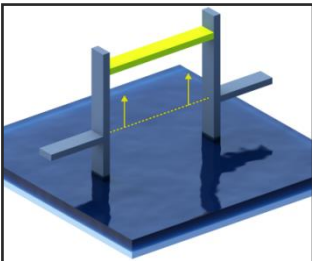
## Bascule – *Not Preferred*

- No precedent: Significant unknown technical challenges and risks
- Higher maintenance costs
- Reduced reliability for bridge users



## Swing Bridge – *Not Preferred*

- Requires large ship impact protection structures in the river
- Higher maintenance costs and a more complex maintenance regime
- Reduced reliability for bridge users



## Vertical lifting – *Preferred*

- Greater precedent: reduced technical risk and uncertainty
- Improved reliability for bridge users: unlikely to misalign when lowered
- Potentially shorter waiting times for bridge users.



## Appendix 2 – Emerging designs for landing areas

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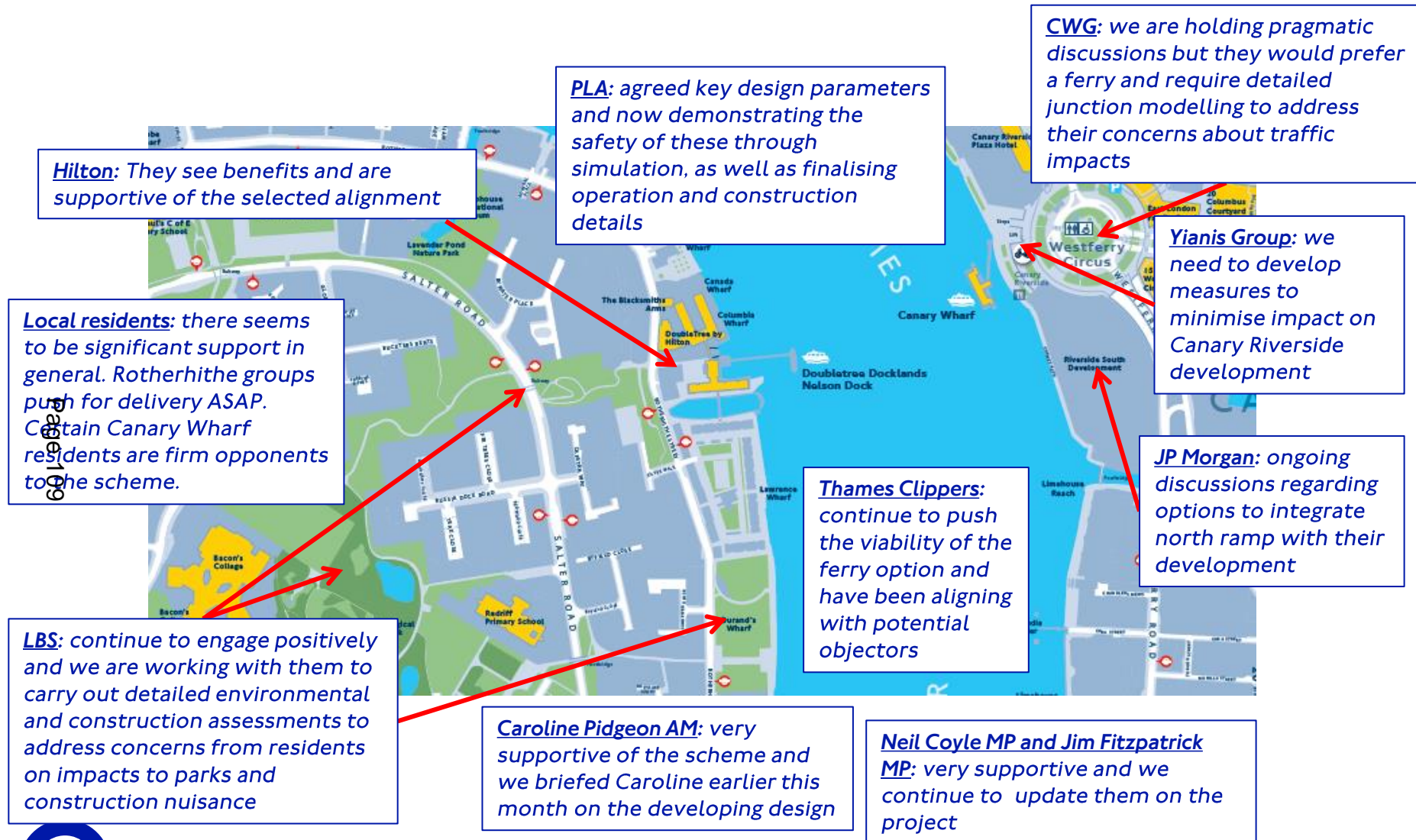


Bridge approach and connections at Durands Wharf



Bridge approach and connections at Westferry Circus

# Appendix 3 - Stakeholders and requirements



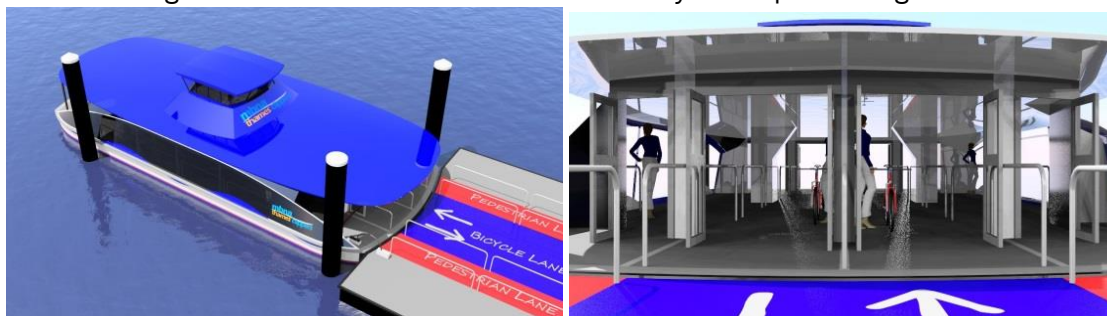
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## Rotherhithe to Canary Wharf Crossing - New Electric Ferry Service Option

### 1 Background

- 1.1 MBNA Thames Clippers currently operates a cross-river pedestrian and cycle ferry service on a commercial basis between Nelson Dock Pier (DoubleTree Docklands Hotel) and Canary Wharf Pier. This service utilises a single vessel, which runs approximately every 10-15 minutes between 06:00 (09:00 at weekends) and 00:00 (22:30 on Sundays) and has a three minute journey time (excluding waiting, boarding, docking and alighting). Both of the piers are privately owned, with access on the Rotherhithe side through lobby of the DoubleTree Docklands Hotel that also subsidises the service.
- 1.2 Different options for providing a new or enhanced ferry service were considered as part of the strategic option selection process for the Rotherhithe to Canary Wharf Crossing.
- 1.3 The central ferry concept is for new electric powered roll-on / roll-off cycle and pedestrian vessels, as shown in Figure 1. The proposal would include pier upgrades at Canary Wharf and Nelson Dock to provide additional capacity to accommodate the river ferries, together with increased passenger demand, and to make the ramps a shallower gradient and therefore more accessible. Access at Nelson Dock would also be provided directly from the Thames Path, rather than just via the hotel, to improve convenience for users. This would help provide ease of access for cyclists and facilitate the efficient and rapid boarding and alighting needed.

Figure 1: New electric roll-on/roll-off ferry concept drawings



- 1.4 The provision of three new vessels could provide a higher 5 minute frequency service with reduced waiting times, while a subsidy could potentially allow the fare to be reduced or eliminated to encourage greater use of this link.
  - 1.5 It is assumed that even with an increased frequency of service, there would be no disruption to navigation along the river in the event of a larger vessel passing up or downstream (because the larger vessel would have priority over the ferry). Disruption to a ferry service in these circumstances is assumed to be short in duration.
- 2** A new ferry service has a lower capital cost than a bridge or tunnel and could be introduced more quickly. However, is likely to be less attractive to potential users than a bridge or tunnel, given the need for cyclists to dismount and wait to board/alight. It is also less likely to deliver as significant economic benefits in the long term as it would not be perceived as a 'permanent' new link unlike a bridge.



### 3 Capital and Operating Costs

- 3.1 Our initial estimates of the ferry capital costs are given in Table 1. In addition to these, there would be costs for operation, renewal and maintenance of the ferries, expected to amount to an annual cost of £2.4m (2016 prices), including staffing, energy, maintenance and scheduled asset replacement. These costs amount to a Net Financial Effect (to the public purse) of the new ferry option of £121m (2016 prices) over a 60 year appraisal period, based upon a free ferry (i.e. with no fare revenue).

Table 1: Summary of new ferry capital costs (£m, 2016 prices)

	2016 prices capital cost only including risk	Outturn costs including risk, inflation and land costs, but excluding optimism bias
New ferry	32	64

### 4 Demand and Revenue

- 4.1 In 2017 a daily average of 1,200 passengers used the existing ferry service. The central concept for a new ferry service (free) with a 5-minute frequency is forecast to be used by around 4,800 pedestrians and 450 cyclists per day by 2031.
- 4.2 Demand forecasts will be significantly lower in a scenario where fares are charged. If TfL subsidised an operator to run the service with a reduced 'TfL Oyster and Travelcard' rate (less than currently charged by MBNA Thames Clippers) this would generate revenue, to the operator, estimated at around £1.06m per annum (2016 prices). Over a 60 year evaluation period this results in an operator income of £49m (2016 prices).

### 5 Benefits

- 5.1 A new ferry service (free) as described above is predicted to attract a similar number of pedestrian users as a bridge, but significantly less cyclists. Wider economic benefits are less likely to be realised due to the 'non-permanency' of the ferry option.
- 5.2 The BCR of the new ferry service (free) is estimated at 2.12:1, compared with the bridge which has a BCR of 1.1:1. A charged ferry offers a significantly reduced BCR, depending on the level of the charge, due to the reduction in demand.

### 6 Timescales

- 6.1 A new ferry service could be operational in a 3-4 year period from a decision to proceed with this option, including the time to complete further design work and consultation, acquire the relevant land interests and gain the necessary consents, tender for the new service, and build & commission the new vessels and infrastructure.

*Note: If resources or timescales are more constrained than as described for the central ferry concept, it would be possible to scale the enhancements accordingly.*

22 FEBRUARY 2018

# Rotherhithe to Canary Wharf Crossing

## Briefing for the Mayor

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EVERY JOURNEY MATTERS

## The Mayor's Manifesto Commitment

*“Work to break down some of the city’s physical barriers, such as by backing the Rotherhithe–Canary Wharf cycle and pedestrian bridge.”*

## The Mayor's Transport Strategy

*“New crossings for pedestrians and cyclists can help connect local communities and encourage healthier lifestyles....A new crossing for pedestrians and cyclists between Rotherhithe and Canary Wharf can help support growth and encourage more active travel.”*





## Purpose of this briefing

1. To provide an update on TfL's work since our last briefing (Sept 17)
2. To present the findings of the recent public consultation
3. To explain how we will refine the preferred option for this new river crossing, the key decisions and next steps.



# Contents

1. Actions from September 2017 briefing
2. Public consultation
3. Developing bridge concepts
4. Option assessment process and timescales
5. Costs and funding
6. Procurement and land
7. Overall timetable

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## Actions from September 2017 briefing

Actions from briefing on Sept 2017	Update
The required consents for the scheme to be pursued through a TWAO	✓ Preparation of TWAO application underway and aiming for a submission in 2019
A Mayoral delegation to be sought to enable us to continue to progress work on the preferred bridge option.	✓ Delegation confirmed in February 2018
Present a report to the Programmes and Investment Committee (PIC) on 13 October 2017	✓ PIC approval secured for provisional selection of a bridge and planned consultation
Funding for the bridge to be confirmed through our business planning process.	£20m development funding from Healthy Streets and £30m contribution towards capital costs from Growth Fund. Additional funding potentially from Business Rates
Formal public consultation is to be held on different bridge options in late 2017 and on a preferred bridge option and more detailed impacts in mid 2018.	✓ First public consultation took place between 8 November and 8 January 2018.



# Consultation: successful engagement

- Leaflets distributed to over 100k residents, with press ads, online and a social media campaign
- Public exhibitions at stations and community centres both sides of the river
- Targeted engagement with stakeholder groups
- Consultation started on 8 November 2017 and closed on 8 January 2018
- Over 6000 public responses and 44 formal stakeholder responses
  - 68% local residents, 20% employed locally



## Consultation: summary of responses

- the need for this crossing **91% support our proposals overall**
- the best strategic option **84% support provisional pref. option of a bridge**
- the best location for a bridge **71% support the northern alignment, 45% support the central alignment and 17% support the southern alignment**
- how high a bridge should be **even split with 39% not stating a preference**
- how a bridge is accessed **80% of cyclists prefer a ramp for access**
- different bridge forms **20% said this was important with no clear preference for any type (lift/swing/bascule)**
- other topics **60% of respondents requested segregation between pedestrians and cyclists**



# Consultation: key stakeholder views

**Jim Fitzpatrick MP:** very supportive

**Neil Coyle MP:** very supportive

**PLA:** will continue to work with us to safeguard use of the river and navigational safety. Key driver of openings/height

**Hilton Hotel:** no formal response but appear keen to explore redevelopment opportunities

**LBS:** very supportive and would also like to see shorter term ferry improvements

**Brunel Bridge:** vocal residents group that wants a bridge implemented ASAP

**Caroline Pidgeon AM:** very supportive and would like us to consider ReForm design

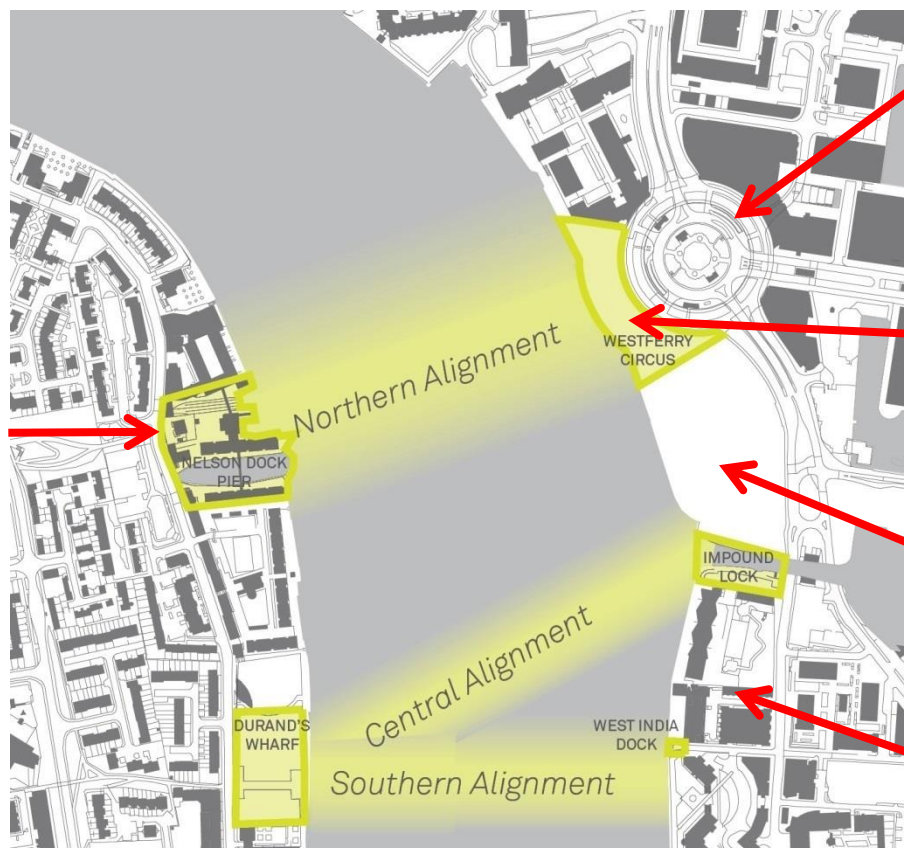
**LBTH:** supportive in principle though question the value for money. Strongly support the northern alignment

**CWG:** question TfL priorities and the value for money. Consider the ferry is better option, even as interim to test demand. Very concerned about impacts to traffic in the estate, particularly with northern alignment

**Yianis Group (owners of Canary Riverside Development):** no formal response, but no in principle objection

**JP Morgan:** significant development site. Have not engaged fully to date but have requested meetings now

**Bridge Action Group:** vocal residents group concerned about impact on views



## Consultation: main issues

Issue	Response
<b>Value for money / case for the scheme:</b> stakeholders and potential objectors have expressed a keen interest in the likely costs and funding decision making process.	Value for money and overall case for the scheme to be tested as part of next stage of Business Case development
<b>The ferry:</b> some stakeholders believe this option should be explored further as it is cheaper, quicker to deliver and could be used to test demand for a bridge.	Back check of alternative options to be completed as part of Business Case development
<b>Impact on landowners:</b> we do not own any of the land required and there are issues associated with all options.	Meetings with each land owner taking place to inform assessment process and identify design issues
<b>Onward journeys:</b> a number of stakeholders have questioned how this links with existing and planned networks either side of the river	We are working closely with the boroughs and other stakeholders to develop plans, but investment will need to be prioritised to maximise benefit of the crossing (see Appendix).





# Developing Bridge Concepts

We have developed a variety of bridge concepts around the alignments presented at consultation

## 1. Northern alignment



- This image shows a lifting bridge.
- Connecting Nelson Dock Pier with Westferry Circus
- Access via ramps, lifts and stairs
- Requires use of land owned by Canary Wharf Group, the Hilton and the use of Pearson Park to connect to Salter Road on the southern side.

Note: no final decision on the bridge design has yet been taken - this will be informed by the next stage of work.





# Bridge Concepts (2)

## 2. Central alignment



- This presents a structure which could open as a bascule or a swing bridge.
- Connecting Durands Wharf with Impound Dock.
- Access via ramps, lifts and stairs.
- Ramps on northern side could run in front or behind JP Morgan site
- In closer proximity to residential buildings compared to northern alignment.

Note: no final decision on the bridge design has yet been taken - this will be informed by the next stage of work.



# Bridge Concepts (3)

## 3. Southern alignment



- This image shows an alternative swing bridge concept
- Connecting Durands Wharf with Cuba Street.
- Access via shallow stairs incorporating cycle channels with additional lift capacity.
- Landing site on northern side further away from Canary Wharf centre than other two options.

## Options Assessment: engineering parameters

These concepts test a number of different engineering parameters. The final design will arrive from resolution of a number of these critical parameters, including:

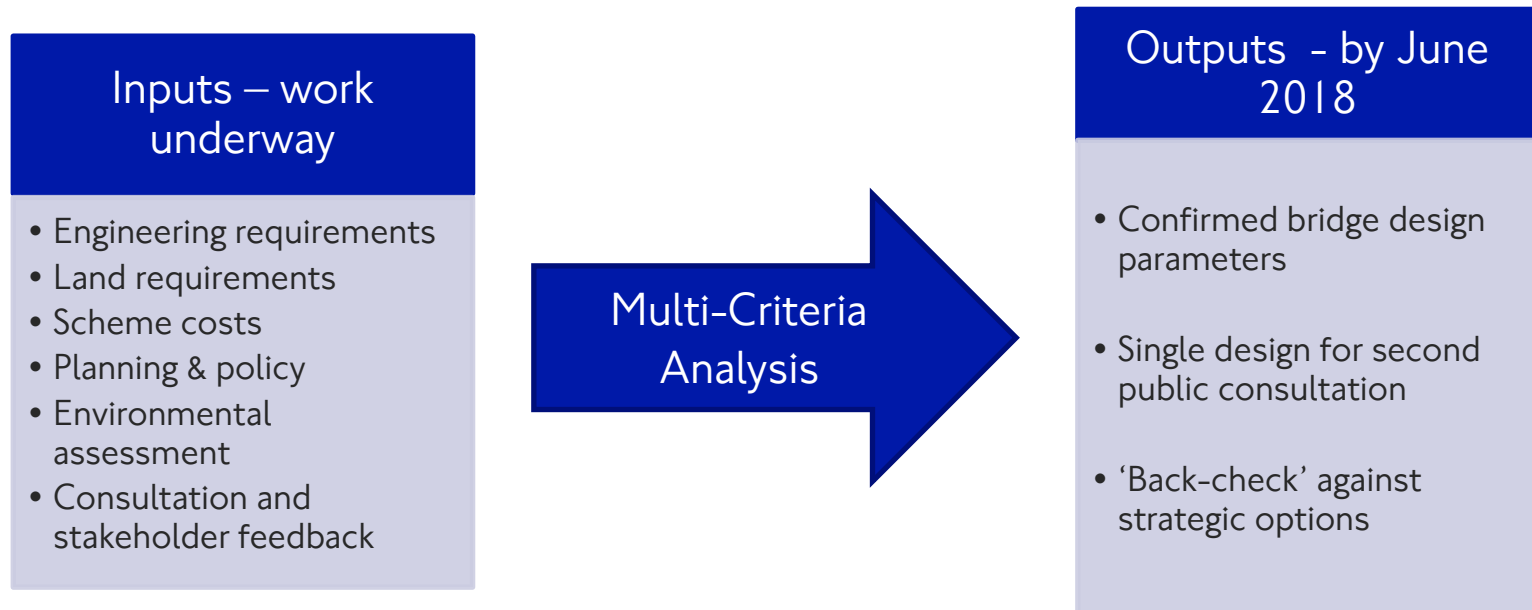
- **Alignment:** we have identified a crossing connecting directly with Canary Wharf will encourage the greatest use and best address the lack of connectivity in Rotherhithe. We presented three possible alignments for consultation and there is a clear preference for north
- **Height:** height is a key driver of cost and ease of use. We have negotiated a 15m central height (reduced from previous PLA requirement of 20m), falling to the river banks and continue to work with the PLA to optimise the height and river operations
- **Opening mechanism:** only 20% of the public said this was important to them and there was no clear preference for any particular type
- **Access arrangements:** whilst there is a clear preference from cyclists for ramped access, these result in significant land take, environmental impact and cost. Lifts are also costly and require significant maintenance
- **Deck arrangement:** the consultation responses indicated a strong public preference for segregation between cyclists and pedestrians



## Options Assessment: decision process

We are resolving all these parameters to form a decision on the best solution for this new crossing:

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We are taking an engineering led approach to resolve the final design and our analysis will consider a number of factors to arrive at a conclusion, including the consultation responses, technical risks and constructability, impacts on the local community and affected landowners, environmental impacts and whole life costs



## Options Assessment: public consultation

- Our final selected option will feed into a second public consultation.
- Whilst we want to incorporate public views into development of the design, we are planning for this to be a 'final' consultation and so it must include sufficient detail to inform the public on our proposals. In particular it must detail:
  - Design issues, such as materials and lighting
  - Projected user numbers and permanent environmental impacts
  - Construction methodologies and temporary environmental impacts
- This requires us to 'freeze' the design in order to undertake assessment on a fixed scheme. We will return to update the Mayor in May 2018 prior to finalising our proposals.



## Costs and funding

- Previous estimates for the total project cost ranged from £150-260m. We are working to refine the cost estimates, but external factors (e.g. inflation, exchange rates, material and land prices) mean that it is likely to be in the upper part of this range
- There is £50m of confirmed funding in the TfL Business plan; £20m from Healthy Streets for development work up to 2020/21 and £30m from Growth Fund towards land and capital costs up to 2021/22
- Additional funding to complete the scheme is needed from other sources such as business rates (e.g. GLA Strategic Investment fund) or in future TfL business plans
- We are exploring sponsorship and other commercial opportunities but do not anticipate these will contribute significantly towards capital costs. More likely to cover the ongoing maintenance costs
- Funding should be identified for the next public consultation and must be confirmed prior to the TWAO application – it will be scrutinised through public inquiry



# Procurement and land

## Procurement

- In line with the September update, we are finalising the procurement of engineering, town planning, environmental and other specialist support services to help us develop the scheme for a TWAO application in 2019.
- The procurement of a Design & Build partner will happen in parallel to the TWAO Inquiry and determination period, so a contractor is ready to start once the consents have been granted.

## Land

- Meetings have taken place with all key landowners along each of the three alignments. Where necessary, we will work with the Deputy Mayor to engage key landowners.
- Key information on engineering parameters have been shared to help inform land considerations and to inform our decisions
- A notification is to be sent out to all land owners later this month advising on the next steps of engagement, including access of land for surveys



## Overall programme

- Additional engineering, environmental and design work is needed to support the second consultation and the subsequent TWAO application, to ensure they are as strong as possible.
- This has led to a small delay to our expected TWAO submission date (from early 2019 to Q2 2019). Our current best case forecast of key programme dates is as follows:

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Sept 2017 programme	Current programme	Milestone
Aug / Sept 18	Aug / Sept 18	Select single design option and begin second public consultation
Q2 2019	Q2 2019	Begin procurement for main Design & Build contractor
Q1 2019	Q2 2019	TWAO submission <i>Previous timetable assumed March 19, now looking at June 19 to accommodate the extra work above</i>
Q4 2019	Q2 2020	Appoint main Design & Build contractor
Q1 2020	Q3 2020	TWAO decision, and enabling works start on site <i>The TWAO timetable is dependent on the Planning Inspectorate and DfT decision making. 15 months to determine the application is ambitious</i>
Q2 2020	Q3/4 2020	Main construction work begins





## Next Steps

- Release the consultation results in March 2018
- Report back to the Mayor on single option selection in May 2018
- Report single option selection to the Programmes & Investment Committee in July 2018
- Launch second consultation on preferred option in August / September 2018, which will include a report detailing how issues raised during the first consultation have been considered
- Complete preparation of TWAO application for submission in 2019.

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# Rotherhithe to Canary Wharf River Crossing

Value Engineering

Transport for London

04 October 2018

# Notice

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This document has 20 pages including the cover.

## Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 1.0	For review / comments					21/09/2018
Rev 2.0	For Issue					04/10/2018

## Client signoff

Client	Transport for London
Project	Rotherhithe to Canary Wharf River Crossing
Job number	5162977
Client signature / date	

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# Introduction

The Rotherhithe to Canary Wharf River Crossing value engineering workshop was undertaken on 4th July 2018. In the workshop, individual disciplines – structures, architecture, mechanical and electrical, geotechnical and constructability – presented their current design proposals and potential value engineering ideas. This was followed by an individual attendee's idea generation round. All ideas were collated and summarised with following actions identified and agreed with TfL in Document ST\_PJ585C-ATK-BAS-ZZ\_12-REP-ZZ-00001 P01 (Refer Appendix D).

Following the value engineering workshop, concept design (including optioneering and construction methodology) has continued in parallel with the value engineering idea progression. The value engineering ideas have been assessed and compared against the design presented at the value engineering workshop. In this report the design presented at the value engineering workshop is used as the baseline design.

This report includes:

- The status of the value engineering items (VE1 to 37) and briefing of the key VE items selected for further assessment to compare it with the baseline designs (and concept designs, where applicable).
- The value engineering on the permanent works design undertaken based on the ideas generated from the value engineering workshop are presented in independent assessment forms (Refer Appendix C). Each assessment form describes a summary of the proposal, advantages, disadvantages and impact evaluations – cost, programme, risk, environmental, buildability, safety and operation and maintenance.

*Note: Quite few of the proposals been incorporated in the concept design to date (as instructed by TfL and part of Atkins concept design progress).*

- The constructability methodology options raised at the value engineering workshop are presented in independent assessment forms (Refer Appendix C).

Note: Costain has provided valuable and vital support on the constructability methodology options and contributions on early indications of constructability and programme for the permanent works value engineering proposals.

Following completion of concept design, Costain will be producing a detailed proposed construction methodology document. It is currently envisaged that this document will detail final recommendations with some options/opportunities/risks. This document may include further detail on the construction methodology options detailed in this report if they are deemed appropriate for the agreed concept design.

# Executive Summary

The purpose of this report is to discuss the feasibility and quantify cost savings on value engineering ideas captured in the workshop conducted on 4<sup>th</sup> July 2018. For each opportunity, a basic concept design has been undertaken and assessed for advantages, disadvantages and impact evaluations – cost, programme, risk, environmental, buildability, safety and operation and maintenance.

From the VE workshop, 37 permanent works and construction opportunities and risks have been identified, discussed and analysed. All the opportunities where applicable have been assessed; a total of 23 opportunities. This includes 12 opportunities with verified cost estimates against the baseline and 2 opportunities with cost estimates pending TfL estimating team review (at the time of writing). Each opportunity is summarised in Table 2-1.

Each opportunity is not mutually exclusive and various opportunities either cannot be applied together or there is a reduction in benefits in doing so. Furthermore, each opportunity comes with new and unique risks that should be considered carefully.

Note: Only basic calculations have been undertaken for each opportunity - additional design / analysis activity is required to incorporate any value engineering opportunities into the concept design and justify opportunity evaluations.

# 1. Value Engineering Baseline Design

## 1.1. Highway Design

The baseline alignment option (denoted as alignment CB5 to CA5) is a 1km route from Rotherhithe street opposite Durand's Wharf to Westferry Circus in Canary Wharf and assumes a 12m air draught from Mean High Water Springs (MHWS) over a 40m width at the centre of the River Thames navigation channel. Refer to drawing ST\_PJ585C-ATK-BAS-ZZ\_12-DRG-DR-00007 in Appendix A for details on CB5-CA5 baseline alignment.

The eastern landing site (CA5) in Canary Wharf is found in the river almost in its entirety, with seven river supports in addition to the main span piers immediately adjacent to the navigation channel. The alignment ramp runs parallel to the JP Morgan development site for 150m with the finished level at least 5m above Thames path level. The ramp is 380m from midspan to the landing site, which is Westferry Circus. The requirement for split decks is eliminated on the moving span due to the modest gradients leading from the crest curve. CA5 would achieve maximum 3% gradients for 80m but with an extended flat 0% gradient section running for 85m before tying into Westferry Circus. Similar to the CB5 landing, a 1% gradient transition at chainage marker 625m from the 2% gradient incline leading from the moving span would provide access to lifts and stairs which would be situated to the south of JP Morgan development site.

The western landing site (CB5) in Durand's Wharf provides a ramp length of ca. 450m from midspan to landing site. CB5 cycle ramp includes three inclined sections at 4% gradient to fit the alignment. The remaining inclines are at a maximum of 3% gradient and maximum 80m in length. Two extended sections at 2% gradient from midspan eliminate the need for split decks on the moving span.

## 1.2. Structure Design

The early phases of the concept design main span consisted of the Arcadis lifting bridge option planted on CB5-CA5 alignment (Section 1.1) which comprises a 160m long twin bowstring tied arch made of steel sections (Figure 1-1). The soffit of the deck is 12m above MHWS in its lowered position and 60m above MHWS in its elevated position. The deck has a consistent width of 8.1m and minimum 2.4m vertical clearances through the tied arch for cyclist and pedestrians.

Prior to the value engineering workshop this was progressed to a Pratt Truss Bridge with the diagonal members as slender architectural tension struts (Figure 1-2). A Pratt Truss Bridge is significantly simpler to fabricate, and construct compared to a tied arch. The same deck width and vertical clearances were maintained. The Pratt Truss Bridge is taken as the baseline design for value engineering.

The baseline tower design at each end of the main span consists of two separate "mushroom" shape in plan towers. The towers are braced together at the bottom, near the machine room and counterweight, and the top. They consist of 80mm thick painted structural steel stiffened plates. They are 80m above mean high water springs (MHWS) and are supported on reinforced concrete foundations. The towers provide sufficient space internally for the plant room, access stairs / ladders and a lift. The floors of the ladders and stairs doubling up as regularly spaced diaphragms. The steel block counterweights to rise and fall outside of the tower.

The approach spans over the river comprise of steel box girders below deck level with varying spans. The river approaches are supported by reinforced concrete piers on caissons for the main and side spans and on driven piles elsewhere.





Figure 1-1 - Architectural render of Arcadis lifting bridge main span and towers

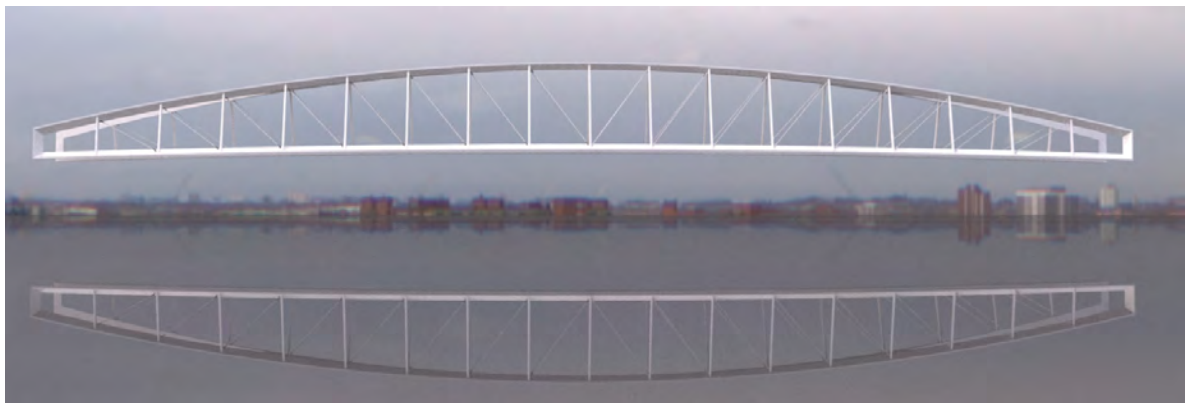


Figure 1-2 - Architectural render of baseline design lift bridge main span

### 1.3. Mechanical and Electrical Design

In the baseline M&E design, at the top of each tower is a set of sheave pulleys which support the deck and counterweight. The weight of the deck is balanced by a counterweight in each tower which is connected to the deck by counterweight 'lift ropes' that pass over the sheaves at the top of the towers.

'Drive ropes' connect the soffit of the deck with the underside of the counterweight via the 'drive drum' in the pier base. When the drum is rotated the counterweight is pulled down which lifts the deck. Rotating the drum in the opposite direction allows the counterweight to rise and the deck to fall. The counterweight weighs slightly less than the deck dead load.

Each drum is electrically powered by motors and have full redundancy with two electric motors and gearboxes. Normal service braking is incorporated within the motor drives, and emergency braking is provided by spring-applied, hydraulic release disc brakes mounted directly on the drum.

Longitudinal guidance of the bridge deck is provided by guide wheels mounted on the bridge deck with allowance for thermal expansion. Lateral guidance during bridge deck lifting is provided by guide wheels mounted on the bridge deck. The counterweights are also guided to reduce noise and impacts from wind.

In the lowered position the deck is restrained vertically by electrically actuated locking pins in the abutment which engage the bridge deck and the drive cable is tensioned before locking the motor to ensure the deck cannot lift from the bearings. *Note: there are no mechanisms on the lifting deck.* In

the raised position the bridge is supported by the lift ropes. When the bridge is in the raised position for maintenance, the deck and counterweight is fixed with additional supports (spragging beams) which would allow the ropes to be removed.

A staircase and maintenance elevator are contained in the tower at each end of the bridge for maintenance access to the top of the tower.

## 1.4. Design Progression to Concept Design to Date

The baseline design has progressed towards concept design in parallel with the assessment of value engineering opportunities. The critical change is under Employers Instruction Notice 005 (EIN005), which instructs the consultant to develop the design of C2 alignment. This change is equivalent to opportunity VE1 listed in Table 2-1 and described in Appendix C. Refer to drawing ST\_PJ585C-ATK-BAS-ZZ\_12-DRG-DR-00010 in Appendix B for details on CB5-CA5 baseline alignment.

In the C2 alignment the western landing site (CB5) and eastern landing site (CA5) remain the same as the baseline design. However, the route between the two land sites is more direct, which reduces the approach ramp length on the eastern landing site. This modification increases the skew angle of the main span over the navigational channel; hence, increasing the main span length.

# 2. Value Engineering - Permanent Works and Constructability

The value engineering assessments undertaken on the baseline design are summarised in Table 2-1 and detailed in Appendix C. Some of the items have been included in the baseline design to date under the request of TfL.

Costain has provided valuable and vital support on the constructability methodology options and contributions on early indications of constructability and programme for the permanent works value engineering proposals.

Note: Only basic calculations have been undertaken for each opportunity - additional design activity is required to incorporate any value engineering opportunities into the concept design and to justify opportunity evaluations.

**Table 2-1 - Value Engineering Summary**

\* - Reference savings costs in LumpSum and refer to respective VE assessment form in Appendix C for details

Value Engineering Item	Action & Results	Cost Impact in Estimated Final Cost*	Critical Risks
(Reference - ST PJ585C-ATK-BAS-ZZ_12-REP-ZZ-00001)	<p><b>Green</b> – Further developed in Appendix C (24 items)</p> <p><b>Red</b> – Risk items that have prevented development (3 items)</p> <p><b>Purple</b> – To be considered and developed at a later stage (11 items)</p>	(comparison with baseline design)	(Further risks and details specified in Appendix C)
VE1 – Different route across river that provides a more direct route to Westferry Circus	Further developed in the VE report. Refer Appendix C.	£34.9 million saving (C2 alignment)	Departure from BS8300 required – inclusivity and accessibility. PLA consultation – undesirable increased skew across river.
VE2 – Construction on land behind the river wall, adjacent to JP Morgan development site	Further developed in the VE report. Refer Appendix C.	£2.4 million saving	JP Morgan consultation – vicinity and visual impact. Unknown existing river wall details. EA consultation – maintenance access and structural changes to existing river wall.
VE3 – Reduce deck width from recommended values to minimum values	Further developed in the VE report. Refer Appendix C.	£16.2 million saving	Does not meet published Sustrans guidance.
VE3a- Reduce ramp widths from landing site to intersection with lifts and stairs	Combined with VE3.	Refer to VE3	Refer to VE3
VE4 – Challenge PLA on the navigable headroom	Further developed in the VE report. Refer Appendix C.	£12.5 million saving	PLA consultation – 15m above MHWS has not currently been approved. 10m above MHWS is a significant further reduction.
VE5 - Temporary causeway or bridge to access main piers (half of the river at a time)	Further developed in the VE report. Refer Appendix C.	Cost saving to be agreed with TfL Estimating Team	PLA consultation – span width required. Note: this is not planned to intrude on the navigable channel.



Value Engineering Item	Action & Results	Cost Impact in Estimated Final Cost	Critical Risks
VE6 - Auger tubular piles	Further developed in the VE report. Refer Appendix C.	Cost saving to be agreed with TFL Estimating Team	Foundation design currently in development, which dictates suitable foundations.
VE7 - Precast caissons in dry dock and floated into position	This had been developed; however, the pilecap size due to ship impact loads has made this unviable. Further details in Appendix C.	N/A – Option no longer feasible for foundation design	N/A – Option no longer feasible for foundation design
VE8 - Precast units used inside the cofferdam to form the caisson	This had been developed; however, the pilecap size due to ship impact loads has made this unviable. Further details in Appendix C.	N/A – Option no longer feasible for foundation design	N/A – Option no longer feasible for foundation design
VE9 - Precast post-tensioned units to form the tower	Discussion on potential differences in reinforced concrete and post-tensioned concrete tower discussed in VE24.	Increase when compared to VE24.	Constructability of post tensioning at 80m height over the river.
VE10 - Intrusion of temporary works into navigation channel	Discussion regarding reducing navigable channel width is discussed in VE17. Temporary works intrusion is a risk item not VE.	N/A	Refer to VE17.
VE11 - Construction noise. Potentially require double skin cofferdam to mitigate.	Further developed in the VE report. Refer Appendix C.	Cost saving to be agreed with TFL Estimating Team	PLA consultation – Currently suggested that PLA will object to any intrusion into the navigable channel that cannot be removed within 24hrs. Cofferdam will need to be evacuated when largest vessels pass through.

Value Engineering Item	Action & Results	Cost Impact in Estimated Final Cost	Critical Risks
VE12 - Remote logistics and compound area adjacent to river required	This has been identified as a necessity by TfL. Insufficient granularity on baseline cost estimates to calculate potential relative cost saving. The cost estimate associated to this identified opportunity will be ascertained in the construction methodology report.	Cost saving anticipated – to be presented in Construction Methodology Report	N/A
VE13 - Steelwork connection details	Simplified main span truss and connection details shown in VE19.	Refer to VE19	Refer to VE19
VE14 - Use bridge lift mechanism to lift central span into position	To be considered in the construction methodology report.	Not assessed in this report	Not assessed in this report
VE15 - Use weathering steel to avoid maintenance painting	To be considered after concept design.	N/A	The appearance shown at public consultation needs to be consistent with the final proposed finish. Weathering steel of visible elements will look significantly different to the current visualisations.
VE16 - Deck drainage – drain directly off deck without channelling.	Deck drainage considered by core team. Not included in this report.	Not assessed in this report	EA approval
VE17 – Challenge PLA on the navigable width	Further developed in the VE report. Refer Appendix C.	£0.5 million saving (potential additional saving in M+E and tower design have not been accounted for)	PLA consultation – Currently suggested that PLA would prefer to maintain the navigable channel and only permit temporary works that can be removed within 24hrs.
VE18 – Architectural truss form (tapered top cord)	Combined with VE19.	Refer to VE19	Refer to VE19



Value Engineering Item	Action & Results	Cost Impact in Estimated Final Cost	Critical Risks
VE19 – Main span standard truss form	Further developed in the VE report. Refer Appendix C.	£19.9 million saving	TWAO consent and LA consultation – Less aesthetic when viewing from river and bank. Deck to feel more enclosed. Increase in weight – M+E needs to be reassessed.
VE 20 – Limit design wind speed in lifted position. Justified by assessing ship movements in high wind.	To be considered after concept design.	N/A	N/A
VE21 – Fibre reinforced polymer bridge	Further developed in the VE report. Refer Appendix C.	No data available to make justifiable comparison	Procurement risk – Minimal FRP bridges in the UK. Design risk – Minimal FRP bridge standards and guidance available.
VE22 – Main span steelwork fabrication offsite and transportation.	This has been identified as a necessity by TfL. Insufficient granularity on baseline cost estimates to calculate potential relative cost saving. The cost estimate associated to this identified opportunity will be ascertained in the construction methodology report.	Cost saving anticipated – to be presented in Construction Methodology Report	N/A
VE23 – Steel truss lifting span towers	Further developed in the VE report. Refer Appendix C.	£9.1 million saving	TWAO consent and LA consultation – Steel truss form is industrial and does not fit with the surrounding Canary Wharf Environment.
VE24 – Concrete lifting span towers	Further developed in the VE report. Refer Appendix C.	£21.2 million saving	TWAO consent and LA consultation – Concrete towers increase footprint, which can remove from the desirable slender appearance of the steel towers. Increase in foundation size due to concrete tower weight may potentially impact on the Jubilee Line Tunnels.

Value Engineering Item	Action & Results	Cost Impact in Estimated Final Cost	Critical Risks
VE25 – Concrete counterweight	Further developed in the VE report. Refer Appendix C.	Cast iron billets- £0.8 million saving	Normal weight concrete will increase the height of the tower. This can be mitigated by using heavyweight concrete; however, there is less certainty on cost and availability of heavyweight concrete.
VE26 – Approach span deck form – concrete or steel concrete composite.	Further developed in the VE report. Refer Appendix C.	£15.2 million saving.	TWAO consent and LA consultation – Less slender appearance.
VE27 – Earthwork ramp – Durand's Wharf	Not included in this report. Core team have developed 6 different options carefully considering many different criteria.	Assessment not undertaken in VE scope	Assessment not undertake in VE scope
VE28 - Maximise approach ramp spans to minimise number of piers in the river	Combined with VE26	Refer to VE26	Refer to VE26
VE29 – Approach Span Steelwork erection	This has been identified as a necessity by TfL. Insufficient granularity on baseline cost estimates to calculate potential relative cost saving. The cost estimate associated to this identified opportunity will be ascertained in the construction methodology report.	Cost saving anticipated – to be presented in Construction Methodology Report	N/A
VE30 – Control of pedestrians and cyclists	No further work at this stage. Part of operation & maintenance concept report.	N/A	N/A
VE31 – Remove maintenance access lift and replace with stairs and hoist	Further developed in the VE report. Refer Appendix C.	£1.0 to £1.5 million saving.	HSW in maintenance.



Value Engineering Item	Action & Results	Cost Impact in Estimated Final Cost	Critical Risks
VE32 – Remove backup generators and replace with hook-up generator	Further developed in the VE report. Refer Appendix C.	£0.8 to 1.2 million saving.	Requirements on emergency lifts – Probability of power failure and emergency bridge lift needs to be assessed.
VE33 – Carbon fibre main span lift ropes	Further developed in the VE report. Refer Appendix C.	Capital costs are unknown due to patented technology	Product availability – Carbon fibre lift ropes are patented products that are solely used in elevators (significantly lighter).
VE34 – Energy regeneration options	No further work at this stage.	N/A	Additional cost and complexity of energy regeneration systems outweighs potential saving
VE35 – Fire suppression system. Note: not many flammable elements in plant room	No further work at this stage. Part of operation & maintenance concept report.	N/A	N/A
VE36 – Intelligent monitoring systems to reduce maintenance requirements	No further work at this stage. Part of operation & maintenance concept.	N/A	N/A
VE37 – Public barriers for when the bridge is open.	No further work at this stage. Part of operation & maintenance concept report.	N/A	N/A



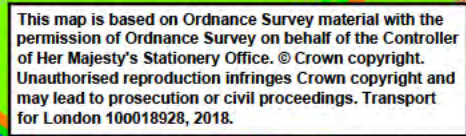
# Appendices



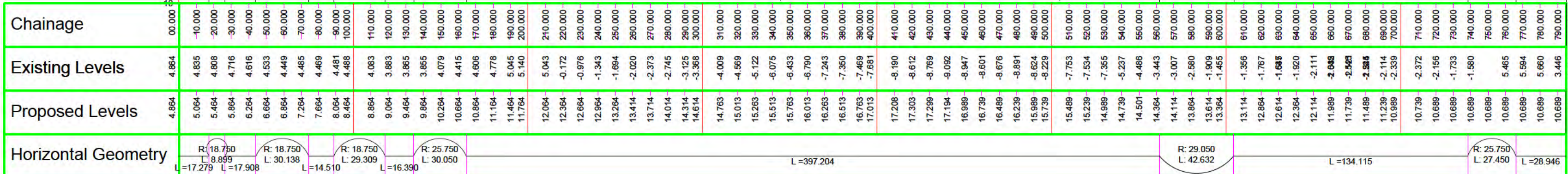
# Appendix A. C1 Alignment Baseline Design



Page 490



PLAN  
SCALE 1:2000



**VERTICAL PROFILE**  
SCALE 1:2000 HORIZONTAL 1:400 VERTICAL

1. THIS DRAWING IS FOR INFORMATION PURPOSES ONLY.
2. ALL DIMENSIONS AND DATUM LEVELS ARE IN METRES.
3. ALIGNMENT ON PLAN IS SHOWN OVER CYCLE PATH/FOOTPATH CENTRELINE. THE LONG SECTION IS BASED ON FINISHED LEVELS.

SOUTHWARK CYCLE ROUTES -  
COMMITTED ROUTE

SOUTHWARK CYCLE ROUTES -  
PROPOSED ROUTE

SUSTRANS ROUTES -  
COMMITTED ROUTE

SUSTRANS ROUTES -  
PROPOSED ROUTE

SUPPORT LOCATION

BUS STOP

SCHOOL

JP MORGAN DEVELOPMENT SITE

JUBILEE LINE TUNNEL  
(WITH 15m ZONE)

GRADE II LISTED BUILDING

GRADE II\* LISTED BUILDING

INDIVIDUAL TPO ZONES

BOROUGH OPEN LAND

METROPOLITAN OPEN LAND

OUTDOORS GYMNASIUM

CHILDRENS PLAYGROUND

**BOROUGH 08 SOUTHWARK**

**BOROUGH 05 TOWER HAMLETS**

Description							
Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date	
Description							
Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date	
Description							
Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date	
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Description							
<b>DRAWING CREATED</b>							
Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date	
SN	P01.1					00/05/14	

## WORK IN PROGRESS



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## Transport for London



Project Title  
Rotherhithe to Canary Wharf Crossing

CENTRAL ALIGNMENT  
PLAN AND PROFILE  
ALIGNMENT OPTION C1  
40m PIER CENTRES

ST\_PJ585G-ATK-BAS-ZZ\_12-DRG-DR-00007

Project	Originator	Volume	Location	Type	Role	Number
Original Size: A1	Scale: As Shown	Project Ref. No: 5162977	Sheet: 1 of 1	Rev: P01.1		



## Appendix B. Initial C2 Alignment Concept Design

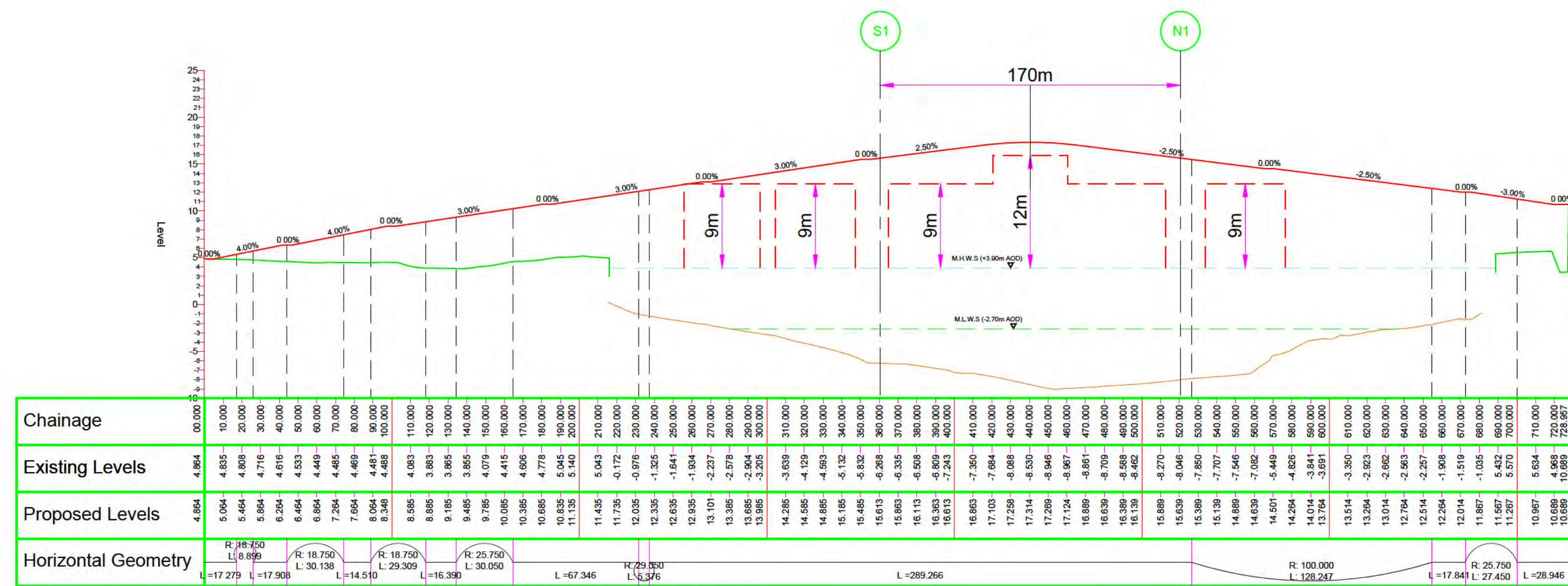
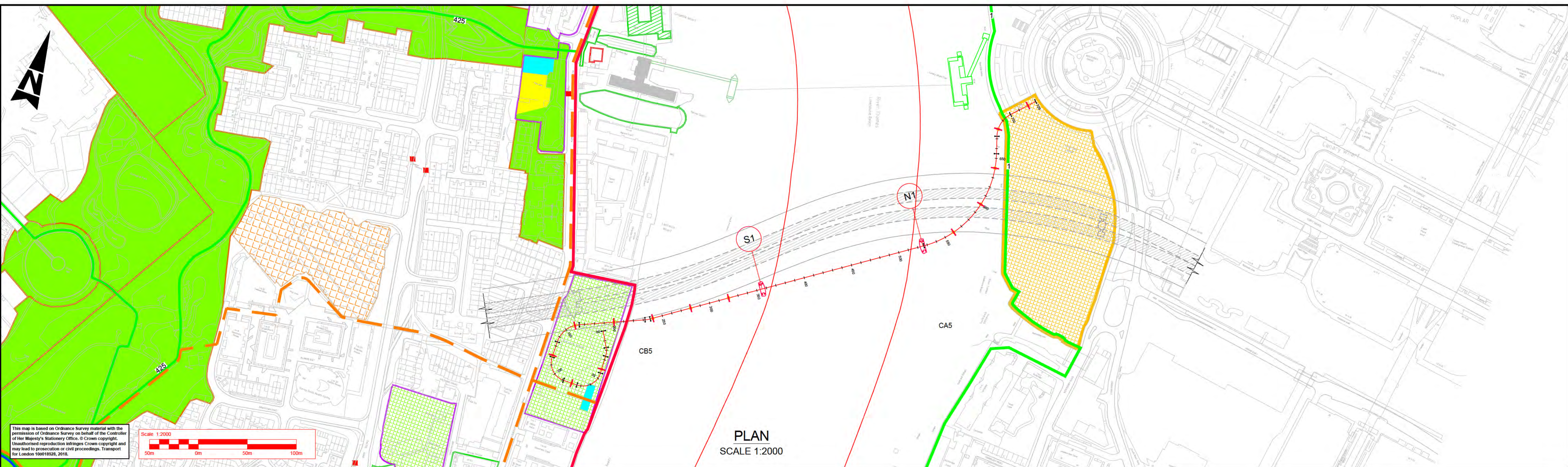


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VERTICAL PROFILE  
SCALE 1:2000 HORIZONTAL 1:400 VERTICAL

NOTES:

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KEY:

- JUBILEE GREENWAY
- SOUTHWARK CYCLE ROUTES - COMMITTED ROUTE
- SOUTHWARK CYCLE ROUTES - PROPOSED ROUTE
- SUSTRANS ROUTES - COMMITTED ROUTE
- SUSTRANS ROUTES - PROPOSED ROUTE
- SUPPORT LOCATION
- BUS STOP
- SCHOOL
- JP MORGAN DEVELOPMENT SITE

JUBILEE LINE TUNNEL (WITH 15m ZONE)

- GRADE II LISTED BUILDING
- GRADE II\* LISTED BUILDING
- INDIVIDUAL TPO ZONES
- BOROUGH OPEN LAND
- METROPOLITAN OPEN LAND
- OUTDOORS GYMNASIUM
- CHILDRENS PLAYGROUND

LOCATION PLAN

Describe

Status	Revision	Draw	Checked	Reviewed	Authorised	Issue Date

Description

Status	Revision	Draw	Checked	Reviewed	Authorised	Issue Date

Description

Status	Revision	Draw	Checked	Reviewed	Authorised	Issue Date

Description

Status	Revision	Draw	Checked	Reviewed	Authorised	Issue Date

Description

Status	Revision	Draw	Checked	Reviewed	Authorised	Issue Date

DRAWING CREATED

Status	Revision	Draw	Checked	Reviewed	Authorised	Issue Date
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Drawing Suitability

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Client

**Transport for London**

Status

**S0**

Project Title

Rotherhithe to Canary Wharf Crossing

Drawing Title

CENTRAL ALIGNMENT  
PLAN AND PROFILE  
ALIGNMENT C2  
40m PIER CENTRES

Drawing Number

ST\_PJ585C-ATK-BAS-ZZ\_12-DRG-DR-00010

Project

Originator	Volume	Location	Type	Role	Number
A1	Scale As Shown	Proj. Ref. No. 5162977	Sheet	1 of 1	Rev P01.1



## Appendix C. Value Engineering

Rotherhithe to Canary Wharf River Crossing	
<b>VALUE ENGINEERING ASSESSMENT FORM</b>	<b>DATE: 28/09/2018</b>
- Item Ref: VE01 – Different route across river that provides a more direct route to Westferry Circus	
SUMMARY DESCRIPTION OF VE PROPOSAL	
<p>The baseline alignment option (C1) is from CB5 to CA5. The ramp of the eastern landing site in Canary Wharf (CA5) runs parallel to the JP Morgan development site. The alignment then turns to the South West to achieve the shortest feasible route across the river to the landing site in Durand's Wharf. Almost the entirety of the ramp is founded in the river. The ramp is 380m from midspan to the landing site.</p> <p>The proposal consists of a variation in the alignment to provide a more direct route to Westferry Circus, denoted C2 alignment, refer to ST_PJ585C-ATK-BAS-ZZ_12-DRG-DR-00010. The C2 alignment is closer to the Jubilee Line alignment. In moving to the C2 alignment there is no feasible place to locate lifts and stairs on Canary Wharf side. To locate the lifts and stairs in the same place as the C1 alignment would result in significant additional permanent structure.</p> <p>The extents of the river channel, navigation channel and the location of the Jubilee Line tunnels crossing beneath the River Thames prevents a direct alignment from Durand's Wharf to Westferry Circus. The comparison of C1 versus C2 alignment is presented in ST_PJ585C-ATK-BAS-ZZ_21-DIA-ST-00001.</p> <p>Note: This VE1 item cannot co-exist with VE2 – Construction on land behind the river wall adjacent to JP Morgan development site.</p>	
ADVANTAGES:	DISADVANTAGES:
<ul style="list-style-type: none"> <li>• 66m (8%) reduction in overall length of the bridge due to a more direct route across the river.</li> <li>• 1 to 3 fewer river foundations and piers compared to the C1 alignment due to a more direct route across the river.</li> <li>• Towers and ramps further away from JP Morgan and Cascades building</li> <li>• Follows key desire lines more closely</li> </ul>	<ul style="list-style-type: none"> <li>• Increase main span by 10m due to spanning the navigational channel at a larger angle.</li> <li>• Increase in M+E requirements due to increased weight of main span.</li> <li>• Increase in deck clearance time due to length of main span.</li> <li>• Loses connection to Impounding Lock</li> <li>• Less accessible from the Canary Wharf side as there is no feasible location to locate stairs and lifts (Rotherhithe landing site remains unaffected). Note: the ramp gradient on the Canary Wharf side does not exceed 3%, which would have to be considered for accessibility.</li> </ul>
LIST OF SUPPORTING DOCUMENTS:	
<ul style="list-style-type: none"> <li>- ST_PJ585C-ATK-BAS-ZZ_12-DRG-DR-00010 (C2 alignment)</li> <li>- 5162977-43-0215 C1 vs C2 Comparison (Memo detailing comparison)</li> <li>- ST_PJ585C-ATK-BAS-ZZ_21-DIA-ST-00001 (COMPARISON OF C1 AND C2 ALIGNMENT OPTIONS)</li> </ul>	
IMPACT EVALUATION	
COST BENEFIT	

The saving in Estimated Final Cost (EFC) of adopting the C2 alignment versus CB5-CA5 has been assessed and previously reported as being £34.9 million (Excluding Land and third-party compensation costs) This assumed that 40m pier spacings were maintained and that the requirement for lifts and stairs is omitted from both ends of the bridge. This saving also assumed a main span length of 170m.

Current concept design development however suggests that the main span length may need to increase to 180m. This is likely to reduce the potential saving and a preliminary assessment pending completion of the concept design is that this could reduce to £33.4 million. This does not however reflect any potential impact on cost should the increased span length generate the need for the foundations to be similarly increased.

#### **PROGRAMME BENEFIT**

Assuming similar structural details for both alignment options;

It would be expected that a shorter bridge with less support structures would be quicker to install. However, back-span construction is not currently envisaged to be on the critical path. Consequently, no reduction in the overall R2CW construction programme will be evident.

Down scaling the number of non-critical path work elements does reduce the potential for over running works to impact on the critical path duration.

#### **RISK EVALUATION**

Departure from BS8300 required – inclusivity and accessibility

PLA consultation –

- 1) PLA are concerned with C2 alignment about safe navigation as the aspect of the bridges is skewed for approaching pilots. They however acknowledge that this needs to be assessed in a simulator and anticipate that a straighter alignment across the channel would significantly reduce this issue.
- 2) PLA believe that (in C2 alignment), it is very likely the bridge pier will need to be relocated further to the North as it will likely impact on existing cruise ship operations as well as impacting on the approach and departure angles for Thames Clippers (concern about Clipper approach angles was related to north of JL tunnels) utilising Canary Wharf Pier. This will likely be further compounded by the addition of impact protection.

The southern bridge pier is also close to the navigational channel as evidenced by previous cruise ship tracks because of the proximity of the bridge location to the nearby bend in the river. The simulation modelling is under progress and if it is ok there will not be any change expected. If not, the pier will need to be moved to the drying line on the south side of the river.

- 3) C2 alignment may need to be moved further away from the JL (Jubilee Line) tunnels when the foundation design is developed, depending on its size.
- 4) The C2 alignment may need to be moved further away from the JL tunnels when the foundation design is developed, depending on its size.

#### **ENVIRONMENTAL**

The reduction in river foundation and piers minimises the impact on the river both in construction and operation.

The reduction in overall length of the structure reduces the amount of material required, energy utilised and CO2 generated by construction.



The bridge and towers are further away from the Cascades building and JP Morgan.

#### **BUILDABILITY**

Closer (still outside) to Jubilee Line exclusion zone – C2 achieved by rotating main leg of C1 alignment by ca. 10° anti-clockwise such that the perpendicular distance from the main span of C2 alignment to the Jubilee Line exclusion zone is ca. 30m compared to 70m as was the case for C1 alignment.

The core design team have developed this further under EIN005. Early considerations of temporary works suggest the temporary works cofferdams will clash with the Jubilee Line exclusion zone. Note: 12.2m thick twin wall cofferdams considered. Potential tweaks to alignment may follow.

#### **SAFETY**

Similarly, as with other risk related impacts, reducing the bridge length will reduce exposure to construction dangers by requiring less construction and maintenance activity.

#### **OPERATIONS AND MAINTENANCE**

The overall structure is shorter and therefore requires less maintenance.

Fewer piers; hence, fewer bearings to maintain.

#### **ACCEPTANCE**

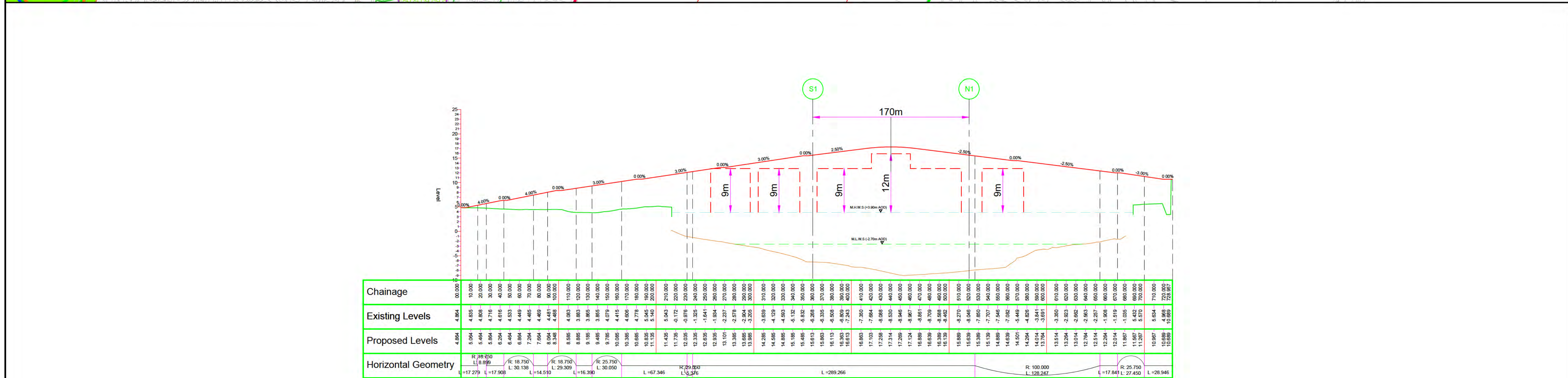
Prepared: [REDACTED]	Name: [REDACTED]	Signed: [REDACTED]
Proposal Implemented:	Yes, implemented in the core design with changes	
Approved by:	Name:	Signed:

#### **IMPLEMENTATION**

#### **COMMENTS / ACTIONS**

To be completed by TfL





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**KEY:**

<span style="color: red;">—</span>	THE JUBILEE GREENWAY		JUBILEE LINE TUNNEL (WITH 15m ZONE)
<span style="color: orange;">—</span>	SOUTHWARK CYCLE ROUTES - COMMITTED ROUTE		GRADE II LISTED BUILDING
<span style="color: orange;">—</span>	SOUTHWARK CYCLE ROUTES - PROPOSED ROUTE		GRADE II* LISTED BUILDING
<span style="color: green;">—</span>	SUSTRANS ROUTES - COMMITTED ROUTE		INDIVIDUAL TPO ZONES
<span style="color: green;">—</span>	SUSTRANS ROUTES - PROPOSED ROUTE		BOROUGH OPEN LAND
	SUPPORT LOCATION		METROPOLITAN OPEN LAND
	BUS STOP		OUTDOORS GYMNASIUM
	SCHOOL		CHILDRENS PLAYGROUND
	JP MORGAN DEVELOPMENT SITE		

**LOCATION PLAN**

BOROUGH 08 SOUTHWARK      BOROUGH 05 TOWER HAMLETS

Description						
Status	Revision	Draw	Checked	Reviewed	Authorised	Issue Date
Description						
Status	Revision	Draw	Checked	Reviewed	Authorised	Issue Date
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S0	P01.1					00/05/18

**WORK IN PROGRESS**

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**Transport for London**

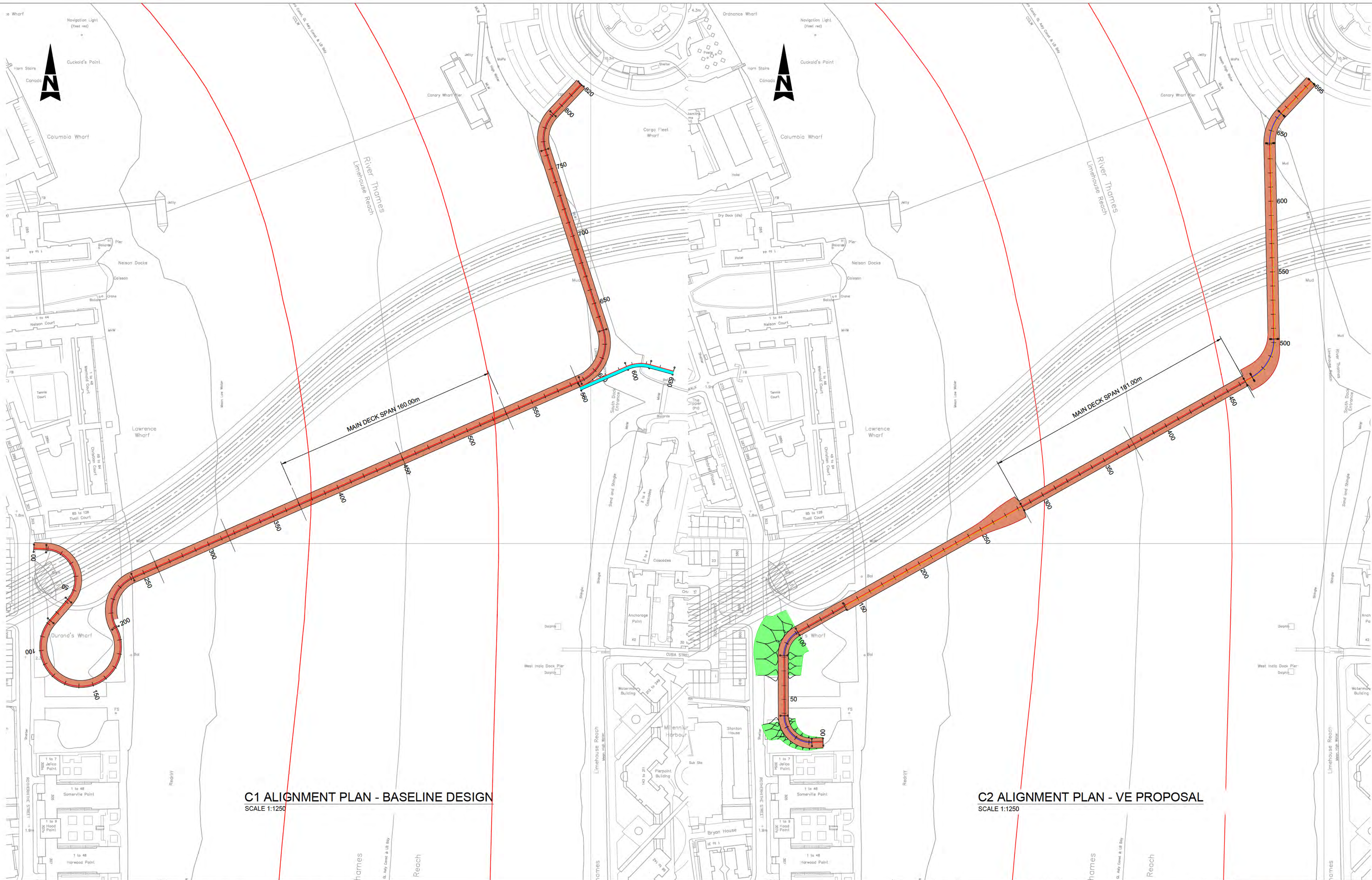
**Project Title**  
Rotherhithe to Canary Wharf Crossing

**Drawing Title**  
CENTRAL ALIGNMENT  
PLAN AND PROFILE  
ALIGNMENT C2  
40m PIER CENTRES

**Drawing Number**  
ST\_PJ585C-ATK-BAS-ZZ\_12-DRG-DR-00010

Project	Originator	Volume	Location	Type	Role	Number
Original Size: A1	Scale: As Shown	Project Ref: No. 5162977	Sheet: 1 of 1	Rev: P01.1		





C1 ALIGNMENT PLAN - BASELINE DESIGN  
SCALE 1:1250

C2 ALIGNMENT PLAN - VE PROPOSAL  
SCALE 1:1250

NOTE:- REFER TO APPENDIX - A & B FOR DIMENSIONS, LEVELS & OTHER DETAILS.

Transport for London <b>TfL Engineering</b>		Surface Transport			
P01.1		FIRST ISSUE			
rev	date	details	dm	chk	app
Multiple Boroughs					
R2CW RIVER CROSSING					
COMPARISON OF C1 AND C2					
ALIGNMENT OPTIONS					
drawing No					
ST_PJ585C-ATK-BAS-ZZ_21-DIA-ST-00001					
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## Rotherhithe to Canary Wharf River Crossing

### VALUE ENGINEERING ASSESSMENT FORM

DATE: 21/09/18

- Item Ref: VE02 – Construction on land behind the river wall adjacent to JP Morgan development site

### SUMMARY DESCRIPTION OF VE PROPOSAL

The baseline alignment option (C1) is from CB5 to CA5. The approach ramps on the eastern landing site, Canary Wharf (CA5), runs parallel to the JP Morgan developments site, refer to the baseline in ST\_PJ585C-ATK-BAS-ZZ\_12-DRG-DR-00014. The piers and foundations for this portion of the approach ramp are located in the river foreshore. The piers are approximately 7.5m away from the current river wall. This is assuming 2 rows of piles at 3d spacing with minimum distance of 3d from the river wall to avoid piles interacting with the wall. Note: EA require an exclusion zone in front of the wall for maintenance access; however, EA have not formally specified the required maintenance working width.

The VE proposal consists of relocating the east back span piers and foundations to minimise the amount of required river works required. Three different options have been considered:

#### Option 1

Option 1 consists of moving the foundation, piers and approach ramp on the eastern landing site on to the land on Thames Path, in front of the JP Morgan development site. Refer below Figure 1 and to ST\_PJ585C-ATK-BAS-ZZ\_12-DRG-DR-00014 for the revised alignment. The foundations would consist of more frequent 750mm dia. piles.



Figure 1: Approach span on land behind the existing river wall

There is very minimal data available on the current sheet pile wall and tie bar details. The available record information (TF-116-1934, TF-117-1934 and TF-118-1934) is believed to be for the previous river wall as it does not align with that specified in ARUP Riverside South Existing Tie Bar Condition Technical Note 2007. The technical note indicates that good condition tie rods were found in the two trial holes dug.

EA consultation is required to obtain the as built data of the existing river wall. Following which an impact assessment is required to understand the influence any additional piles would have on the existing river wall. It is anticipated that a 3d spacing is required from the pile to the river wall.

### **Option 2**

Monopile construction immediately in front of the existing river wall. The monopiles can be constructed from the Thames Path. Refer below Figure 2.



**Figure 2: Approach span on the river (infront of the river wall)**

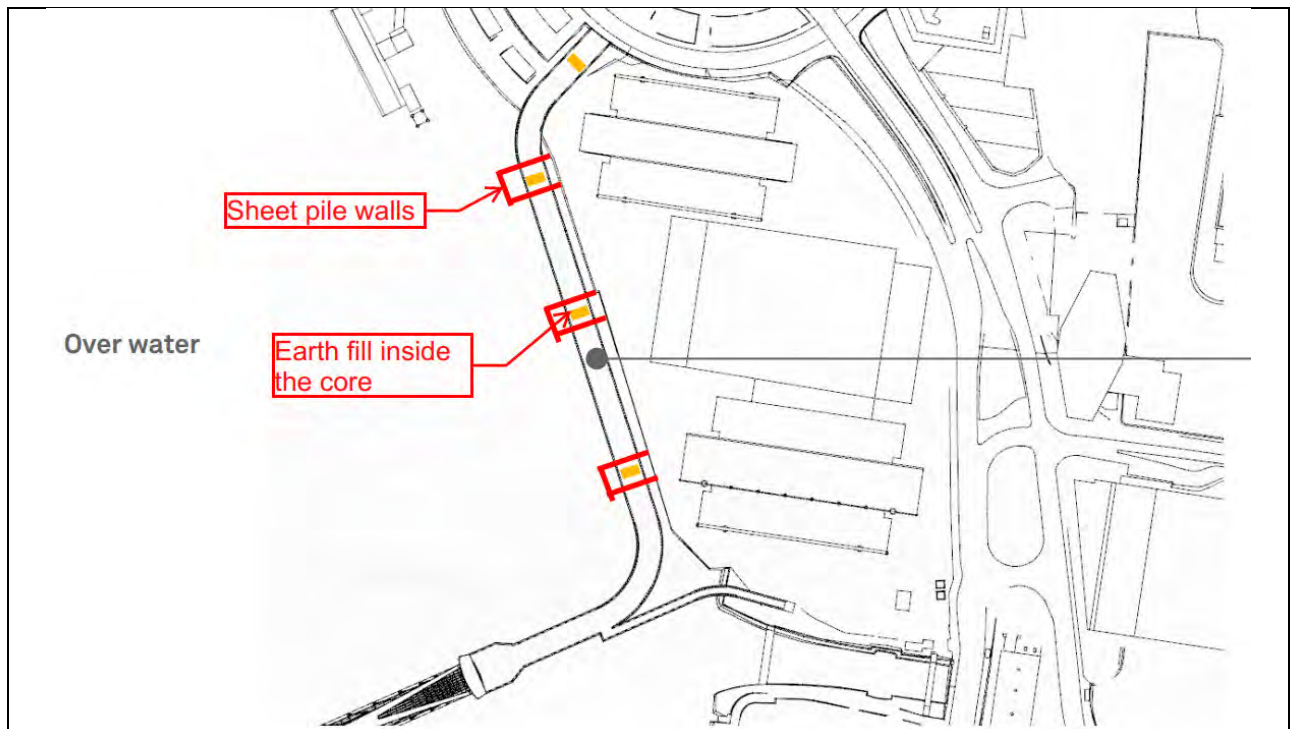
Assessment of the reach and depth of available piling rigs is required. The monopiles need to be protected for ship impact loads which may happen at high tide (low probable risk).

Similar to Option 1 – record information on the existing river wall is required to assess whether it can support the piling rig.

### **Option 3**

If the EA does not accept the vicinity of the monopiles from the front of the river wall due to their maintenance requirements, option 3 can be considered. Locally replace parts of the existing river wall with a new sheet pile wall that steps out (in plan) towards the river where the piers and foundations are to be located, refer to Figure 3. It is assumed the new river wall will require approximately 120m plan length of AZ46 sheet pile sections that are approximately 20m in length (using the baseline approach ramp foundation design).

Similar to Option 1 – record information on the existing river wall is required to assess whether it can support the piling rig.



**Figure 3: Option 3 - Sheet piles around the proposed piers**

Consultation with EA is required to fully understand their maintenance requirements. If the EA maintenance requirements can be avoided, then it would be significantly preferable to pursue Option 2 rather than Option 3.

Each option requires significant stakeholder liaison. Considerations have been included in Risk Evaluation.

For the purpose of this study, no changes in the deck and approach ramps have been assumed.

This VE2 item cannot co-exist with VE1 – “More direct route to Westferry Circus”

**ADVANTAGES:**

- Relocate 4 river foundations to land or readily accessible from land
- Avoids having river plant for construction of 4 piers
- Easier deck erection
- Option 1 only - close columns would allow a more slender deck which would have less visual impact from Thames Path

**DISADVANTAGES:**

- Option 1 only – Likely requirement of alternate footpaths (existing) along the Thames river
- Over shadowing the Thames Path
- Available details of the existing river wall are either limited or of a low quality. Site investigations may be required to ascertain the as built details of the wall such that the foundations can be configured to avoid them.
- Impact on fire tender access for the JP Morgan development – fire strategy for the building would need to be obtained and reviewed before options could be verified as feasible.

**LIST OF SUPPORTING DOCUMENTS:**



<ul style="list-style-type: none"> <li>- ST_PJ585C-ATK-BAS-ZZ_12-DRG-DR-00014 (Option 1 alignment)</li> <li>- PA_07_00229-RIVERSIDE_SOUTH_TIE_RODS_DETAILS-412647 (ARUP Riverside South Existing Tie Bar Condition Technical Note 2007)</li> <li>- C1 Alignment on land / over water (illustrated sketches &amp; architect's view)</li> <li>- Soilmec SA-40 system mounted to an SC120 crane drawing</li> </ul>
<b>IMPACT EVALUATION</b>
<b>COST BENEFIT</b>
<p>The saving in Estimated Final Cost (EFC) of adopting Option 1 as described above (i.e. C1, composite deck, 55m ramp support spacing "on-land" option) versus CB5-CA5 has been assessed and previously reported as being £41.8 million (Excluding Land and third-party compensation costs). This compares with a £39.4 million saving for the C1, composite deck, 55m ramp support spacing option running along the foreshore. So, the anticipated value of the VE2 saving itself would only be the difference between the two, i.e. A £2.4 million saving in EFC.</p> <p>Whilst outline design proposals and estimates have not been produced for Options 2 and 3 above, our initial assessment is that these would likely generate less potential savings than option 1.</p>
<b>PROGRAMME BENEFIT</b>
<p>Currently back span construction does not sit on the critical path so no overall programme saving will be seen, but programme risk will be reduced. Option 1 delivers the most risk reduction.</p>
<b>RISK EVALUATION</b>
<p>Vicinity, overshadowing, visual impact and future integration with JP Morgan site needs to be investigated.</p> <p>Review of JP Morgan designs and discussions required to ensure the proposed pier foundations don't interfere with the JP Morgan basement design.</p> <p>Currently understood that EA require maintenance access of the existing river wall. Consultations with EA regarding replacement of river wall needs to be discussed.</p> <p>Currently understood that Emergency services require access along Thames Path and it should not be obstructed during construction or operational phases. Consultations with Emergency services regarding access required along the riverside walk needs to be discussed.</p>
<b>ENVIRONMENTAL</b>
<p>Reduces/eliminates environmental risk of constructing in river.</p> <p>May appear more integrated into existing infrastructure.</p> <p>Hydraulic modelling of crenelated pile wall would be required. This could require scour protection.</p>
<b>BUILDABILITY</b>
<p>The Contractor's designer has advised that there would likely be 2nos. of 0.75m diameter piles per location. These will require a pile cap with its top near river bed / ground level. Please note that the mobilisation costs for marine plant will still be incurred as marine piling is still required on the scheme. Delivery and erection of these shorter &amp; lighter spans would still be from the river. Increasing the number of spans, from 3 to 12 nos., means more beam lifts &amp; beam connections to be made on site at height. It</p>



may be possible to lift in the pre-cast deck units using a land-based crane (NB site access to be considered) or use a marine crane to lift spans with the pre-cast in place to offset some of this cost.

**Option 1 (on land):** This option requires high level investigation prior to the commencement of works, to confirm anchor locations, to determine risk of damage and any improvement works required for the existing wall.

There will be a construction cost saving by avoiding the need for marine plant to carry the piling rig and the need for temporary cofferdams. Earth retaining works will be required to construct 26 nos. of small pile caps and will be much simpler than cofferdams construction in the river.

**Option 2 (on river):** Considering 3.5m to 4m from pile centre to edge of support platform so allowing for the tracks to sit approx. 500mm from the edge. Refer attached Soilmec SA-40 system mounted to an SC120 crane drawing. A support frame will be required to support the pile casing and a scaffold accessway. The suitability of the existing sheet pile wall to support such a crane would need to be confirmed. To minimise the wall loading this should be located as far as possible.

There will be a construction cost saving by avoiding the need for marine plant to carry the piling rig for the foundations. We believe the temporary cofferdams could be formed from the shore (say within 15m of bank). However, forming these 11 smaller temporary cofferdams in different locations will involve more work, costlier and time consuming than the baseline 3 large ones. Cofferdams and the specialist piling equipment costs will diminish the gain due to Option 1.

**Option 3 (with encasing):** It is similar to option 2. It requires infilling of the cofferdam to provide a working platform to avoid the need for the long reach of Soilmec SA-40 piling system. Up-rated sheeting and finishes incl. capping beam will likely be required (to accommodate the 120-year design life) as permanent works. The sheet piles will need to be purchased outright and additional fill will need to be brought in to backfill behind the sheets. The cost of extraction will be avoided. The resulting construction cost saving is likely to be negligible given these additional expenses. Similarly, any programme risk reduction will be lost in the additional works required.

NOTE: The contractors assume the bulk of the cost saving quoted in the cost benefit section comes from a weight related fabrication cost savings as our estimated site construction cost savings are only a fraction of that quoted. From the Contractor's investigation, Option 1 delivers the largest construction cost saving, Option 2 less & Option 3 the least

#### **SAFETY**

Positive impact on safety during construction – simpler to construct on land than in river.

Similarly for inspection and maintenance works.

#### **OPERATIONS AND MAINTENANCE**

Bearing inspection from land as opposed to river

#### **ACCEPTANCE**

Prepared: [REDACTED]

Name: [REDACTED]

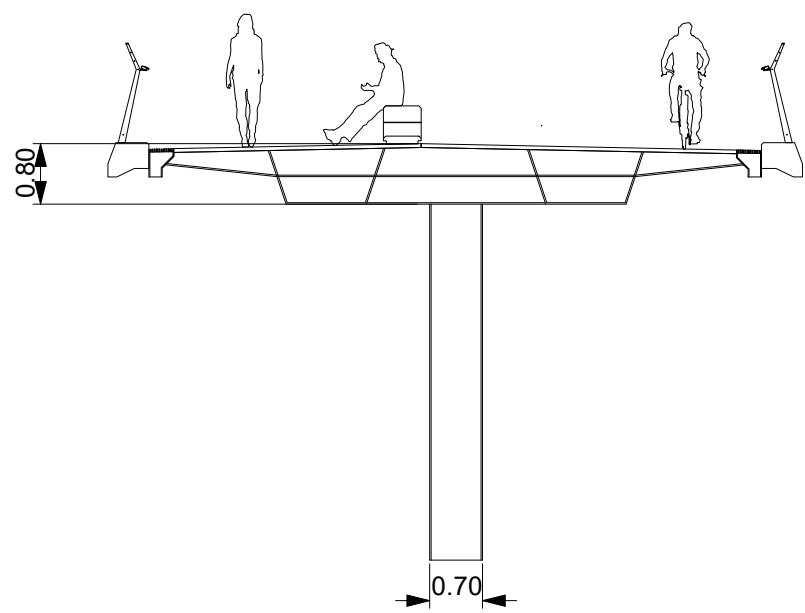
Signed: [REDACTED]

<b>Proposal Implemented:</b>	<b>Proposal is not appropriate for the current C2 Alignment.</b>	
<b>Approved by:</b>	<b>Name:</b>	<b>Signed:</b>
<b>IMPLEMENTATION</b>		
<b>COMMENTS / ACTIONS</b>		
<p>To be completed by TfL</p>		

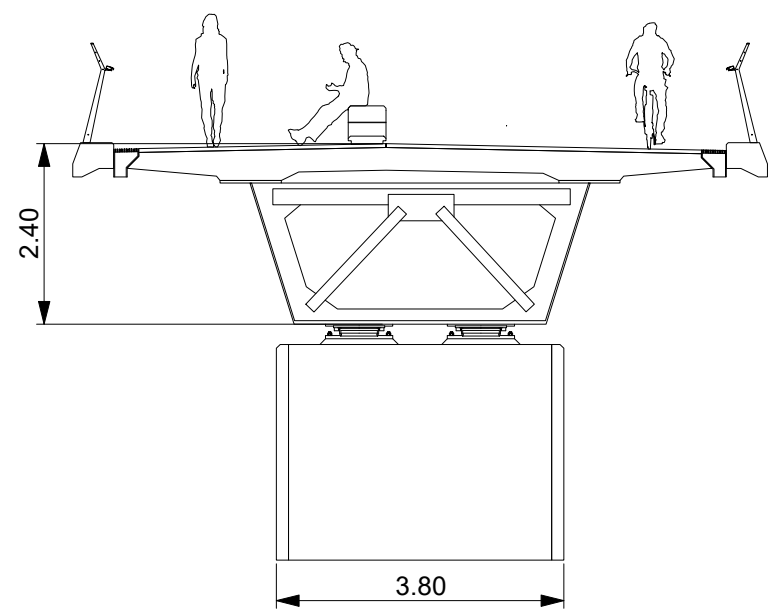
## **C1 ALIGNMENT**

On land / Over water

On land



Over water

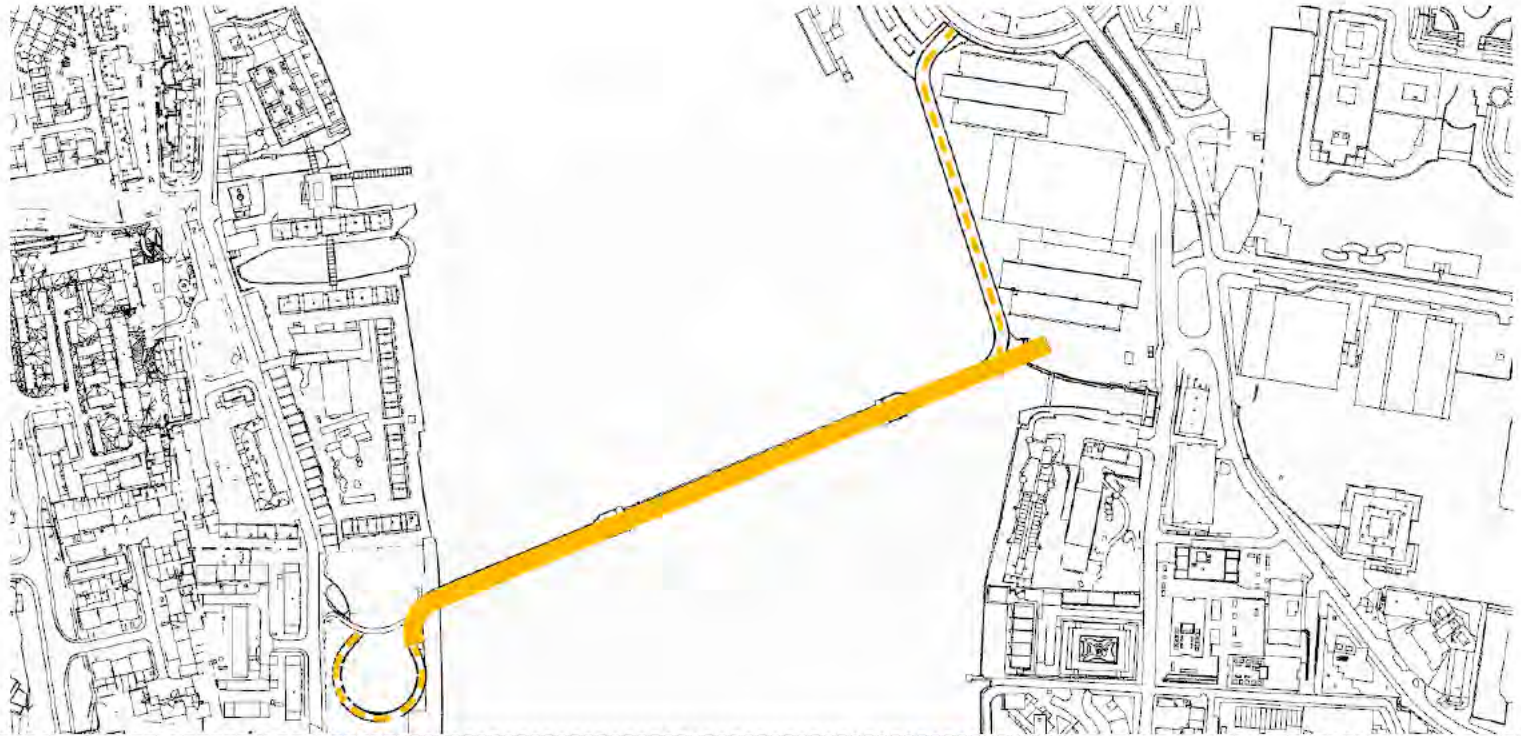




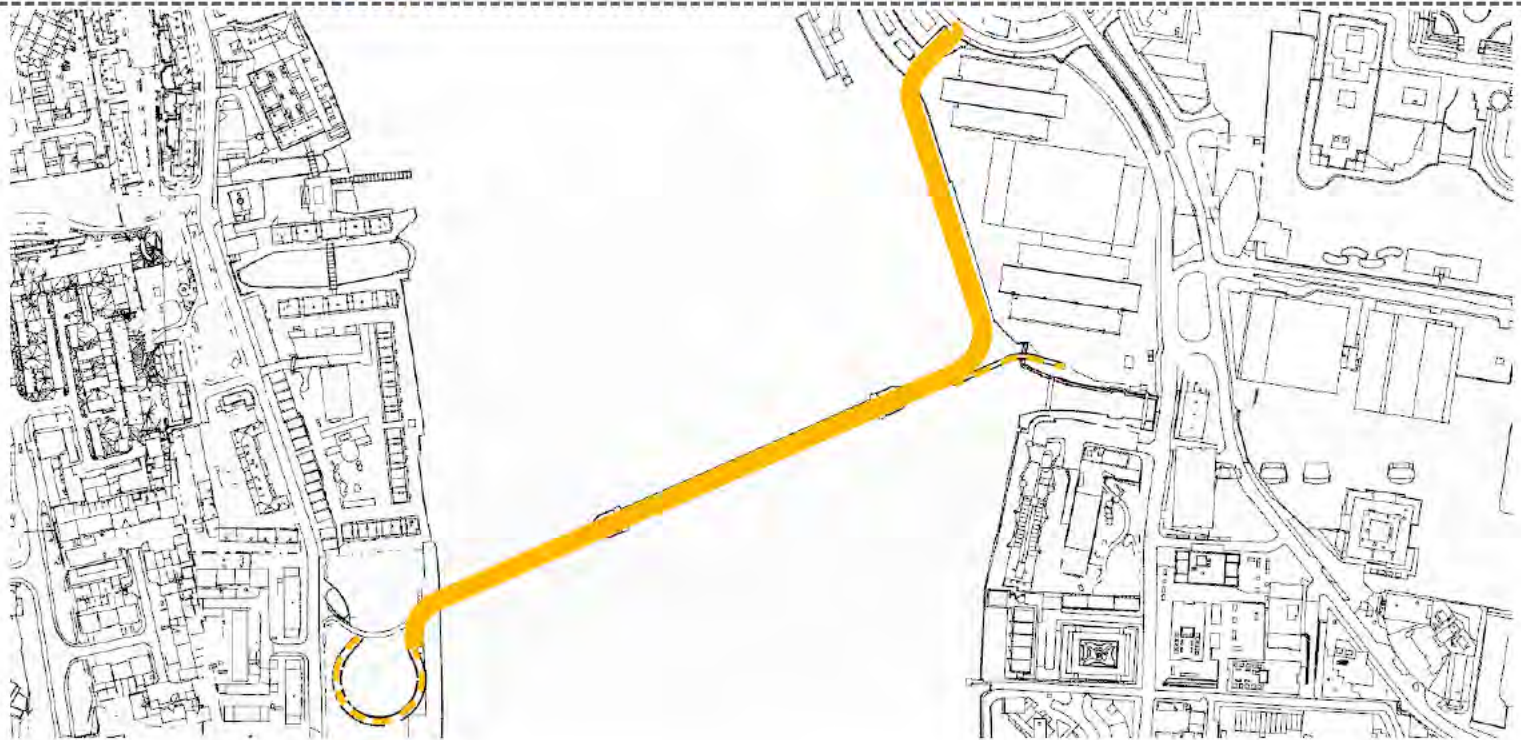




On land  
Bridge + ramps



Over water  
Bridge

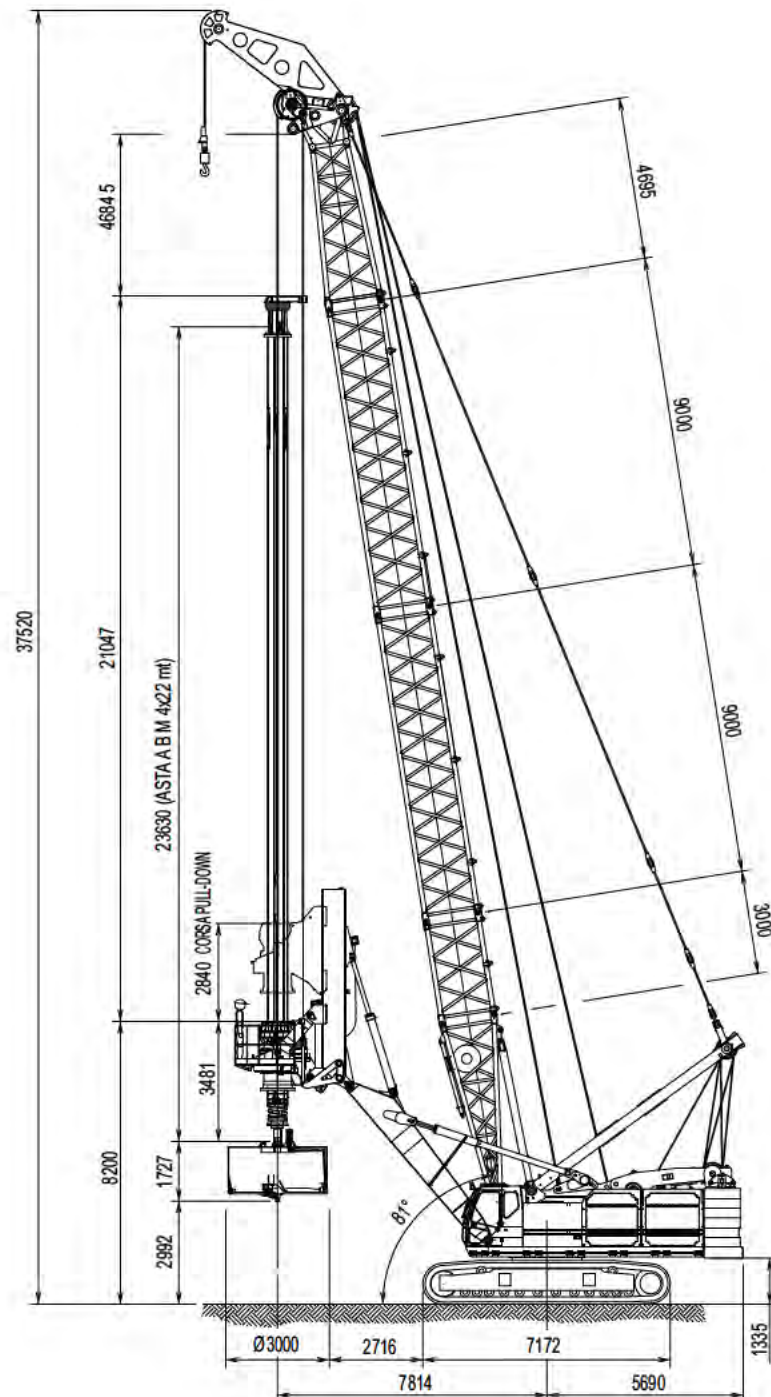




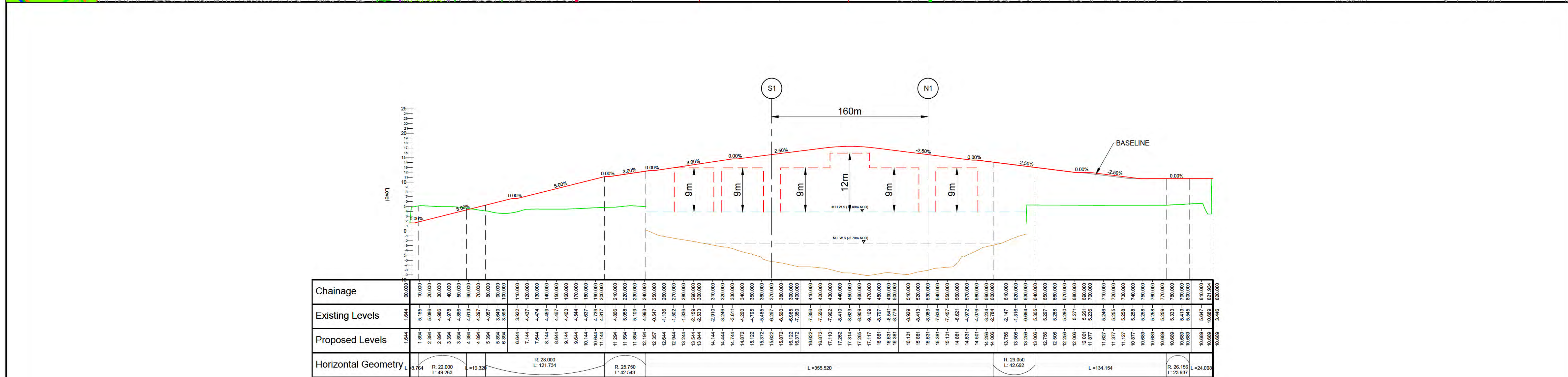
ITALIANO

Soilmec SA-40 system mounted to an SC120 crane

Dimensionale della macchina SC-120 con installata la SA-40.








**LOCATION PLAN**

The map shows the proposed development area highlighted in red, situated between the A102 and A103 roads. The area is divided into two boroughs: **BOROUGH 08 SOUTHWARK** to the west and **BOROUGH 05 TOWER HAMLETS** to the east. A north arrow is located in the top right corner, and a scale bar is at the bottom.

Description						
Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
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S0	P01.1					00/05/18

Drawing Suitability <div>WORK IN PROGRESS</div>		Status <div>SO</div>		Project Title Rotherhithe to Canary Wharf Crossing															
 <div>ATKINS</div> <div>Member of the SNC-Lavalin Group</div>		No 1 Croydon 12-16 Addiscombe Road Croydon CR0 0XT  Tel: +44 (0) 20 8663 5000 Fax: +44 (0) 20 8663 5111 <a href="http://www.atkinsglobal.com">www.atkinsglobal.com</a>		Drawing Title  <div>CENTRAL ALIGNMENT PLAN AND PROFILE</div> <div>ALIGNMENT OPTION C1 40m PIER CENTRES</div>															
Copyright © Atkins Limited (2018)		Client		Drawing Number  <div>ST_PJ585C-ATK-BAS-ZZ_12-DRG-DR-00014</div>															
 		<table border="1"> <thead> <tr> <th>Project</th> <th>Originator</th> <th>Volume</th> <th>Location</th> <th>Type</th> <th>Issue</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>Original Size: A1</td> <td>Scale: As Shown</td> <td>Project Ref No: 5162977</td> <td>Sheet: 1 of 1</td> <td>Rev: P01.1</td> <td></td> <td></td> </tr> </tbody> </table>				Project	Originator	Volume	Location	Type	Issue	Number	Original Size: A1	Scale: As Shown	Project Ref No: 5162977	Sheet: 1 of 1	Rev: P01.1		
Project	Originator	Volume	Location	Type	Issue	Number													
Original Size: A1	Scale: As Shown	Project Ref No: 5162977	Sheet: 1 of 1	Rev: P01.1															



## Rotherhithe to Canary Wharf River Crossing

### VALUE ENGINEERING ASSESSMENT FORM

DATE: 21/09/18

- Item Ref: VE03 – Reduce deck width from recommended to minimum values

### SUMMARY DESCRIPTION OF VE PROPOSAL

The width of the footway and cycleway is defined by several standards as shown in ST\_PJ585C-ATK-ZZZ\_25-REP-DR-00001. The minimum and recommended values are summarised below.

#### Footway:

- 2.00m minimum required (excludes buffers)
  - BD29/17
- 2.90m recommended (excludes buffers)
  - TfL Pedestrian Comfort Guidance for London (2010)

#### Cycleway:

- 3.00m minimum accepted (excludes buffers)
  - Suitable for 2 cyclists side by side
  - London Cycling Design minimum standards for two-way track
- 4.00m maximum recommended (excludes buffers)
  - Suitable for 3 cyclists side by side
  - Sustrans preferred

#### Buffers:

- 0.20m between footway and parapet minimum required
  - TfL Pedestrian Comfort Guidance for London (2010)
- 0.50m between cycleway and parapet
  - Ibid 17 (p11) and Ibid 18 (p47)
- 0.50m between pedestrians and cyclists
  - Cycling, Walking and Accessibility report

Baseline design allows for the clear width of the deck as 8.10m (Total deck width = 9.2m). The VE03 proposes minimum acceptable clear width of the deck as 6.20m ( $=2.00+3.00+0.20+0.50+0.50$  & total deck width = 7.3m). Refer Figure 1 for details. The comparison of the min. deck width with the original deck width is presented in sketch ST\_PJ585C-ATK-BAS-ZZ\_21-DIA-ST-00002.

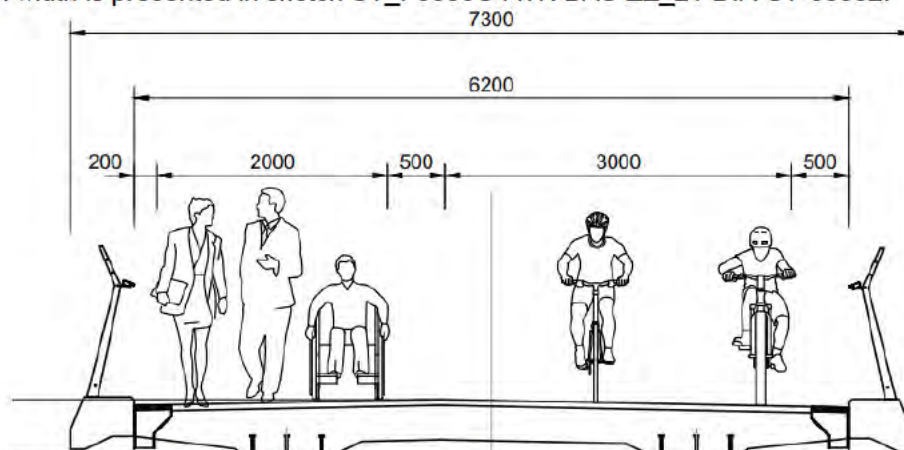


Figure 1 - Reduced Deck width as per VE proposal

By reducing the width of the deck in the main span, the horizontal stiffness is reduced, which affects the natural frequency of the structure. The horizontal natural frequency in the baseline design is 0.99Hz. By reducing the width of the deck by 1.9m to the minimum acceptable deck width and maintaining the other parameters of the deck, the horizontal natural frequency undesirably reduces to 0.82Hz. As a result, reducing the horizontal deck width requires an increase in the horizontal damping ratio (eg. mass tuned dampers). In accordance with NA to BS EN 1991-2:2003 NA2.44.7 approximately 5% horizontal damping ratio is required to achieve a minimum 0.8Hz natural frequency.

A drawing of the revised main span is included in ST\_PJ585C-ATK-BAS-ZZ\_09-DRG-ST-00006.

Cost savings have been calculated based on revised main span orthotropic deck width and pro-rata reduced approach span deck width.

Savings from reduced tower design requirements, counterweight, M+E and foundations have not been included.

#### ADVANTAGES:

- Reduction in main span steel quantities and weight
- Reduced counterweight weight (due to reduction in main span weight)
- Reduced tower design requirements (reduced vertical load due to reduced main span and counterweight)
- Reduced cost of approach span

#### DISADVANTAGES:

- Reduced pedestrian comfort levels; however, still within TfL Pedestrian Comfort Guidance for London (2010) for 2041 forecast flows.
- Increased accident risk – pedestrians migrating to cycle path and vice versa.
- Limited space for stationary activities along the deck and for groups; unless dedicated areas are included in the design.
- Reduced standing area when footway and cycle path is closed for opening.

#### LIST OF SUPPORTING DOCUMENTS:

- [ST\\_PJ585C-ATK-ZZZ-ZZ\\_25-REP-DR-00001](#) (*Gradients and Widths Technical note*)
- ST\_PJ585C-ATK-BAS-ZZ\_09-DRG-ST-00006 (*Revised main span deck GA drawing with reduced deck width*)
- ST\_PJ585C-ATK-BAS-ZZ\_21-DIA-ST-00002 (*Deck Width Comparison Concept Design & VE Proposals*)

#### IMPACT EVALUATION

##### COST BENEFIT

The saving in Estimated Final Cost (EFC) of reducing the deck clear width to 6.2m as described above has been assessed and previously reported as being £16.2 million versus CB5-CA5 (Excluding Land and third-party compensation costs.) This assessment relates to the savings in the deck/superstructure costs only and further opportunity for reduction in the cost of the foundations may exist should their design also be simplified as a reduced or reduced dead load from the structure.

It should however be noted that the currently proposed C2 Concept design incorporates a significant reduction in the length of the approach ramps and therefore, there would be a commensurate reduction in the potential saving that this proposal would generate.

##### PROGRAMME BENEFIT

Negligible benefits anticipated.

##### RISK EVALUATION

Stakeholder discussion: *Note:* Proposed would not meet the standards in published Sustrans guidance or TfL's own pedestrian comfort level guidance.

##### ENVIRONMENTAL

Reduced materials used.

#### **BUILDABILITY**

Same construction method expected. Small benefits anticipated as construction methodology would be the same, but lighter deck and smaller foundations.

#### **SAFETY**

Increased accident risk – pedestrians migrating to cycle path and vice versa. This is a risk highlighted in the TfL Pedestrian Comfort Guidance for London (2010) for over capacity footpaths/cycle paths.

#### **OPERATIONS AND MAINTENANCE**

Less area to repaint

#### **ACCEPTANCE**

Prepared: [REDACTED]

Name: [REDACTED]

Signed: [REDACTED]

Proposal Implemented:

Y / N

(Delete as appropriate)

Approved by:

Name:

Signed:

#### **IMPLEMENTATION**

#### **COMMENTS / ACTIONS**

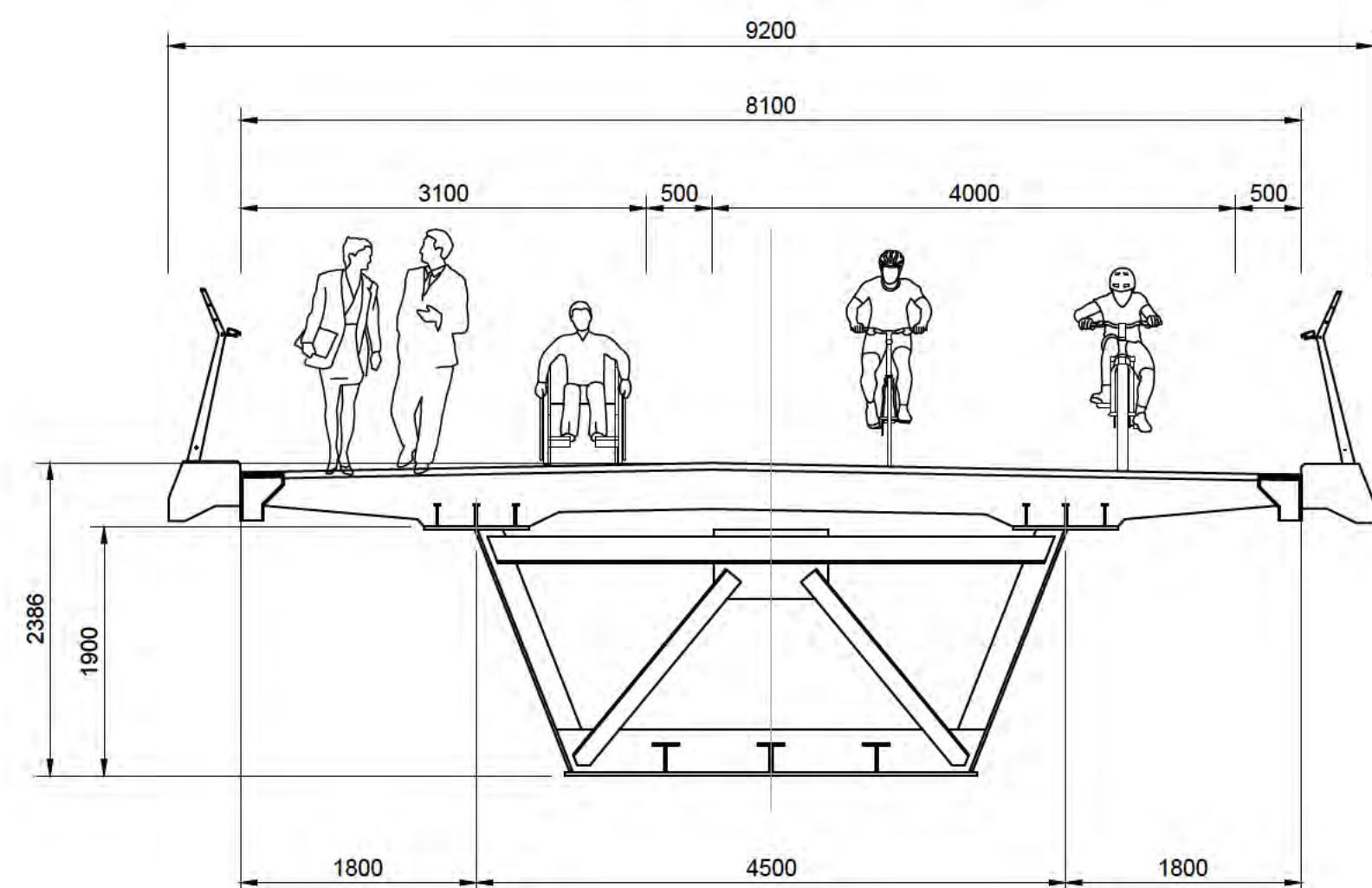
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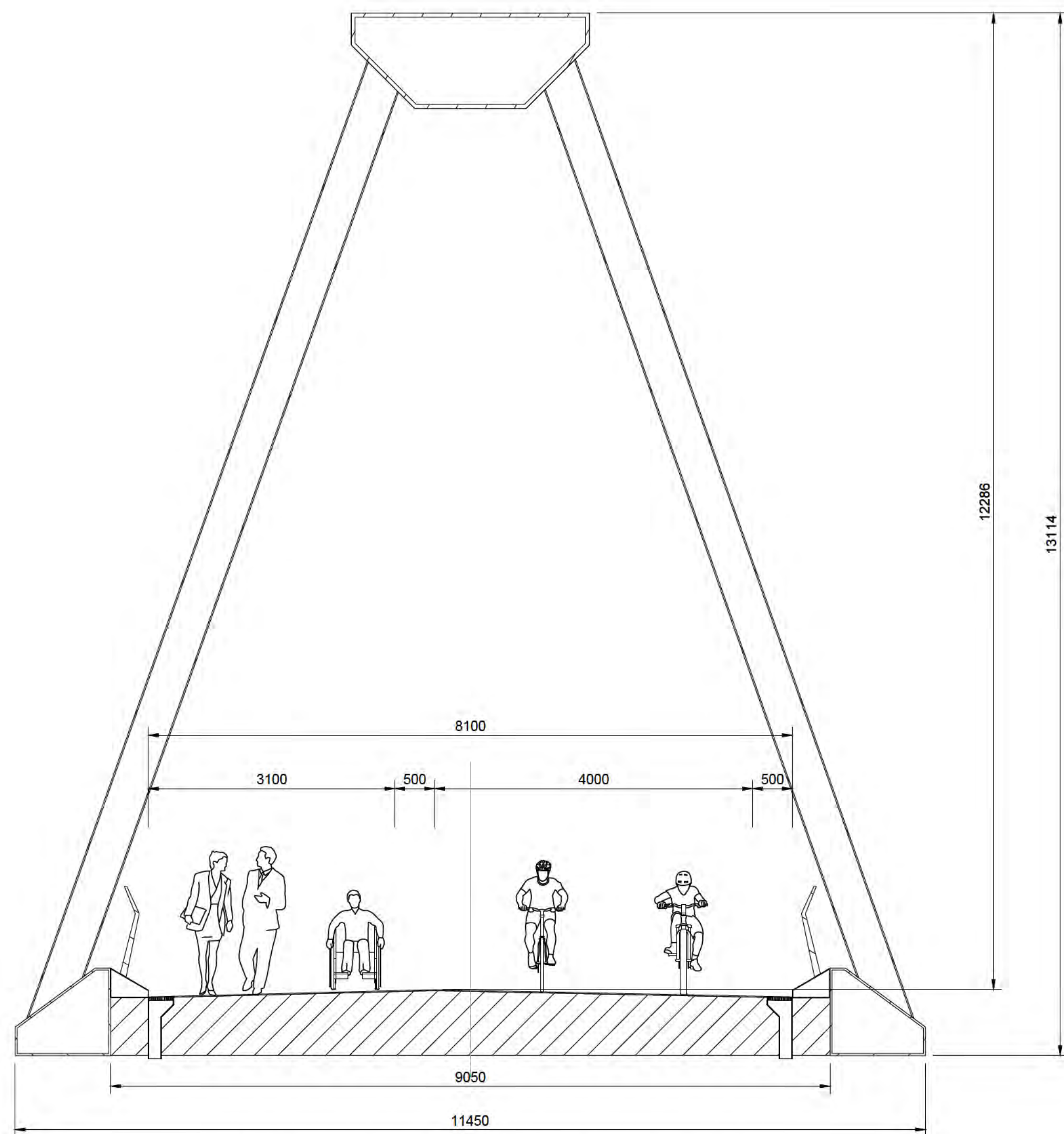




## CONCEPT DESIGNS



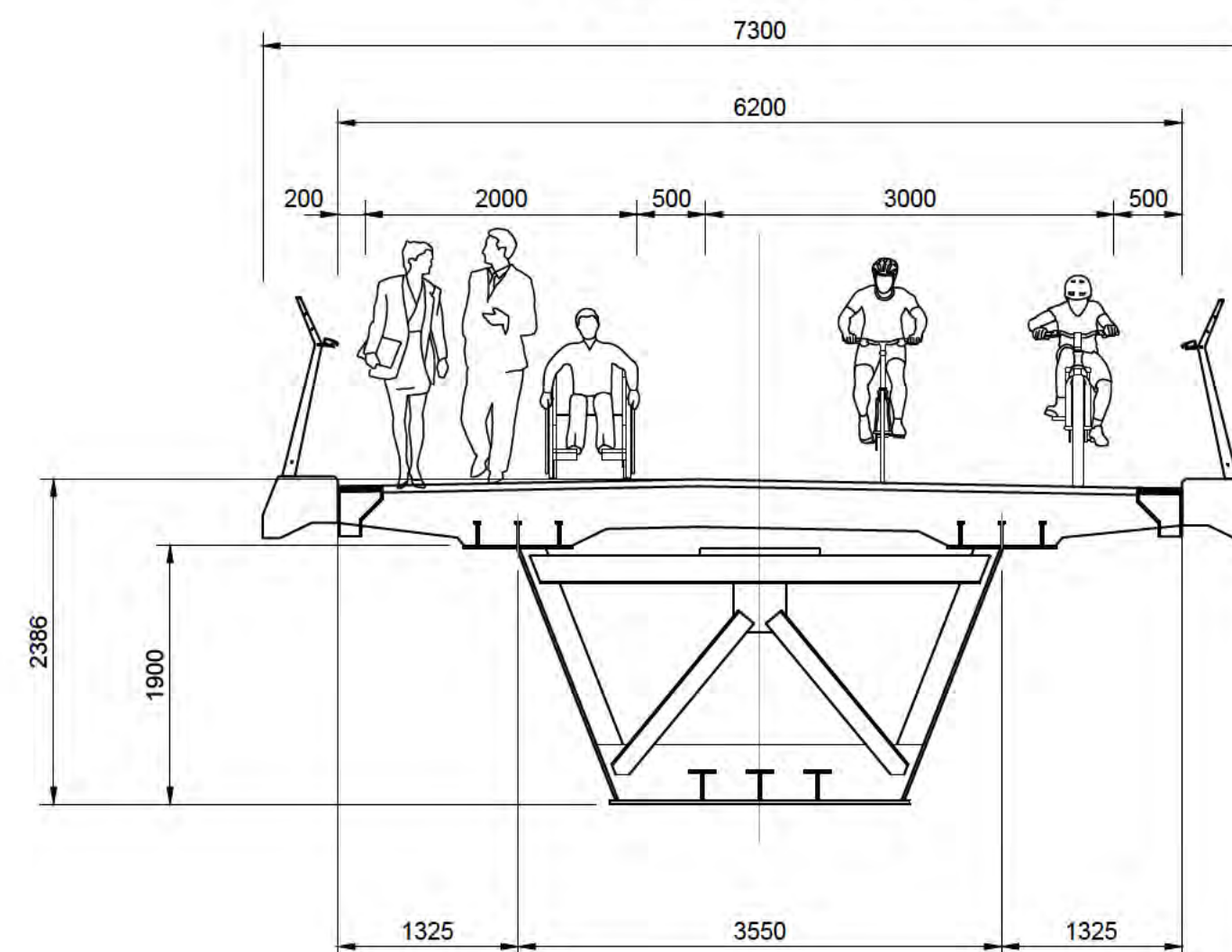
APPROACH SPANS ORIGINAL DECK WIDTH - 8.1m



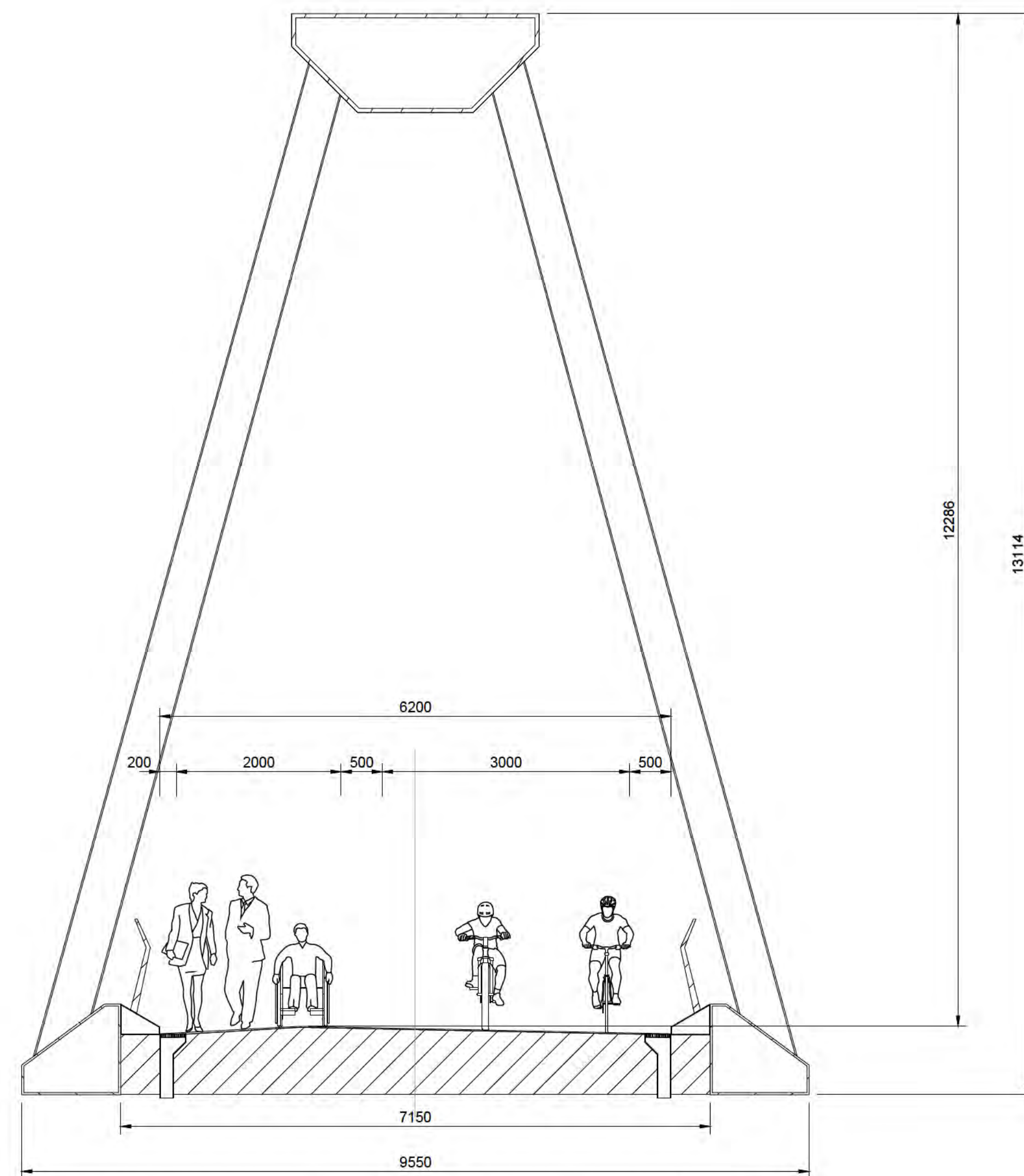
MAIN SPAN ORIGINAL DECK WIDTH - 8.1m

NOTE:- REFER TO APPENDIX - A & B FOR DIMENSIONS, LEVELS & OTHER DETAILS.

## VE PROPOSALS



APPROACH SPANS REDUCED DECK WIDTH (VE03) - 6.2m



MAIN SPAN REDUCED DECK WIDTH (VE03) - 6.2m

[illegible]



## Rotherhithe to Canary Wharf River Crossing

### VALUE ENGINEERING ASSESSMENT FORM

DATE: 21/09/18

- Item Ref: VE04 – Challenge Port of London Authority (PLA) on the required navigable headroom

### SUMMARY DESCRIPTION OF VE PROPOSAL

The baseline design considers 12m above MHWS for the central 40m of the main span and minimum 9m above MHWS for the entire main span. This has been calculated based on frequency of opening from Marico Marine shipping data.

On reviewing the Marico Marine shipping data, it was found that the river users or the bridges users are not significantly more inconvenienced by having the soffit at 10m above MHWS compared with 12m above MHWS. However, this is dependent on the opening management plan of the bridge, the review considers the following the management rules:

- Rule 1: Bridge must open within 1 hour of arrival of a vessel. Bridge is not required to open again for an hour after subsequent closure. Bridge opening time is assumed to be 30 minutes
- Rule 2: Bridge must be open within 2 hours of arrival of a vessel. Bridge is not required to open again for 2 hours after subsequent closure. Bridge opening time is assumed to be 30 minutes

The potential savings shown here are an estimate based on reduced ramp lengths (resulting from 10m above MHWS) from the baseline alignment. There needs to be an agreement of the opening management plan and PLA requirement to define the required navigable channel headroom.

Note: The value engineering design opportunities described below are for the preferable Durand's Wharf landing site alignment at the time. However, similar principles and savings can be applied for the other alignments.

#### Value Engineering Iteration 1

10m clearance has been fixed for the central 40m of the main span and as a first iteration an average longitudinal gradient of 3% is provided towards Rotherhithe approach and 2.5% towards Canary Wharf. 3% is a recommended value for best comfort level for cyclists and pedestrians based on current standards and case studies, refer to ST\_PJ585C-ATK-ZZZ-ZZ\_25-REP-DR-00001. However, this solution leads to reduction of only a few meters in total ramp length (when considering tie in at Durand's Wharf level, as opposed to Rotherhithe Street level), making the change not economically relevant.

Refer to ST\_PJ585C-ATK-BAS-ZZ\_12-DRG-DR-00015 for revised highway alignment.

#### Value Engineering Iteration 2

10m clearance has been fixed for the central 40m of the main span and the longitudinal gradient limit was increased to 5%. This value represents the maximum generally accepted in accordance to BD29/17, IAN195/16 and other guidance, refer to ST\_PJ585C-ATK-ZZZ-ZZ\_25-REP-DR-00001. In summary the following restrictions have been considered:

- Gradient of 5% for maximum 30m long sections (IAN195/16 Table 2.2.9)
- Gradient of 2.5% for maximum 100m long sections (IAN195/16 Table 2.2.9)
- Landings for minimum 5m long sections (IAN195/16 2.2.9)
- Allowance of minimum 2.4m clearance over Thames Path at Durand's Wharf.

A reduction of approximately 130m in approach ramp length has been achieved.

Refer to ST\_PJ585C-ATK-BAS-ZZ\_12-DRG-DR-00016 for revised highway alignment.

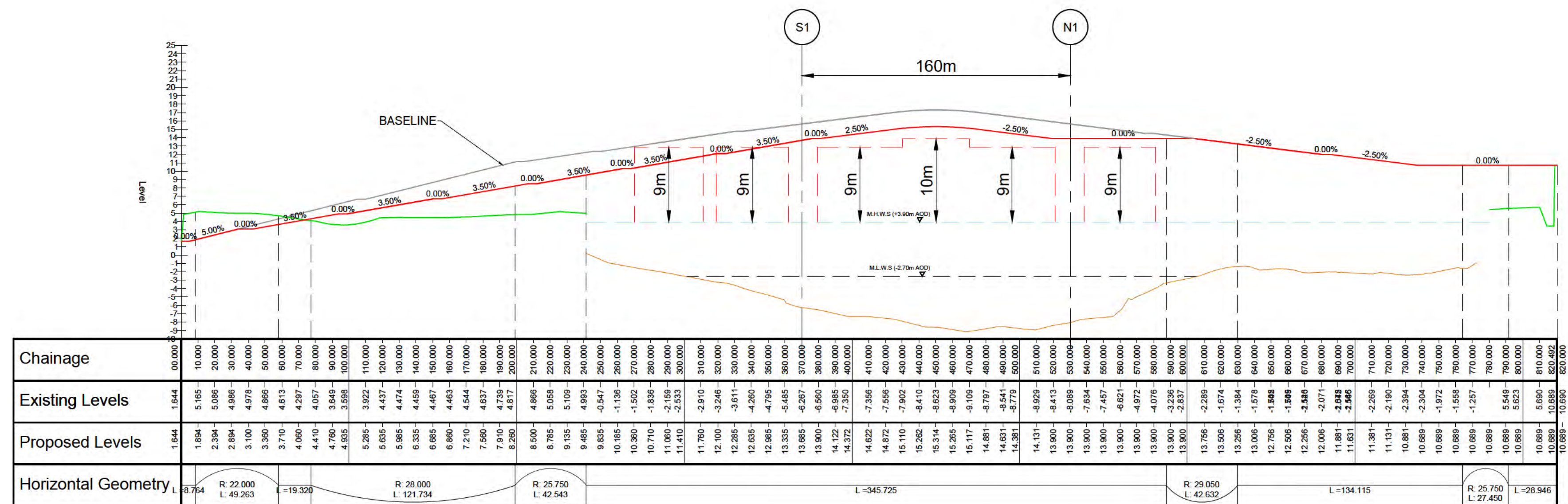
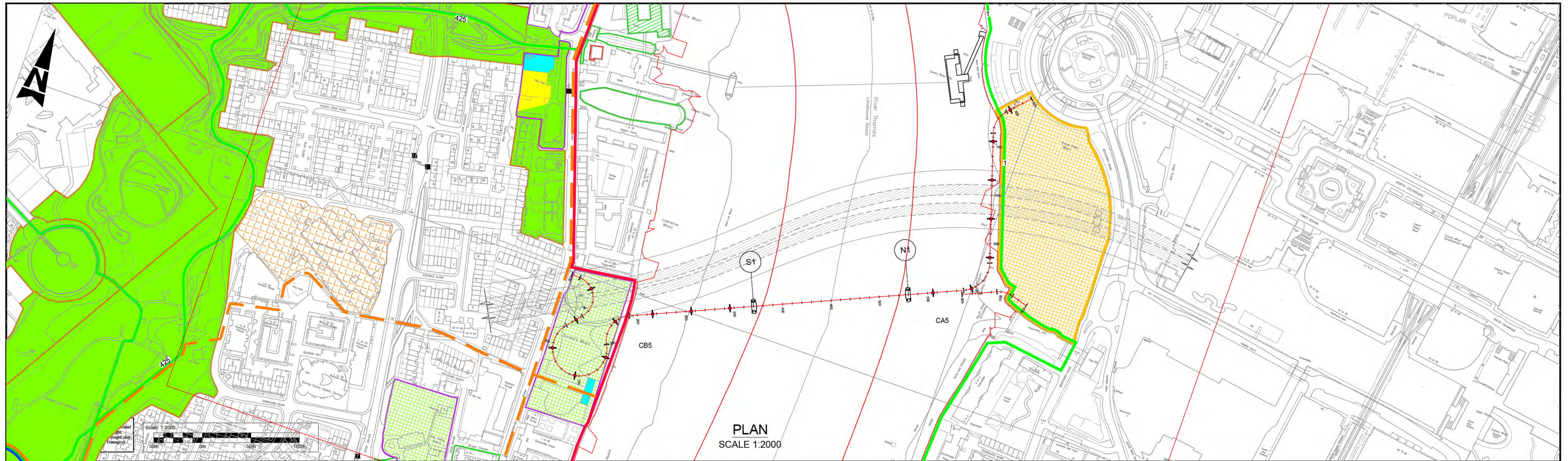
ADVANTAGES:	DISADVANTAGES:
<ul style="list-style-type: none"> <li>Reduces length of approach ramps/back spans at western end</li> <li>Reduce impact on Durand's Wharf</li> </ul>	<ul style="list-style-type: none"> <li>Increase amount of bridge openings – greater unavailability to pedestrians and cyclists</li> <li>Approach ramp MHWS headroom clearance reduced. Reduced number of smaller vessels which could use the back spans. The clipper vessels may be restricted to certain tides in the back spans.</li> </ul>
<b>LIST OF SUPPORTING DOCUMENTS:</b>	
<ul style="list-style-type: none"> <li>5169277-45-0137 P01 Analysis for Assessing Bridge Opening Frequency (Technical Note Assessing Bridge Opening Frequency)</li> <li>5162977-45-0137 Addendum P01 Analysis for Assessing Bridge Opening Frequency (Addendum to Technical Note Above)</li> <li>ST_PJ585C-ATK-ZZZ-ZZ_25-REP-DR-00001 (Technical Note for Acceptable Gradients)</li> <li>ST_PJ585C-ATK-BAS-ZZ_12-DRG-DR-00015 (Value Engineering Iteration 1 Highway Alignment)</li> <li>ST_PJ585C-ATK-BAS-ZZ_12-DRG-DR-00016 (Value Engineering Iteration 2 Highway Alignment)</li> </ul>	
<b>IMPACT EVALUATION</b>	
<b>COST BENEFIT</b>	
<p>An initial assessment of the impact on the Estimated Final Cost (EFC) of reducing the ramp length as described in Iteration 2 above has been made, and results in a potential saving of £12.5 million versus CB5-CA5 (Excluding Land and third party compensation costs.)</p>	
<b>PROGRAMME BENEFIT</b>	
<p>Benefits anticipated associated to reduction in earthwork ramp construction as Durand's Wharf; however, it is anticipated that the earthwork ramp construction at Durand's Wharf is a small component of the overall programme.</p>	
<b>RISK EVALUATION</b>	
<p>To be approved by the PLA, it may require moving the bridge to be on a straight section of the river. This is a less desirable connection on Canary Wharf side.</p> <p>There needs to be an agreement with PLA regarding the opening management plan to assess the suitable clearance from MHWS.</p> <p>Increased ramp gradients – Impact on PRM and cyclists scoring assessment; however, it is within the limits specified in the standards.</p>	
<b>ENVIRONMENTAL</b>	
<p>Reduction in headroom could result in significantly more openings; hence, increasing energy usage.</p> <p>Reduction in approach ramp reduces materials used.</p> <p>Less ramp in Durand's Wharf (Borough Open Land)</p>	



<b>BUILDABILITY</b>		
Construction method is similar to the one in base line design and no major changes are expected.		
<b>SAFETY</b>		
No changes, except reduced height while working in river.		
<b>OPERATIONS AND MAINTENANCE</b>		
Depending on the agreed opening management plan, it may result in an increase in the number of openings of the bridge; hence, increasing wear and maintenance required on the M+E.		
<b>ACCEPTANCE</b>		
Prepared: [REDACTED]	Name: [REDACTED]	Signed: [REDACTED]
Proposal Implemented:	Y / N (Delete as appropriate)	
Approved by:	Name:	Signed:
<b>IMPLEMENTATION</b>		
<b>COMMENTS / ACTIONS</b>		
To be completed by TfL		



DO NOT SCALE




















### VERTICAL PROFILE

SCALE 1:2000 HORIZONTAL 1:400 VERTICAL

NOTES:

1. THIS DRAWING IS FOR INFORMATION PURPOSES ONLY.
2. ALL DIMENSIONS AND DATUM LEVELS ARE IN METRES.
3. ALIGNMENT ON PLAN IS SHOWN OVER CYCLE PATH/FOOTPATH CENTRELINE. THE LONG SECTION IS BASED ON FINISHED LEVELS.

KEY:		THE JUBILEE GREENWAY
		SOUTHWARK CYCLE ROUTES - COMMITTED ROUTE
		SOUTHWARK CYCLE ROUTES - PROPOSED ROUTE
		SUSTRANS ROUTES - COMMITTED ROUTE
		SUSTRANS ROUTES - PROPOSED ROUTE
		SUPPORT LOCATION
		BUS STOP
		SCHOOL
		JP MORGAN DEVELOPMENT SITE

	JUBILEE LINE TUNNEL (WITH 15m ZONE)
	GRADE II LISTED BUILDING
	GRADE II* LISTED BUILDING
	INDIVIDUAL TPO ZONES
	BOROUGH OPEN LAND
	METROPOLITAN OPEN LAND
	OUTDOORS GYMNASIUM
	CHILDRENS PLAYGROUND


**LOCATION PLAN**

BOROUGH 08 SOUTHWARK

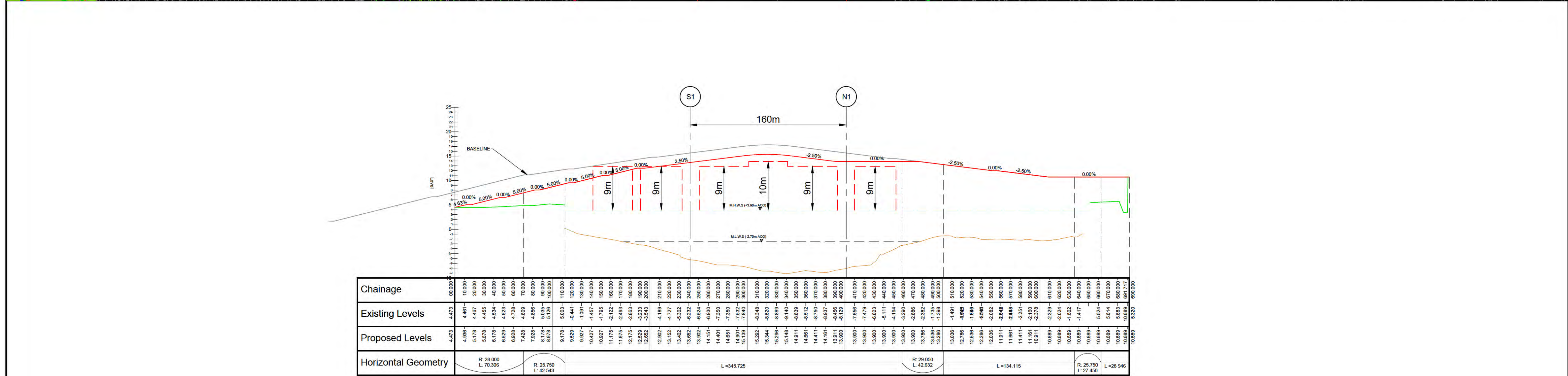
BOROUGH 05 TOWER HAMLETS

16

Description						
Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
Description						
Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
Description						
Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
Description						
Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
Description						
<b>DRAWING CREATED</b>						
Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
SO	P01.1					00/05/16

Drawing Suitability		Status	Project Title				
WORK IN PROGRESS		SO	Rotherhithe to Canary Wharf Crossing				
 <b>ATKINS</b> <small>Member of the SINCLAIR Lavalin Group</small>		No 1 Croydon 12-16 Addiscombe Road Croydon CR0 0XT  Tel: +44 (0) 20 8663 5000 Fax: +44 (0) 20 8663 5111 <a href="http://www.atkinsglobal.com">www.atkinsglobal.com</a>		Drawing Title			
Copyright © Atkins Limited (2018)		CENTRAL ALIGNMENT PLAN and PROFILE ALIGNMENT OPTION C1 40m PIER CENTRES					
Client			Drawing Number				
Transport for London 			ST_PJ585C-ATK-BAS-ZZ_12-DRG-DR-00015				
Project		Originator	Volume	Location	Type	Role	Number
Original Size: A1	Scale: As Shown	Project Ref. No: 5162977	Sheet: 1 of 1	Rev: P01.1			




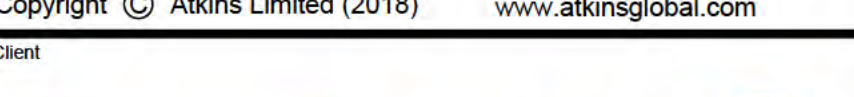


NOTES:

1. THIS DRAWING IS FOR INFORMATION PURPOSES ONLY.
2. ALL DIMENSIONS AND DATUM LEVELS ARE IN METRES.
3. ALIGNMENT ON PLAN IS SHOWN OVER CYCLE PATH/FOOTPATH CENTRELINE. THE LONG SECTION IS BASED ON FINISHED LEVELS.

- 
- LOCATION PLAN**
- The map shows the proposed site highlighted in red, situated between Borough 08 Southwark and Borough 05 Tower Hamlets. A north arrow is located in the top right corner.

Description						
Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
Description						
Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
Description						
Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
Description						
Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
Description						
DRAWING CREATED						
Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
S0	P01.1					00/05/18

Drawing Suitability		Status	Project Title															
WORK IN PROGRESS		SO	Rotherhithe to Canary Wharf Crossing															
 <p>No 1 Croydon 12-16 Addiscombe Road Croydon CR0 0XT</p> <p>Tel: +44 (0) 20 8663 5000 Fax: +44 (0) 20 8663 5111 www.atkinsglobal.com</p>		<p>Drawing Title</p> <p>CENTRAL ALIGNMENT PLAN AND PROFILE ALIGNMENT OPTION C1 40m PIER CENTRES</p>																
Copyright © Atkins Limited (2018)		Drawing Number																
Client		ST_PJ585C-ATK-BAS-ZZ_12-DRG-DR-00016																
		<table border="1"> <thead> <tr> <th>Project</th> <th>Originator</th> <th>Volume</th> <th>Location</th> <th>Type</th> <th>Role</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>Original Size: A1</td> <td>Scale: As Shown</td> <td>Project Ref. No: 5162977</td> <td>Sheet: 1 of 1</td> <td>Rev: P01.1</td> <td></td> <td></td> </tr> </tbody> </table>			Project	Originator	Volume	Location	Type	Role	Number	Original Size: A1	Scale: As Shown	Project Ref. No: 5162977	Sheet: 1 of 1	Rev: P01.1		
Project	Originator	Volume	Location	Type	Role	Number												
Original Size: A1	Scale: As Shown	Project Ref. No: 5162977	Sheet: 1 of 1	Rev: P01.1														







### Option 2:

Simply supported bridge sections spanning between adjacent pier construction worksites to provide operative access and to carry pumping lines for concrete. Temporary intermediate supports would be required between the permanent piers.



*Image from Thames Cable Car*

#### Advantages

River flow impact marginal.

Small vessels may still pass through the back spans (outside the navigation). Assume 9m above MHWS for span just behind primary piers then sloping downwards to shore level at embankments.

More likely to be approved for implementation concurrently on both banks

At this stage, it is proposed that the optimum option would be Option 2, where the bridge will carry just people, hand tools and concrete pipes. We believe this will deliver the majority of the benefits at a fraction of the cost.

#### **ADVANTAGES:**

- This will provide safe access for personnel and material
- Personnel will be able to access and egress the main tower and side spans at all times
- As it is only designed for pedestrian and service pipe lines, security will be minimised
- Does not block whole back span.
- Removes need to ferry concrete to workface and avoids tidal limitations.

#### **DISADVANTAGES:**

- It will not support vehicles / plant
- Temporary supports piles will need to be installed in the river to carry the walkway.

<b>LIST OF SUPPORTING DOCUMENTS:</b>
Images within body of text.
<b>IMPACT EVALUATION</b>
<b>COST BENEFIT</b>
To be agreed with TfL estimating team
<b>PROGRAMME BENEFIT</b>
No programme savings quantifiable – saving on man access and concrete works.  Man access saving could be assumed to be the period of time to wait for and embark the access tug, as well as travelling time, plus alighting – assume 0.5hrs per day = 15 man-days per year per operative.
<b>RISK EVALUATION</b>
Is an approx. 25m wide x 9m high clearance acceptable for marine traffic outside the navigation?  Some level of impact would need to be considered if marine traffic would pass.  Risk of concrete pipe burst to be managed. Eg regular inspection etc..  Marshalling may be required to permit small craft to navigate safely under access way.
<b>ENVIRONMENTAL</b>
Additional temporary piles needed in the river to support.  Reduced risk of concrete and oil spills in the river e.g. washing out barge based agitators. However pumping lines will still need to be cleared at end of each shift.  Reduced working on the river and associated fuel usage / carbon emissions.  Avoids significant noise from agitators, pump and generator combined.
<b>BUILDABILITY</b>
As above
<b>SAFETY</b>
Reduced working on the river and avoids task based risk exposure.  Access to workface will be via a bridge rather than embarking / alighting small river craft.

Provides a quick evacuation route to shore.

Avoids storage of drilling support fluid on water.

#### **OPERATIONS AND MAINTENANCE**

N/A

#### **ACCEPTANCE**

<b>Prepared:</b> <span style="background-color: black; color: black;">XXXXXXXXXX</span>	<b>Name:</b> Costain	<b>Signed:</b>
<b>Proposal Implemented:</b>	Y / N	(Delete as appropriate)
<b>Approved by:</b>	<b>Name:</b>	<b>Signed:</b>

#### **IMPLEMENTATION**

#### **COMMENTS / ACTIONS**

To be completed by TfL

## Rotherhithe to Canary Wharf River Crossing

### VALUE ENGINEERING ASSESSMENT FORM

DATE: 18/09/18

- Item Ref: VE6 - Auger tubular piles

### SUMMARY DESCRIPTION OF VE PROPOSAL

VE6 was raised to review the baseline design decision of caissons foundations. Initially piles driven to depth were being considered until the noise and vibration issues were highlighted. Costain suggested augered tubular piles at the VE workshop. Since then, further design development has taken place and other piling options explored in light of these changes. In the descriptions below the feasibility to use this option with either a single or double skinned cofferdam is stated.

#### Option 1 Auger lead bored piles:

Auger would lead with the sleeve following, being vibrated to the pile's full depth before being filled with concrete

This option will work with either a double or single skinned cofferdam.

#### **Advantages:**

- No need for a polymer / bentonite support fluid.
- Auger lead will be better dealing with any obstructions that are met.
- Reduction in noise vs driving to depth.

#### **Disadvantages:**

- Slower than option 2



Photo of Hungerford Bridge



Option 2 1200mm ID Ø option:

A 1200mm Ø (internal) cutting ring and sleeve is vibrated to a depth of approximately 9m. An auger then drives through this hollow tube, supported by polymer supporting fluid before being filled by reinforced concrete.

This option will work with either a double or single skinned cofferdam.

**Advantages:**

- Less vibrating required than option 1.
- Quicker than option 1.
- Less steel casing used than option 1
- At this ID an environmentally friendly polymer support fluid can be used instead of bentonite.

**Disadvantages:** Beyond 1.2m diameter, bentonite would need to be used with additional pollution prevention controls implemented. However, this can be managed with additional management controls.



Photo – Thames Cable Car

Option 3 Large Diameter “Offshore” Piling:

This option has the greatest upfront costs of all 3 options due to the size and specialism of the plant that is required. However, as the overall number of piles increases with design development, the cost per pile and associated programme savings of this option makes it a viable alternative. NB the current assumption is that 1 large diameter pile (3600mm Ø) is the equivalent to 6 no. 1200mm Ø piles.

These large diameter casings are bored and excavated (pushed) to depth before being filled with concrete to the required depth. 3.64m Ø – 20m depth = 203m<sup>3</sup> (300m<sup>3</sup> practical daily limit assumed). See risk evaluation for the feasibility risks associated with end bearing capacity in Thanet sands at Thames river.

This option will not work with the double skinned cofferdam option due to the sheer size of the workforce (encroachment onto the navigable channel) and also the marine based nature of the specialist plant.

**Advantages:**

- Fewer manoeuvres between pile locations
- Fewer piles

**Disadvantages:**

- Significant upfront costs
- Marine based with no alternative option.
- Floating jetty would be required to supply concrete from end of backspan “ship to shore” bridge.



Photograph 3 – Casing installation lift



Photograph 5 – Drilling works underway



Photograph 9 – Second stage concrete pour completed and shuttering removed. Upper access platform in preparation of 3<sup>rd</sup> stage/final pour for the pile cap and bearing plate



Photograph 11 – Completed structure. Temporary casings now removed

Photos - Clackmannanshire Bridge

**ADVANTAGES:**

- See above

**DISADVANTAGES:**

- See above

<b>LIST OF SUPPORTING DOCUMENTS:</b>
NA
<b>IMPACT EVALUATION</b>
<b>COST BENEFIT</b>
To be agreed with TfL estimating team
<b>PROGRAMME BENEFIT</b>
<p>Baseline costs / task timeline</p> <ul style="list-style-type: none"> <li>• Main Pier twin caisson baseline (Arcadis) = 10 months each (+ uplift for impact protection required)</li> <li>• Back span support construction not on critical path</li> </ul> <p><u>Option 2 1.2m piles:</u>  <i>Marine Based:</i> 2 shifts per pile  Land based (cofferdam VE11): 1.33 shifts per pile  Duration 1year + mobilisation (1 rig). Multiple rigs could be utilised</p> <p><u>Option 3 Large Diameter "Offshore" Piling:</u>  Duration 4 months + mobilisation (Assume x3 if 24hr working not permitted)</p>
<b>RISK EVALUATION</b>
<p>See above</p> <p>Option 2 - costs of additional impact protection piles around single skin cofferdam or in front of tubular wall.</p> <p>Option 3 – Capacity provided needs to be demonstrated / accepted by Designer.  24hour working would need to be agreed with stakeholders.</p>
<b>ENVIRONMENTAL</b>
Less disturbance to river bed.
<b>BUILDABILITY</b>
See above
<b>SAFETY</b>
Avoids need for large scale open excavation into the river bed.
<b>OPERATIONS AND MAINTENANCE</b>

N/A

**ACCEPTANCE**

Prepared: [REDACTED]

Name: Costain

Signed:

Proposal Implemented:

Y / N

(Delete as appropriate)

Approved by:

Name:

Signed:

**IMPLEMENTATION**

**COMMENTS / ACTIONS**

To be completed by TfL



## Rotherhithe to Canary Wharf River Crossing

### VALUE ENGINEERING ASSESSMENT FORM

DATE: 02/10/18

- Item Ref: VE7 - Precast caissons in dry dock and floated into position

### SUMMARY DESCRIPTION OF VE PROPOSAL

VE proposal was discussed during the workshop 04/07/18 to use precast caisson sections in dry dock, float them out on a barge and drop them into position. This is deemed as an unfavourable alternative to the baseline due to the difficulty in preparing and maintaining the river bed during installation.

Costain did develop an option that would support itself above the bed on the piles. However, as design developed, with ship impact requirements now accounted for, it is now envisaged that 70 no. 1.2m piles and a pile cap of 50mx19m will be required. It is therefore no longer considered practical (aligning 70 piles to fit through holes in a preformed shell will require high precision and steady installation which is complicated by working in a marine environment).

This option will therefore not be taken further.

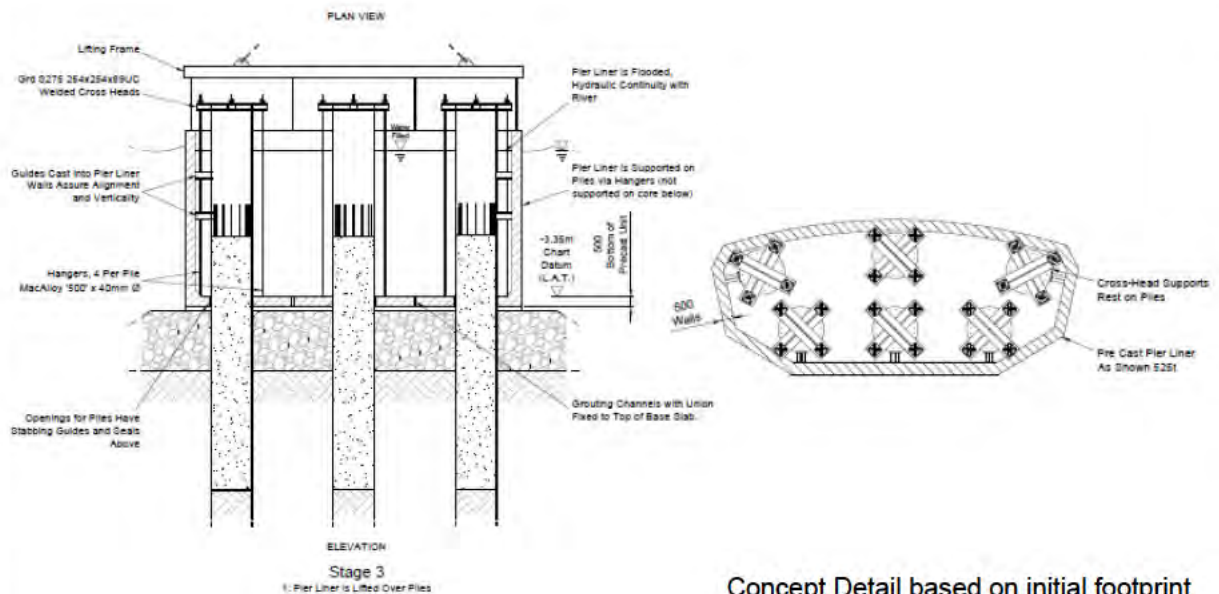
#### ADVANTAGES:

- Avoided the need for cofferdams
- Developed solution avoided difficult bed preparations due to silt and flow.

#### DISADVANTAGES:

- The developed / enlarged "pile cap" would be a large concrete mass above river bed and water level – not just a "slimline tower" visible.

#### LIST OF SUPPORTING DOCUMENTS:



### IMPACT EVALUATION

#### COST BENEFIT

NA

#### PROGRAMME BENEFIT

NA		
<b>RISK EVALUATION</b>		
NA		
<b>ENVIRONMENTAL</b>		
NA		
<b>BUILDABILITY</b>		
NA		
<b>SAFETY</b>		
NA		
<b>OPERATIONS AND MAINTENANCE</b>		
NA		
<b>ACCEPTANCE</b>		
Prepared: <span style="background-color: black; color: black;">[REDACTED]</span>	Name: Costain	Signed:
Proposal Implemented:	Y / N (Delete as appropriate)	
Approved by:	Name:	Signed:
<b>IMPLEMENTATION</b>		
<b>COMMENTS / ACTIONS</b>		
To be completed by TfL		

Rotherhithe to Canary Wharf River Crossing	
<b>VALUE ENGINEERING ASSESSMENT FORM</b>	<b>DATE: 18/09/18</b>
- Item Ref: VE8 - Precast units used inside the cofferdam to form the caisson	
SUMMARY DESCRIPTION OF VE PROPOSAL	
<p>During the VE workshop, the option to precast caisson units to use within the confines of the cofferdam as the pile cap of the main towers was proposed. Since then, development of the design has meant that the bases of the main towers have become significantly larger; currently 70no. 1200mm Ø piles, with a 19 x 50m pile cap. Pre-cast caisson units are still feasible, however, they would now be most effective if used as the pier bases rather than the pile caps. It is proposed therefore that they are placed within the cofferdam (built to enable piling and pier cap construction) and once in place, filled with concrete.</p> <p>This is similar to the original baseline concept and therefore not seen as a VE opportunity.</p>	
<b>ADVANTAGES:</b>	<b>DISADVANTAGES:</b>
<ul style="list-style-type: none"> <li>• Reduce programme impact of pier base construction</li> <li>• Temporary cofferdam can be removed earlier due to programme savings, reducing the potential, perceived impact on the navigable channel</li> <li>• Reduction of working in water</li> </ul>	<ul style="list-style-type: none"> <li>• Heavy lifting equipment and marine plant required for lifting into place</li> </ul>
LIST OF SUPPORTING DOCUMENTS:	
NA	
IMPACT EVALUATION	
<b>COST BENEFIT</b>	
NA.	
<b>PROGRAMME BENEFIT</b>	
NA  Pre-casting forms off-site will reduce the time required on site.	
RISK EVALUATION	
NA	
ENVIRONMENTAL	
NA	



<b>BUILDABILITY</b>		
<p>M&amp;E could be pre-installed.</p> <p>Quality of finish can be ensured off-site (inspections may be necessary).</p> <p>Pre-cast formers will reduce the need for in-situ formwork.</p>		
<b>SAFETY</b>		
<p>The precast formers will be engineered to be stable in the temporary condition and will reduce the controls necessary on site to ensure stability of temporary formwork.</p>		
<b>OPERATIONS AND MAINTENANCE</b>		
NA		
<b>ACCEPTANCE</b>		
Prepared: <span style="background-color: black; color: black;">XXXXXXXXXX</span>	Name:	Signed:
Proposal Implemented:	Y / N	(Delete as appropriate)
Approved by:	Name:	Signed:
<b>IMPLEMENTATION</b>		
<b>COMMENTS / ACTIONS</b>		

## Rotherhithe to Canary Wharf River Crossing

### VALUE ENGINEERING ASSESSMENT FORM

DATE: 02/10/18

- Item Ref: VE11 Construction noise. Potentially require double skin cofferdam to mitigate.

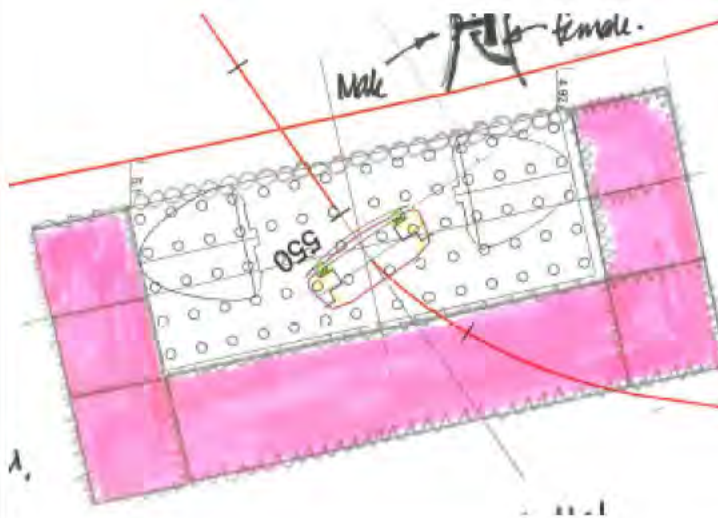
### SUMMARY DESCRIPTION OF VE PROPOSAL

#### Construction of the Main Tower Base – Cofferdam

Construction of the main tower foundations requires a significant level of piling, excavation and construction or steel erection works (dependent on final design of towers). The baseline construction methodology requires a significant amount of marine plant which is costly, slows production manoeuvring and carries a level of risk based on plant availability.

To avoid such heavy reliance on marine based plant, a double skinned cofferdam is proposed. This will create the safe, dry conditions required for man access and efficient work, as well as temporary ship impact protection and a broad flat base for marine deliveries & storage.

High level calculations have been carried out which suggest the sheet piles will need to be AZ38-700 at 21.4m long forming a 12.2m wide base. The tubular piles will need to be supported with an additional propping frame.



#### ADVANTAGES:

- Additional fender tubular piles to be installed along front edge to protect the workforce during construction of the tower as this will be designed for ship impact onto to protect the cofferdam
- Double wall cofferdam, therefore no support frames required (wailings). So, it will be freestanding
- The double wall construction is on the land side of the tower; this will minimise the noise impact to the public. This will give you the ability to erect sound screens to minimise the nuisance.
- Double wall provides additional platform for the construction of the tower base. It will be designed for plant & material; it will also be an unloading facility that will reduce the requirements of marine spread (jack-up barges etc)
- There are no requirements for base preparation that will be for caissons (The flow of the river and the silt will affect caisson preparation)

#### DISADVANTAGES:

- Increased temporary footprint vs single skin

<ul style="list-style-type: none"> <li>• More likely to permit works to continue on both main towers concurrently (remaining outside of the navigable channel for the duration of works).</li> <li>• If main area is filled with ballast, then the marine spread for the 1.2m piling could be avoided.</li> </ul>	
<b>LIST OF SUPPORTING DOCUMENTS:</b>	
<b>IMPACT EVALUATION</b>	
<b>COST BENEFIT</b>	
To be agreed with TfL estimating team	
<b>PROGRAMME BENEFIT</b>	
Configuration should permit concurrent working on both piers.	
<b>RISK EVALUATION</b>	
<p>May require temporary marine plant access for installation of the tubular piles from the shipping lane – PLA agreement req. But this is true of all construction methods.</p> <p>Ship impact capabilities to be resolved to practical level. Cofferdam operatives will need to be evacuated to shore before largest vessels pass through. Risk item to be included in Project Risk register in case of impact leading to damage (similar for caisson options).</p> <p>Costs of additional impact protection piles around single skin cofferdam or in front of tubular wall.</p>	
<b>ENVIRONMENTAL</b>	
Noise and potential marine pollutants confined within cofferdam.	
<b>BUILDABILITY</b>	
<b>SAFETY</b>	



<b>OPERATIONS AND MAINTENANCE</b>		
<b>ACCEPTANCE</b>		
Prepared: <span style="background-color: black; color: black;">XXXXXXXXXX</span>	Name: Costain	Signed:
Proposal Implemented:	Y / N (Delete as appropriate)	
Approved by:	Name:	Signed:
<b>IMPLEMENTATION</b>		
<b>COMMENTS / ACTIONS</b>		
To be completed by TfL		

## Rotherhithe to Canary Wharf River Crossing

### VALUE ENGINEERING ASSESSMENT FORM

DATE: 21/09/18

- Item Ref: VE17 – Reduce main span length to minimum navigable channel width

### SUMMARY DESCRIPTION OF VE PROPOSAL

The navigation channel defined by Port of London Authority (PLA) is approximately 135m wide at the proposed location of Rotherhithe Bridge. Currently it is unknown if the channel width is determined to account for passage of particular set of vessel movements.

The baseline design locates the main span towers outside and at a skew to the navigation channel. The baseline tower locations result in approximately 169m lifting main span length.

The clear span (or navigable width) of the other significant structures on the River Thames for reference are:

- Thames Barrier – 61m
- Tower Bridge – 61m



Figure 1 Clear span of the key bridges on the River Thames

BS6349-1-1:2013 *Maritime Works – Code of Practice for Planning and Design for Operations* refers to PIANC guidance for the navigation channels. PIANC Report no 121 – 2014 – *Harbour Approach Channels Design Guidelines* sets out guidelines and recommendations for the design of vertical and horizontal dimensions of harbour approach channels. The design aspects are mostly centred on the ship and environmental factors: its manoeuvring behaviour under influence of wind, currents and waves, its vertical motions in waves and the horizontal and vertical motions at berth. The outlined design methodology considers a two-stage process consisting of Concept Design, where empirically based methods are used, and Detailed Design, where a more elaborate process may utilise simulation models and risk analysis.

A high-level assessment has been conducted based on the PIANC concept design approach to investigate the potential of reducing the navigational channel width, allowing a reduction in the proposed bridges main span. The concept design undertake is based the assumptions listed. To pursue this further will require a detailed design to be undertaken in consultation with PLA, which is aligned with PIANC report No. 121 and is likely to be a significant undertaking.

Following concept design assumptions:

- Moderate vessel speed – It is intended to ask Marico Marine to identify the typical speed of transit that each of these vessels uses when it passes the site.

- Moderate prevailing cross wind – Built up area, therefore, unlikely to have significant cross winds.
- No prevailing cross current – River.
- Strong prevailing longitudinal current – Significant fresh and tidal current anticipated.
- Small beam and stern quartering wave height
- Moderate Aids to Navigation

Assuming a one-way channel where the ships would not be able to pass under the bridge together for the largest ship specified in the Marico Marine Data (Hamburg) results in a navigable channel width of **121m (14m decrease from current navigable channel width)**. In accordance with the baseline design assumptions for temporary works and pier protection this reduces the main span length to approximately 155m. However, the concept design assumptions have been refined from the baseline and is currently work in progress; hence, this value should be revisited when additional allowances from navigable width are confirmed in the concept design.

Refer to drawing ST\_PJ585C-ATK-BAS-ZZ\_21-DIA-ST-00005 for reference with baseline design.

For situations with two-way channels (vessels passing side-by-side), PIANC advise the channel is increased using the most onerous vessel the to accommodate an additional basic manoeuvring lane/width and a safe passing distance. Adopting the approach stated in the PIANC report the design channel width is greater than what is currently defined. It is unlikely that a large ship would not be allowed to leave HMS Belfast to travel east when a large ship is travelling west towards HMS Belfast. Due to the type and recorded frequency of the most onerous vessels in practice it is unlikely vessels of this size would be in the same vicinity to pass each other. Some optimisation was considered that assumes a large cruise ship and cargo vessel are passing, however this still results in a design channel width greater than is currently defined. As the Thames only has one access point an allowance for multi-vessel passing is required and requirements would need to be agreed with PLA.

It is important to understand from PLA their operational methodology as to what ships can pass together (this might potentially be a three-way channel or more for smaller ships). This then needs to be supported by an assessment of whether those ships can pass under the approach spans or are required to pass under the main span. This assessment should be coordinated with the bridge opening operational methodology. From this the combination of ships to pass under the main span can be understood; hence, the broad concept design required for the main span length calculated.

This value engineering item has only calculated potential reductions in navigable channel as specified above. The potential savings to the structure has not been calculated as it would require a wholesale change in design. Should a reduction in navigable channel be pursued and agreed with PLA then a change in design should be undertaken. There will be a saving through a reduction of the components described above. It is worth noting that the approach spans will increase to accommodate the reduction in main span; however, the cost of the approach span is significantly less than the components described above.

ADVANTAGES:	DISADVANTAGES:
<p>By reducing the main span length by 8%, the following can be reduced:</p> <ul style="list-style-type: none"> <li>• Main span cost as steel weight and fabrication required is reduced</li> <li>• M+E bridge lift equipment due to reduction in main span weight</li> <li>• Main span counterweights due to reduction in main span weight</li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in length of two-way channel, i.e. ship passing points, along the River Thames</li> <li>• Increase in approach ramp lengths to account for the reduction in main span length</li> <li>• Piers will be located in a deeper part of the Thames; hence, increase in pier height and temporary works construction</li> <li>• Permanently reduces navigable channel width of Thames River. It is important to note that the</li> </ul>



<ul style="list-style-type: none"> <li>• Tower axial loading is reduced two-fold as the main span and counterweights are reduced; hence, reducing the thickness of the costly steel sections</li> </ul>	navigable width of the Thames Barrier and Tower Bridge is 61m.
<b>LIST OF SUPPORTING DOCUMENTS:</b>	
<ul style="list-style-type: none"> <li>- 5169277-45-0137 P01 Analysis for Assessing Bridge Opening Frequency (Technical Note Assessing Bridge Opening Frequency)</li> <li>- 5162977-45-0137 Addendum P01 Analysis for Assessing Bridge Opening Frequency (Addendum to Technical Note Above)</li> <li>- 180804 Addition Ship Analysis 1.0 (Technical Note Outlining Dimensions of Marico Marine Shipping Data)</li> <li>- PIANC Report No 121: 2014 – Harbour Approach Channels Design Guidelines</li> <li>- ST_PJ585C-ATK-BAS-ZZ_21-DIA-ST-00005 (VE17 - Reduced Navigable Width)</li> <li>- Lower Pool to Limehouse Reach River Thames Admiralty Chart, courtesy of PLA</li> </ul>	
<b>IMPACT EVALUATION</b>	
<b>COST BENEFIT</b>	
<p>Reducing the main span length would reduce the cost of that element of the structure due to the reasons listed in “Advantages”, although these would be tempered by the need for corresponding increases in the length of the back spans and/or approach ramps. An initial assessment of the cost benefit of the reduction has been calculated and suggests a potential saving of £0.5 million could be achieved. This is based purely on a pro-rata basis to the deck length but there may be potential for greater savings to be achieved if the reduction in lifting span length resulted in a change to the deck design itself, which if it reduced the deck mass may also facilitate savings associated with the lifting mechanism and foundations. Without a firm design proposal however, it is not possible to accurately estimate what these may be, but they could offer further VE opportunities. There are however also additional risks to the cost, should there be a need for increased vessel impact protection measures and additional cost of constructing foundations in a deeper part of the Thames.</p> <p>Should a reduction in main span length be pursued further then the proposed design can be reviewed and costed appropriately.</p>	
<b>PROGRAMME BENEFIT</b>	
None anticipated as the same plant will have to be mobilised.	
<b>RISK EVALUATION</b>	
<p>To date PLA have not provided any specific issues nor rational to their objection to reducing the navigable width. Current consultation suggests they would prefer to maintain current navigable width and only allow for any temporary works that can be removed within 24hrs.</p> <p>Further consultation is required to understand PLA's root cause for this position and if there are any other stakeholders influenced by this proposal.</p> <p>Reduced main span length increases the risk of ship impact. It is important to note, however, that it has no influence on the ship impact design loading.</p>	
<b>ENVIRONMENTAL</b>	

No environmental changes anticipated.

#### **BUILDABILITY**

Construction in deeper part of the River Thames.

#### **SAFETY**

The challenges are similar to that in the baseline design:

- Working directly in/around/over water
- Working next to navigable channel
- Ship impact on piers
- Maintenance inspections

#### **OPERATIONS AND MAINTENANCE**

There is a chance of increase in number of openings (vertical lift operations) of the bridge and will increase the operating energy costs.

#### **ACCEPTANCE**

Prepared: [REDACTED]

Name: [REDACTED]

Signed: [REDACTED]

Proposal Implemented:

Y / N

(Delete as appropriate)

Approved by:

Name:

Signed:

#### **IMPLEMENTATION**

#### **COMMENTS / ACTIONS**

To be completed by TfL







## Rotherhithe to Canary Wharf River Crossing

### VALUE ENGINEERING ASSESSMENT FORM

DATE: 07/09/2018

- Item Ref: VE18 – Architectural Truss Form & VE19 – Standard Truss Form

### SUMMARY DESCRIPTION OF VE PROPOSAL

The Arcadis baseline design for the main movable span consisted of a slender tied arch, where the arch splits at the towers and converges at midspan.

At the value engineering workshop, a Pratt Truss structure was presented. VE18 recognises the desire to proceed with this option. The structure consists of a weathering steel orthotropic deck with flat plate stiffeners welded to the underside of the deck plate in the longitudinal and transverse directions. Above the deck will be a varying steel hollow section arch section, where the arch splits at the towers and converges at midspan. The arch will form the top chord of the Pratt truss. The vertical elements will be bespoke steel hollow sections and the diagonals will be formed by architectural tension struts.

This is significantly simpler to construct, than the Arcadis baseline design, whilst maintaining a lot of the architectural qualities of the Arcadis baseline design. This has been incorporated into the core team's concept design.

However, for the structure to maintain its desirable architectural qualities it requires many bespoke sections that come with it high fabrication costs.

VE19 consists of eliminating as many of the bespoke sections as possible. The structure consists of weathering steel orthotropic deck with flat plate stiffeners welded to the underside of the deck plate in the longitudinal and transverse directions. Above the deck will be two separate standard section steel arches. The arch will form the top chord of the truss. The vertical and diagonal elements will be formed of standard steel sections. The arches will be braced together by standard steel sections.

Painted structural steel has been assumed to achieve the maximum benefit from using standard steel sections (it is assumed these are not available in weathering steel).

Refer to ST\_PJ585C-ATK-BAS-ZZ\_21-DRG-ST-00004 for a General Arrangement Drawing for VE19.

#### ADVANTAGES:

- Potential for significant savings in deck fabrication & material costs
- Standard sections (off-the shelf products) and connections.
- Simpler connection details.
- Stiffer structure.

#### DISADVANTAGES:

- Bracing required between the separated top chord.
- Increase in total weight of the deck and counterweight needs to be altered accordingly.
- Less aesthetic while viewing from sideways compared to baseline design due to replacing the architectural tension struts with standard steel sections.
- The thicker vertical bracing members and separated top chord makes the deck feel more enclosed – negatively influencing experience on the bridge deck.

#### LIST OF SUPPORTING DOCUMENTS:

- Main span AIP 3.12
- ST\_PJ585C-ATK-BAS-ZZ\_21-DRG-ST-00004 (Standard truss main span GA drawing)
- VE18 & 19 - Standard truss bridge deck with the original steel towers (from concept design) - Rendered Views
- Reference: 3D visuals



**Figure 1 3D visualisation of standard truss bridge deck**

## **IMPACT EVALUATION**

### **COST BENEFIT**

The procurement and fabrication costs will reduce due to standard sections being used with simpler connections against that of the bespoke fabricated steel sections proposed for the baseline design.

The overall mass of the structure is assessed as being approximately 1100t versus the 1200t allowed in the baseline design for CB5-CA5.

Advice has been received from the American Bridge Company in respect of supply and fabrication rates as follows.

1. The top and bottom chord prices would remain essentially the same as they have a significantly higher degree of complexity. For reference the figures previously quoted are included below.
2. For the truss fabrication the price would come down as per the figures below. The reason for the drop is the use of standard rolled sections and the simpler fabrication and erection. Other elements like QC, painting and delivery would remain the same.

### **Truss Sections**

<b>Element</b>	<b>Cost per kilo in £</b>
Material	1.90
Fabrication	1.40

QC & testing	0.11
Painting	0.44
Delivery	0.11
Overhead & profit	0.44

### Top and Bottom Chord Sections

The base price of £5.54 per kilo (converted from \$ and Lbs) would cover material cost, shop fabrication, quality control & testing, painting, and delivery to site. The breakdown would be material 40%, fabrication 40% QC & testing 2%, painting 8% delivery 2% overhead & profit 8%.

Element	Cost per kilo in £
Material	2.22
Fabrication	2.22
QC & testing	0.11
Painting	0.44
Delivery	0.11
Overhead & profit	0.44

Applying these rates to the revised structure weights generates a saving in EFC of £19.9 million.

It should be noted that in order to assess this proposal on a like for like basis a main span length of 169m has been utilised. The current C2 Concept design assumes a 181m main span. This could potentially increase the level of saving slightly but only if that increase in span had no material effect on the sizing of any of the standard sections proposed.

### PROGRAMME BENEFIT

The programme duration will significantly reduce for fabrication of the steel sections due to usage of standard sections (off the shelf products) against bespoke steel sections in the baseline & concept design.

### RISK EVALUATION

- Local Authority consents required. There is a concern that the deck may not fit in with surrounding environment.
- Transport and Work Acts Order (TWAo) consent

### ENVIRONMENTAL

Reducing the construction period would be beneficial to the environment.

The painting of deck during future maintenance may have a little impact over the river water body.



**BUILDABILITY**

Construction of long span steel truss deck can be achieved by fabricating the truss elements in the factory, transporting to site in the form of segments / panels, assembling the segments near the site and installing it using incremental launch method from land (with temporary towers in the river with the help of barges / anchors).

Alternate option is to erect the truss deck at site in segments with the help of barges and assembling it using HSFG bolts.

**SAFETY**

Possible elimination of site welding. There is a possibility of single lift erection of the deck using heavy lift jacks through the temporary barges in the river, as it will reduce work hours at site and associated HSE issues.

**OPERATIONS AND MAINTENANCE**

Steel truss tower requires periodical maintenance and needs painting or corrosion protection measures due to closer proximity to river. There is sufficient space for the inspection and maintenance of the deck.

**ACCEPTANCE**

Prepared: [REDACTED]	Name: [REDACTED]	Signed: [REDACTED]
Proposal Implemented:	Y / N	(Delete as [REDACTED])
Approved by:	Name:	Signed:

**IMPLEMENTATION****COMMENTS / ACTIONS**

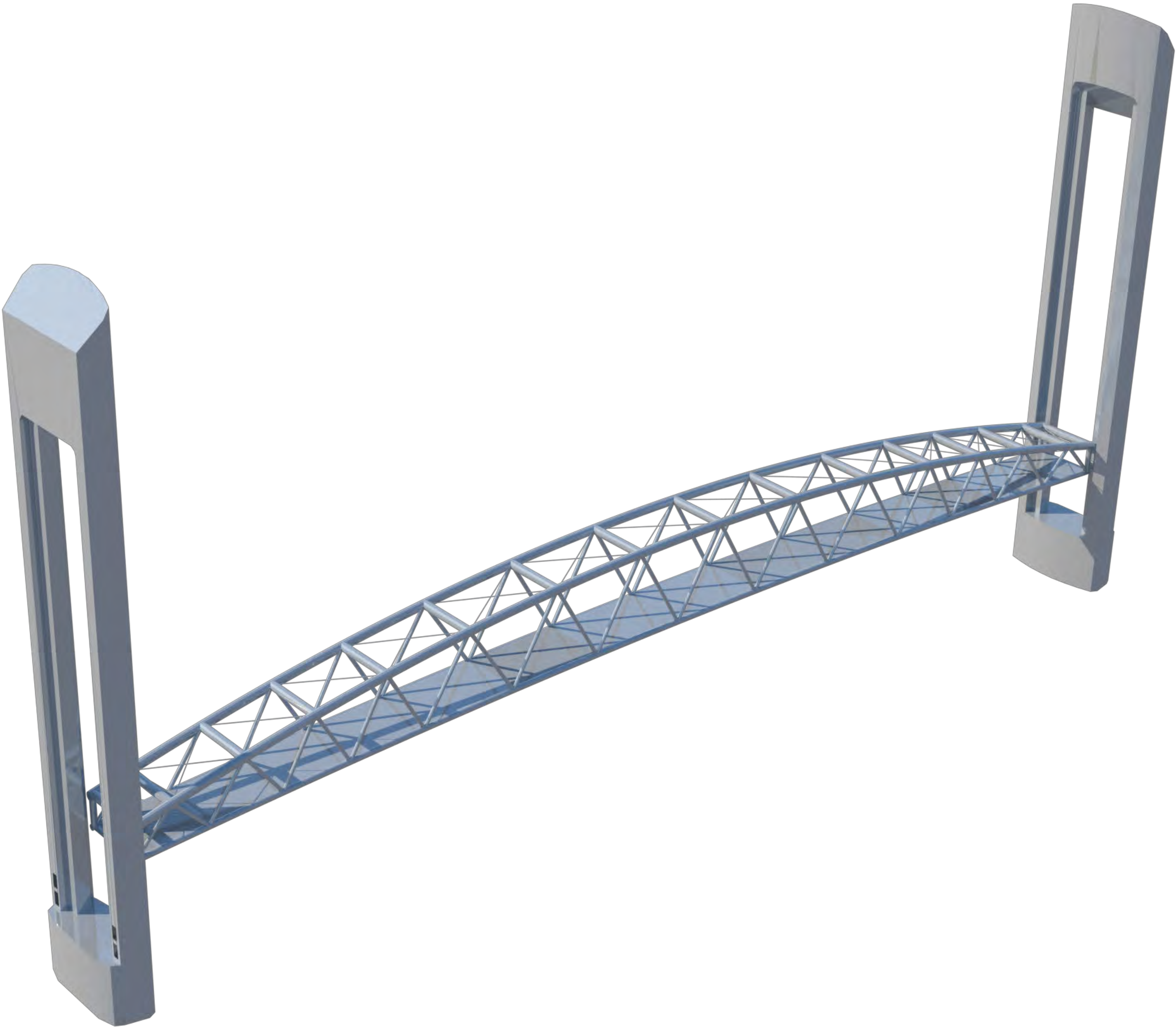
To be completed by TfL

VE18 & 19 - Standard truss bridge deck with the original steel towers (from concept design) - Rendered Views





VE18 & 19 - Standard truss bridge deck with the original steel towers (from concept design) - Rendered Views

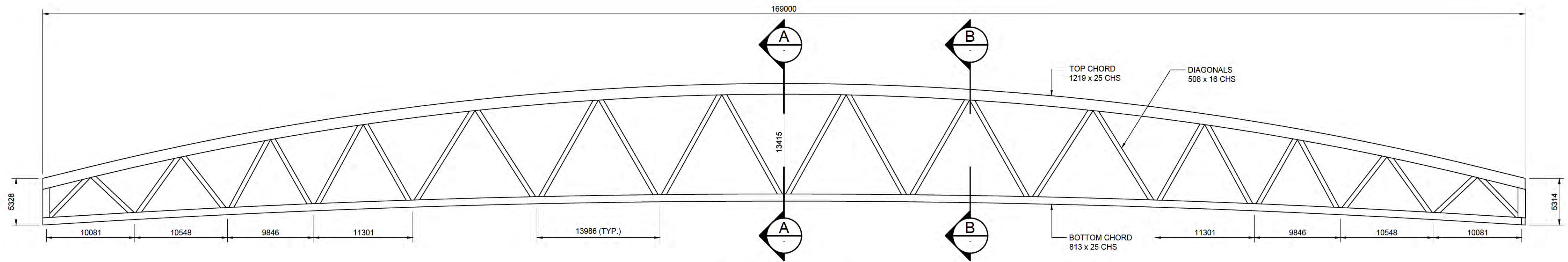




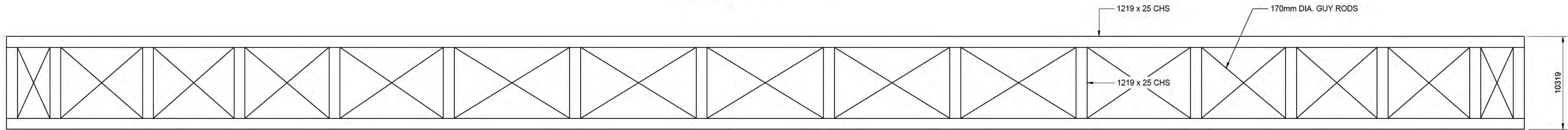
VE18 & 19 - Standard truss bridge deck with the original steel towers (from concept design) - Rendered Views



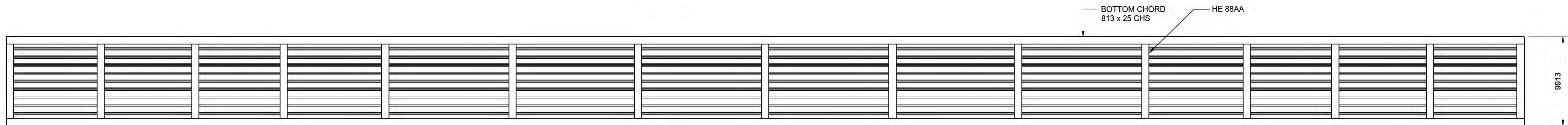




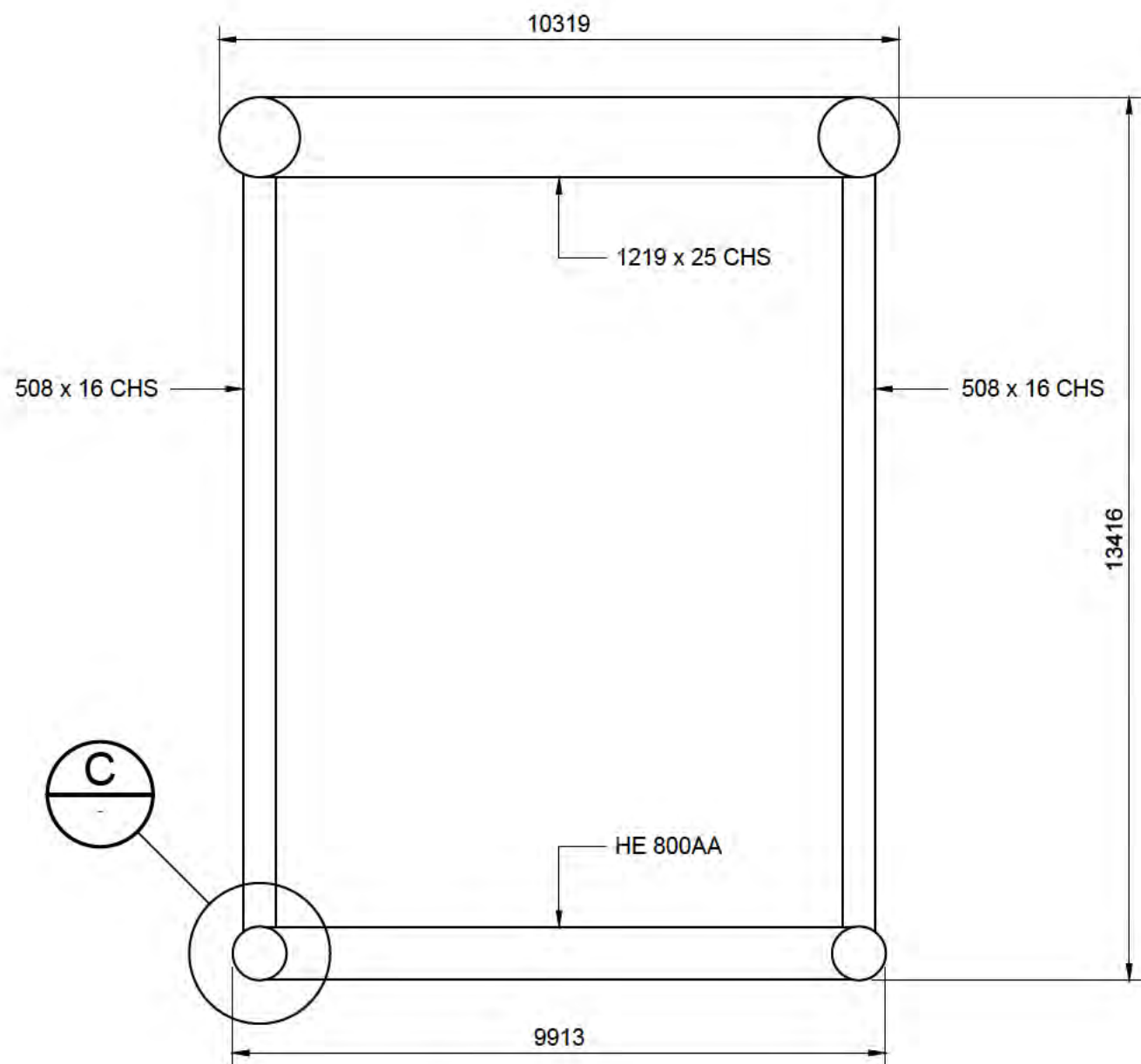
ELEVATION ON TRUSS  
SCALE 1:250



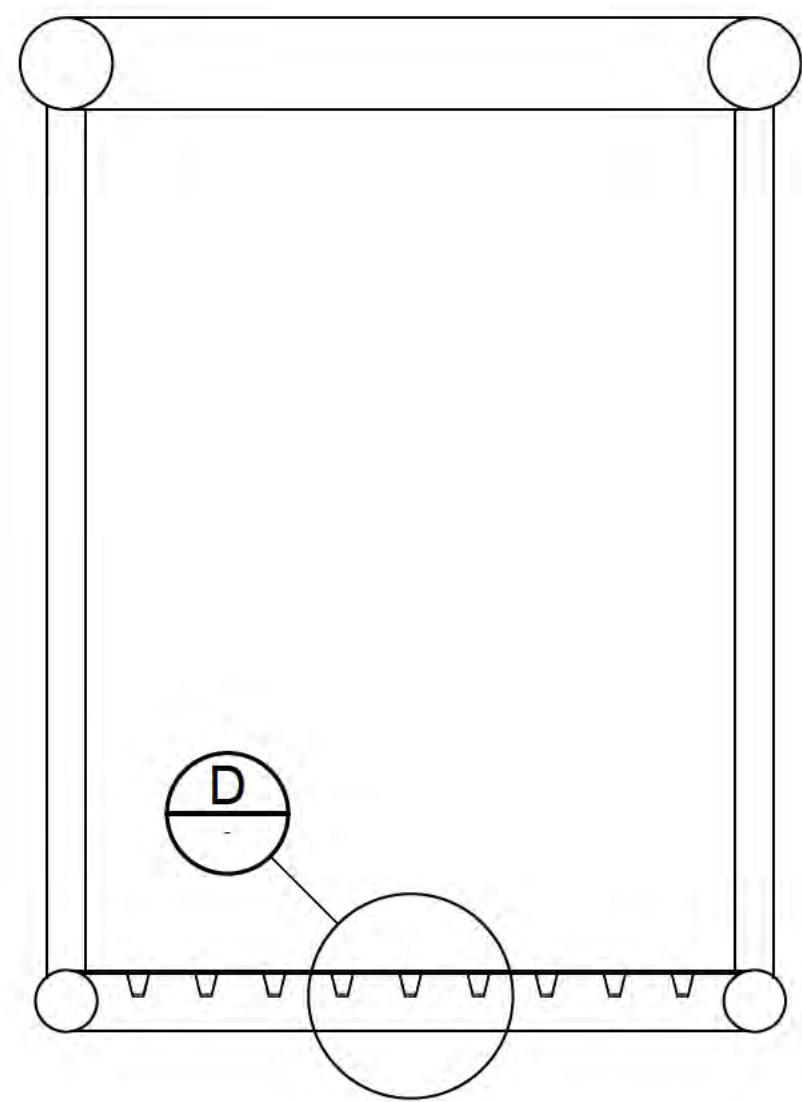
PLAN ON TOP STRING OF TRUSS  
SCALE 1:250



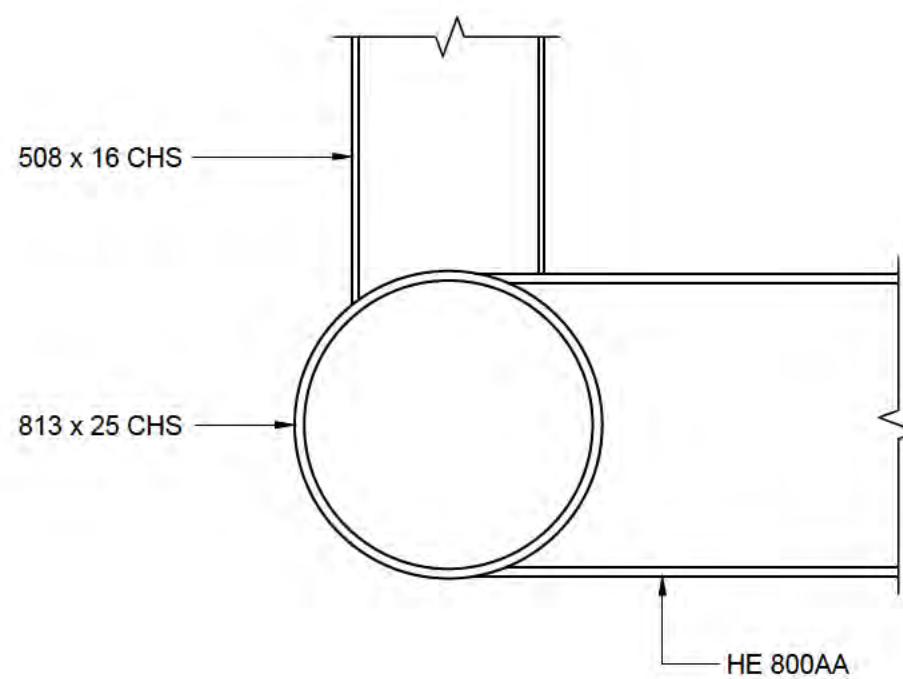
PLAN ON BOTTOM STRING OF TRUSS  
SCALE 1:250



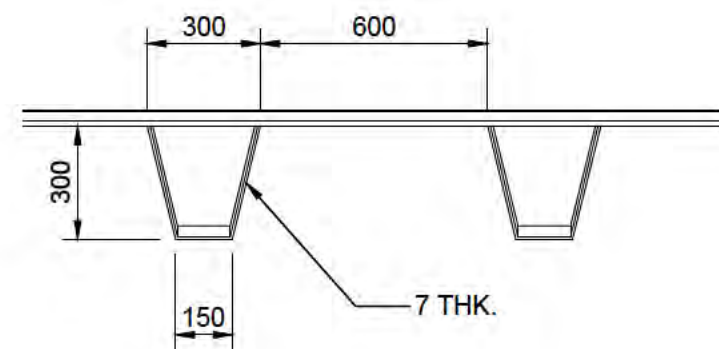
A SECTION  
SCALE 1:100



B SECTION  
SCALE 1:100



C DETAIL  
SCALE 1:20



D DETAIL  
SCALE 1:20  
(ORTHOTROPIC DECK PLATE)

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION			
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:			
CONSTRUCTION	MAINTENANCE/CLEANING	OPERATION	DEMOLITION
NONE	NONE	NONE	NONE
It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement			

Transport for London				Traffic Design Engineering			
TfL Engineering				Palestra			
197 Blackfriars Road				London SE1 8NJ			
P01.1				FIRST ISSUE			
rev				date			
details				dm			
app				rev			
scheme				date			
scale				AS SHOWN			
suitability				S0			
drawing No				WORK IN PROGRESS			
ST_PJ585C-ATK-BAS-ZZ_21-DRG-ST-00004				P01.1			
project				revision			
owner				3 OF 3			
asset				Multiple Boroughs			
location				R2CW RIVER CROSSING			
type				VE19 - MAIN SPAN			
role				STANDARD TRUSS FORM			
number				© Crown copyright and database rights 2018 Ordnance Survey 100059871 / 0408			



## Rotherhithe to Canary Wharf River Crossing

### VALUE ENGINEERING ASSESSMENT FORM

DATE: 21/08/18

- Item Ref: VE21 – Fibre-reinforced Plastic (FRP) deck

### SUMMARY DESCRIPTION OF VE PROPOSAL

The baseline bridge main span design consists of a Pratt Truss Structure with towers and piers located in the River Thames as close as possible to the navigable channel without encroaching on it.

In VE21, it is proposed to construct the superstructure using FRP components. This assessment separately details differences associated to using an FRP deck and full FRP superstructure.

#### FRP Deck

FRP composites are primarily made up of fibres aligned within a resin material in such a way to make a very strong and very customizable material. The most common fibre choices are glass and carbon fibres. In the use of bridge decking, FRP have been moulded into cellular panels that can be installed as full-depth deck panels. An example of an FRP deck panel is provided in Figure 1.



**Figure 1 – Example of conventionally adhesively bonded composite decks** (Source: ZellComp Inc.)

**Constructability:** To connect the panels to one another, the panels are design to interlock with male-female shear keys. Another option for connecting the panels is the use of high quality epoxy adhesives. To connect the panels to the steel framing, pockets are formed over the beams to allow for welded stud shear connectors and non-shrink grout. Bolts can also be used to connect the panels to the steel framing.

**Evaluation:** FRP products have the benefits of having high strength, low weight, high stiffness to weight ratio, and corrosion resistance. The deck being prepared in panels, transporting the deck to the jobsite and placing the deck panels is efficient.



Given the increased fabrication costs compared to conventional materials, it is anticipated this would increase capital costs; however, it is anticipated whole life costs will reduce as there are less maintenance requirements. Furthermore, it can be an option to be considered in detailed design to make weight reductions where required.

ST\_PJ585C-ATK-BAS-ZZ\_21-DIA-ST-00004 outlines potential structural layout changes.

### FRP Superstructure

Secondly, it is proposed to construct the superstructure using an FRP deck. This would reduce the overall deck weight and thereby reduce the size of the machinery required to operate the lifting mechanism. Furthermore, using a lightweight deck could increase the overall span of the structure, eliminating the need for piers within the river. This would have significant construction and programme benefits.



**Figure 2 Example of a FRP Truss bridge** (Reference: E.T. Techtonics)



**Figure 3 Example of connections used in FRP truss bridge** (Reference: E.T. Techtonics)

However, this proposal is well beyond what has been achieved to date in terms of span length. Initial studies completed by others have suggested this could be technically feasible. The proposal has a number of technical risks from a design perspective and fabrication perspective.

There have been numerous pedestrian bridges built within Europe with spans of up to **40m**. The longest span FRP pedestrian footbridge constructed currently is a **63m** span (Aberfeldy Footbridge, constructed in 1992). Further FRP structures have been constructed for vehicle loading up to 400kN in a two-span arrangement covering a total deck length of 52m. (Ascione, et. al. 2016).

Further theoretical proposals suggest a 300m span footbridge could be built as a single span. The deck depth would vary from 6m deep to 11m deep and be delivered to site using 6 preformed sections. The depth of the deck section would require increasing the level of the bridge to meet the navigable channel headroom requirements, and in turn increasing the approach ramp lengths.

The proposal suggested the costs were competitive with other landmark bridges. The competitiveness was a result of reduced substructure costs, offsetting the increased superstructure costs. (Kendall, 2016) However, this piece of literature did not provide evidence of a peer review. Therefore, the assumptions, limitations and exclusions were not clear. Further work would be required to determine how much of this proposal is aspirational and how much is feasible.

Using a theoretical bridge based upon the Millennium Bridge and Hungerford Bridge, it is claimed that a 300m single span FRP bridge could cost 12,500 €/m<sup>2</sup>. The Millennium Bridge and Hungerford Bridge had a total cost of 22,000 €/m<sup>2</sup> and 16,000 €/m<sup>2</sup> respectively. (Kendall, 2010) This is a significant potential saving. It is important to note this cost saving is suggested to be from a reducing in substructure costs, offsetting the increased superstructure costs. Again, there is limited evidence of an independent technical review. Further work would be required to determine how much of this proposal is aspirational and how much is feasible.

The single span FRP proposal would require major changes in the design to achieve the single span. The substructure arrangement and lifting arrangement would require significant modification.

To conclude, a single span structure represents an opportunity to eliminate river working. There is possibly capability to deliver an FRP structure in multiple prefabricated sections, but a single span structure would be significantly larger than other bridges or components to date. Consequently, the increase in span length will present significant design, procurement and fabrication risk. There is no available data to facilitate a justifiable cost estimate for the superstructure as nothing of this scale has been constructed in the past. Engagement with potential fabricators would have to be made to ascertain potential superstructure costs; however, it is envisaged that there will be high costs associated to the bespoke requirements of the bridge.

#### **ADVANTAGES:**

- Potential to eliminate river pier construction and associated Health and Safety Risks, operational risks and costs.

#### **DISADVANTAGES:**

- Feasibility unknown as the structure would span five times further than any existing FRP deck
- Large design risk as there is minimal design standards and guidance.
- Large fabrication risk
- Procurement risk
- The theoretical proposal suggests a 6m construction depth is required; hence, increasing the level of the structure, in turn increasing the length of the approach ramps.
- Significantly increased deck clearance time.

#### **LIST OF SUPPORTING DOCUMENTS:**

##### **References**

ST\_PJ585C-ATK-BAS-ZZ\_21-DIA-ST-00004 (VE21 – Deck plate types comparison)

(Aerospace Engineering blog, 2013) Composite Materials and Renewables: Wind Energy on AUGUST 21, 2013 · in Composite Materials, Manufacturing, Novel Materials/Tailored Structures, Renewables. <https://aerospaceengineeringblog.com/composite-materials-wind-energy/> retrieved 22/08/18

(Ascione et al 2016) - Prospect for New Guidance in the Design of FRP. Luigi Ascione, Jean-François Caron, Patrice Godonou, Kees van IJselmuiden, Jan Knippers, Toby Mottram, Matthias Oppe, Morten Gantriis Sorensen, Jon Taby, Liesbeth Tromp

(Cairns et. al., 2011) Cairns, D., Nelson, J., & Riddle, T. (2011). Wind Turbine Composite Blade Manufacturing: The Need for Understanding Defect Origins, Prevalence, Implications and Reliability. Montana State University, Department of Mechanical and Industrial Engineering. Albuquerque, NM: Sandia Corporation

(Gamesa Corporation, 2011) Gamesa Corporación Tecnológica. Gamesa Corporation. Viewed on 04. 12 2011 from Wind Turbines: <http://www.gamesacorp.com/en/products-and-services/wind-turbines/productos-y-servicios-aerogeneradores-2catologo.html>

(Kendall 2010) Technical and Economic Viability of FRP Bridges

(Kendall 2016) Future Potential for FRP composites

(Scenta, 2007) "How to make an elephant fly". Scenta. 31 July 2007. Archived from the original on 20 July 2011

## IMPACT EVALUATION

### COST BENEFIT

Item	Comments	Effect on CAPEX	Effect on OPEX
Design costs	The design cost of the structure would increase as a result of the unconventional material	Increase	No effect
Substructure cost	A single river span could negate the need for river piers. This would reduce materials and allow land-based construction	Decrease	Decrease
Superstructure cost	The cost of the proposed superstructure is not known. There is no known manufacturer of these FRP deck this size based in the UK. Therefore, costs may significantly increase.	Increase	Unknown

### PROGRAMME BENEFIT




Item	Description	Effect on programme
Design	The design programme duration the structure would increase because of the unconventional material	Increase
Substructure	A single river span could negate the need for river piers. This would mean faster land-based construction could be adopted	Decrease
Superstructure	The effect of using an FRP superstructure on the programme is unknown. There is a significant programme risk for procuring the unconventional material and fabrication.	Unknown.

### RISK EVALUATION

Item	Description	Effect on risk
Design	The design is more complex using unconventional materials with limited standards and guidance and as a result there are more risks of delays and unforeseen events during the design period	Increase
Substructure	Eliminating the river piers is a significant reduces programme risk during construction	Decrease
Superstructure	Using a material that is used significantly less in bridge construction than concrete and steel increases risk. A single span here would represent a fivefold increase in the current maximum FRP span.	Increase

### ENVIRONMENTAL

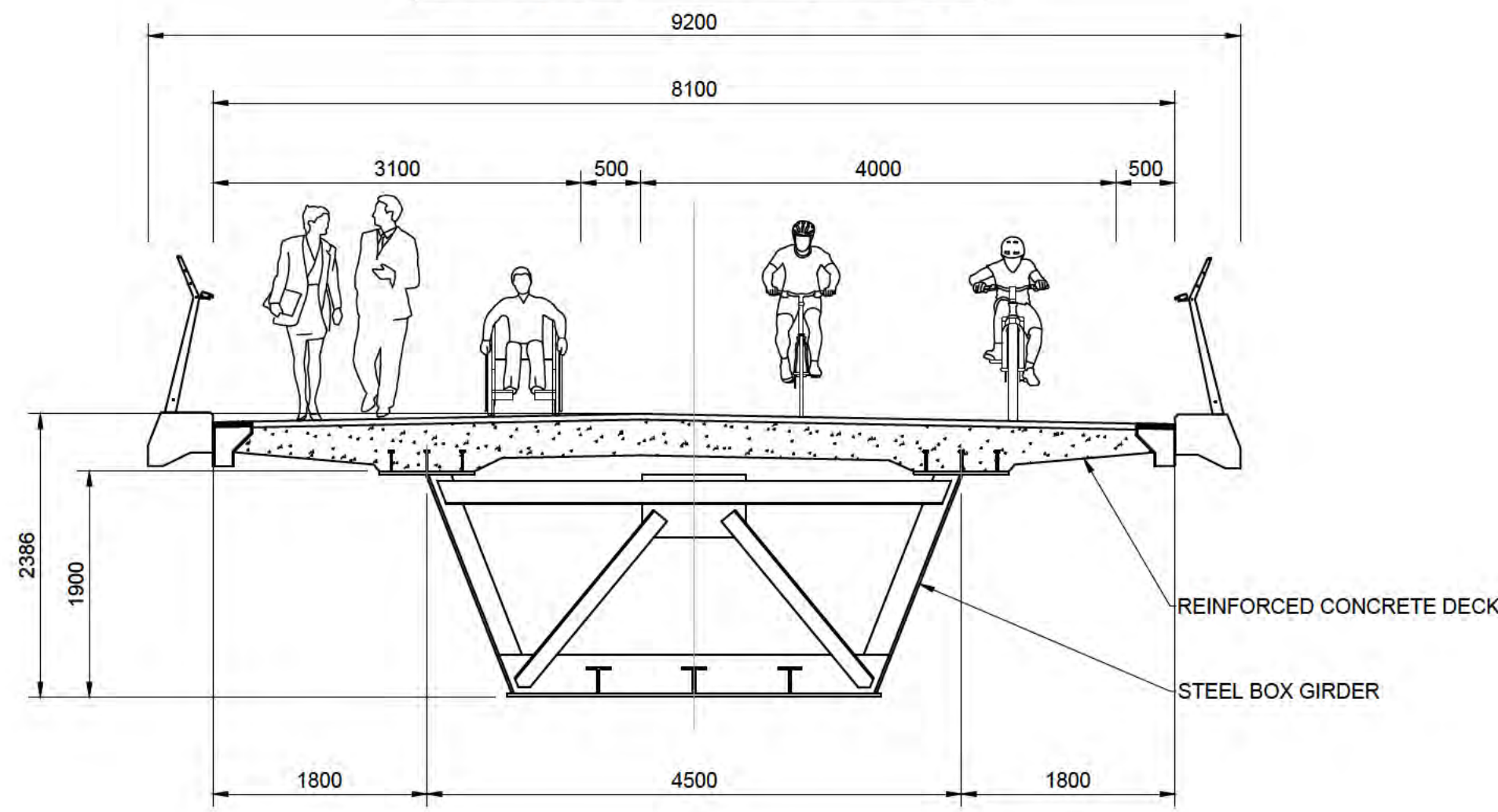


Item	Description	Effect on the environment
Construction	The programme impact evaluation conclusion is unknown. Reducing the construction period would be beneficial to the environment.	Unknown
Substructure	Reducing the deck weight and number of piers will reduce the quantity of substructure materials, decreasing the carbon footprint of the substructure.	Beneficial
Superstructure	The total embedded carbon of the superstructure is unknown.	Unknown
<b>BUILDABILITY</b>		
Substructure	Removal of the river piers significantly increases the buildability of the structure	Beneficial
Superstructure	A single span, precast deck, could be easier to build. However, the use of unconventional materials may add complexity.	Unknown
<b>SAFETY</b>		
Item	Description	Effect
River impact	Removal of piers in river eliminates risk of pier impact	Beneficial
Maintenance	Refer to section below	N/A
Construction	Refer to buildability section	N/A
<b>OPERATIONS AND MAINTENANCE</b>		
Item	Description	Effect
Lifting bridge	A single lifting span would be operationally different to lifting only the central 160m.	Unknown
Lifting mechanism replacement	If the deck is lighter, a smaller lifting mechanism would be adopted, reducing cost.	Unknown
Inspection	The bridge could be inspected from an underbridge unit located on the superstructure, eliminating the need for river-based inspection	Beneficial
Bearing replacement	Bearings would be replaced from land increasing safety and reducing cost	Beneficial
Painting	An FRP deck theoretically would not need repainting. However, other methods of repair may be required instead	Unknown
<b>ACCEPTANCE</b>		
Prepared: 	Name: 	Signed: 
Proposal Implemented:	Further investigation required	
Approved by:	Name:	Signed:
<b>IMPLEMENTATION</b>		
<b>COMMENTS / ACTIONS</b>		

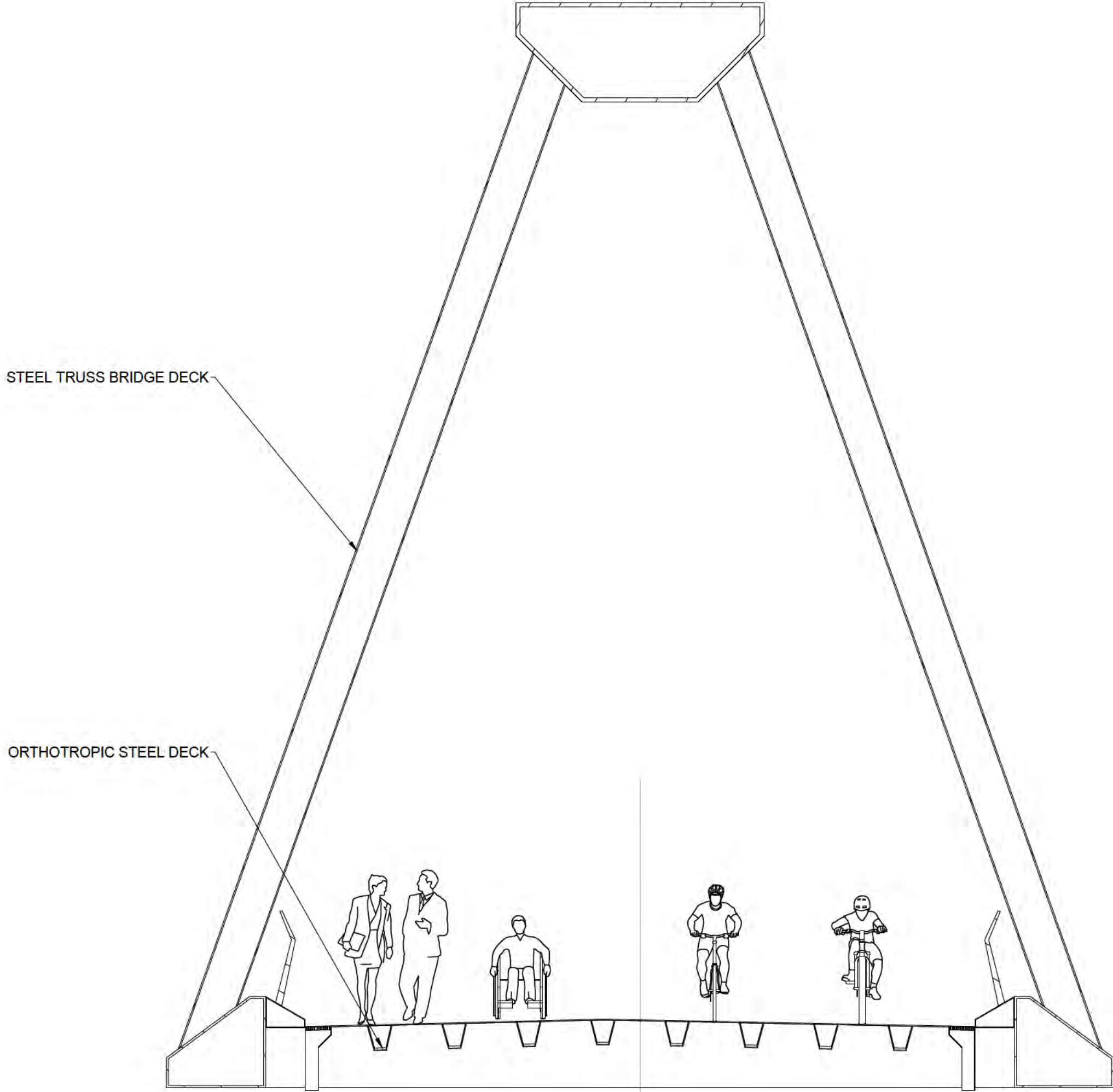
**To be completed by TfL**



CONCEPT DESIGNS

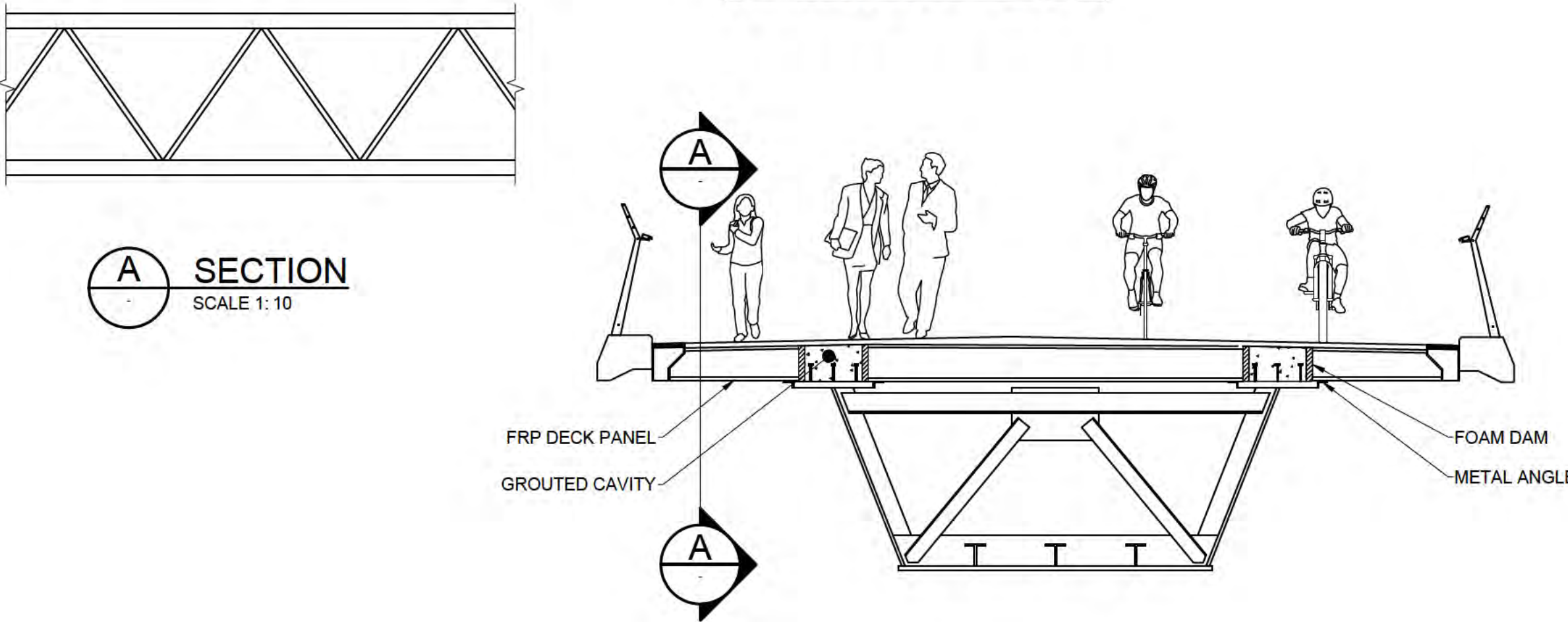


APPROACH SPANS STEEL/CONCRETE COMPOSITE DECK

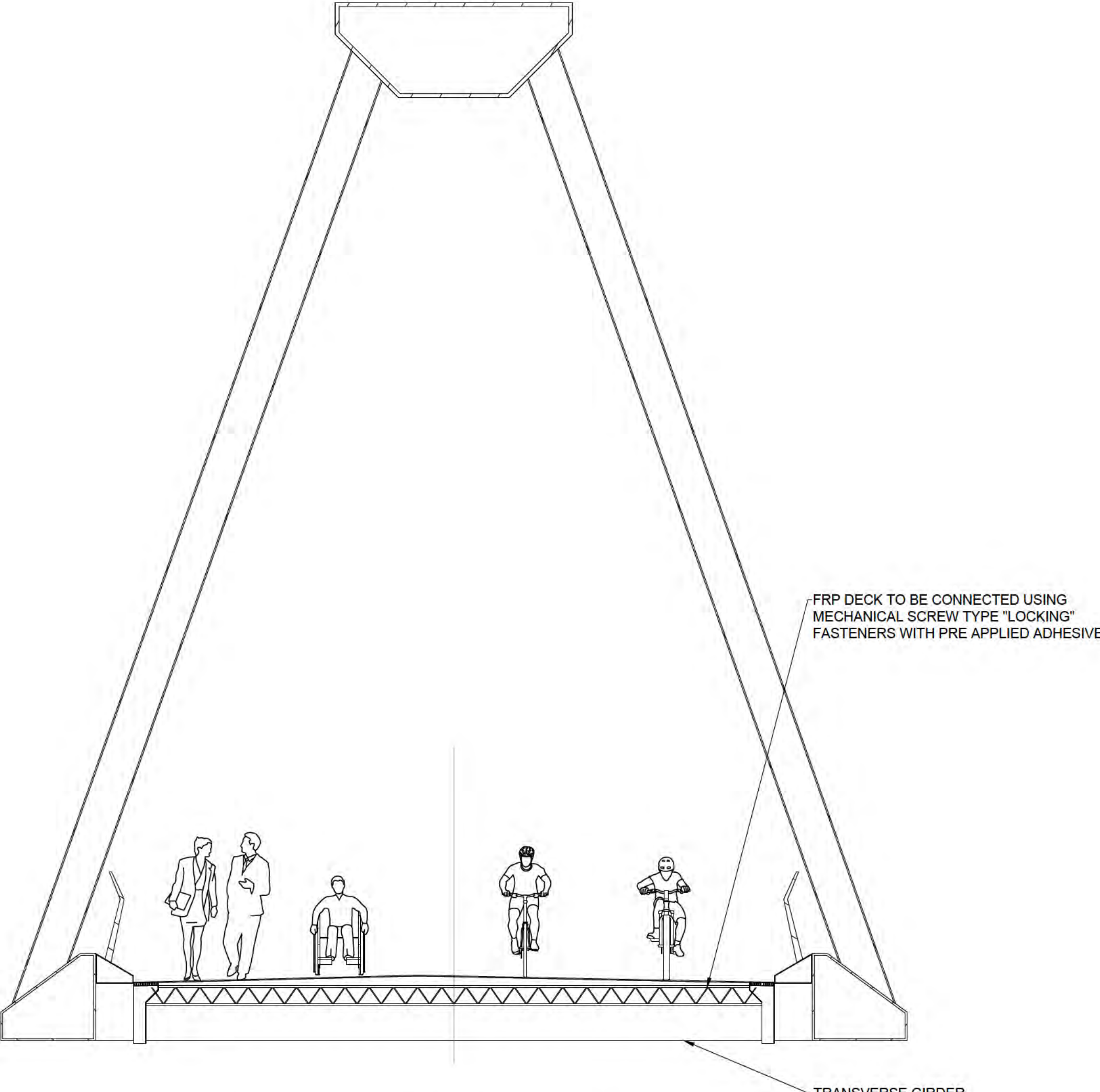


MAIN SPAN STEEL ORTHOTROPIC DECK PLATE

VE PROPOSALS



APPROACH SPANS FRP DECK PLATE



MAIN SPAN FRP DECK PLATE

NOTE:- REFER TO APPENDIX - A & B FOR DIMENSIONS, LEVELS & OTHER DETAILS.

Transport for London TfL Engineering				Surface Transport			
P01.1				P01.1			
FIRST ISSUE				WORK IN PROGRESS			
Multiple Boroughs				P01.1			
R2CW RIVER CROSSING				ST_PJ585C-ATK-BAS-ZZ_21-DIA-ST-00004			
VE21 DECK PLATE TYPES				© Crown copyright and database rights 2018 Ordnance Survey 100050671 / 0408			
COMPARISON							



## Rotherhithe to Canary Wharf River Crossing

### VALUE ENGINEERING ASSESSMENT FORM

DATE: 22/08/2018

- Item Ref: VE23 – Steel truss-type tower
- Reference: ST\_PJ585C-ATK-BAS-ZZ\_12-REP-ZZ-00001

### SUMMARY DESCRIPTION OF VE PROPOSAL

The baseline design considers steel sections for the 80m tall tower proposed for the vertical lift of the bridge deck. The steel plate of 80mm thick is considered in the baseline design for the towers (Ref.: ST\_PJ585C-ATK-BAS-ZZ\_09-DRG-ST-00003). It will be fabricated to the desired shape and installed with significant stiffener rings/diaphragms at the intermediate floors of the stairs, approx. 4m to control buckling. The provision of intermediate stiffeners rings/diaphragms in one of the tower will be complex to allow space proofing for the lift shaft. Painting of tower is required for maintenance and for better aesthetics. The current concept design for the towers has refined and it is currently 55mm thick section at the bottom and the section thickness varies gradually till the top of the tower (Refer Figure 1). The weight of the tower is approx. 900 tonnes of steel.

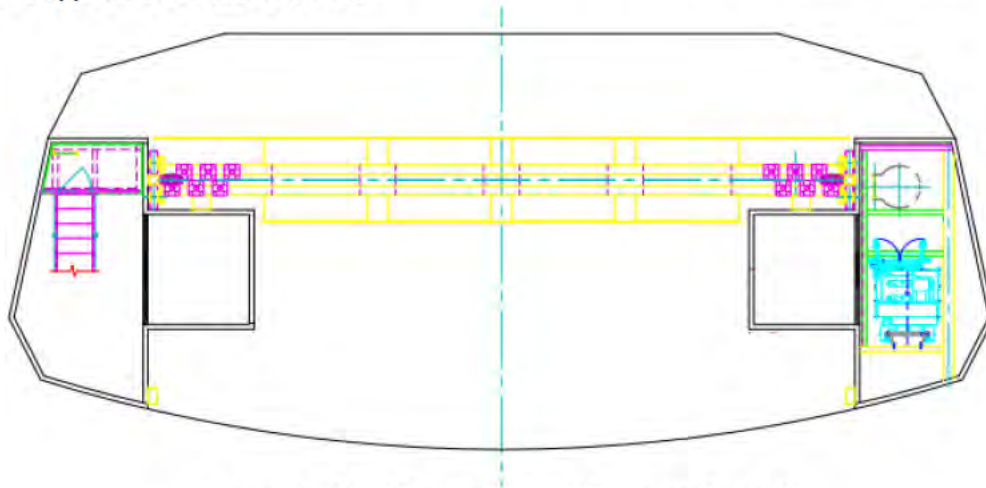



Figure 1 - Steel Tower option (Concept design)

The VE23 is to propose the steel truss tower for the 75m height and the top 5m will comprise of rotors, M&E equipments with a service floor deck. The current proposal of the truss tower comprises uniform CHS sections with bracings and can potentially be reduced along the height during the detailed design stage. For the steel truss option, the lift shaft & staircase are not considered as it is uneconomical and require higher space inside the truss. Ladders (to be attached at the rear side of the truss) separated by floors at various levels is considered for maintenance operations. The counterweights at either side will be split in two and will be located inside the truss tower with cable hangers & sheaves at top. The weight of the truss tower is approx. 250 tonnes of steel and is comparatively lesser than the steel plate tower.

For the VE proposal, CHS 600 x 25 section is considered for the main truss chords to satisfy the design checks, which can be optimised during the detailed design stage. Drawings with estimated section sizes can be seen in ST\_PJ585C-ATK-BAS-ZZ\_21-DRG-ST00005 and ST\_PJ585C-ATK-BAS-ZZ\_21-DRG-ST00006.

Note: This VE proposal requires a significant M+E redesign and rework on operational mechanism. Outstanding M+E design includes relocating spragging beams and balancing main span lift forces caused from separate counterweights.

ADVANTAGES:	DISADVANTAGES:
<ul style="list-style-type: none"> <li>• Potential for significant savings in Tower construction &amp; material costs</li> <li>• Significantly simpler fabrication than steel towers</li> <li>• Comparatively reduced wind load impact on the tower and on the foundation.</li> <li>• Total weight of the tower is reduced by 4.5 times in calculation of foundation loads.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in overall size of the tower will impact the aesthetics and is visually intrusive to the surroundings.</li> <li>• The truss form of the tower is not fitting with the Canary Wharf environment.</li> <li>• Two separate counter-weights are required on each side and needs to balance during deck lift operation.</li> <li>• Lift shaft or stairs inside the tower is not possible as it obstructs counterweight movement. They are to be replaced with ladders separated by floors at various levels.</li> </ul>
<b>LIST OF SUPPORTING DOCUMENTS:</b>	
<ul style="list-style-type: none"> <li>- ST_PJ585C-ATK-BAS-ZZ_21-DRG-ST-00005 (Steel truss towers GA drawing 1 of 2)</li> <li>- ST_PJ585C-ATK-BAS-ZZ_21-DRG-ST-00006 (Steel truss towers GA drawing 2 of 2)</li> </ul> <p>Reference: Salford Quay bridge truss towers</p> 	



<b>IMPACT EVALUATION</b>
<b>COST BENEFIT</b>
<p>An initial assessment has been made of the impact of reducing the overall mass of the materials and the impact on fabrication costs by adopting standard steel sections and allowing land-based construction.</p> <p>An additional allowance has been made for the provision of four rotatory motor drums to lift the bridge compared to two in the baseline design. It should be noted however that as has been identified above, this proposal will require a significant M+E redesign and operational concept rework, and it is not clear therefore what other impacts this may have on the costs of those elements.</p> <p>It is also possible that the reduction in wind load impact upon the foundations may result in a simplified foundation/pier design but at present no saving has been included for this.</p> <p>This exercise has currently generated an anticipated saving in EFC of £9.1 million but a significant amount of additional design development would need to be undertaken before a more informed and robust estimate of potential savings could be generated.</p>
<b>PROGRAMME BENEFIT</b>
<p>The steel truss could be constructed off site while the foundation is being cast at site, thus reducing the programme. Erection of tower in a single lift using heavy cranes will reduce the site possession time.</p>
<b>RISK EVALUATION</b>
<ul style="list-style-type: none"> <li>• Imbalance in appearance – large truss towers carrying a small deck.</li> <li>• Canary Wharf local authority consents require - does not fit in with surrounding environment.</li> <li>• TWAO consent risk.</li> <li>• Counterweight needs special buffer material at sides to avoid getting clash / pounding with main structural members during high winds.</li> </ul>
<b>ENVIRONMENTAL</b>
<p>Reducing the construction period would be beneficial to the environment.</p> <p>The reduction in the steel quantity of the substructure will reduce the carbon footprint.</p> <p>The painting of towers during future maintenance may have a little impact over the river water body.</p>
<b>BUILDABILITY</b>
<p>Construction of tall steel truss tower can be achieved by fabricating the truss elements in the factory, transporting to site in the form of segments / panels, assembling the segments near the site and erecting the tower in a single lift (either from land or from river using barges).</p> <p>Alternate option is to erect the truss tower at site in segments and assembling it using HSFG bolts.</p>
<b>SAFETY</b>
<p>Appropriate safety measures to be implemented at site for the installation of steel truss towers. There is a possibility of single lift erection using heavy cranes, as it will reduce work hours at site, site related HSE issues as well as to save possession time.</p> <p>Maintenance access to the top of the tower is achieved by ladders separated by floors at various levels. This is not preferable; however, Salford Quays Bridge Truss Tower adopts a similar methodology.</p>
<b>OPERATIONS AND MAINTENANCE</b>



Steel truss tower requires periodical maintenance and needs painting or extensive corrosion protection measures. There is well enough space for inspection and maintenance and no issues with respect to ventilation.

Maintenance access to the top of the tower is achieved by ladders separated by floors at various levels.

#### ACCEPTANCE

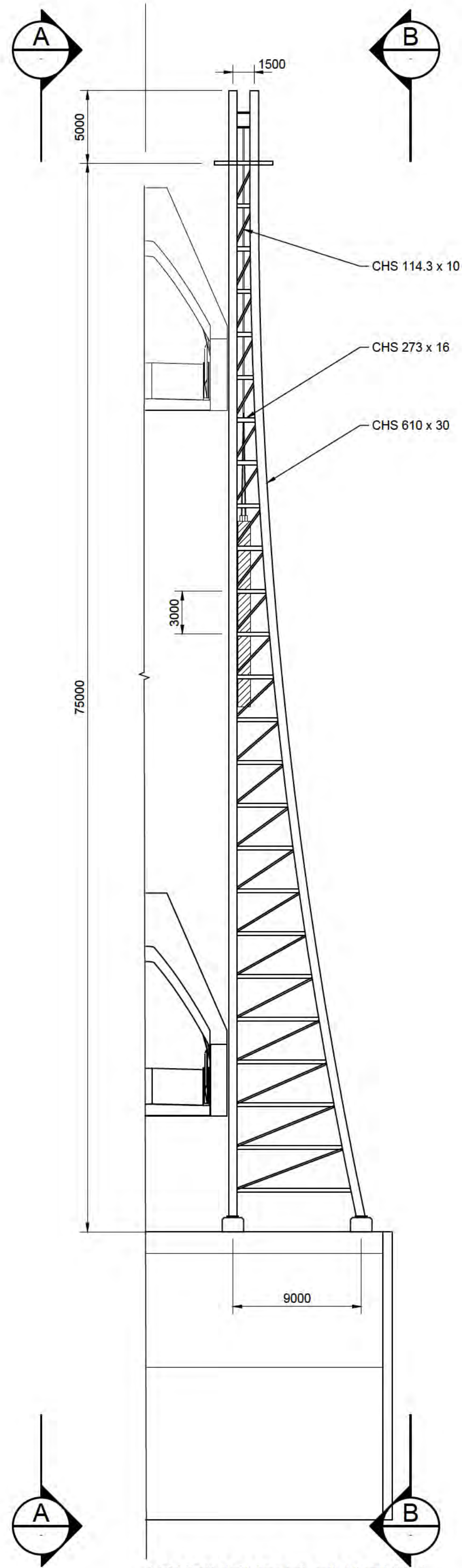
Prepared: [REDACTED]	Name: [REDACTED]	Signed: [REDACTED]
Proposal Implemented:	Y / N	(Delete as appropriate)
Approved by:	Name:	Signed:

#### IMPLEMENTATION

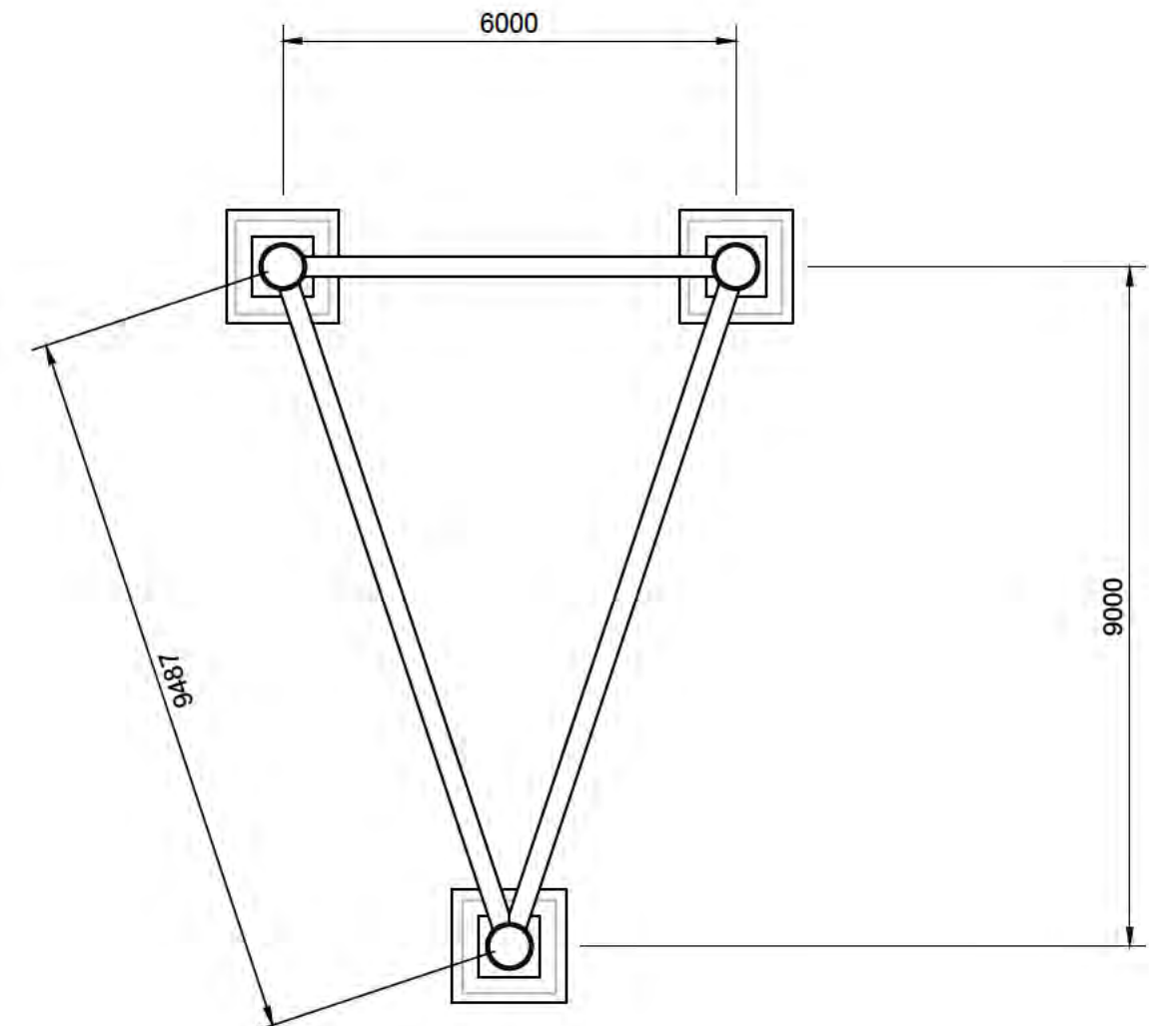
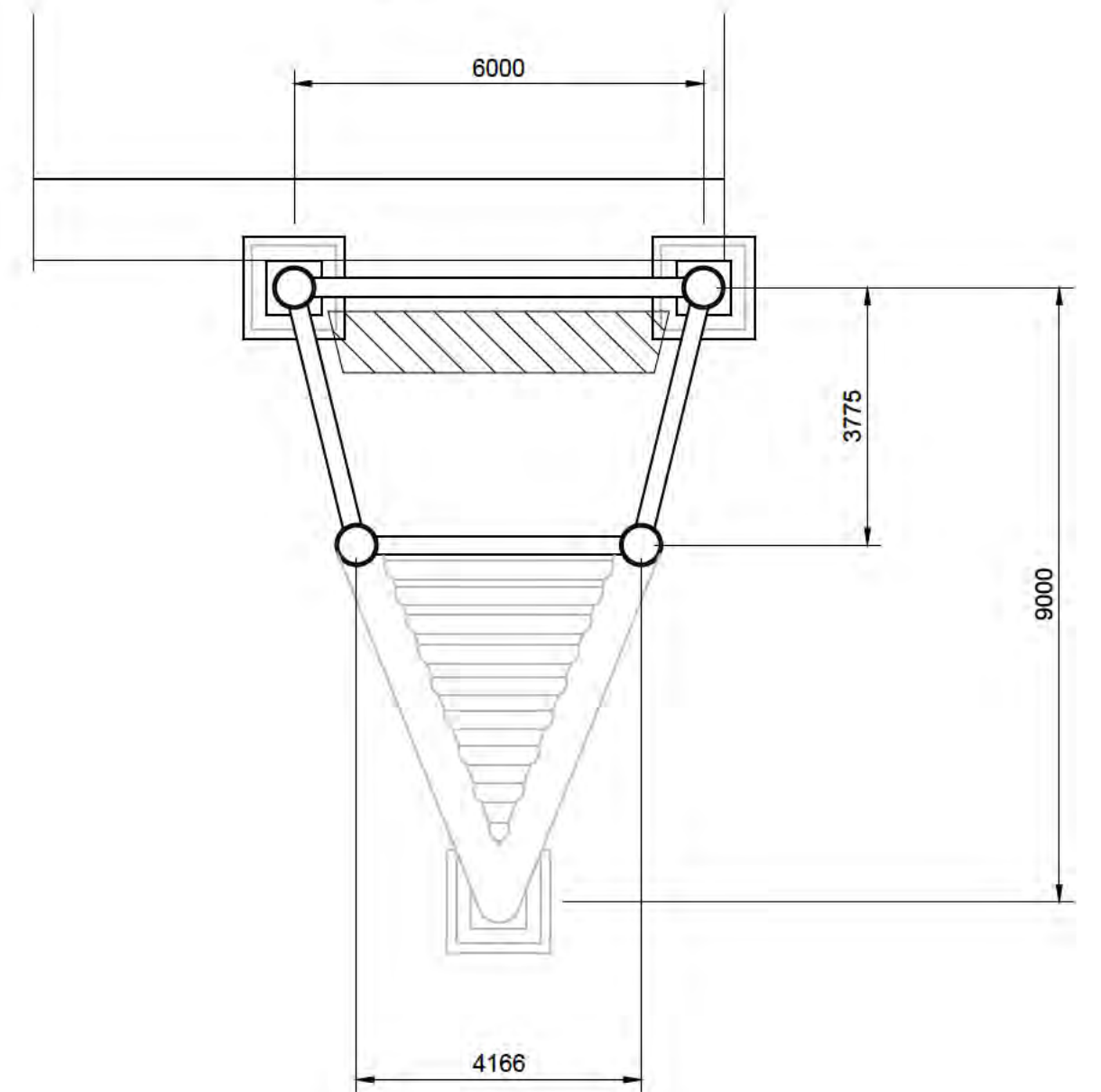
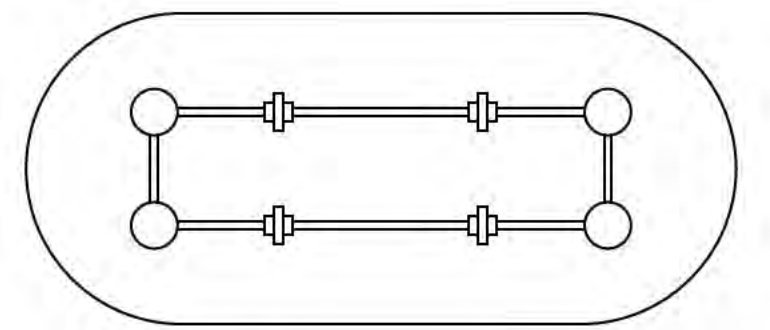
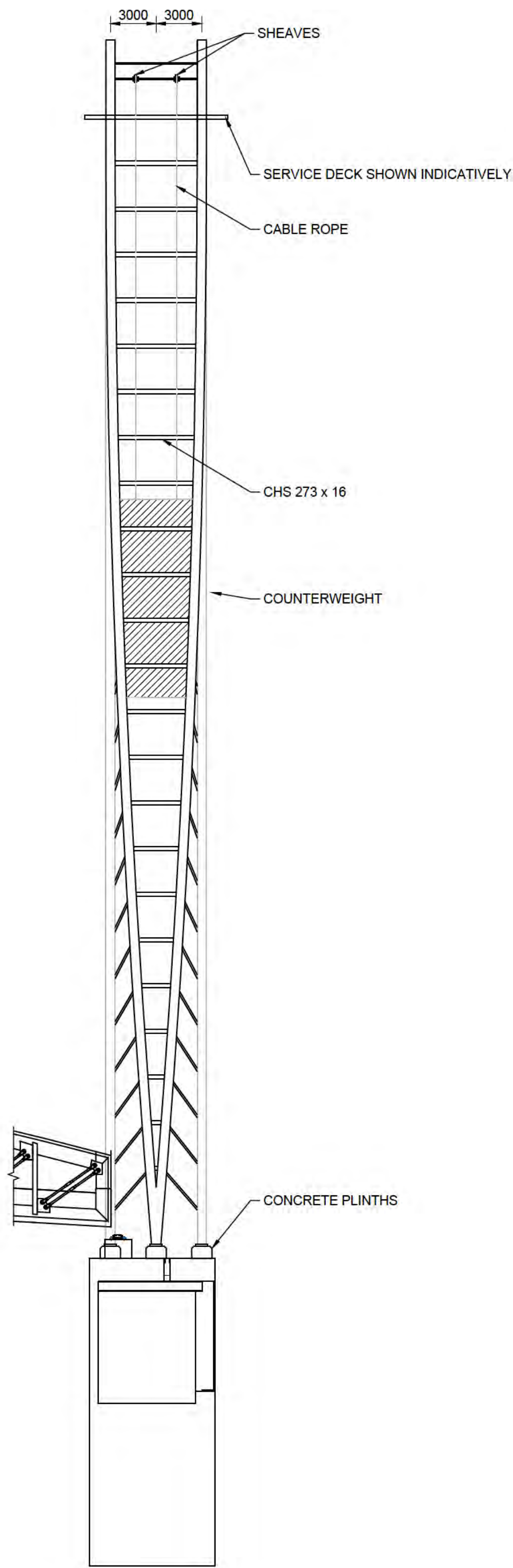
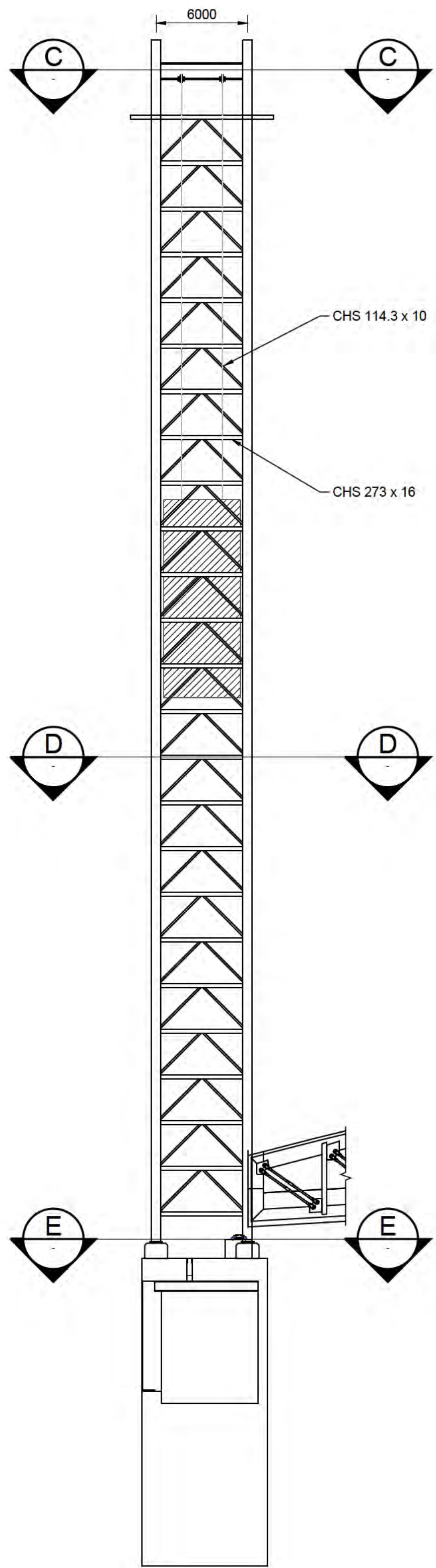
#### COMMENTS / ACTIONS

To be completed by TfL





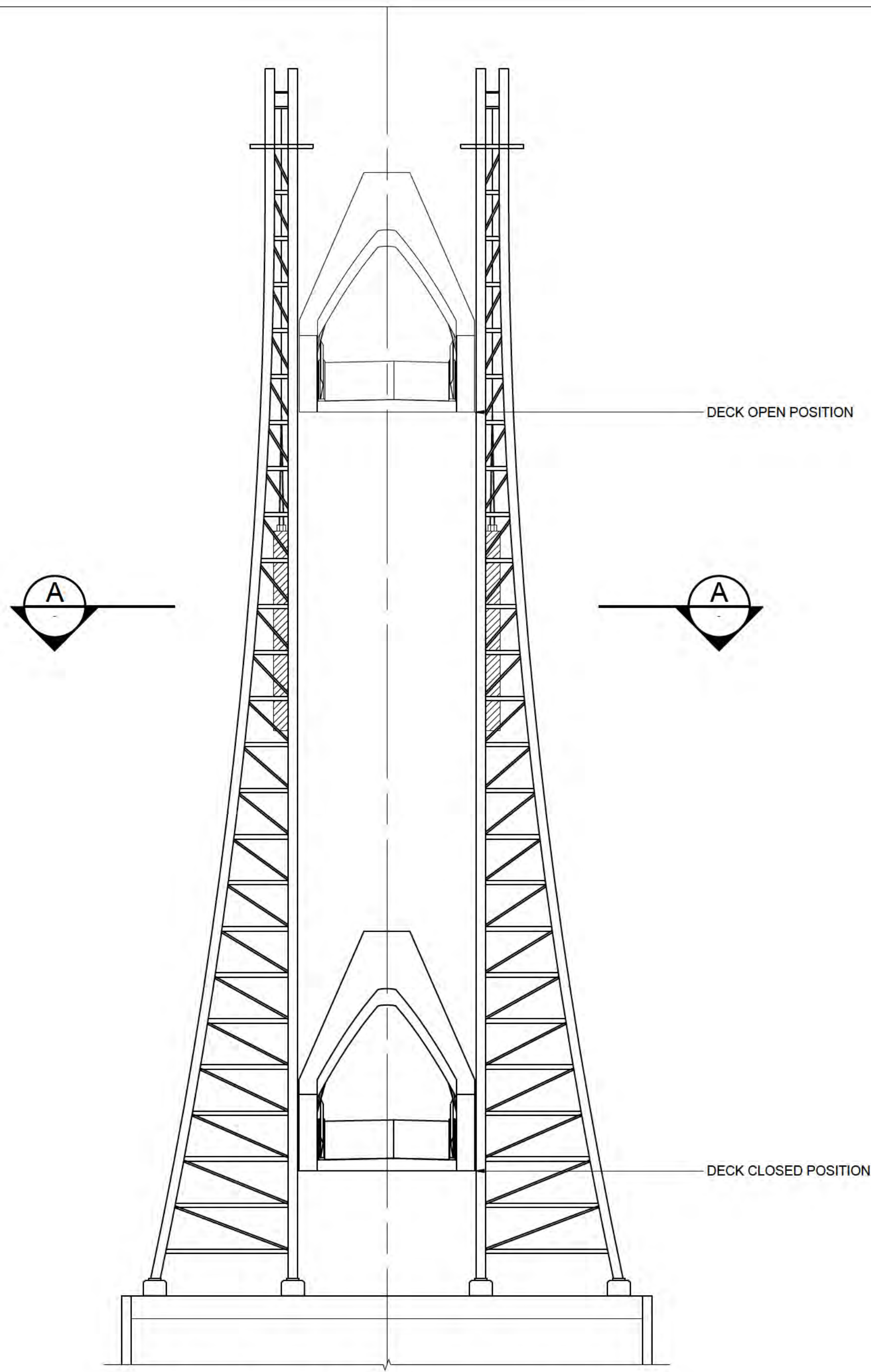
- NOTES:
- SERVICE LADDER AND M & E DETAILS NOT SHOWN.
  - WELDED CONNECTIONS PREFERRED.



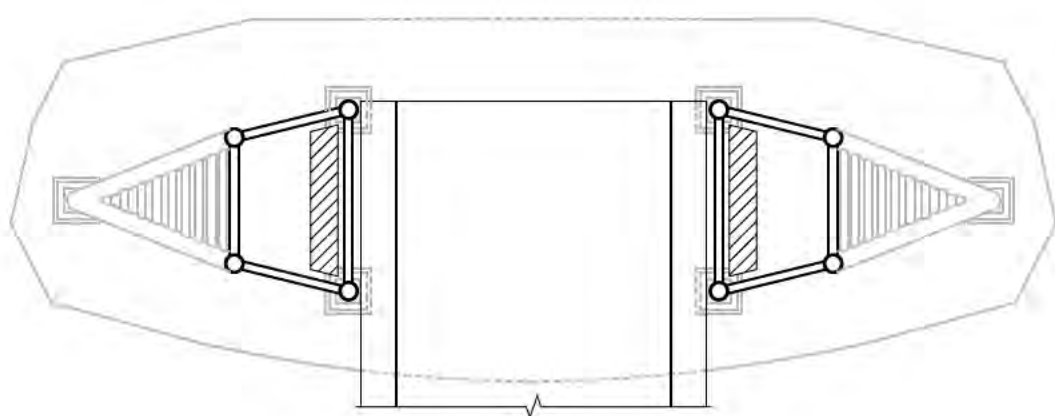
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION			
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CONSTRUCTION	MAINTENANCE/CLEANING	OPERATION	DEMOLITION
NONE	NONE	NONE	NONE
It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement			

Transport for London TfL Engineering				Traffic Design Engineering			
P01.2				FIRST ISSUE			
rev	date	details	dm	chk	app	date	scale
Multiple Boroughs				1:1			
R2CW RIVER CROSSING				WORK IN PROGRESS			
STEEL TRUSS TOWER				P01.2			
ST_PJ585C-ATK-BAS-ZZ_21-DRG-ST-00005				P01.2			
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ELEVATION OF TOWER FROM WALKWAY  
SCALE 1:250



A SECTION  
SCALE 1:250

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION			
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:			
CONSTRUCTION	MAINTENANCE/CLEANING	OPERATION	DEMOLITION
NONE	NONE	NONE	NONE
It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement			

Transport for London TfL Engineering		Traffic Design Engineering			
197 Blackfriars Road London SE1 8NJ					
rev	date	details	dm	chk	app
P01.2	—	FIRST ISSUE			
borough	Multiple Boroughs				
scheme	R2CW RIVER CROSSING STEEL TRUSS TOWER				
date	scale	1:1	dm	chk	app
—	—	—	—	—	—
suitability	S0	WORK IN PROGRESS	revision P01.2		
drawing No	ST_PJ585C-ATK-BAS-ZZ_21-DRG-ST-00006				
project	owner	asset	location	type	role
—	—	—	—	—	—
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## Rotherhithe to Canary Wharf River Crossing

### VALUE ENGINEERING ASSESSMENT FORM

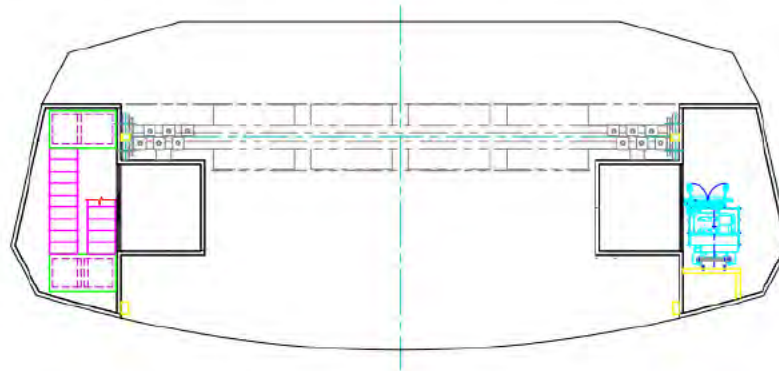
DATE: 22/08/2018

- Item Ref: VE24 – Concrete tower – jump form, slip form or precast construction

### SUMMARY DESCRIPTION OF VE PROPOSAL

The baseline design considers steel sections for the 80m tall tower proposed for the vertical lift of the bridge deck. The steel plate of 80mm thick is considered in the baseline design for the towers (Ref.: ST\_PJ585C-ATK-BAS-ZZ\_09-DRG-ST-00003). It will be fabricated to the desired shape and installed with significant stiffener rings/diaphragms at the intermediate floors of the stairs, approx. 4m to control buckling. The provision of intermediate stiffeners rings/diaphragms in one of the tower will be complex to allow space proofing for the lift shaft. Painting of tower is required for maintenance and for better aesthetics.

The current concept design for the towers has refined and it is currently 55mm thick section at the bottom and the section varies gradually till the top of the tower (Refer Figure 1). The weight of the tower is approx. 900 tonnes of steel.

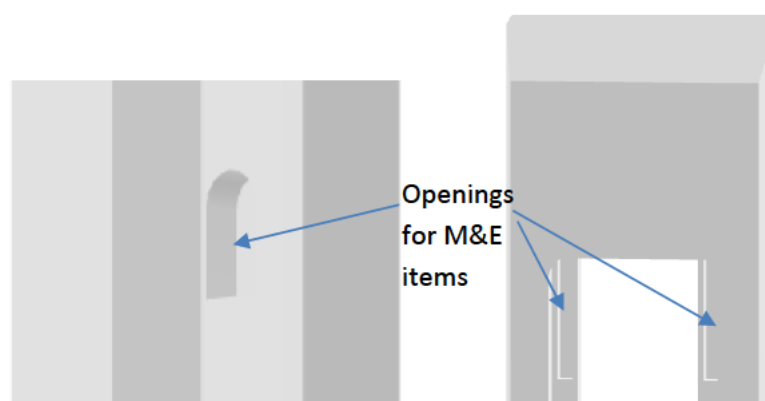


**Figure 1 Steel Tower option (Concept design)**

The VE24 is to propose the concrete tower for the 75m height and the top 5m (an aesthetic requirement) will comprise of steel frames with cladding arrangement (possibly aluminium cladding for longer shelf life) and do not carry any bridge loads. The concrete tower is currently assumed as 600mm thick uniform section and can potentially be reduced along the height during the detailed design stage. For the concrete option, the width & length of the pier must be increased to satisfy the M&E spacing requirements, stairs and lift shaft. The total weight of the reinforced concrete tower is approx. 2500 tonnes, which is nearly 2.8 times heavier than steel tower option.

For the VE proposal, HYSD (High Yield Strength Deformed) bars of 40mm diameter bars at 150mm c/c spacing in 2 layers (reduced to single layer at top 25m height of the tower) is considered to satisfy the design checks, which can be optimised during the detailed design stage.

For concrete towers, small openings are required at top of the tower (Refer Figure 2) to install M&E items such as spragging beams, lift pins / locks and needs access from inside of the tower for inspection and maintenance.



**Figure 2 Minor openings at top of the tower for M&E items**

The General Arrangement drawings for the concrete tower can be seen in ST\_PJ585C-ATK-BAS-ZZ\_21-DRG-ST-00001, ST\_PJ585C-ATK-BAS-ZZ\_21-DRG-ST-00002 and ST\_PJ585C-ATK-BAS-ZZ\_21-DRG-ST-00003

For the Post-tensioned concrete options, the concrete tower can be built using precast segments (fabricated at precast yard) with post-tensioning strands / PT threaded bars with a similar cross-section. The precast option will reduce the programme time and reduced working hours at site leads to improved health and safety.

ADVANTAGES:	DISADVANTAGES:
<ul style="list-style-type: none"> <li>• Potential for significant savings in Pier construction &amp; material costs</li> <li>• Potential in reducing operational risks and maintenance costs.</li> <li>• The steel tower design requires intermediate bracing/stiffener rings/diaphragm at 4m (approx.). In the concrete tower design no intermediate bracings/stiffener rings/diaphragms are required.</li> <li>• Considering higher mass &amp; stiffness, the concrete tower will be subjected to reduced lateral deflection than the steel towers due to wind loads.</li> </ul>	<ul style="list-style-type: none"> <li>• Marginal increase in main span by 1.36m</li> <li>• Construction time may be comparatively higher than steel tower in case of in situ construction</li> <li>• Increase in size of the tower will impact the aesthetics</li> <li>• Openings required for spragging beams and M&amp;E access, depending on construction methodology this could require additional formwork at height to create minor opening in the face of the concrete towers.</li> <li>• Total weight of the tower increases by nearly 2.8 times in calculation of foundation loads. Increase in foundation loads would lead to significantly larger foundations.</li> </ul>
<b>LIST OF SUPPORTING DOCUMENTS:</b>	
<ul style="list-style-type: none"> <li>- ST_PJ585C-ATK-BAS-ZZ_21-DRG-ST-00001 (Concrete tower GA drawing sheet 1 of 3)</li> <li>- ST_PJ585C-ATK-BAS-ZZ_21-DRG-ST-00002 (Concrete tower GA drawing sheet 2 of 3)</li> <li>- ST_PJ585C-ATK-BAS-ZZ_21-DRG-ST-00003 (Concrete tower GA drawing sheet 3 of 3)</li> <li>- VE24 - Concrete towers with the current truss bridge deck (from concept design) - Rendered Views</li> </ul>	
<b>IMPACT EVALUATION</b>	
<b>COST BENEFIT</b>	



An initial assessment has been made of the impact of implementing the proposals described above.

This exercise has currently generated a potential saving in EFC of £21.2 million.

However, in the absence of any identified proposals, no allowance has currently been included for potential additional works required to the foundation/pier design arising from the additional dead load imposed by the 2.5 times heavier tower structures. This cost could be extremely significant and there are other “knock-on” effects that could potentially add further costs and reduce that saving. It is to note that the mentioned saving would be potentially reduced by the increase in foundation requirements.

It should also be noted that this assessment is made against the CB5-CA5 baseline estimate which retained the steelwork masses of the original Arcadis design (700t per tower). Ongoing development of the design has resulted in an increase in that weight which could theoretically mean that the substitution of concrete towers versus the Concept Design proposals could generate a greater saving, although a significant amount of additional design development would need to be undertaken before a more informed and robust estimate of potential savings could be generated.

#### **PROGRAMME BENEFIT**

Based on the Arcadis baseline programme the steel towers would take 6 months to erect per pair. The towers could be completed by jump forming within this same duration.

#### **RISK EVALUATION**

- Has the potential to make foundations very wide, although this is likely to be governed by ship impact requirements.
- Increase in tower weight.
- Imbalance in appearance – large piers carrying a small deck.
- Canary wharf local authority consents require - does not fit in with surrounding environment.
- TWAO consent risk.
- Increase in foundation size due to concrete tower weight may potentially impact on the Jubilee Line Tunnels.
- Open space available for inspection access will have to be carefully considered; however, it is envisaged that the same as the steel tower can be achieved.

#### **ENVIRONMENTAL**

Cast in place construction option of concrete towers and associated temporary works in the Thames river needs concordance from the Environmental agency & water body. However, it is anticipated the high-risk item is in the foundation construction, which remains the same.

As painting of towers is not required for the concrete option, it reduced the impact on the river water body.

#### **BUILDABILITY**

Construction of tall concrete tower can be achieved by cast in place construction using jump / climbing formwork (involves significant amount of time) or precast segments (comparatively lesser duration) attached using epoxy grout.

#### **SAFETY**

Necessary safety measures to be implemented at site for jump formwork construction of tower.

The additional form work to create minor openings at the face of the concrete towers (refer Figure 2) is applicable for cast in place construction method (disadvantage concerns about assembling & dismantling of form work at 60 ~ 65m height) and may not be an issue for precast solutions.

Costain have suggested that there are equal challenges and risks associated to steel tower construction. And that all foreseen risks can be mitigated on both steel and concrete tower construction.

#### OPERATIONS AND MAINTENANCE

Concrete tower requires less maintenance than steel towers and did not require painting or extensive corrosion protection measures. However, this advantage is lost if any architectural cladding is required and the proposal currently considers aluminium cladding at the top of the tower.

#### ACCEPTANCE

Prepared: [REDACTED]	Name: [REDACTED] A	Signed: [REDACTED]
Proposal Implemented:	Y / N	(Delete as a [REDACTED])
Approved by:	Name:	Signed:

#### IMPLEMENTATION

#### COMMENTS / ACTIONS

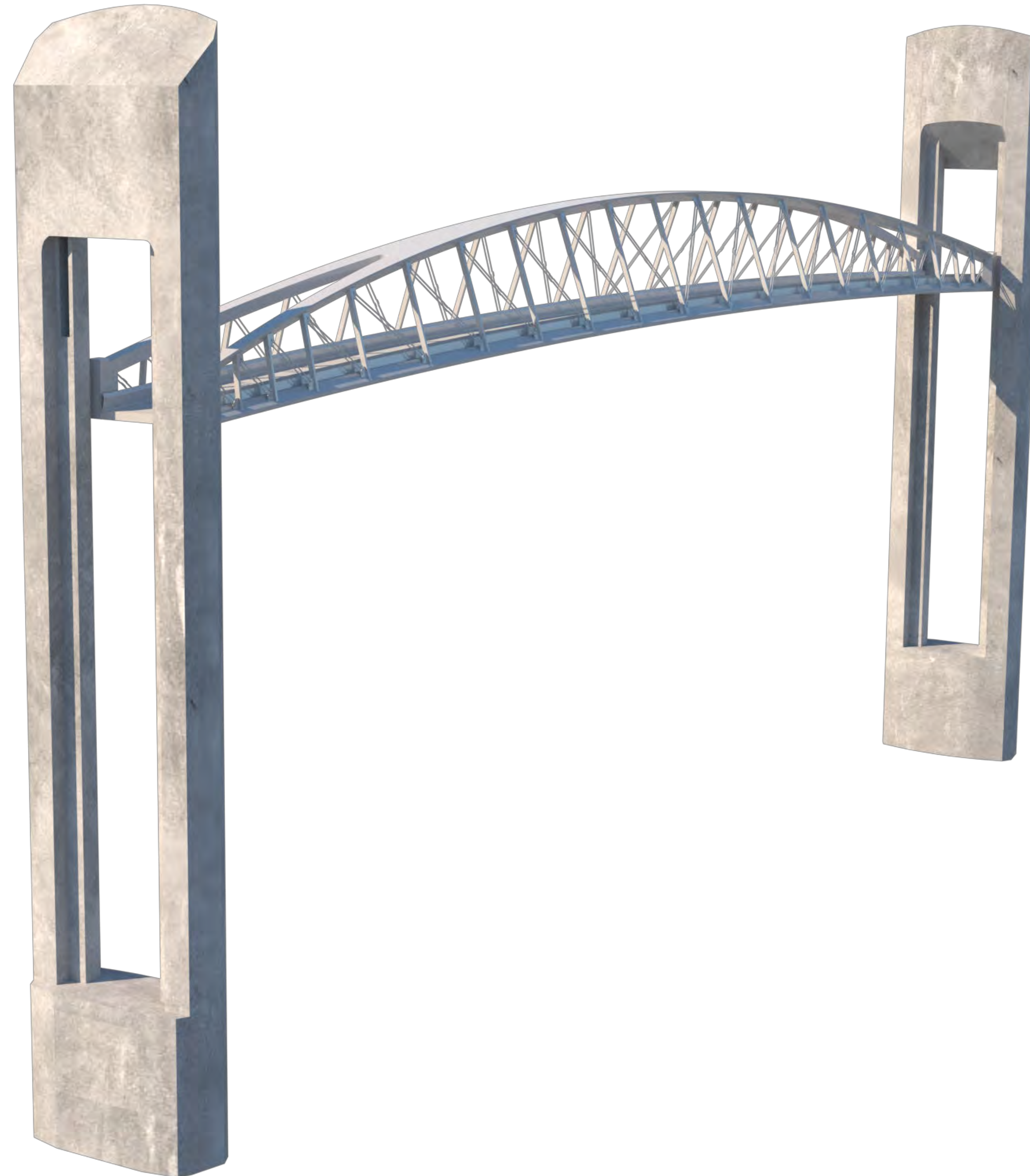
To be completed by TfL

## VE24 - Concrete towers with the current truss bridge deck (from concept design) - Rendered Views





## VE24 - Concrete towers with the current truss bridge deck (from concept design) - Rendered Views





## VE24 - Concrete towers with the current truss bridge deck (from concept design) - Rendered Views





Technical drawing of a cable-stayed bridge tower and deck section. The drawing includes the following labels and components:

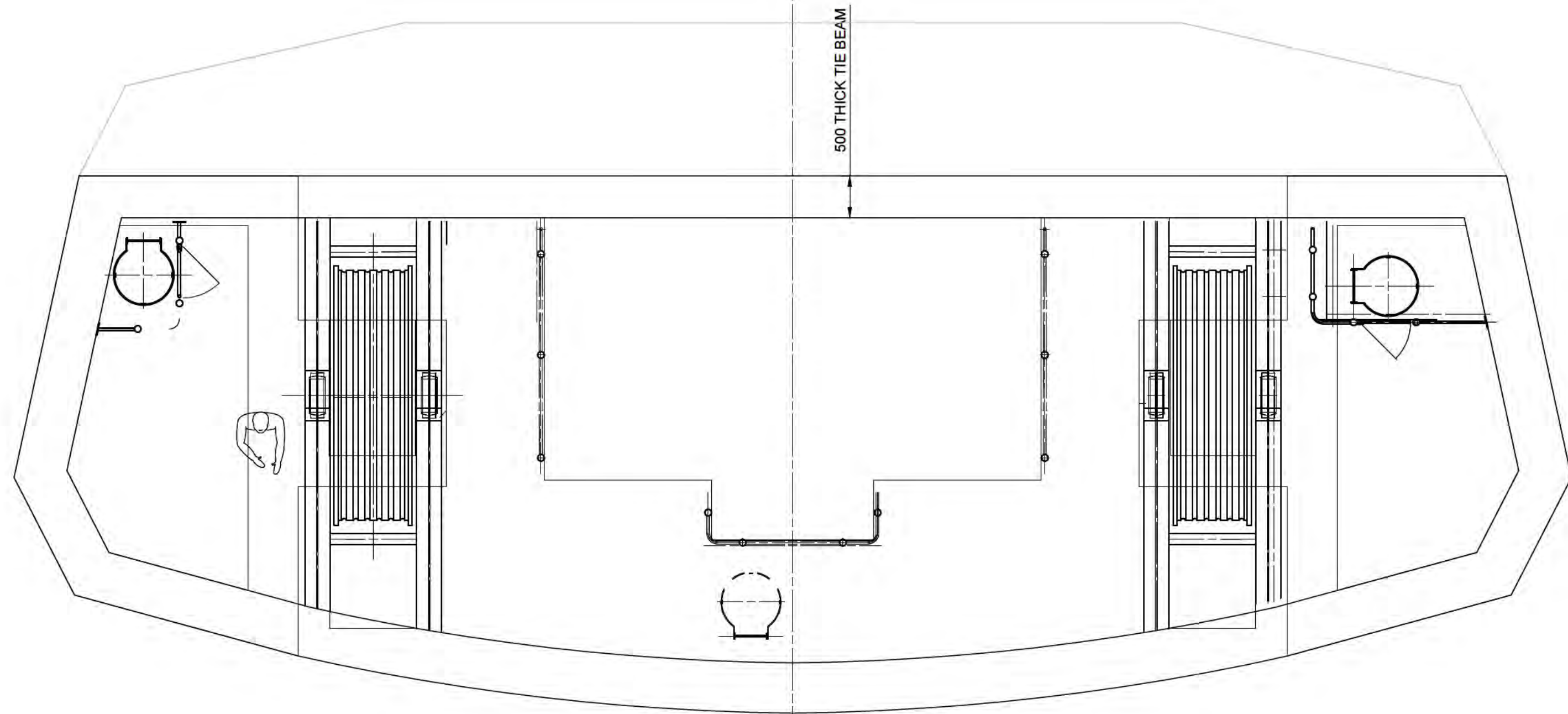
- CLADDING SUPPORTED BY STEEL FRAMES**: Points to the upper section of the tower.
- COUNTER WEIGHT**: Points to a weight on the left side of the tower.
- CONCRETE TOWER**: Points to the main vertical structure of the tower.
- BRIDGE DECK**: Points to the horizontal structure at the base of the tower.

On the left side, there are several circular diagrams labeled B, C, D, E, F, G, H, and J, each showing a cross-section of a cable or structural element. A compass rose labeled K is located at the top left.

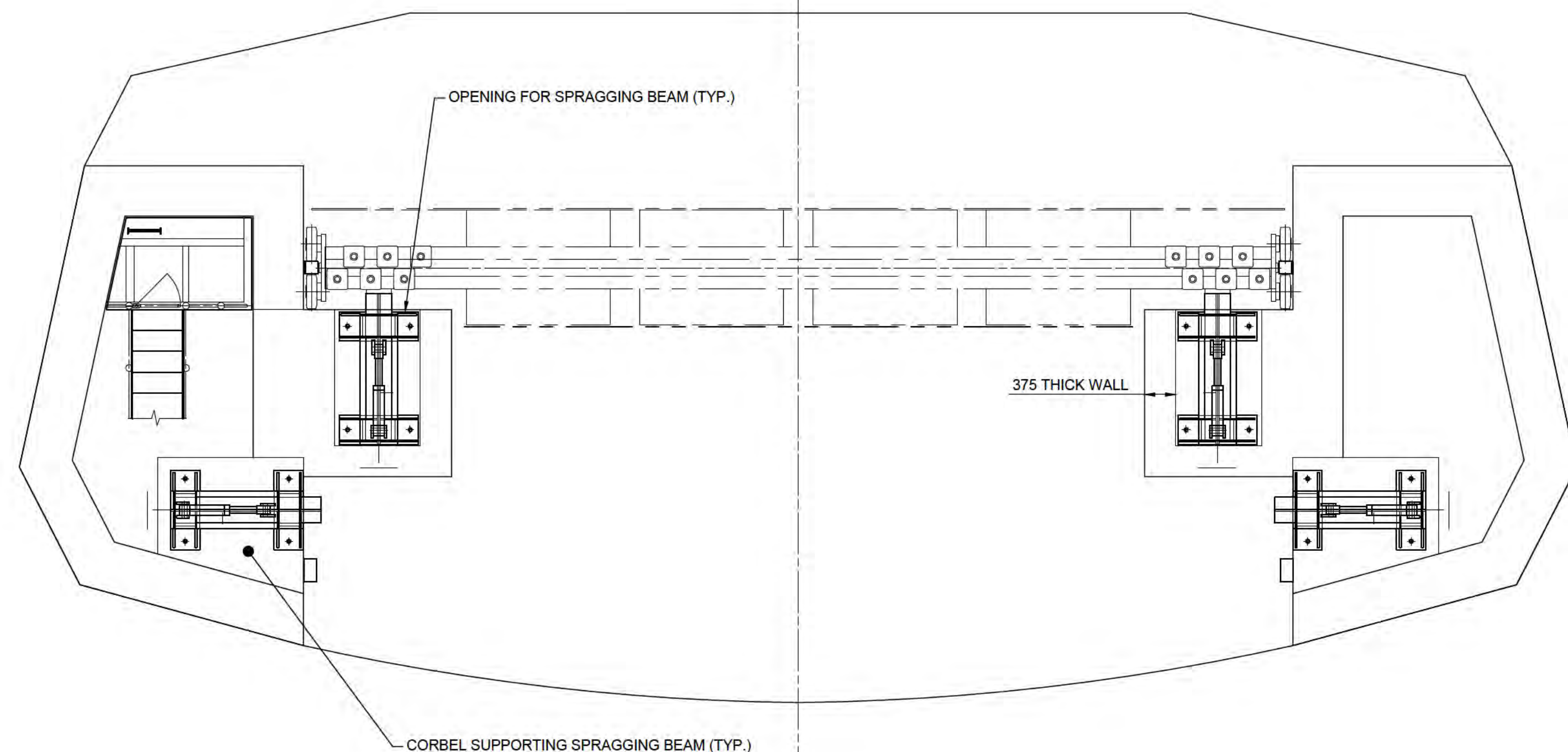
This technical drawing illustrates the internal layout of a tunnel boring machine (TBM) and its associated conveyor system. The top section shows a cross-section of the tunnel, with the cutterhead and conveyor system visible. The cutterhead is a large, circular structure with multiple cutting tools (cutters) arranged in a grid pattern. The conveyor system consists of a series of rollers and belts that transport the cut material from the cutterhead to the tunnel exit. The bottom section shows a side view of the machine, highlighting the conveyor system and the tunnel structure. The drawing includes various labels and dimensions, indicating the specific components and their relative positions within the machine.

DO NOT SCALE

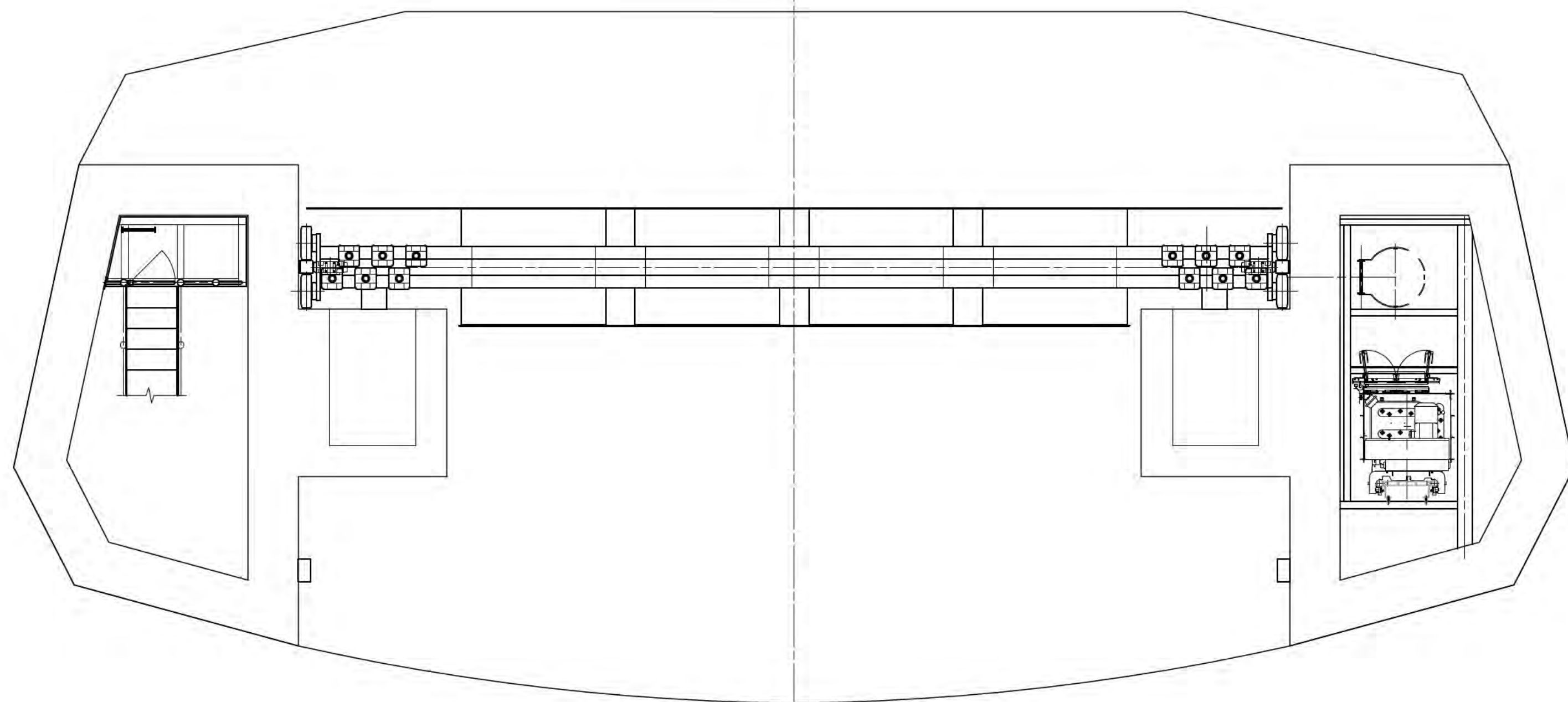




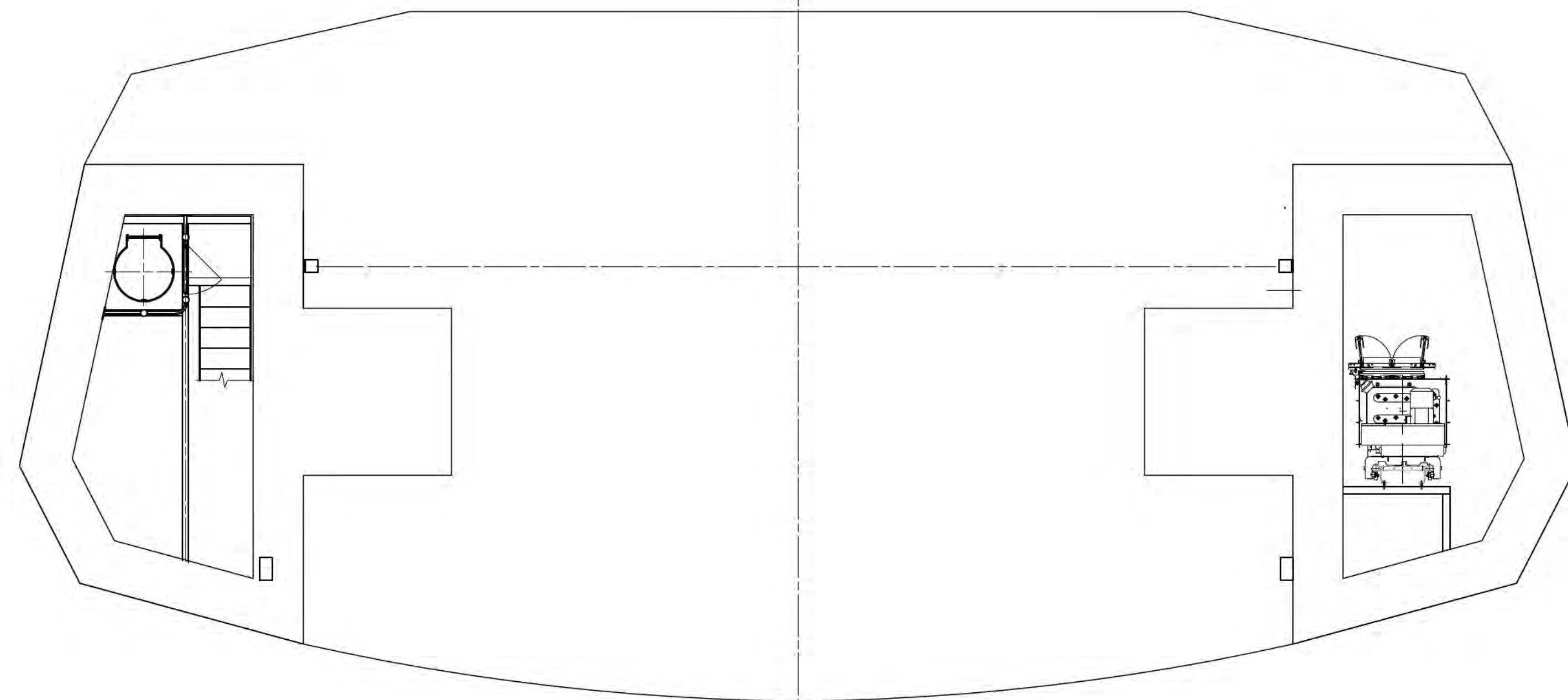
**B SECTION**  
00001 SCALE 1: 50



**D SECTION**  
00001 SCALE 1: 50



**C SECTION**  
00001 SCALE 1: 50



**E SECTION**  
00001 SCALE 1: 50

**SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION**

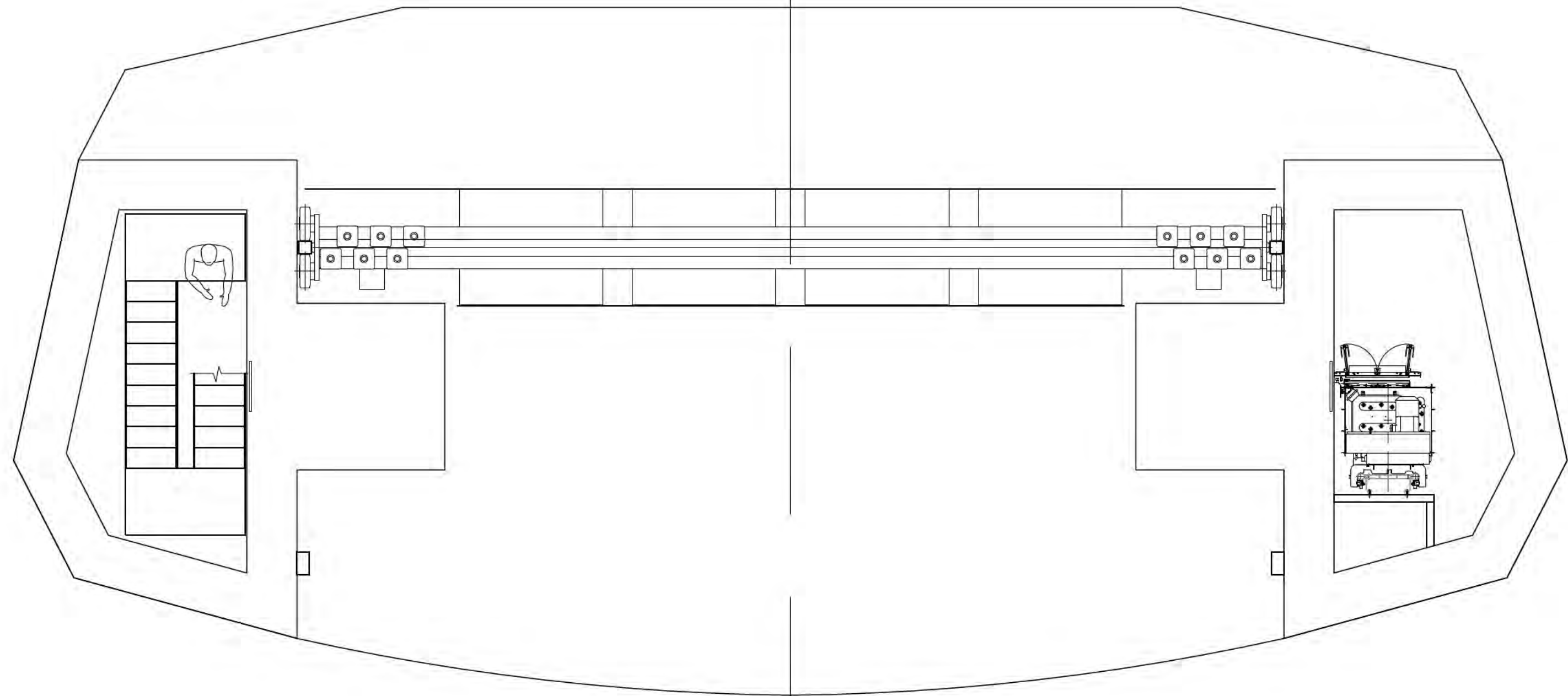
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NONE	NONE	NONE	NONE

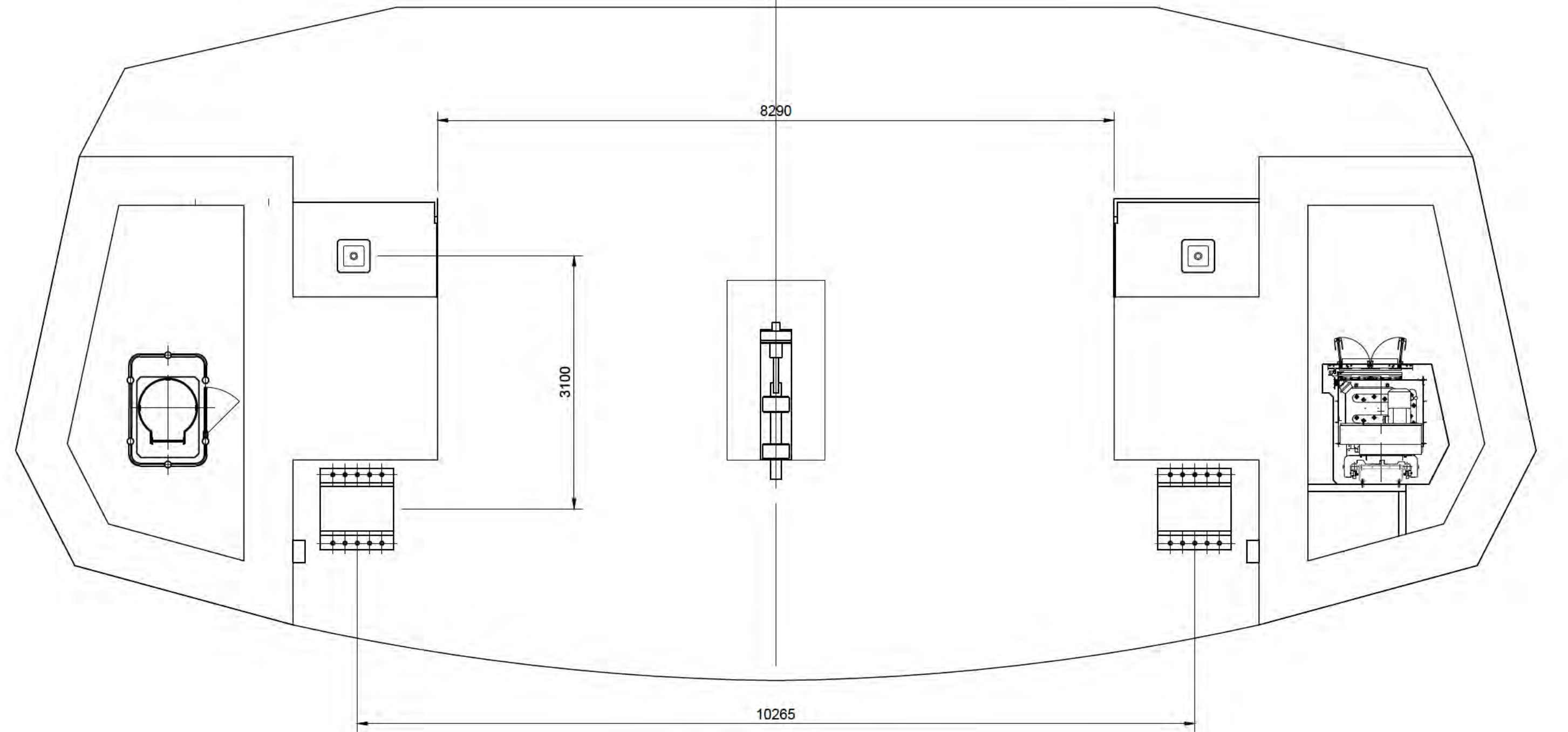
It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

Transport for London TfL Engineering				Traffic Design Engineering			
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ROTHERHITHE TO CANARY WHARF CROSSING				P01.1			
CONCRETE TOWER SECTIONS				ST_PJ585C-ATK-BAS-ZZ_21-DRG-ST-00002			
project	number	revision	location	type	role	number	number
© Crown copyright and database rights 2018 Ordnance Survey 100056711 / 0408							

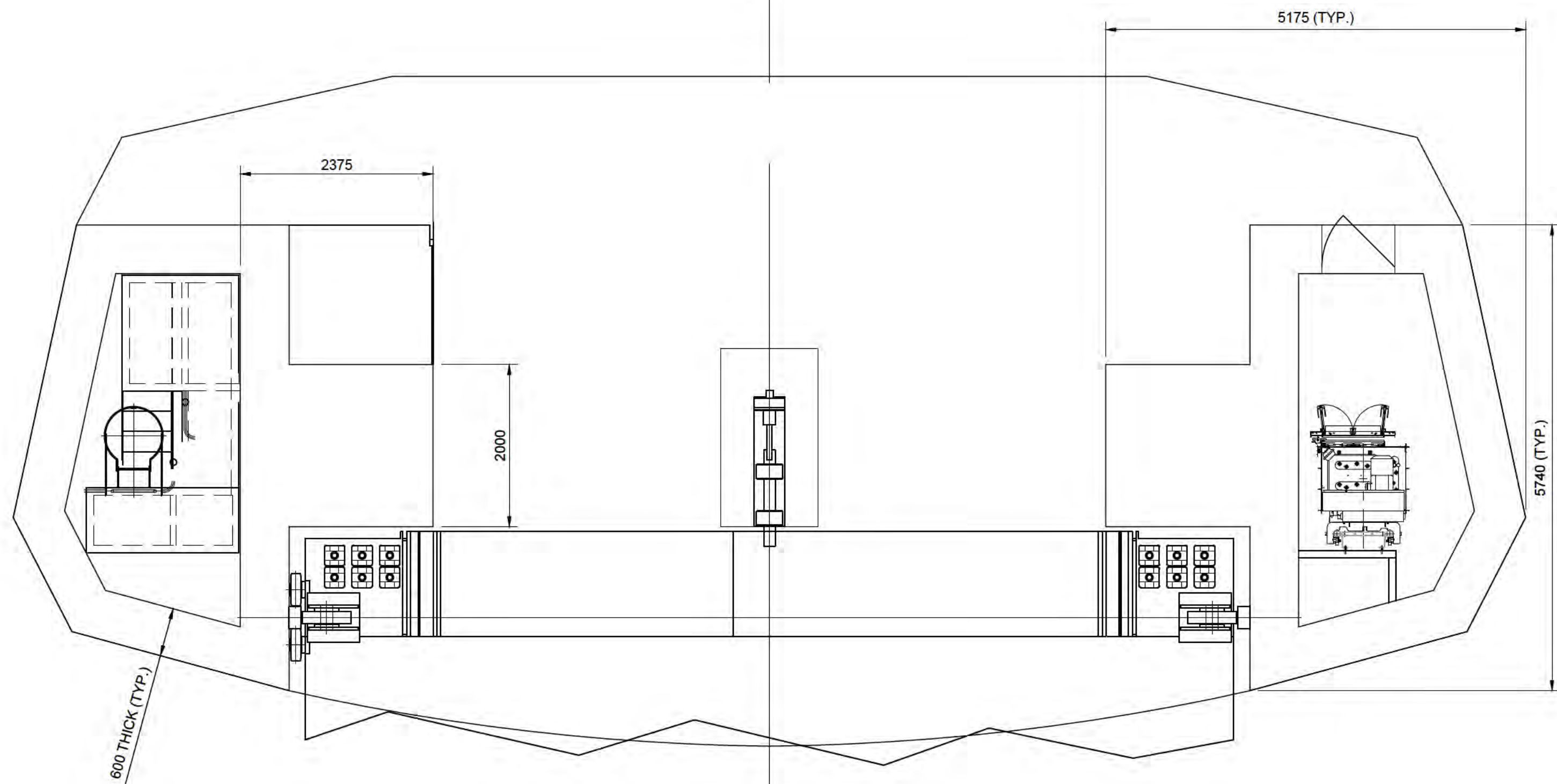




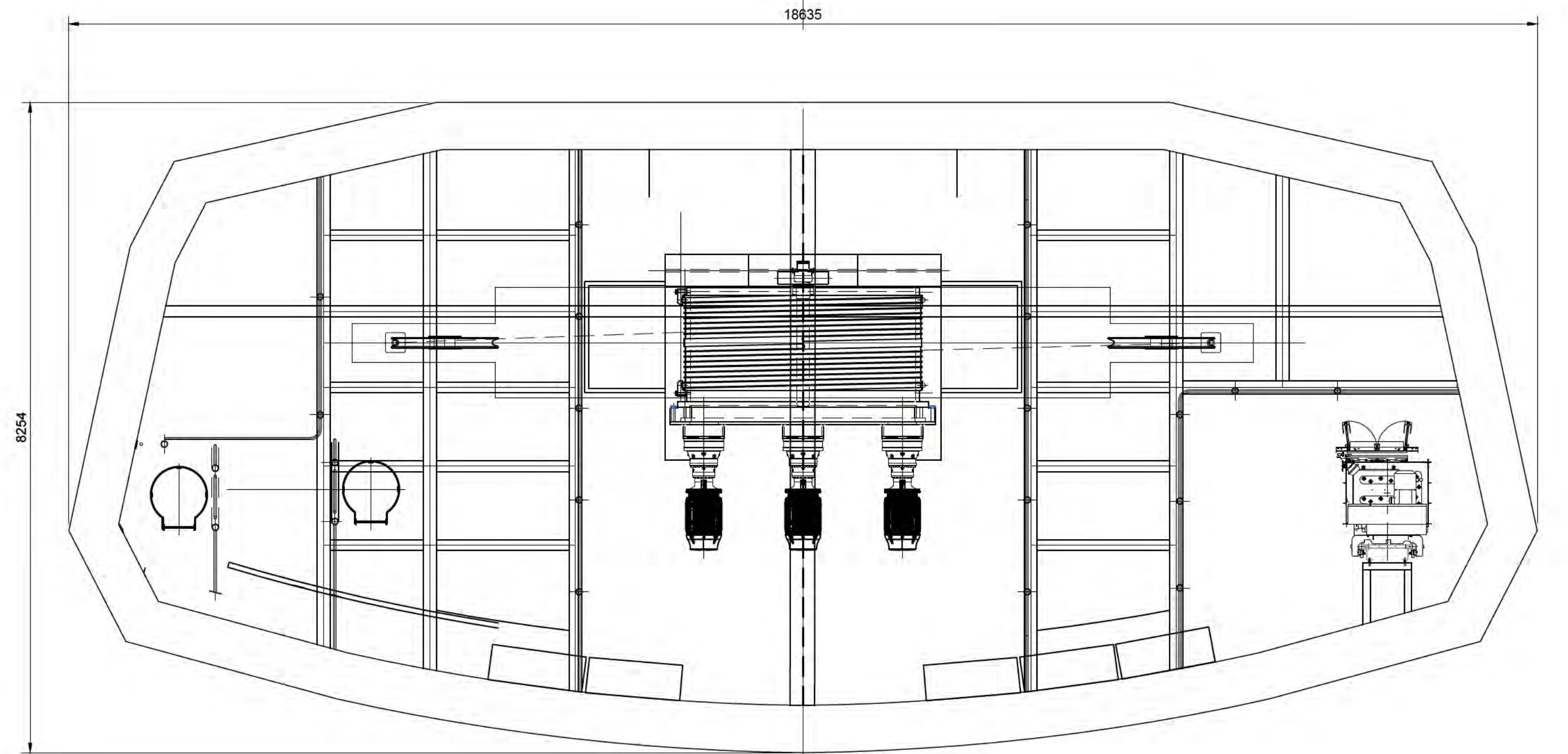
**F SECTION**  
00001 SCALE 1: 50



**H SECTION**  
00001 SCALE 1: 50



**G SECTION**  
00001 SCALE 1: 50



**J SECTION**  
00001 SCALE 1: 50

**SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION**

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

CONSTRUCTION	MAINTENANCE/CLEANING	OPERATION	DEMOLITION
NONE	NONE	NONE	NONE

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

Transport for London TfL Engineering				Traffic Design Engineering			
P01.1				FIRST ISSUE			
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Multiple Boroughs				WORK IN PROGRESS			
ROTHERHITHE TO CANARY WHARF CROSSING				P01.1			
CONCRETE TOWER SECTIONS				ST_PJ585C-ATK-BAS-ZZ_21-DRG-ST-00003			
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## Rotherhithe to Canary Wharf River Crossing

### VALUE ENGINEERING ASSESSMENT FORM

DATE: 21/09/2018

- Item Ref: VE25 – Main span lift counterweight – concrete with steel casing or other infill materials

### SUMMARY DESCRIPTION OF VE PROPOSAL

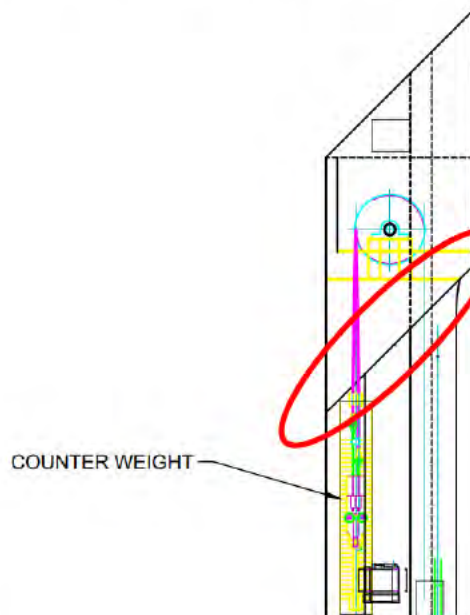
The baseline design of the lift counterweights considers solid steel billets supported by steel frame. The counterweight dimensions (approximate) considered in the design are **8m wide x 9.4m high x 1.4m thick**, which weighs approx. 826tonnes considering steel billets as infill. The counterweight will be designed as 90% of the total bridge weight to balance the deck during operation. The fabrication involves the steel frames to be transported to site and infilled with steel billets stacking over each other. Painting is required for maintenance and better aesthetics.

The VE25 is to propose the alternate cheaper options for the counterweight. The total weight of the 169m span bridge deck is approximately 1290t and considering 90% it will be 1161t. The counterweight on each end should weigh 581t. Considering the flexibility in available space, two options for the infill been considered.

Normal grade concrete: - is not considered in the VE proposals, as it requires the height of the counterweight to be increased by 3 times (due to restriction in plan dimensions). Increasing the height of the counterweight reduces the displacement between lifted and lowered position of counterweight. Increasing the height of the counterweight by 3 times requires the height of the tower to increase to achieve the required displacement for the lifting span.

Heavy weight concrete infill: - Concrete's density can be improved by adding dense aggregates such as limonite, hematite, or magnetite, or metal bits and scraps into the concrete mix. For example: MagnaDense (LKAB Minerals) in concrete can provide a density of typically 4.0 t/m<sup>3</sup>. When mixed with other iron-based materials, concrete including MagnaDense can achieve a density up to 5.0 t/m<sup>3</sup>.

Heavy weight concrete infill counterweight estimated size – **8m wide x 13m high x 1.4m thick**.



The reduction in displacement between lifted and lowered position of the counterweight due to the increase in height of the counterweight can be accommodated by either increasing the height of tower by 4m or removing the 45 degree architectural finish highlighted.



Cast iron billets infill: is indeed stronger and harder than concrete which automatically makes counterweights more resistant to impact and strains and guarantees longer fatigue life against cyclic stress. Usually counterweights need screws for fastening or mounting additional equipment.

The mass for cast iron is the same as that of steel; hence, the counterweight dimensions are expected to be the same as the baseline. The illustrated sketch of both the options are presented in drawing ST\_PJ585C-ATK-BAS-ZZ\_21-DIA-ST-00003.

#### ADVANTAGES:

- Potential for significant savings in material costs for both options.
- Steel casing is lighter to transport to site and can be infilled to the desired weight on site.

#### DISADVANTAGES:

- Concrete Infill material will have to be sufficiently dense to not increase tower height.
- The concrete's surface cracks easily and hardly support any additional constructions.

#### LIST OF SUPPORTING DOCUMENTS:

ST\_PJ585C-ATK-BAS-ZZ\_21-DIA-ST-00003 (Counterweight concept design & VE proposals)

Reference:



Figure 1 Cast Iron Billets



Figure 2 Example of Concrete counterweight

### IMPACT EVALUATION

#### COST BENEFIT

The baseline estimate currently includes a base construction cost of £1.7million for the fabrication and erection of the bridge counterweights. Applying Indirect costs on a pro-rata basis, this would translate to an Estimated Final Cost (EFC) of £5.9 million.

Heavyweight concrete, even if incorporating a dense aggregate such as limonite, hematite, or magnetite, or metal scrap would be cheaper in respect of its material supply costs than the steel billets currently allowed for. Initial research suggests that the material in terms of its cost per tonne would be significantly cheaper as a material than cast steel, although this is dependent on the actual aggregates/material used, its availability and the manner in which it can be transported to the tower locations. We would suggest therefore that the maximum reduction in EFC would likely be in the order of £1.8 million. If however, as has been suggested above, this would also result in the need to increase the tower height to accommodate a larger counterweight, this would eliminate this saving entirely and would actually result in an increased overall EFC.

It is anticipated that Cast iron counterweight billets would be cheaper in respect of their material supply costs than the steel billets currently allowed for. Initial research suggests that cast iron billets would be circa 30-40% cheaper as a material than cast steel, although this is dependent on the actual grades used. This would not result in a similar percentage overall reduction in EFC however as the erection element of the costs will likely remain unaltered and it is assumed that there will still be a need to construct a similar

steel frame to contain them. We would suggest therefore that the reduction in EFC would likely be in the order of £0.8 million.

- 

#### **PROGRAMME BENEFIT**

- Cast in place construction of concrete consumes more time than the installation of cast iron counterweights.

#### **RISK EVALUATION**

- For concrete counterweights, there will be an increase in height of the counterweight, which may increase the total height of the tower and it requires consents of local Authority / Transport and Work Acts Order (TWAO) to fit in with surrounding environment.

#### **ENVIRONMENTAL**

- Cast iron is a product of recycling and doesn't require any extraction of new raw materials, which is not the case with concrete.
- Cast iron has less carbon foot print.

#### **BUILDABILITY**

Heavy weight concrete counterweights – The concrete will be casted at site using dense aggregates with encased steel frames. Special care to be taken during handling and concreting.

Cast iron billets counterweights – Iron billets will be procured and transported to site and will be stacked in layers encased by steel frames.

Both the options may require very large, one-off castings moved into place with heavy lift material handling equipment.

#### **SAFETY**

Necessary safety measures to be implemented for transportation, concrete mixing and shutter formwork of heavy weight concrete using dense aggregates.

#### **OPERATIONS AND MAINTENANCE**

Heavyweight concrete / cast iron billets counterweights require less maintenance than steel ones and do not require any corrosion protection measures.

Concrete counterweights will be encased with steel frames to avoid any damage during lift operation.

Considering the bridge weight and distributions (deck replacement, new span locks etc...) can change during its life time, counterweights to be designed to allow for the adjustment of bridge balance by providing a pocket. The pockets are then partially filled with smaller blocks to adjust the balance of the bridge.

#### **ACCEPTANCE**

Prepared: [REDACTED]

Name: Deepak [REDACTED]

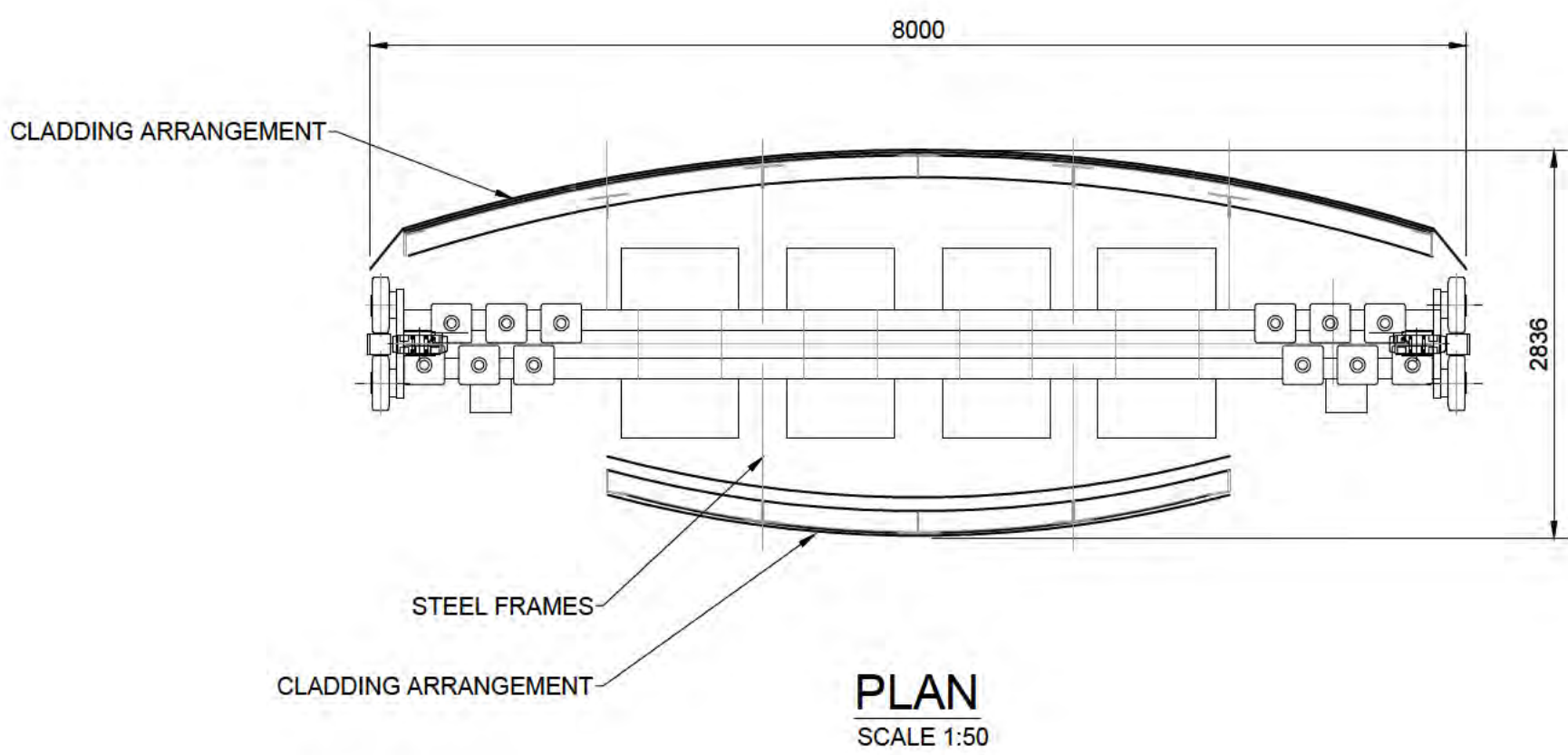
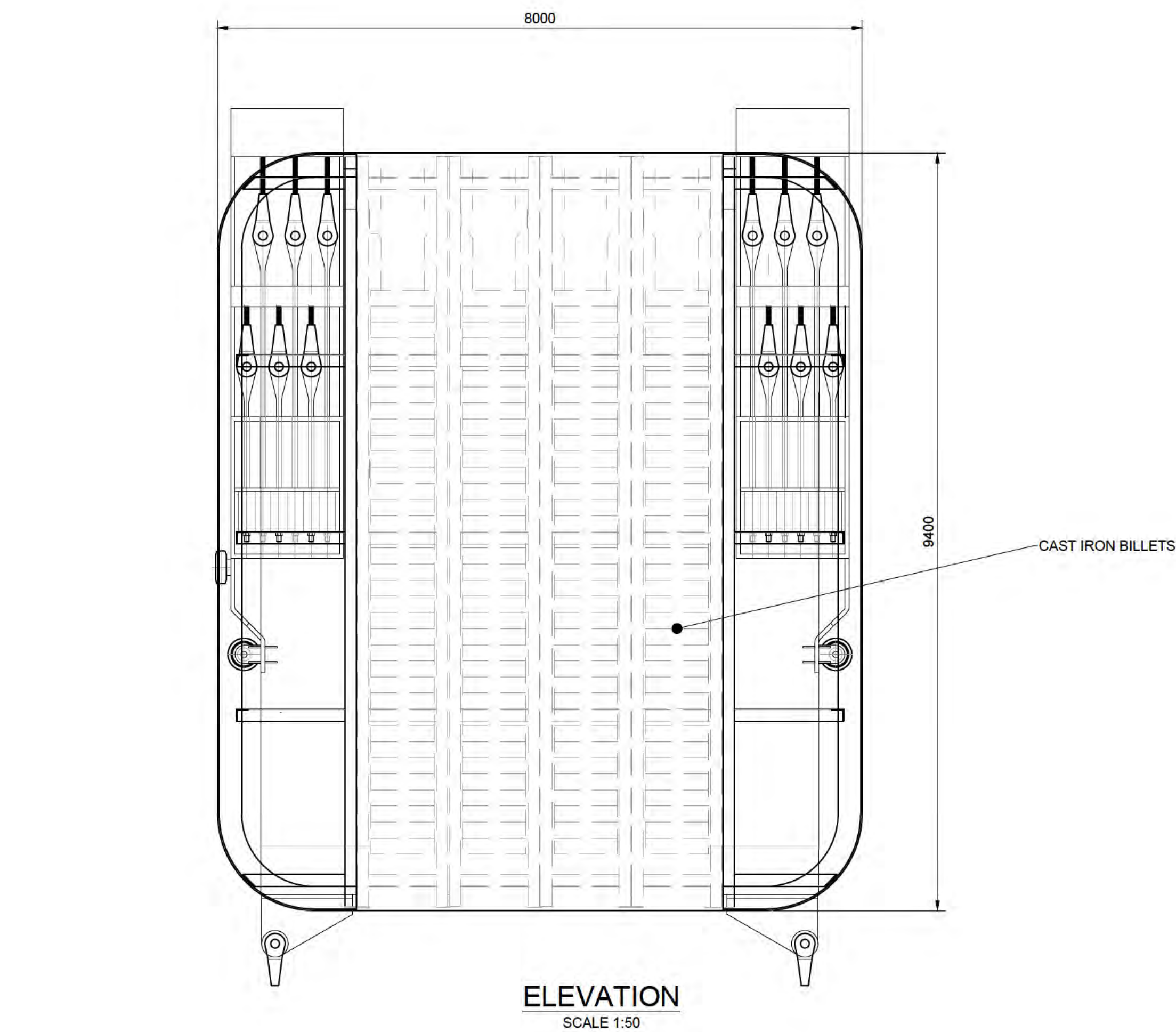
Signed [REDACTED]



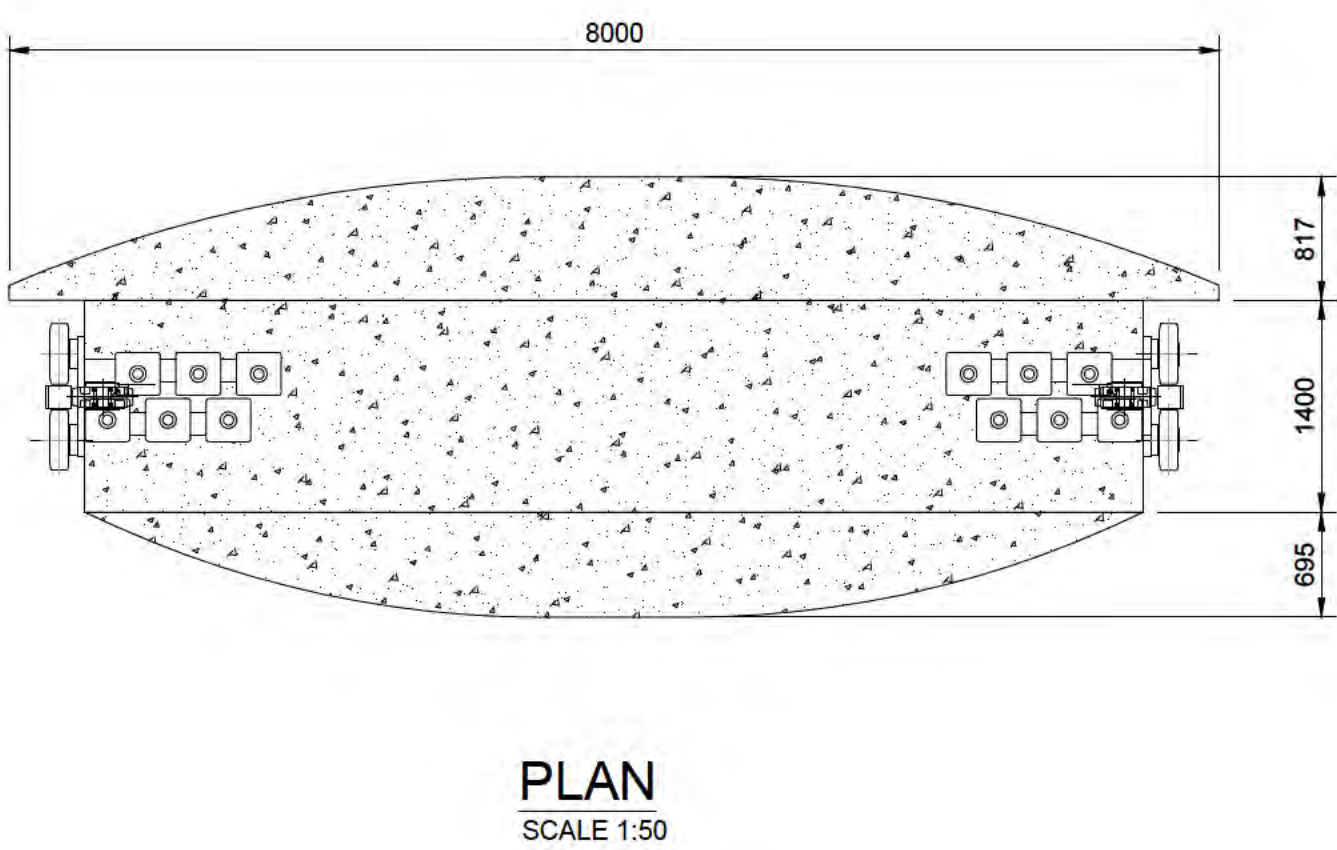
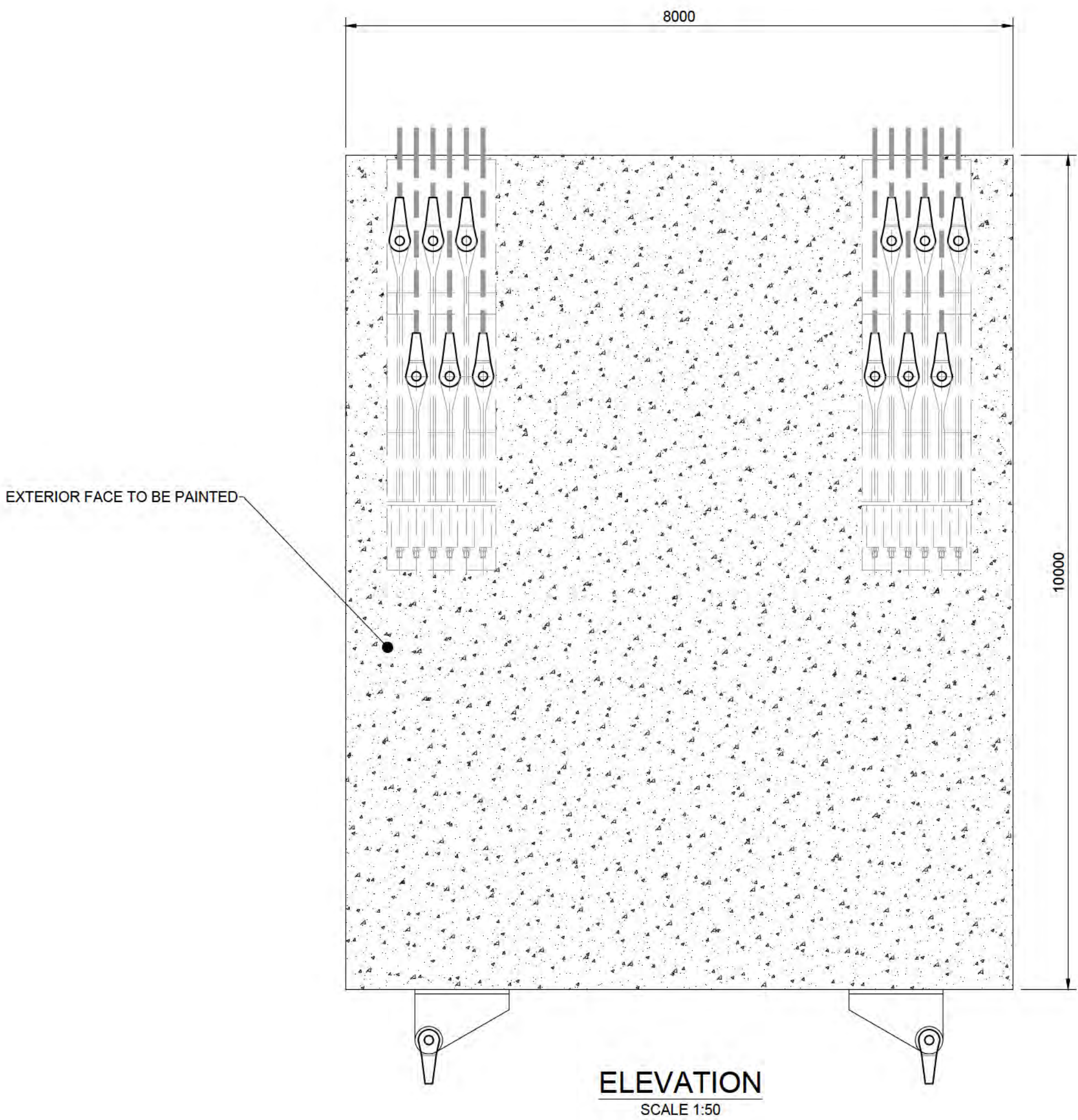
<b>Proposal Implemented:</b>	<b>Y / N</b> (Delete as appropriate)	
<b>Approved by:</b>	<b>Name:</b>	<b>Signed:</b>
<b>IMPLEMENTATION</b>		
<b>COMMENTS / ACTIONS</b>		
To be completed by TfL		



OPTION A: COUNTER WEIGHT INFILLED WITH CAST IRON BILLETS



OPTION B: HEAVY WEIGHT CONCRETE COUNTER WEIGHT



NOTE:- REFER TO APPENDIX - A & B FOR DIMENSIONS, LEVELS & OTHER DETAILS.

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## Rotherhithe to Canary Wharf River Crossing

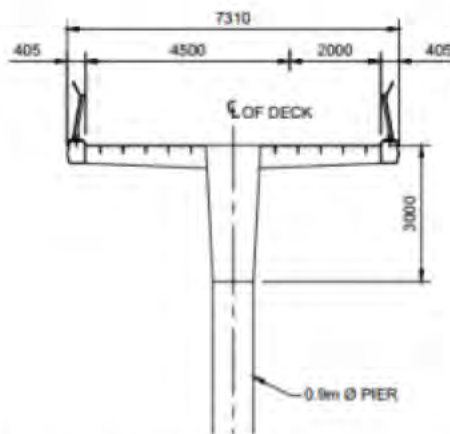
### VALUE ENGINEERING ASSESSMENT FORM

DATE: 21/09/18

- Item Ref: VE26 – Approach Span Deck Form  
VE28 – Maximise Approach Ramp Spans to Minimise Number of Piers in the River

### SUMMARY DESCRIPTION OF VE PROPOSAL

For the approach spans, the Arcadis feasibility design consist of steel box girders below deck level with an orthotropic steel deck. The spans range from 20m-55m. The depth of the steel box girder varies depending the length of the span.



Ref: ST\_PJ585C-ARC-BAS-ZZ-REP-CE-100014 Bridge Feasibility Report Appendices.

The structural form enables a slender long span structure (minimising the number of piers and foundations in the river); however, the steel orthotropic deck requires complex and expensive steel fabrication and construction costs.

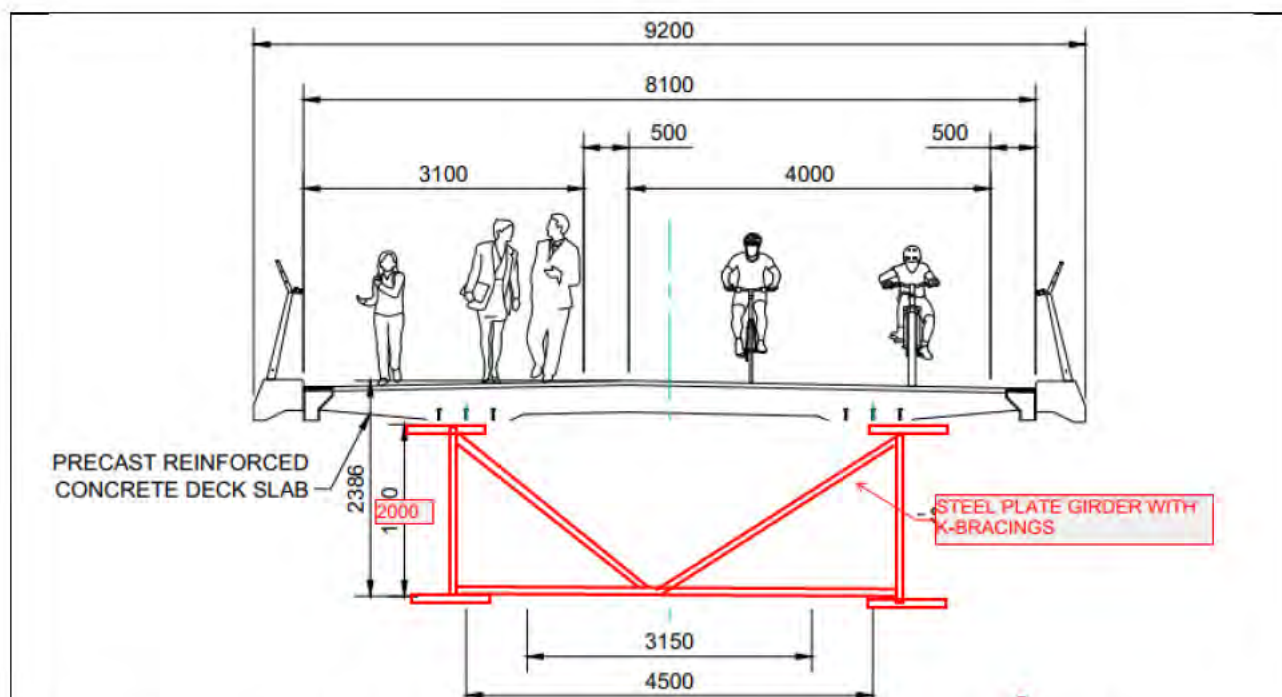
The VE26 proposal consists of modifying the approach ramp structural form with the aim of minimising the cost of complex steel fabrication and maximising the approach ramp span lengths to minimise the number of piers and foundations in the river.

A concrete composite (steel box girder and RC deck) was considered to maintain the long span and minimise the steel costs. The cross-section details can be seen in ST\_PJ585C-ATK-BAS-ZZ\_12-DM2-ST-00012. The 40m and 55m span lengths have been considered.

#### Steel Plate I-girders with composite deck slab:

The alternate option to steel box girder for approach span is Steel plate I-girders stiffened with intermediate K-bracings (say 2.5m approx.) as shown in below Figure 1. The approximate quantity of steel for the I-girder option is 266 kg/m<sup>2</sup> (nearer to steel box girder quantity). The key advantage is significant reduction in fabrication costs compared to steel box girders although material costs are same, and the disadvantage is it is not visually appealing to the surroundings. This needs further investigation and discussion with the client and contractor about the feasibility and costs savings.





**Figure 1 - Steel Plate Girder (with K-bracings & concrete deck) – alternate option to box girder**

ADVANTAGES:	DISADVANTAGES:
<ul style="list-style-type: none"> <li>• The concrete composite structural form minimises the amount and cost of steel used.</li> <li>• The long spans minimise the amount of river works required.</li> </ul>	<ul style="list-style-type: none"> <li>• The deck form is deeper than steel only option, which will influence the aesthetics of the structure.</li> <li>• The deck form is heavier than steel only option.</li> </ul>
<b>LIST OF SUPPORTING DOCUMENTS:</b>	
<ul style="list-style-type: none"> <li>- 5162977-43-0215 C1 vs C2 Comparison P02</li> <li>- ST_PJ585C-ATK-BAS-ZZ_12-DM2-ST-00012 (Approach Span GA with composite deck layout)</li> </ul>	
<b>IMPACT EVALUATION</b>	
<b>COST BENEFIT</b>	
<p>A number of option estimates have been prepared and previously reported incorporating a composite deck design and potential associated increases in the spans between piers. The most pertinent of these are as follows:</p> <ul style="list-style-type: none"> <li>- Provision of Composite deck form to CB5-CA5 alignment, maintaining 40m pier spacings. The anticipated saving in EFC for this option was £9.1 million.</li> <li>- Provision of Composite deck form to CB5-CA5 alignment, increased pier spacings to 55m. The anticipated saving in EFC for this option was £15.2 million.</li> </ul>	

A composite deck design has now been adopted as part of the Concept Design proposals and any savings generated by this will therefore be incorporated within the Concept Design Capital Cost estimate.

#### **PROGRAMME BENEFIT**

It is anticipated that the steel only deck form can be lifted into position in one lift.

The composite form deck form will be significantly heavier; hence it may be preferable to lift the concrete deck separately or pour insitu. This will extend the programme appropriately.

#### **RISK EVALUATION**

All the risks pertaining to cast in situ concrete construction of deck slab (for the approach spans) over the river needs to be evaluated.

#### **ENVIRONMENTAL**

Increased environmental risk of any concrete leak /spillage into the river during cast in place construction of deck over River Thames.

#### **BUILDABILITY**

Steel girders shall be fabricated, transported to site (with temporary bracings) and installed in its place. The concrete deck slab can be achieved by either cast in place construction (requires permanent formwork, concrete batch plant & handling at the site) or using precast slabs with stitch concrete at connections (slabs will be erected using cranes / barges).

#### **SAFETY**

Increased HS risk for casting of concrete deck slab– working at height and over the River Thames for long period.

#### **OPERATIONS AND MAINTENANCE**

Concrete deck requires less maintenance compared to steel plate decks which requires protective coating against corrosion and needs to be repainted at regular intervals.

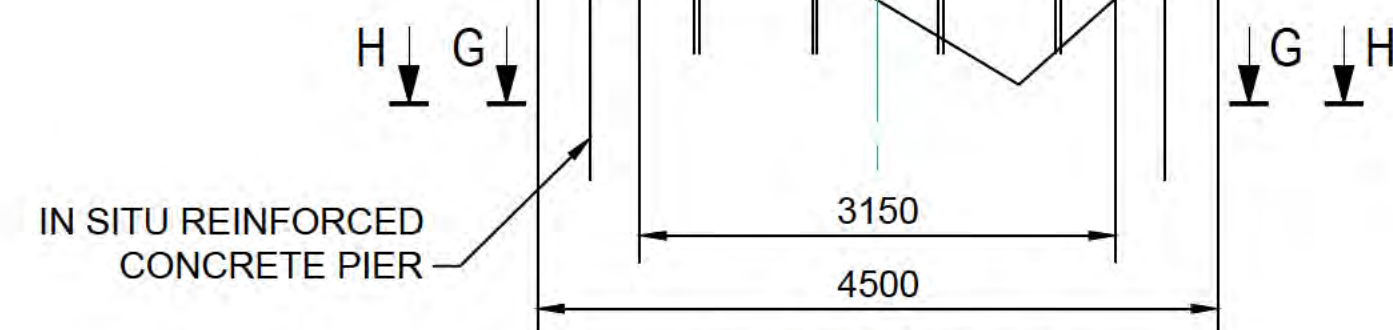
#### **ACCEPTANCE**

Prepared: [REDACTED]	Name: [REDACTED] Krishnan	Signed: [REDACTED]
Proposal Implemented:	Yes, implemented in the core design with changes	
Approved by:	Name:	Signed:

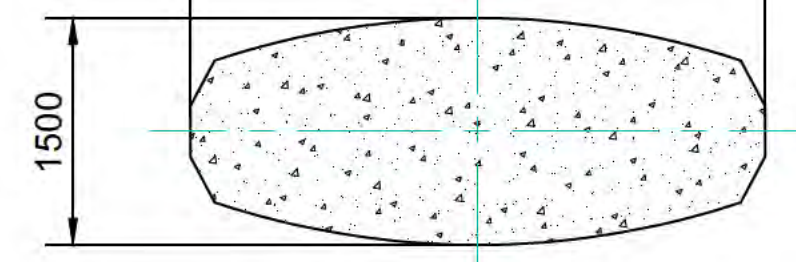
#### **IMPLEMENTATION**

COMMENTS / ACTIONS
To be completed by TfL

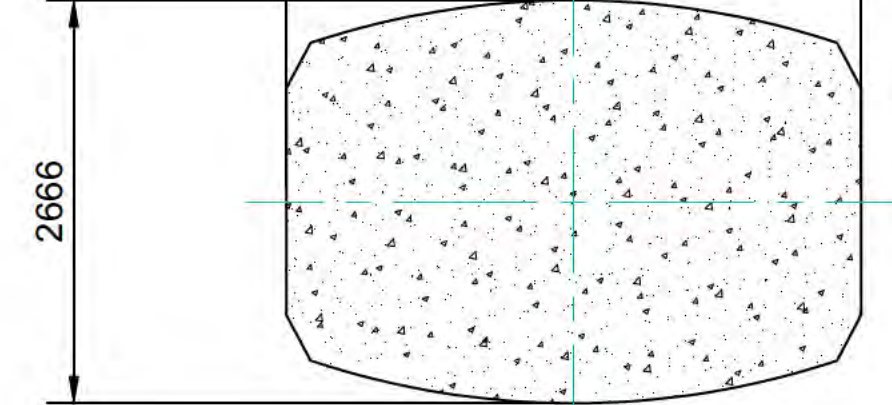




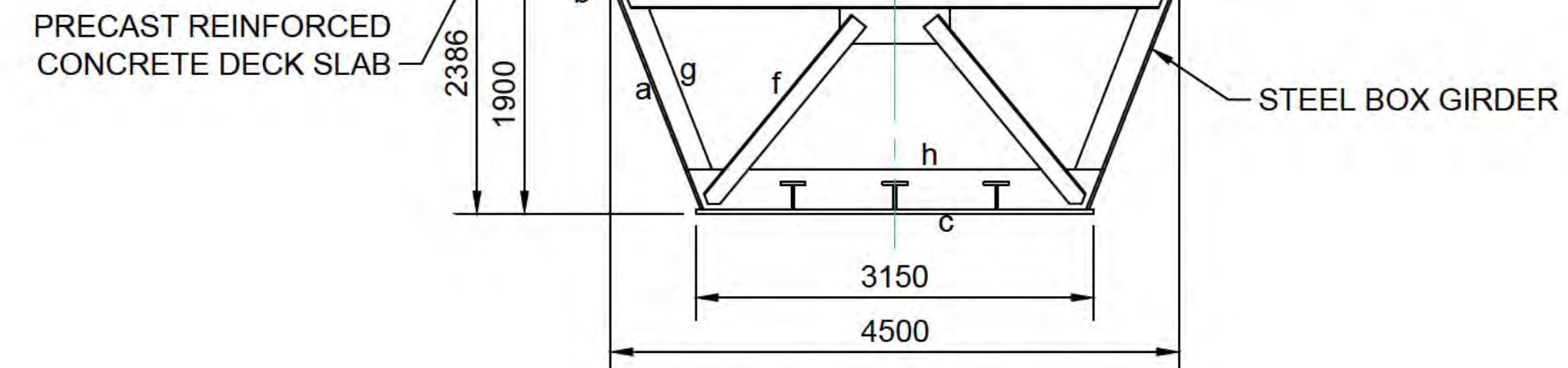
TYPICAL AT PIERS  
(SCALE 1:50)



SECTION THROUGH  
INTERMEDIATE PIER  
(SCALE 1:50)

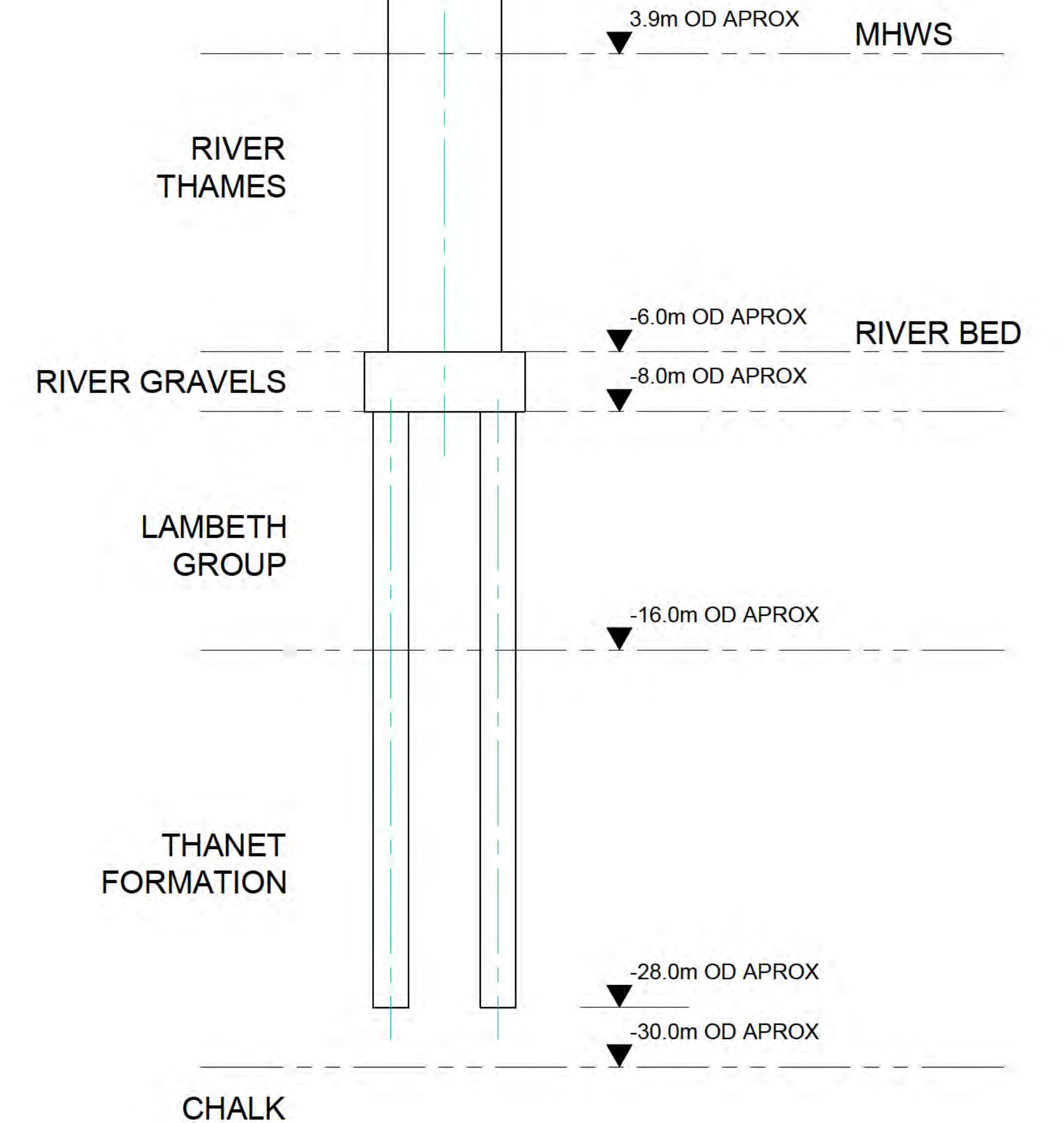


SECTION THROUGH PIER  
AT EXPANSION JOINTS  
(SCALE 1:50)



TYPICAL BETWEEN PIERS  
(SCALE 1:50)

ID	MEMBER	PIER SECTION	SPAN SECTION
a	WEBS	30 THK	20 THK
b	TOP FLANGE	800 x 65	800 x 30
c	BOTTOM FLANGE	3150 x 45	3150 x 30
d	DIAPHRAGM	25 THK	-
e	K BRACING - HORIZONTAL	-	200 x 200 x 12
f	K BRACING DIAGONAL	-	150 x 150 x10
g	WEB STIFFENER	-	200 x 20
h	BOTTOM FLANGE STIFFENER	-	325 x 20



PRELIMINARY FOUNDATIONS BACK SPAN PIER  
(SCALE 1:150)

## NOTES

1. DO NOT SCALE.
2. THIS DRAWING IS IN MILLIMETRES.

[illegible]



## Rotherhithe to Canary Wharf River Crossing

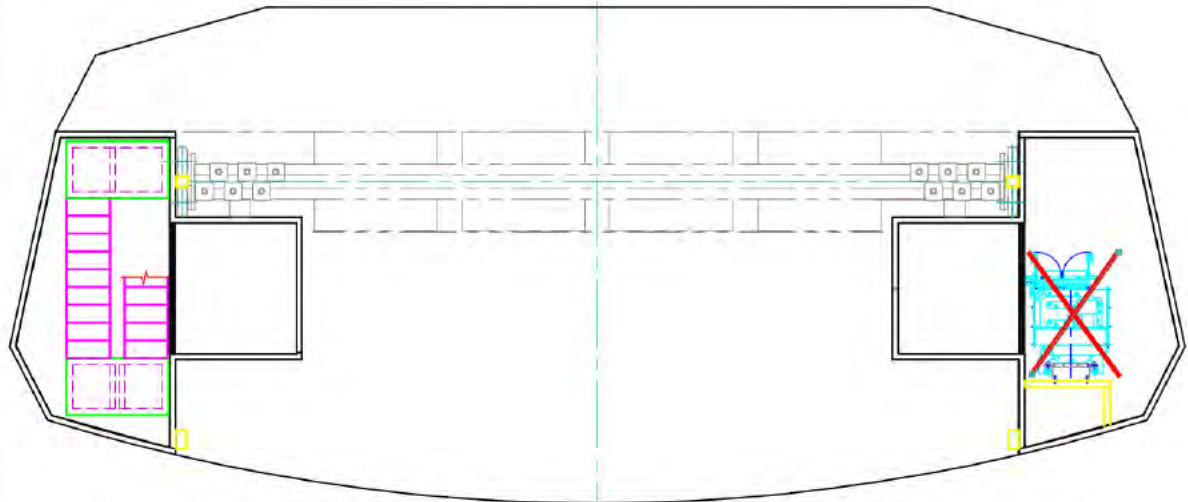
### VALUE ENGINEERING ASSESSMENT FORM

DATE: 22/08/18

Item Ref: VE31 – Remove maintenance access elevator and replace with stairs (and hoist / winch for equipment)

### SUMMARY DESCRIPTION OF VE PROPOSAL

In VE31, it is proposed to remove the two maintenance access elevators located within the main span towers.



**Figure 1 Tower cross-section showing the proposal to remove access elevator located inside the tower**

Maintenance access stairs are already proposed on other side of the tower; it is proposed to retain the elevator shaft but replace the elevator with a motorised hoist / winch. The hoist / winch would allow equipment to be moved within the pier. It would also allow the emergency evacuation of an injured person but avoiding the need to use the staircase. Safety concerns involved are access to the steel wire ropes, spragging beams on lift shaft tower for periodical inspections and it cannot be achieved with motorised hoist / winchs.

Note: Inspection / maintenance at the top of the tower is expected every 3 months (including rope inspection at top deck) and a 6-month discharge period for automatic lubricator.

#### ADVANTAGES:

Reduced capital requirements & lift maintenance costs

#### DISADVANTAGES:

Maintenance operations would take longer.

Manual handling no longer eliminated from equipment movement activity.

Climbing 75m tower every 3 months (for inspection) is a H&S concern.

#### LIST OF SUPPORTING DOCUMENTS:

- [ST PJ585C-ATK-MEC-ZZ 21-REP-ME-00002](#) (Operational Concept Report)
- [ST PJ585C-ATK-MEC-ZZ 12-REP-ME-00001](#) (Atkins Lifting Span M&E AIP)

## IMPACT EVALUATION

### COST BENEFIT

Item	Description	Effect on CAPEX	Effect on OPEX
Elevator cost	Removing the elevator would result in a reduced structure costs. Moving plant within the structure would take longer, potentially increasing operational costs due to increased maintenance time. A manually operated hoist / winch would result in further CAPEX reductions, but a further increase in OPEX when compared to a motorised hoist / winch. This is because the hoist / winching operations would take longer.	Initial assessment is that saving in EFC could be in the order of £1.0 to £1.5 million but this would be dependent on the nature of the equipment installed in lieu of the lift.	Negative in respect of maintenance activities potentially taking longer but there would be a saving in lift maintenance and renewals costs.

### PROGRAMME BENEFIT

Item	Description	Effect on programme
Elevator installation	Removing the elevator would offer a minor reduction in construction time	Beneficial

### RISK EVALUATION

Item	Description	Effect on risk
Moving plant	Manual handling risk was reduced when using an elevator. Replacing the elevator with a hoist / winch increases the amount of manual handling operatives must complete. There is a total increase in the risk to operatives. The manual handling increases further if a manual hoist / winch is used.	Negative
Maintenance access	Maintenance access in the lift shaft tower to the steel wire ropes, spragging beams (required for periodical inspection) needs to be evaluated	Negative

### ENVIRONMENTAL

Item	Description	Effect on the environment
Elevator installation	Removing the elevator decreases the total amount of embodied carbon within the structure.	Positive

### BUILDABILITY



Item	Description	Effect
Elevator installation	Removing the elevator will increase the buildability of the structure. However, the buildability of any repair work will decrease as component weights may be limited by the hoist / winch capacity.	Neutral
<b>SAFETY</b>		
Item	Description	Effect
Safety	Appropriate safety measures to be followed while using the winch / hoist to lift machines such as tracker, monitor, trigger etc...	Neutral
<b>OPERATIONS AND MAINTENANCE</b>		
Item	Description	Effect
Manual handling	Manually elevating components using a hoist / winch is more time consuming than using an elevator. There also may be a limit on the size of components that can safely be elevated.	Negative
<b>ACCEPTANCE</b>		
Prepared: [REDACTED]	Name: [REDACTED]	Signed: [REDACTED]
Proposal Implemented:		
Approved by:	Name:	Signed:
<b>IMPLEMENTATION</b>		
<b>COMMENTS / ACTIONS</b>		
To be completed by TfL		

Rotherhithe to Canary Wharf River Crossing	
<b>VALUE ENGINEERING ASSESSMENT FORM</b>	<b>DATE: 23/08/18</b>
<i>Item Ref: VE32 – Remove backup generators. Replace with hook-up generator</i>	
SUMMARY DESCRIPTION OF VE PROPOSAL	
<p>In the baseline design, the backup generator (Permanent Enclosed generator) is proposed to supply power to the lifting mechanism in the event of a power failure. It is supplemented by an uninterruptable power supply (UPS) that powers control and instrumentation while the generator powers up. The baseline design considers UPS to supply 30 mins of power.</p> <p>In VE32, considering the probability of emergency power failure it is proposed to remove the backup generator and in the event of a power failure, a portable generator (such as mobile diesel generators) shall be brought on to the site and connected to the lifting motors (3 phase). Therefore, the UPS would need to run for longer, as the time between the two power supplies being operational would increase.</p> <p>The time to replace any power supply would significantly increase as backup would need to be sourced, transported (amidst city traffic) and installed near the bridge deck.</p> <p>A power failure is an infrequent event, either due to planned maintenance period by power companies or due to unplanned maintenance or accidental power failure which may unlikely to happen (approx. sequence TBC from data analysis of power failures – see Risk Evaluation). A power failure would keep the main span in the open or closed position as the spragging beams would keep it locked in its position. A power failure would only prevent bridge deck moving. Hence, by removing a backup generator, would not influence pedestrian/cyclist safety.</p>	
ADVANTAGES:	DISADVANTAGES:
<ul style="list-style-type: none"> <li>Reduced capital requirements &amp; maintenance costs.</li> <li>Fire and safety risks of storing fuel can be eliminated by removing generator plant within the towers.</li> </ul>	<ul style="list-style-type: none"> <li>Replacement of the power supply will take longer time (to connect to portable generators).</li> <li>The UPS would need to work for a longer period (approx. 1~1.5hrs, assumption considering the transportation of mobile diesel generators to the site) between the change in power source.</li> <li>There is a risk that the bridge remains closed when passage of vessels over 12m height is required during the longer period (approx. 1~1.5hrs,) and unlikely to be acceptable to PLA.</li> </ul>
LIST OF SUPPORTING DOCUMENTS:	
<ul style="list-style-type: none"> <li><a href="#">ST PJ585C-ATK-MEC-ZZ 21-REP-ME-00002</a> (Operational Concept Report)</li> <li><a href="#">ST PJ585C-ATK-MEC-ZZ 12-REP-ME-00001</a> (Atkins Lifting Span M&amp;E AIP)</li> </ul>	
IMPACT EVALUATION	

COST BENEFIT			
Item	Description	Effect on CAPEX	Effect on OPEX
Cost	Omission of the backup generator & associated plant room would reduce the overall CAPEX. It would also eliminate the testing and inspection costs associated with maintaining a backup generator. However, a UPS with a longer supply duration would be required. Hiring a mobile power supply will incur cost.	Without further details as to the exact nature of the equipment type etc. being omitted and/or substituted it is not possible to assess the potential cost saving with certainty. An initial assessment would be that the potential saving in EFC is likely to range from £0.8 to 1.2 million.	Whilst the Maintenance and renewals cost associated with the generator versus an upgraded UPS is likely to reduce, there is a greater risk of additional OPEX costs being incurred dependent on the frequency at which a mobile power supply is required.
PROGRAMME BENEFIT			
Item	Description	Effect on programme	
Backup Power supply omission	Removal of the backup power supply & associated building of generator plant room from the programme would have a considerable reduction on the programme duration.	Positive	
RISK EVALUATION			
Item	Description	Effect on risk	
Mobility	Transportation of mobile diesel generators from the supplier to the bridge at canary wharf in a shorter time (amidst busy city traffic) needs to be evaluated.	Negative	
Backup Power supply omission	Probability of emergency / accidental power failure during bridge lifting operations needs to be evaluated.	Positive / Negative	
	PLA approval required for a low probable risk that the bridge remains closed when passage of vessels over 12m height is required during the longer power-off period (approx.1~1.5hrs,)	Negative	
ENVIRONMENTAL			



Item	Description	Effect on the environment
Backup Power supply omission	Elimination of storing fuel in the plant room near the river or buildings is positive to the environment. Eliminating generator plant room construction reduces carbon footprint on the site.	Positive
<b>BUILDABILITY</b>		
Item	Description	Effect
Omission of plant room	Building of generator plant room can be eliminated and space to be identified (near bridge deck or river bank sides) for the mobile diesel generator during power failure.	Positive
<b>SAFETY</b>		
Item	Description	Effect
Backup Power supply omission	Enhanced fire safety due to removal of fuels storage near the bridge site.	Positive
<b>OPERATIONS AND MAINTENANCE</b>		
Item	Description	Effect
Backup Power supply omission	In the event of a power failure, a mobile backup generator would have to be sourced, transported and installed. All the while, the UPS would need to maintain control and instrumentation telemetry.  This would result in an increased duration of the lifting elements being non-operational.	Negative
<b>ACCEPTANCE</b>		
Prepared: [REDACTED]	Name: [REDACTED]	Signed: [REDACTED] [REDACTED]
Proposal Implemented:	Yes	
Approved by:	Name:	Signed:
<b>IMPLEMENTATION</b>		
<b>COMMENTS / ACTIONS</b>		
To be completed by TfL		

Rotherhithe to Canary Wharf River Crossing	
<b>VALUE ENGINEERING ASSESSMENT FORM</b>	<b>DATE: 21/09/18</b>
- Item Ref: VE33 – Carbon Fibre Ropes	
SUMMARY DESCRIPTION OF VE PROPOSAL	
<p>VE33 proposes replacing the main span lift ropes (Counter &amp; drive ropes) with carbon fibre lift ropes.</p> <p>Lift manufacturers generally use steel cords coated with elastomeric material or carbon fibre belts.</p> <p>The main advantage of the belt construction is that the smaller diameter cords permit use of significantly smaller radius pulleys and sheaves, enabling much more compact machinery. Furthermore, monitoring systems are available which permits continuous measurement of cord diameter, for assessment of remaining usable life. It is unknown what the cost comparison is vs steel ropes, however it's widespread use amongst leading elevator suppliers would suggest a cost benefit.</p> <p>The main issue regarding implementation on a moveable bridge is patents. The carbon fibre belt technology is protected by the respective lift manufacturing companies, as suggested by supporting document 1. Furthermore, because the technology is protected there are no publicly available standards to cover this, refer to support document 2.</p> <p>Hence, it is recommended this is not progress further.</p>	
ADVANTAGES:	DISADVANTAGES:
<ul style="list-style-type: none"> <li>Reduced maintenance costs</li> <li>Durable and corrosion resistant</li> </ul>	<ul style="list-style-type: none"> <li>The product needs to be tested and certified by the EU approval authority.</li> <li>Non-availability of published standards for design and manufacturing.</li> <li>Patented to few companies.</li> </ul>
LIST OF SUPPORTING DOCUMENTS:	
<ol style="list-style-type: none"> <li><a href="https://www.schindler.com/com/internet/en/media/press-releases-english/press-release-2014/otis-and-schindler-announce-settlement-and-license-agreement.html">https://www.schindler.com/com/internet/en/media/press-releases-english/press-release-2014/otis-and-schindler-announce-settlement-and-license-agreement.html</a></li> <li>EN81-20</li> </ol>	
IMPACT EVALUATION	
COST BENEFIT	
<p>Capital costs are unknown. It's widespread use amongst leading elevator suppliers would suggest a cost benefit. However, this is likely to be achieved through significant economies of scale cost savings, which is not the case for the unique requirements associated to Rotherhithe Bridge. Furthermore, the cost of using a patented technology might come at a high cost.</p> <p>Operational costs potentially decrease using monitoring technology as described above.</p>	
PROGRAMME BENEFIT	

None anticipated.		
<b>RISK EVALUATION</b>		
High risks associated to using new technology with no available published standards.		
<b>ENVIRONMENTAL</b>		
None anticipated.		
<b>BUILDABILITY</b>		
None anticipated.		
<b>SAFETY</b>		
None anticipated.		
<b>OPERATIONS AND MAINTENANCE</b>		
Improvements associated to the compatibility with continuous monitoring devices.		
<b>ACCEPTANCE</b>		
Prepared: VE Champion	Name: [REDACTED]	Signed [REDACTED]
Proposal Implemented:	Not implemented due to the issues listed in the disadvantages	
Approved by:	Name:	Signed:
<b>IMPLEMENTATION</b>		
<b>COMMENTS / ACTIONS</b>		
To be completed by TfL		



# Appendix D. Value Engineering Workshop No.1 - Report

# Rotherhithe to Canary Wharf River Crossing

Value Engineering Workshop No.1

Transport for London

25 July 2018

# Notice

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This document has 37 pages including the cover.

## Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
P01	For review / comments					25/07/2018
P02.1						

## Client signoff

Client	Transport for London
Project	Rotherhithe to Canary Wharf River Crossing
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# Introduction

Rotherhithe to Canary Wharf River Crossing Value Engineering Workshop No.1 was undertaken on 4<sup>th</sup> July 2018. In the workshop, individual disciplines – Structures, Architecture, Mechanical and Electrical, Geotechnical and Constructability – presented their current design proposals and potential value engineering ideas.

This was followed by individual attendee's idea generation round. All ideas were grouped into categories and discussed in depth for potential size of benefit, advantages, risks and dependencies. The size of benefit was allocated:

- Small (S) <£500,000
- Medium (M) £500,000 - £1,000,000
- Large (L) >£1,000,000

This report documents the value engineering discussion and outputs. All individual generated ideas and meeting minutes are included in **Appendix A** and **Appendix B** respectively.

Define core team and challenge team.

# 1. Methodology/Process

## 2. Alignment

### 2.1. Baseline alignment design

The baseline alignment option (denoted as alignment CB5 to CA5) would provide a 1km route from Rotherhithe street opposite Durand's Wharf to Westferry Circus or Westferry Road in Canary Wharf and assumes a 12m air draught over a 40m width at the centre of the River Thames navigation channel.

The western landing (CB5) ramp would transport cyclists from Rotherhithe Street on a gentle loop around Durand's Wharf mainly in 25m horizontal radii curves to an 80m section parallel to and founded on the River Thames foreshore before joining the main bridge span. Altogether the ramp would be 465m from landing to midspan. CB5 cycle ramp would include three inclined sections at 4% gradient to fit the alignment. The remaining inclines would be at a maximum of 3% gradient and maximum 80m in length. All inclines would be interspersed by 5m flat sections. Two extended sections at 2% gradient from midspan would eliminate the need for split decks on the moving span. The 2% gradient section would also serve as a transition into another deck at 1% gradient after the moving span to provide access to lifts and stairs located in Durand's Wharf. The deviation between access to lifts and cycle ramp would occur at chainage marker 290m. The main span pier would sit next to the navigation channel with five further supports founded on the river behind the pier.

The eastern landing (CA5) in Canary Wharf would be founded in the river almost in its entirety, with seven river supports in addition to the main span pier immediately adjacent to the navigation channel. The alignment ramp would run parallel to JP Morgan developments site for 150m with the finished level at least 5m above Thames path level. The ramp would be 380m from midspan to the landing site which is Westferry Circus. The requirement for split decks would be eliminated on the moving span due to the modest gradients leading from the crest curve. CA5 would achieve shallow gradients of maximum 3% gradient for 80m but with an extended flat 0% gradient section running for 85m before tying into Westferry Circus. Similar to the CB5 landing, a 1% gradient transition at chainage marker 625m from the 2% gradient incline leading from the moving span would provide access to lifts and stairs which would be situated to the south of JP Morgan development site.

Refer to drawing ST\_PJ585C-ATK-BAS-ZZ\_12-DRG-DR-00005 in **Appendix C** for further details on CB5-CA5 baseline alignment.



## 2.2. Value engineering options discussed

Ref.	Description	Benefit	Advantages	Risks	Dependencies	Comments	Actions
VE1	Different route across river that provides a more direct route to Westferry Circus.	M	<ul style="list-style-type: none"> <li>Shorter overall route.</li> </ul>	<ul style="list-style-type: none"> <li>Longer span over navigable channel.</li> <li>Proximity to Jubilee Line.</li> <li>Unknown location of Unexploded Ordnance (UXOs) in the river bed noted. Geophysics picks up all metal items not just UXOs. Severity of hazard increases with proximity to Jubilee Line. Probability of hazard decreases with shorter structure and fewer foundations.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure tie in to Westferry Circus.</li> <li>Accessibility review.</li> </ul>	<p>More direct route.</p> <p>Boroughs prefer alignment.</p> <p>10m extra main span length is small in comparison to the overall saving from shorter ramp length.</p>	<p>Core team to refine alignment option for costing.</p> <p>Accessibility review to be completed.</p>
VE2	Construction on land behind the river wall adjacent to JP Morgan development site.	M	<ul style="list-style-type: none"> <li>Adjust ramp alignments to reduce length constructed in River Thames foreshore.</li> <li>Cantilever support ramp from river wall.</li> </ul>	<ul style="list-style-type: none"> <li>Impingement of Environmental Agency (EA) exclusion zone behind river wall resulting in interaction / clash with anchors.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with JP Morgan regarding interface required.</li> </ul>	<p>Intrusion into JP Morgan site that jeopardises their planning permission is deemed too risky but building in front (river side) of the river wall from land to be investigated.</p>	<p>To be developed by Challenge Team.</p>

Ref.	Description	Benefit	Advantages	Risks	Dependencies	Comments	Actions
VE3	Further reduce deck width from recommended to minimum values.	S	<ul style="list-style-type: none"> <li>Minimise the use of steel which has a high unit cost.</li> </ul>	<ul style="list-style-type: none"> <li>Excessive reduction in width may adversely impact the view of how the deck integrates with the rest of the structure i.e. narrow deck with respect to tall massive towers.</li> <li>Impacts on bridge user experience.</li> </ul>	<ul style="list-style-type: none"> <li>Not likely to generate significant savings as width has already been discussed with TfL. Potential to generate more saving if agreed design values are revisited.</li> </ul>		Core team to cost the minimum deck width option.
VE3a	Reduce ramp widths from landing site to intersection with lifts and stairs	S	<ul style="list-style-type: none"> <li>Narrower structure, reduced steelwork weight.</li> </ul>	<ul style="list-style-type: none"> <li>Impacts on bridge user experience.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>		Core team to cost the minimum deck width option.
VE4	Challenge Port of London Authority (PLA) on the required navigable headroom and channel width.	S	<ul style="list-style-type: none"> <li>Minimise weight of moving span (reduced deck steelwork), lifting mechanism and associated costs.</li> <li>Minimise approach ramp length and gradients and possibly eliminate the need for lifts.</li> </ul>	<ul style="list-style-type: none"> <li>Strong objection by the PLA.</li> <li>Narrowing navigational channel may require the bridge to be on a straight section of the river, further south. Less desirable connection on Canary Wharf side.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure tie in to Westferry Circus. Alignment is already flat at JP Morgan side.</li> </ul>	No further work on height – covered by heights study.	Challenge team to review BS on navigation widths before progressing further.

## 3. River works constructability

### 3.1. Baseline river works constructability assumptions

Prior to the value engineering workshop, no design had been undertaken on the foundations so the baseline design described here relates to the Arcadis design. The towers supporting the main lifting span would be supported reinforced concrete piers on 8m x 15m caissons, designed to resist ship impact loads. The back spans and approaches in the river would be supported on reinforced concrete piers on caissons up to 8m in diameter. Including the two main span piers, a total of 14 foundations would be constructed in the river.

Refer to drawing ST\_PJ585C-ATK-BAS-ZZ\_12-DRG-DR-00005 in **Appendix C** for support locations.

### 3.2. Baseline cost

River works baseline cost estimate (not including overheads and profit) for the baseline alignment = £25.8M.

### 3.3. Value engineering options discussed

Ref.	Description	Benefit	Advantages	Risks	Dependencies	Comments	Actions
VE5	Temporary causeway or bridge to access main piers (half of the river at a time)	L	<ul style="list-style-type: none"> <li>Minimises costly river works operations.</li> <li>Eliminate or reduce need for barge to transport.</li> </ul>		<ul style="list-style-type: none"> <li>Discussion with PLA required. Note: the temporary causeway/bridge can be kept out of the navigable channel.</li> <li>Discussion with EA regarding temporary flood capacity required.</li> </ul>	Technical Note required to compare against the baseline cost estimate.	Constrain to develop options as part of methodology in conjunction with Challenge Team.
VE6	Auger tubular piles	L	<ul style="list-style-type: none"> <li>Minimise noise.</li> <li>Reduce clearances to</li> </ul>	<ul style="list-style-type: none"> <li>Use of bentonite for piling in the river could make it difficult</li> </ul>			To be incorporated by the Core Team.



Ref.	Description	Benefit	Advantages	Risks	Dependencies	Comments	Actions
			Jubilee Line tunnels.	to obtain consents even with controls (suitability of alternative materials to be investigated) <ul style="list-style-type: none"> <li>Concrete in river</li> <li>Note: Cofferdam reduces risks</li> <li>Consents with all associated stakeholders</li> </ul>			
VE7	Precast caissons in dry dock and floated into position.	Negative value	<ul style="list-style-type: none"> <li>Reduces site concrete work and temporary works needed.</li> </ul>	<ul style="list-style-type: none"> <li>River bed preparation very difficult to maintain whilst dropping in precast caisson.</li> </ul>			No further action at this stage as not seen as financially beneficial.
VE8	Precast units used inside the cofferdam to form the caisson	L	<ul style="list-style-type: none"> <li>Reduces site concrete work needed. Easier and quicker delivery to site using the river.</li> <li>No advantage for temporary works</li> </ul>			Technical Note required.	Challenge Team to develop with Costain.
VE9	Precast post-tensioned units to form the tower	L	<ul style="list-style-type: none"> <li>Reduces site concrete work and temporary works needed.</li> </ul>				Combined with VE24

Ref.	Description	Benefit	Advantages	Risks	Dependencies	Comments	Actions
VE10	Intrusion of temporary works into navigation channel	Risk		<ul style="list-style-type: none"> <li>Navigable Channel could be tight for any temporary works for foundation of piers or discussion with PLA regarding temporary works in navigable channel.</li> </ul>			Add to Risk Log.
VE11	Construction noise. Potentially require double skin cofferdam to mitigate.	Risk		<ul style="list-style-type: none"> <li>Construction noise needs to be carefully considered. Significant objections from Canary Wharf.</li> </ul>	<ul style="list-style-type: none"> <li>Understand how noise will be measured.</li> </ul>		Add to Risk Log.
VE12	Remote logistics and compound area adjacent to river required	Risk		<ul style="list-style-type: none"> <li>Compound area required for temporary accommodation for work force.</li> </ul>			Add to Risk Log.

## 4. Main span

### 4.1. Baseline main span design

The baseline bridge main span design is the Arcadis lifting bridge option planted on CB5-CA5 alignment (**section 2.1**) which comprises a 160m long concrete twin bowstring tied arch. The deck would be such that cyclists pass between and under the arch structure and towers, while pedestrians would use the cantilever footpaths on either side of the arches. The deck width would vary along the main span length, ranging from 12.6m at midspan to almost 20m towards the towers. The cyclists and pedestrians would be generally segregated by the structure with a mixing point at midspan as the depth of the bottom chord recedes. The cycle way would have a stiffened plate deck with open mesh areas adjacent to the arch to allow rainwater to pass through without a drainage water collection system. The footway would be of a similar construction. An architect's perspective of the Arcadis baseline main span design is as shown in **Figure A-1**.

### 4.2. Baseline cost estimate

Main span design baseline cost estimate (not including overheads and profit) for the baseline alignment = £15.0M

### 4.3. Value engineering options discussed

Ref.	Description	Benefit	Advantages	Risks	Dependencies	Comments	Actions
VE13	Steelwork connection details	L	<ul style="list-style-type: none"> <li>Cost of steelwork is predominately based on the complexity of unique steel connection details. Simplifying or standardising can have a significant influence on cost estimate.</li> <li>All elements same length therefore different spacing in bay?</li> </ul>	<ul style="list-style-type: none"> <li>Significant increase in deadweight and hence foundation requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with steelwork fabricator required.</li> </ul>		Core Team to engage with specialist contractors



Ref.	Description	Benefit	Advantages	Risks	Dependencies	Comments	Actions
VE14	Use bridge lift mechanism to lift central span into position	L	<ul style="list-style-type: none"> <li>Reduce erection costs.</li> </ul>	<ul style="list-style-type: none"> <li>Increased fabrication costs.</li> <li>Restricts construction sequence.</li> </ul>	<ul style="list-style-type: none"> <li>Granularity of cost rate not yet developed in detail.</li> </ul>	Need to understand what the baseline estimate assumes.	Costain to produce technical note comparing against baseline.
VE15	Use weathering steel to avoid maintenance painting	S	<ul style="list-style-type: none"> <li>Minimise maintenance cost.</li> </ul>	<ul style="list-style-type: none"> <li>Weathering steel sections may not be available for the desired sections.</li> <li>Potential impacts on aesthetics/ planning permission.</li> </ul>	<ul style="list-style-type: none"> <li>Capital cost and whole life cost balance.</li> </ul>		To be considered after concept design.
VE16	Deck drainage – drain directly off deck without channelling.	S	<ul style="list-style-type: none"> <li>Eliminate deck drainage costs.</li> </ul>	<ul style="list-style-type: none"> <li>Likely to lead to environmental concerns.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with EA over discharging directly into river.</li> </ul>		Core Team – covered in Drainage Strategy Technical Note
VE17	Reduce main span length to minimum navigable channel width.	L	<ul style="list-style-type: none"> <li>Reduced main span complex steelwork thereby cutting on main span weight.</li> <li>Reduced M&amp;E lift requirements.</li> <li>Reduced main span foundation sizes due to lower main span weight.</li> </ul>	<ul style="list-style-type: none"> <li>Ship impact protection (either larger foundations or otherwise) encroaching into the navigable channel.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with PLA required.</li> </ul>		Covered by VE4

Ref.	Description	Benefit	Advantages	Risks	Dependencies	Comments	Actions
VE18	Architectural truss form (tapered top cord)	M	<ul style="list-style-type: none"> <li>Simpler connection details.</li> <li>Stiffer structure.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>		Core Team to develop.
VE19	Standard truss form (more rectangular)	L	<ul style="list-style-type: none"> <li>Standard sections and connections.</li> <li>Stiffer structure.</li> </ul>	<ul style="list-style-type: none"> <li>Local Authority consents required. Does not fit in with surrounding environment.</li> <li>Transport and Work Acts Order (TWAO) consent</li> </ul>	<ul style="list-style-type: none"> <li>Granularity of steel costs in cost estimate required to understand and realise saving.</li> </ul>		Challenge Team to develop.
VE20	Limit design wind speed in lifted position. Justified by assessing ship movements in high wind.	M	<ul style="list-style-type: none"> <li>Reduce design requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Bridge will be maintained in raised position</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with PLA and other stakeholders required.</li> </ul>		Core Team to develop.
VE21	Fibre-reinforced Plastic (FRP) deck	Negative value	<ul style="list-style-type: none"> <li>Potential for a significantly lighter deck.</li> </ul>	<ul style="list-style-type: none"> <li>Significant cost increase anticipated.</li> <li>New technology for this type and size of structure.</li> </ul>			Challenge Team to investigate if this is worth taking any further.
VE22	Steelwork fabrication offsite and transportation.	Risk	<ul style="list-style-type: none"> <li>TfL engineering has a build off-site ambition for its projects.</li> </ul>	<ul style="list-style-type: none"> <li>Need to identify a suitable location and secure its availability.</li> </ul>			Constrain to develop as part of construction methodology.



Figure A-1 - Architectural render of baseline Arcadis lifting bridge main span



## 5. Towers

### 5.1. Baseline tower design

Prior to the value engineering workshop, no design had been undertaken on the towers so the baseline design described here relates to the Arcadis design. The towers would be formed of painted structural steel stiffened plates and have a height of 91m above mean high water springs (MHWS) supported on reinforced concrete foundations. The towers would provide sufficient space for the plant and steel block counterweights to rise and fall, access stairs or ladders and a lift, with the floors of the ladders and stairs doubling up regularly spaced diaphragms. The towers would be formed of two legs separated by the cycleway. There would be horizontal elements and cross-bracing at the bottom of the tower at the level of the arch cross-beam and near the top around the machine room and counterweight.

### 5.2. Baseline cost estimate

Tower design baseline cost estimate (not including overheads and profit) for the baseline alignment = £16.4M.

### 5.3. Value engineering options discussed

Ref.	Description	Benefit	Advantages	Risks	Dependencies	Comments	Actions
VE23	Steel truss-type tower	S	<ul style="list-style-type: none"> <li>Wider foundation enables more and hence shallower piles.</li> </ul>	<ul style="list-style-type: none"> <li>Has the potential to make foundations very wide.</li> <li>Increase in tower weight.</li> <li>Imbalance in appearance – large piers carrying a small deck.</li> <li>Canary wharf local authority consents require - does not fit in with surrounding environment.</li> <li>TWAO consent risk.</li> </ul>			Challenge Team to develop.

Ref.	Description	Benefit	Advantages	Risks	Dependencies	Comments	Actions
VE24	Concrete tower – jump form, slip form or precast construction	L	<ul style="list-style-type: none"> <li>Wider foundation enables more and hence shallower piles</li> <li>Benefits with respect to ship impact loads.</li> </ul>	<ul style="list-style-type: none"> <li>Has the potential to make foundations very wide.</li> <li>Increase in tower weight.</li> <li>Imbalance in appearance – large piers carrying a small deck.</li> <li>Canary wharf local authority consents require - does not fit in with surrounding environment.</li> <li>TWAO consent risk.</li> <li>Open space available for inspection access.</li> </ul>	<ul style="list-style-type: none"> <li>Cost saving is dependent on the granularity of steelwork cost rate.</li> </ul>	Technical Note required – Challenge Team to assist.	Core Team to develop.
VE25	Main span lift counterweight – concrete with steel casing or other infill materials	M	<ul style="list-style-type: none"> <li>Steel casing is lighter to bring to site and can be infilled to the desired weight on site.</li> <li>Likely a cheaper alternative than having a solid steel counterweight.</li> <li>Could be used to get M&amp;E tested before bringing to site.</li> </ul>	<ul style="list-style-type: none"> <li>Infill material will have to be sufficiently dense to not increase tower steelwork and footprint.</li> </ul>		Technical Note required – Challenge Team to assist.	Core Team to develop.

## 6. Approach span

### 6.1. Baseline approach span design

The approach spans over the river would comprise steel box girders below deck level with varying spans. The river approaches would be supported by reinforced concrete piers on caissons for the main and side spans and on driven piles elsewhere.

### 6.2. Baseline cost estimate

Approach spans design baseline cost estimate (not including overheads and profit) for the baseline alignment = £12.8M (superstructure up to and excluding back spans) + £13.8M (superstructure for back spans).

### 6.3. Value engineering options discussed

Ref.	Description	Benefit	Advantages	Risks	Dependencies	Comments	Actions
VE26	Approach span deck form – concrete or steel concrete composite. There is more work to be done by concept design team.	L	<ul style="list-style-type: none"> <li>Minimise cost of complex steel fabrication and construction.</li> </ul>	<ul style="list-style-type: none"> <li>Changing form can increase depth, and hence take visual focus away from main span.</li> </ul>	<ul style="list-style-type: none"> <li>Optimum cost for span length.</li> </ul>		Core Team developing options for 40m or 55m spans and steel box or steel/concrete composite.
VE27	Earthwork ramp – Durand's Wharf	S	<ul style="list-style-type: none"> <li>Potential saving on earthworks ramp compared to pier and deck.</li> <li>Minimises lighting required.</li> </ul>	<ul style="list-style-type: none"> <li>Affects public open space.</li> <li>Minimises sheltered spaces.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with local authority required.</li> </ul>		Core Team developing options.
VE28	Maximise approach ramp spans to minimise number of piers in the river	M	<ul style="list-style-type: none"> <li>Minimise complex river work operations.</li> </ul>	<ul style="list-style-type: none"> <li>Increasing span lengths can increase deck depth, and hence take visual focus</li> </ul>			Covered by VE26 and alignment



Ref.	Description	Benefit	Advantages	Risks	Dependencies	Comments	Actions
				away from main span.			
VE29	Steelwork erection	L	<ul style="list-style-type: none"> <li>Smaller individual components for approach spans can potentially save cost and programme.</li> </ul>	<ul style="list-style-type: none"> <li>Concerns about amount of time available for each bridge lift.</li> </ul>	<ul style="list-style-type: none"> <li>Plant required for bridge lift.</li> </ul>		Core Team to engage with specialist contractors
VE30	Control of pedestrians and cyclists	Risk		<ul style="list-style-type: none"> <li>Barriers to prevent pedestrian, PRMs and cyclists crossing whilst the bridge is open requires more thought</li> </ul>			To be developed as part of operational concept by the Core Team.

## 7. Mechanical and electrical

### 7.1. Baseline mechanical and electrical (M&E) design

In the Arcadis baseline M&E design, the bridge deck would be lifted by a total four winches located within the piers. At the top of each tower would be a set of sheave pulleys which would support the deck and counterweight. The weight of the deck would be balanced by a counterweight in each tower which would be connected to the deck by counterweight 'lift ropes' that would pass over the sheaves at the top of the towers. 'Drive ropes' would connect the soffit of the deck with the underside of the counterweight via the 'drive drum' in the pier base.

When the drum is rotated the counterweight would be pulled down which lifts the deck. Rotating the drum in the opposite direction would allow the counterweight to rise and the deck to fall. The counterweight would weigh slightly less than the deck dead load. A second drum on each hoist would incorporate a rope which would be attached to the underside of the bridge deck to prevent any chance of the counterweight keeping the bridge open.

Each drum would be electrically powered by motors and would have full redundancy with two electric motors and gearboxes. Normal service braking would be incorporated within the motor drives, and emergency braking would be provided by spring-applied, hydraulic release disc brakes mounted directly on the drum.

Longitudinal guidance of the bridge deck would be provided by guide wheels mounted on the bridge deck with allowance for thermal expansion. Lateral guidance during bridge deck lifting would be provided by guide wheels mounted on the bridge deck. The counterweights would also be guided to reduce noise and impacts from wind.

In the lowered position the deck would be restrained vertically by electrically actuated locking pins in the abutment which engage the bridge deck and the drive cable would be tensioned before locking the motor to ensure the deck could not lift from the bearings. There would be no mechanisms on the lifting deck. In the raised position the bridge would be supported by the lift ropes. When the bridge is in the raised position for maintenance, the deck and counterweight would be fixed with additional supports which would allow the ropes to be removed.

### 7.2. Baseline cost estimate

Mechanical and electrical design baseline cost estimate (not including overheads and profit) = £9.2M (not including lifts).

### 7.3. Value engineering options discussed

Ref.	Description	Benefit	Advantages	Risks	Dependencies	Comments	Actions
VE31	Remove maintenance access lift and replace with stairs (and winch for equipment) or ladders.	M	<ul style="list-style-type: none"> <li>Note: maintenance is only expected once every 6 months.</li> </ul>	<ul style="list-style-type: none"> <li>Recovery of personnel needs to be considered.</li> </ul>	<ul style="list-style-type: none"> <li>Construction Design and Management (CDM) regulations make it unlikely</li> </ul>		Challenge Team to progress.

Ref.	Description	Benefit	Advantages	Risks	Dependencies	Comments	Actions
			<ul style="list-style-type: none"> <li>Significant cost saving and weight reduction.</li> </ul>		to be able to argue removing stairs for ladder access.		
VE32	Remove backup generators. Replace with hook-up generator. Note: Power cuts are infrequent	S/M	<ul style="list-style-type: none"> <li>Save cost of procuring, installing and maintaining back-up generators.</li> </ul>	<ul style="list-style-type: none"> <li>Increase opening times in emergencies.</li> </ul>	<ul style="list-style-type: none"> <li>Opening at reduced speed.</li> </ul>		Challenge Team to progress.
VE33	Carbon fibre lift ropes.	S	<ul style="list-style-type: none"> <li>Much lighter than steel ropes resulting in smaller lifting mechanism.</li> </ul>	<ul style="list-style-type: none"> <li>There appears to be less prevalent use of synthetic ropes compared to steel belts.</li> <li>Main technology owners likely to be protective of patent rights.</li> <li>Lack of a suitable design standard to work to making it very difficult to justify compliance with the Machinery Directive without extensive testing and third-party certification.</li> </ul>			Challenge Team to produce Technical Note to explain why this will not be progressed further at this stage.
VE34	Energy regeneration options	S	<ul style="list-style-type: none"> <li>Improve likelihood of progressing TWAO.</li> <li>Reduced operating costs.</li> </ul>		<ul style="list-style-type: none"> <li>Capital cost and whole life cost balance.</li> </ul>		No further work at this stage.



Ref.	Description	Benefit	Advantages	Risks	Dependencies	Comments	Actions
VE35	Fire suppression system. Note: not many flammable elements in plant room	Negative value		<ul style="list-style-type: none"> <li>Review if required. Previous design experience suggests not required.</li> <li>No allowance made in cost estimate.</li> </ul>			Next stage of design.
VE36	Intelligent monitoring systems to reduce maintenance requirements	Negative Value	<ul style="list-style-type: none"> <li>Small allowance made in cost estimate.</li> </ul>	<ul style="list-style-type: none"> <li>Type of motor required makes it hard to remotely sensor.</li> </ul>	<ul style="list-style-type: none"> <li>Capital cost and whole lift cost balance.</li> </ul>		To be developed as part of operational and maintenance concept.
VE37	Public barriers for when the bridge is open. Note: £375,000 has been allowed for in the Arcadis design.	Risk		<ul style="list-style-type: none"> <li>Manned barriers may be required.</li> <li>There's a risk of the public jumping over barriers depending on barrier design.</li> </ul>			To be developed as part of operational concept by the Core Team.

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**Rotherhithe to Canary Wharf Crossing****Notes of meeting with the Port of London Authority.**

**10-00 am – 12-00 noon 22 December 2016 at London River House Royal Pier Road Gravesend Kent DA12 2BG.**

**Those present**

Name	Role	Contact
Andrew Tunnicliffe	Development Delivery Engineer	07850 237311
Stephen Jones	Principal Engineer Strategy and Development	0784 1223658
Tony Wilson	Transport Planning Manager	0203 054 7158
James (Jim) Trimmer	Director of Planning and Development	0771 365 4595
Mark Towens	PLA Harbour Master	
Thomas Southall	Deputy VTS Manager	0147 456 2200

**Copy to**

Name	Role	Contact
Roozbeh Shirandami	Lead Engineer - Bridges & Structures	(020) 7918 4259
Malcolm Payne	Principal Engineer Infrastructure Protection	07802 657485
Helen Jones	Transport Planner	(020) 3054 6737
Andrew Lunt	Technical Requirements Manager Surface Transport Asset Management	(020) 3054 6686

**The purpose of the meeting was:**

1. To discuss the alignment of the proposed bridge.
2. To ask the PLA about the numbers of vessels of different air draughts that may need to navigate through the bridge.
3. To understand the operational process for Tower Bridge and how this might translate to a moving bridge at this location.
4. To discuss the impact of the weather and any special events.

**Notes of meeting****Navigation rights**

Jim explained the legal context to the rights of navigation for river users.

River Users have a right to navigate the river and this can only be impeded by Act of Parliament or the powers delegated to the PLA. The PLA can grant a reverse licence of these rights subject to the approval of its Governing Committee.

In the case of the QE2 bridge, an Act of Parliament was required for the structure which included the changes to the navigation rights.

The policy of the PLA as set out in the Thames Vision and the London Plan of the previous Mayor is to increase the use of the River. A severing of the river or curtailment of navigation rights would not be supported in principle.

Jim offered to set out the PLA's legal position for the record in response to a written request from TfL.

### **Fixed Crossing Option**

The air draft of a bridge structure is quoted as measured from mean high water at spring tides. However, there are some tide conditions that are higher than this and will have to be taken into account when determining the requirement to move the bridge for a vessel.

A fixed crossing would have to be at least as high as the fixed crossing at Tower Bridge which is around 42M. The QE2 bridge is 54M. The Cable car is around 60M at the bottom of its catenary.

The use of a swing bridge was discussed. The PLA would prefer the opening span to open more than 90 degrees on the northern bank to reduce the impedance to navigation.

A swing bridge will require a design that provides a safe locked state in the open position. 4 piers in the river would be acceptable for a 2 span swing bridge including 2 piers for the open and locked position. The PLA would expect the spans between the bank and the piers to be navigable.

### **Alignment**

The alignment of the crossing was discussed at length with Sustrans and a provisional assumption is provided in their navigation report. The PLA would require that a navigational operability simulation test is conducted of any proposed bridge design. This would be undertaken on their navigation simulator. A series of simulation tests with vessels of different sizes and under a range of tide and wind conditions would be run to create confidence that the configuration of the bridge structure would not impede navigation. This will require drawings of the bridge to be provided to the PLA and digitised. The digitised drawings would be sent to the simulator supplier in Holland. The supplier will then provide a software update for the PLA. The PLA simulator team would then run a series of tests using their pilots to navigate the bridge. This will be used to identify scenarios where navigation is impaired or unsafe. The whole process should take less than 3 months. The PLA would charge TfL for this work and will provide a quote if asked formally.

If a range of design options was presented to them, the PLA could model a number of different bridge design and alignment options and check them for their impact on navigation.

A straighter alignment based on a swing bridge concept was discussed. The PLA would prefer an alignment orthogonal to the river because that reduces the vessel transit time and moves the structure away from the bend on the river. This might allow the vertical alignment – span and height suggested in the Sustrans report to be relaxed slightly subject to simulation tests.

The PLA are not keen to have bridge ramps on the foreshore. Vessel collisions with the bank are a risk and do occur from time to time. These collisions are more likely on the outside of a bend in the river. However, if the use of ramps on the foreshore improved the alignment of the main structure and the design provided mitigations to the risk of collisions with the ramps, it could be considered. S Jones suggested that a swing bridge could park the spans in an open position to protect the ramps and this was thought to be an idea worthy of consideration.

The PLA are happy to consider piers in the river but they must be resilient to an impact from a large vessel.

### **Navigational traffic**

Navigation is particularly difficult for the large cruise ships and warships that visit the pool of London. There are about 40 transits per annum of these vessels and they are towed in and out by tugs. Draught is a key consideration. There is a 'hole' dredged into the pool of London next to HMS Belfast. These large vessels can berth in this hole without risk of grounding at low tide. They can only move at high tide within 30 minutes of high water. Typically, they will be towed in by Tugs and then towed out in reverse through Tower Bridge to Wapping before the ship is turned in a deeper and wider part of the river before the bend at Westferry. The next berth of safety is Convoys Wharf just before Deptford Creek and Greenwich.

Thames Barges typically have an air draught of up to 30M as do the larger Yachts. Between Easter and October, there can be 15-20 Thames Barges moored in St Katharine's dock. These are commercial operations and typically will carry up to 12 passengers on recreational trips either up to Tower Bridge and back or down river.

St Katharine's dock is entered through a lock and this is only open within 2 hours of high water, so vessels transiting to the dock have to travel around this time or wait on the river until the dock gate is open. The smaller vessels that use these berths are not constrained by draught.

The PLA offered to ask St Katharine's dock for more information about usage, air draughts and other data in response to a formal request from TfL.

The Dixie Queen is the largest commercial recreational vessel and this has an air draught of 18M. In this case, the PLA would expect a bridge lift if the air draught of the bridge was less than 19M. A bridge lift may also be required for this vessel in extreme tide scenarios.

### **Tower Bridge Operations**

The operational process for Tower Bridge was established by Act of Parliament. Any licensed river user can ask for the bascules to be opened on 24 hour notice. In practice, the large cruise ships will plan their itineraries 12 months in advance. Warships plan their



passages with about 3 months notice. Thames sailing barges will plan their passages based on advance bookings but some can be as short as 24 hours.

A ship will be in VHF contact with the bridge control room around 30 minutes before their booked time and will confirm their ETA. For vessels travelling upstream, Tower Bridge control room can see the vessel as it rounds Wapping Ness and will start to open the bridge. If the air draught is just over 9M, the Tower Bridge control room will only partially open the bridge – but to provide sufficient clearance.

Fro a downstream transit, the bridge control room has good visibility of the ship in the Pool of London. Large vessels will cast off from HMS Belfast and then wait for the bridge to open. Then the vessel will start it's transit. Large ships will be towed in reverse. At Wapping the ship will be turned. The ship must move down to Convoys Wharf on the full tide because there is limited depth in the upper reaches and nowhere to berth the ship at low water.

This constraint means that the transit from the 'hole' in the Pool needs confirmation that the bridge is open before setting off. This could take an hour.

One option to reduce this time could be to dredge a second hole with 7.5M depth in the Wapping reach. This would provide a safe berth between the Pool and Convoys Wharf. There is not a lot of space and there are many constraints but it could be looked at to mitigate this constraint. This hole would need to be around 200M long and 30M wide with a depth of 6-7M. This could save 20-30 minutes wait on the outbound transit.

The PLA would expect triple redundancy on the bridge opening mechanism. Tower Bridge is very reliable. The Harbour Master cannot remember an instance when the opening mechanism has failed.

Large Yachts and Thames barges are not limited by depth of water and so the commit time can be shorter.

### **The Vessel Traffic Service (VTS) and Bridge Control Room**

The PLA expect that the bridge structure would include a Control Room. The Creek Road Bridge is a good example of the type of facility they would expect. Control of the Rotherhithe Bridge would be TfL's safety, performance and cost responsibility. The Rotherhithe control room would have CCTV and VHF facilities and these would be linked to the Woolwich Control Room of the Thames Vessel Traffic Service. (VTS). The VTS monitors all traffic on the river. Unlike a railway control room, the VTS does not route vessels. Vessels submit their transit plans, these are accepted by the VTS and the vessels are autonomous but under the control of a PLA pilot or a Thames qualified master. However, the VTS has the power to instruct a pilot or master in the event of the risk of an incident. Failure to respond to an instruction can result in a prosecution of the master.

The PLA suggest that the Rotherhithe control room should be on the north bank to give good sighting upriver.

The PLA would prefer Bridge openings to be on a similar 24 hour notice period to Tower Bridge. Large ships must travel on the tide but they are prepared to consider restrictions for smaller and/or leisure vessels.

## **Weather**

Large vessels are prohibited from transiting the Thames barrier when wind speeds exceed 15 knots.

The PLA will consider whether a maximum wind speed should apply for transits through this structure. The span is greater than the Thames barrier, 30 knots is a guess.

Fog at the Thames barrier will prohibit transits.

## **Special events.**

Tall ship events happen a couple of times a year. There is one this Easter and one in September. The September 1 will have 20 vessels. Typically, they will make a transit from Woolwich to Wapping swing and return down river. This would require 2 transits through the R2CW bridge. The ships tend to travel in groups of 4 that could make a single transit through the bridge together. This could require 10 openings in the day.

## **VTs visit.**

We visited the VTS control centre at Gravesend. This covers the area from Ramsgate to Harwich up to the Thames Barrier. A similar but slightly smaller control room at Woolwich covers the reaches between the Thames Barrier and Teddington.

There are 2 desks monitoring vessel movements. 1 Desk is responsible for planning and is manned by a senior pilot and VTS manager. There are 3 desks that communicate with vessels and accept bookings and transit plans.

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**TfL/PLA Meeting Minutes**  
15 August 2017 10:30  
PLA Offices, Pinnacle House, London EC3

**Attendees:**

Name	TfL Area
James Trimmer	PLA
Mark Towens	PLA
Andrew Lunt (AL)	TfL
Clive Appleyard (CA)	TfL
Tony Wilson (TW)	TfL
David Collings (DC)	Arcadis (for TfL)
David Phillips (DP)	Marico (for TfL)

Ref.	Description	Action
1	<b>Introductions</b>	No action.
2	<b>PLA requirements</b>  TW outlined the key PLA requirements as understood; these were agreed as correct (albeit they are a summary of the key parameters, not a detailed or final position)	No action.
3	<b>Northern alignment (Hilton to Westferry Circus)</b>  TfL asked the PLA's views on a northern alignment (Hilton to Westferry Circus); this was discounted by Sustrans/reForm, but TfL queried whether a different type of structure with a longer span may overcome the issues  PLA confirmed that although the strong preference remains for any bridge alignment to be as far from from the bend as possible, this location could remain for consideration now on the basis that the piers would need to be set sufficiently far from the channel particularly on the outside of the bend (e.g. where the current passenger pier is/or in line with it) and there is no structure impinging into the main span (e.g. through a swing or lift bridge).	No action.          Northerly alignment to remain in consideration for now
4	<b>Central alignment (Durand's to Impound lock) and southern alignment (Durand's to West India Pier)</b>	

	<p>Navigational issues would be more or less the same for these two alignments ; perpendicular crossing alignments preferred.</p> <p>Side opening channel concept (small opening sections outside the main piers to simplify/speed opening procedure for sailing boats); PLA understand the rationale but it would only work with a channel on each side, as a single side channel would increase the navigational risks as half the vessels would have to cross to the opposite side of the river to pass through an opening section.</p> <p>A small opening section on both sides may work, but PLA would need to see it on a chart to understand how this would work in terms of the water flow and depths, e.g. would the channel not be available at low tides through lack of water.</p> <p>MT will discuss the plans with pilots in advance of the next meeting (if the plans received in time) to allow their feedback into the options, although they are necessarily very much in outline at the moment.</p> <p>Key to presenting all alignments is to be highlight proposed spans and pier locations on charts.</p> <p>Subsequently simulator trials will be needed.</p>	<p>TfL to provide PLA with plans of the concepts with piers located onto a chart.</p> <p>MT to discuss alignment concepts with pilots</p> <p>TfL to present future options in this style</p>
5	<p><b>Bridge height/clearance</b></p> <p>TfL and PLA understand the competing pressures on bridge height (the higher the better for vessels and for user reliability, the lower the better for cost, land and planning impacts and user convenience) although the PLA's perspective is based on the riverine issues. These issues were explored.</p> <p>PLA agreed that the data TfL is collecting will be a key consideration and requested sight of the data set. A full year's data would be useful, but the summer months TfL is already collecting is the most critical period</p> <p>Some examples of data analysis/presentation were discussed to understand what metrics would be helpful in getting to an agreed navigational envelope; PLA will look at the examples provided and provide feedback, and TfL will analyse/present the data as requested for the next meeting.</p>	<p>TfL to provide raw data (done 15/8).</p> <p>PLA to provide feedback on the data analysis (done 16/8)</p> <p>TfL to analyse data as per PLA feedback</p>
6	<b>Variable height concept</b>	

	<p>TfL outlined a potential variable height concept; should a lifting bridge be provided it could potentially have three height settings:</p> <p><b>Low clearance</b>, where the bridge is left at a low height to maximise user comfort when vessel traffic is low, e.g. through winter, peak periods, low tide etc.</p> <p><b>Medium clearance</b>, less convenient access but still available for users, used when vessel traffic is higher, e.g. summer season, off-peak/weekends, high tide.</p> <p><b>High clearance</b> when tall vessels are passing.</p> <p>PLA thought this was an interesting response to the conflicting problems but thought there were some key question:</p> <ul style="list-style-type: none"> <li>a) Would there be pressure on TfL/PLA from bridge users to keep the bridge at the low position even when there is conflicting sailing traffic on the river?</li> <li>b) Would the variable height cause confusion and increase the risk to river traffic?</li> <li>c) As with other lifting bridge options, what is the risk of a bridge deck failing in its lowest position?</li> </ul> <p>TfL to consider these issues as well as looking at the technical practicality.</p>	<p>TfL to consider further.</p>
7	<p><b>Ramp length/gradient</b></p> <p>Given the potential for the height to be influenced by any decision on ramp gradient, and the potential for that to impact on the river (e.g. if ramps are planned over the river/foreshore) PLA would want to understand the need for shallower ramps than previously proposed by Sustrans/reForm and therefore the implications for further use of the foreshore for the ramps.</p>	<p>TfL to provide more information on gradient considerations.</p>
8	<p><b>Operations</b></p> <p>The potential operating processes were discussed; the PLA's view is that mirroring the procedures from Tower Bridge would be ideal in terms of convenience for river users as that would provide consistency. This has been applied for the bridges at Deptford and Leamouth. Additional restrictions (e.g. rush hour restrictions) would be more problematic.</p> <p>PLA suggested TfL are 'in the right ball park' for current assumed abort points and timings although there may be an issue with inbound transits to Tower</p>	



	<p>Bridge (Upper) with the bridge closing once the vessel has passed under it. This will need to be considered further. In terms of commit time, MT suggested that a review of the AIS data would give a good set of data on the ship transit times from HMS Belfast to this location.</p> <p>TfL to consider all failure scenarios in conjunction with Tower Bridge</p>	<p>TfL to speak to Marico about the method for doing this.</p>
9	<p><b>Next meetings</b></p> <p>The next PLA meeting is scheduled for 31 August in Gravesend.</p> <p>It was agreed that this would focus on the issue of clearance height, following further data analysis, although any views reached would be subject to detailed risk assessment prior to the PLA reaching a more definitive position.</p> <p>A longer session would be helpful (currently 1 hour); TfL happy to be flexible in terms of extending that session if PLA can accommodate a longer meeting</p> <p>Key dates to consider are PLA licencing committee meetings on 12<sup>th</sup> September and 12<sup>th</sup> December. JT is planning to prepare papers on this project.</p>	<p>JT to advise whether PLA can extend the meeting slot</p>

# Rotherhithe to Canary Wharf Crossing - Meeting Note



Title: Meeting with PLA and TfL	
<b>Date</b> 31-08-2017	<b>Timing:</b> 1400 – 1600
<b>Type:</b> Meeting	<b>Location:</b> PLA Offices, London River House, Gravesend
<b>Attendees:</b> James Trimmer (JT) Mark Towens (MT) Nick Evans Andrew Lunt Tony Wilson Clive Appleyard David Collings Tom Osborne	PLA (Director of Planning) PLA (Harbourmaster – upper) PLA (assistant harbourmaster) TfL (project sponsor) TfL (transport planning) TfL (engineering) Arcadis (for TfL) Knight Architects (for TfL)

**Aim of the meeting:** To update on TfL's developing design options and agree suitable assumptions for key physical parameters (height and pier locations) on which to base the developing design work

**Topics of discussion:** Key topics of discussion were: (i) height (ii) pier locations (ii) project timetable

No.	Action	Owner	Deadline
1	Additional data analysis to be carried out to predict how Tower Bridge operating procedures would affect number of openings/grouping of vessels	TfL (TW)	12-09-17
2	PLA to provide confirmed air draft of Dixie Queen, or advise if this information is not available so that TfL can undertake a physical survey.	PLA (NE)	12-09-17
4	TfL to provide example of central secondary opening channel	TfL (TO)	12-09-17
5	TfL to provide navigational charts with indicative pier locations	TfL (DC)	12-09-17
6	Meeting to be arranged with MT and NRA consultants	TfL (AL)	12-09-17
7	Extraordinary licencing committee to be arranged for early November, in advance of TfL's public consultation. AL/JT to confirm timings at next meeting.	PLA (JT)	12-09-17
8	TfL to update on plans, timetable and discussions with other stakeholders at subsequent meetings	TfL (AL)	12-09-17

# Rotherhithe to Canary Wharf Crossing - Meeting Note



## Key outcomes and notable information shared

- 1) AL presented information to give context to why a lower bridge is preferred
  - a) Stakeholder concern over visual and other impacts of a higher bridge
  - b) A higher bridge requires longer ramps which gives many problems including:
    - i) Shallower gradient required for bridge users over long lengths, exacerbating the problem to that presented by Sustrans
    - ii) Penalty to cyclists journey
    - iii) Heavily developed area means little available land
    - iv) Some parkland available although environmental/legal issues
    - v) Foreshore also has environmental and navigational risk issues
- 2) Discussion around the data analysis previously issued by TW:
  - a) AL reiterated that TfL are continuing the surveys and will continue to update the data
  - b) MT queried whether safety clearance was included in the heights presented. TW confirmed it was, at 10%
  - c) MT queried grouping of vessels, indicating that this may work for yacht clubs but less so for individuals. MT agreed that Tower Bridge operating principles are an accepted precedent and a sensible starting assumption (30minutes between openings available at 24 hours notice). TW agreed to produce data analysis to represent this.
  - d) MT raised concern about the true air draft of the Dixie Queen as TfL's data (Marico) suggests it is different to his assumption. Nick Evans to verify the air draft of Dixie Queen and share with TfL. If this is not possible, TfL could physically survey the vessel.
- 3) Height clearance:
  - a) AL suggested that TfL's interpretation of the data is that there is a limited benefit to river users with a bridge height above 11m, certainly commercial vessels (<1% affected)
  - b) MT agreed (on commercial vessels) but raised concerns about the impact of 11m height on recreational vessels and frequent users.
  - c) MT suggested that up to 11 openings per day at the 11m height would be problematic for users (of the bridge)
  - d) AL explained that TfL hopes this could be reduced by some grouping of vessels, and that TfL believes this is a broadly acceptable number for bridge users
  - e) After significant discussion, it was agreed that an appropriate assumption on which TfL could base their developing design would be a 15m high, 40m wide clearance in the centre of the channel. This could then reduce to the piers/banks at a suitable gradient.
  - f) JT reiterated that PLA cannot give any endorsement or agreement to this parameter until discussion with their Licencing Committee.
  - g) Discussions around vertical lifting bridge and MT suggested the cable car (60m+) is the appropriate precedent for ultimate vertical clearance. QEII is not a direct comparator as difference in water depth etc. To be discussed further if vertical lifting bridge
- 4) Pier Locations
  - a) DC presented outline pier locations for the north, central and south alignments being considered by TfL



# Rotherhithe to Canary Wharf Crossing - Meeting Note



- b) MT raised concerns over the north proposals, highlighting the issue of vessels navigating round the bend.
  - c) It was agreed that an appropriate assumption on which TfL could base their developing design for the north would be to locate piers for the bridge in line with the existing river piers at Canary Wharf and Hilton
  - d) MT suggested canary wharf pier might need relocating if this option was pursued and this would need appropriate risk assessments etc.
  - e) DC presented options for the central and southern alignment and MT agreed that the permitted channel +15m was a sensible assumption for pier locations at this part of the river.
  - f) Discussion around secondary channels with indicative pier locations presented by DC
    - i) MT raised concerns about proposals and reiterated that secondary channels would need at least 30-35m width to be useful.
    - ii) TO raised concept of central secondary opening section and MT requested further information on precedents for this, agreeing it was a concept worth exploration. MT highlighted that a problem with this concept would be pushing more vessels to the centre
  - g) MT requested drawings showing pier locations on navigational charts in order that preliminary discussions could be held with pilots. Ultimately these parameters would be tested by pilots in simulator trials, however
- 5) Next steps
- a) MT questioned when parameters need agreement.
  - b) AL explained that TfL is considering a TWAO approach and a consultation starting from November 2017.
  - c) JT stated that the licencing committee would ideally agree the parameters on which TfL consults publicly and all agreed we would work to this goal. This requires an extraordinary meeting and JT would look to arrange this. AL to keep PLA updated on TfL's plans, timetable and discussions with other stakeholders
  - d) MT explained the nature of Navigational Risk Assessments that PLA require to consider any formal agreement. TfL to arrange a meeting between MT and the consultant tasked with NRA to agree requirements
  - e) JT stated that simulator trials currently have a long lead time with other projects but all agreed this was not necessary in advance of the first consultation. MT suggested speaking with Richard Flynn and/or Marico about the process of simulator trials
- 6) Other
- a) Temporary licences would be required for any intrusive investigations in the river. JT's area provide licences but appropriate risk assessments etc. would need to be discussed with MT. TfL to provide further details
  - b) Canary Wharf group own the pier on west side of Isle of Dogs
  - c) West India Pier is potentially up for sale

*Next meeting – 1400, 12<sup>th</sup> September 2017, Pinnacle House*

*Please Note: Any amendments to these notes to more accurately reflect the meeting in question are welcomed up to two weeks after issue.*

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# Rotherhithe to Canary Wharf Crossing - Meeting Note



<b>Title: R2CW Port of London Authority Liaison</b>	
<b>Date</b> 11-01-18	<b>Timing:</b> 09:30-11:30
<b>Type:</b> Meeting	<b>Location:</b> PLA Offices, Pinnacle House, London EC3
<b>Attendees:</b> James Trimmer (JT) Mark Towens (MT) Andrew Lunt (AL) John Pardoe (JP) Ed Rogers (ER)	PLA (Director of Planning and Environment) PLA (Harbour Master) TfL (Senior Lead Sponsor, River Crossings) TfL (Principal Sponsor, River Crossings) Marico Marine (for TfL)

**Aim of the meeting:** To update PLA on consultation and the forward programme. Also to discuss current navigational requirements and PLA feedback for consideration in the next stages of design.

**Topics of discussion:** Key topics of discussion were: i. Project programme; ii. Consultation response; iii. Navigational Risk Assessment and Vessel Analysis; iv. Design and Operational Protocol



# Rotherhithe to Canary Wharf Crossing - Meeting Note

No.	Action	Owner	Deadline
1	Provide a summary of river consultation responses	JP	23-02-2018
2	Undertake risk analysis for a lifting bridge falling on the deck of a large ship following pier impact	JP	23-02-2018
3	Survey air draught of Dixie Queen	JP	02-03-2018
4	Update and include in cost estimates that there is a risk that the south/west pier may have to move away from the navigational channel	JP	23-02-2018
5	Produce different operational protocols to assess against navigational safety	JP	02-03-2018
6	The protocol for large vessels requires detailed scenario risk analysis	JP	02-03-2018
7	Options and recommendation for control centre location. This should include appropriate risk assessment.	JP	02-03-2018
8	PLA to invite a river pilot to the next meeting for further input	MT	23-02-2018
9	Produce elevations, clearances and distances for the preferred alignment option.	JP	02-03-2018

## Key outcomes (dis/agreements, notable information shared)

1. PLA do not object to any of the three alignments in principle, but consider that bridge piers are likely to require moving from current designs to ensure an acceptable level of risk subject to detailed NRA involving a marine model.
2. PLA require further risk assessment on the selected alignment and its operational protocol
3. PLA advised they had no objection in principle to removal of the Hilton Pier if Hilton agree although any application would be subject to internal consultation.

Ref.	Description	Action
1.0	Introductions/Overview	
2.0	Public Consultation	
2.1	There has been a good response to the consultation –	

# Rotherhithe to Canary Wharf Crossing - Meeting Note

Ref.	Description	Action
	approx. 6,000 respondents mostly supporting the project and provisional selection of a bridge.	
2.2	The northern alignment is preferred. Possible reasons include the protection of Durand's Wharf park and a preference to have direct access to Canary Wharf off the bridge.	
2.3	River consultation responses were similar to the PLA position i.e. not against a bridge if it is not to the detriment of river users.	TfL to provide a summary of river consultation responses
<b>3.0</b>	<b>Current Programme</b>	
3.1	Further options assessment – finalise bridge location – March 2018	
3.2	Initial concept design – work up concept design – June 2018	
3.3	Final Concept – design frozen – Oct 2018	
3.4	TWAO – Submission – early 2019	
<b>4.0</b>	<b>Navigational Risk Assessments</b>	
4.1	PLA were disappointed that the pier locations assessed were not the ones the PLA recommended in the previous meeting. However AL explained the rationale that TfL wished to test different scenarios in order that the risk assessment can be used to influence the design.	
<b>5.0</b>	<b>Review of bridge concepts</b>	
5.1	The three alignments were discussed and the PLA advised they do not object to any of the alignments in principle although they expect the north will result in higher costs for TfL due to additional mitigation that may be required to assure navigational safety closer to the bend.	
5.2	The PLA were concerned that for a lift bridge there is risk the deck could fall on a vessel if the vessel impacted the bridge pier particularly for cruise ships travelling around 8 knots. It was agreed that further risk analysis was required for this specific scenario to enable a final decision on the viability of a vertical lifting bridge.	TfL to undertake risk analysis for this scenario
5.3	The PLA advised that TfL current assumption of 9m clearance to MHWS on the side spans was not required all the way across the span and possibly could be dropped to around 7-8m, at the mid point of the side span and could be closer to the river wall	

# Rotherhithe to Canary Wharf Crossing - Meeting Note

Ref.	Description	Action
	dependent on review of vessel track data. Side span widths should be in the region of 30m as a minimum. Such refinements could be considered in the next stages of design	
5.4	The PLA advised the main span clearance to MHWS of 15m over a width of 40m should not necessarily be the centre of the main span but should be based on optimal transit path (passage plan) of target vessels.	
5.5	As there is some inconsistency of information the PLA recommended a survey of the Dixie Queen height and air draught. Due to the likely impact of this vessel on the height of the bridge in the closed position, this was considered a priority.	TfL to survey air draught of Dixie Queen
5.6	The PLA advised they had no objection in principle to removal of the Hilton Pier. If it is redundant with no service there is no reason for it to be there. However, the hotel (as beneficiary of an existing licence) must agree.	
5.7	The PLA advised they had no objection in principle to integration of the Canary Wharf Pier with the eastern bridge pier.	
5.8	The PLA advised that the tracked path data suggested that our current designs were not wide enough and recommended we ensure our cost estimates reflected this when comparing alignments at this decision stage. The western piers of the central and southern alignments should move ~15m nearer the bank. It is also likely the western pier of the northern alignment would need to be moved closer to the bank	TfL to update and include in cost estimates for this stage
5.9	The PLA were concerned about the passage of large vessels (e.g. cruise ships) and their ability to manoeuvre past the proposed bridge whilst maintaining their intended track for the turn round Cuckolds Point.	Simulator trials with PLA pilots to inform the assessment of risk for large vessels and refine bridge pier locations.
5.10	The PLA recommended the swing bridge deck resting pier should be aligned to the river traffic direction and be as close to the main pier as possible (not necessarily at the end of the swing deck).	
5.11	The PLA advised it may be possible to open only a single leaf of the swing bridge but this would need to be considered in risk assessment and impact protection may be an issue.	
6.0	<b>Operational Rules</b>	
6.1	PLA recommended the rules be consistent with other nearby bridges (Tower Bridge, Leamouth Bridge) i.e. booking concept 24hr in advance and no opening for 30mins following transit. AL explained the potential problems this could cause a very long span bridge where the opening cycle might exceed 20 mins (e.g.	TfL to produce different operational protocols for PLA view and to assess against navigational safety



# Rotherhithe to Canary Wharf Crossing - Meeting Note

Ref.	Description	Action
	very limited time for crossing between two vessel transits 30 mins apart). PLA will consider these protocols and will respond with their thoughts. AL agreed to provide opening scenario's alongside vessel data to help the discussion.	
6.3	The PLA advised the protocol for large ships must be included in the NRA. Some large ships go through Tower bridge stern first when berthing against HMS Belfast and leave bow first on the flood tide – this may enable an outbound vessel to have capacity to turn and return to Belfast in the event of R2CW failing to open. It would not be possible for a vessel to reduce speed waiting for the bridge to open due to the loss of steerage of ships as slow speed. TfL discussed the level of resilience/reliability that could be provided to mitigate the risk. PLA thought this might come at poor value. It was agreed that more detailed risk analysis was required for this scenario.	TfL to undertake detailed scenario risk analysis.
<b>7.0</b>	<b>Control Centre Location</b>	
7.1	TfL presented options being considered for operating the opening bridge, including within TfL's existing centralised control facilities for the road/rail network in London. PLA requirements were discussed including the competence of bridge opening personnel and personnel training if a part of the TfL control centre and not site based. Control required experience of the marine environment and navigation. The control centre would need to communicate on Marine band VHF radio with vessels. Reliability and resilience of infrastructure would need to be considered. PLA recommended that the location of the control centre is subject to a risk assessment process.	JP to detail the options and recommendation for control centre location to discuss at the next meeting. This should include appropriate risk assessment.
8.0	JT reiterated that on all design matters the views expressed represent advice from officers only and any final decisions will be for the licensing committee.	
	<b>Next Meeting</b>	
	The next River Works Licencing Committee is Monday 12 <sup>th</sup> March and it was requested a meeting was planned for a week or two before to update on TfL's selection of a single option and discuss that in detail	TfL
	At the next meeting the PLA agreed to bring a river pilot.	PLA
	TfL will produce elevations, clearances and distances for the preferred alignment option to ensure it is a productive meeting.	TfL

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# Rotherhithe to Canary Wharf Crossing - Meeting Note



<b>Title: R2CW Port of London Authority Liaison</b>	
<b>Date</b> 14-08-18	<b>Timing:</b> 14:00-15:00
<b>Type:</b> Meeting	<b>Location:</b> PLA Offices, Pinnacle House, London EC3
<b>Attendees:</b> James Trimmer (JT) Mark Towens (MT) Katie-Jane Moorhouse (KM) Christopher Miles (CM) Jonathan Green (JG) Robin Philips (RP) Jamie Holmes (JH)	PLA (Director of Planning and Environment) PLA (Harbour Master) TfL (TfL Consultation and Engagement) TfL (Engineering) TfL (Sponsorship) Atkins Marico Marine

**Aim of the meeting:** To update PLA on crossing design and project programme

**Topics of discussion:** Key topics of discussion were: i. Project update and design development from January 18 to date; ii. Single Preferred alignment and opening mechanism; iii C1 and C2 alignment; iv. Vessel Survey Summary; 12m v 15m bridge height v1 Programme and engagement going forward



# Rotherhithe to Canary Wharf Crossing - Meeting Note

No.	Action	Owner	Deadline
1	Share Vessel survey report and all monthly reports with PLA for their review	JH	20-08-2018
2	Confirm the vessel survey report categorises sailing barges and tall ships as commercial (and not recreational) – <i>Post meeting note – confirmed.</i>	JH	14-08-2018
3	Share C1 and C2 visuals with the PLA	JG	14-08-2018
4	Survey air draught of the Dixie Queen	JG	12-09-2018
5	PLA to provide initial comments on the proposed alignments and to confirm the maximum height the bridge would need to lift to and whether this needed to only be in the centre of the bridge.	MT	28-08-2018
6	TfL/Atkins to provide the PLA with more details on the ship protection and how this would impact on the navigational channel	RP	12-09-2018
7	Meeting between PLA, JH and river pilot to take place after the TfL / PLA meeting on the 12 September to progress the objectives and method/structure of the bridge simulation model. JH to arrange	JH	03-09-2018
8	TfL to confirm consultation dates to PLA so they can set up licencing committee meeting	KM	07-09-2018

# Rotherhithe to Canary Wharf Crossing - Meeting Note

## Key outcomes (dis/agreements, notable information shared)

1. PLA do not currently support a 12m bridge height, the greater the impacts on the river users then the harder it is to justify to the licensing committee. PLA asked that they would not want the option of a 12m bridge in the public domain before it has gone to their licensing committee and before TfL have provided clarity on;
  - Air draught of Dixie Queen
  - Impact of operational concept on average bridge opening a day for 12m and 15m air draught above MHWS
2. PLA stated that the C2 alignment is problematic and the PLA would favour an alignment that is straighter to the navigable channel, there is a concern that the perception for pilots changes with a more skewed alignment
3. PLA stated that on both the C1 and C2 alignments the pier at the Rotherhithe side would need to be approximately 15m back from the navigational channel (although this would need to be modelled) as there is a risk that larger boats could hit it if caught by the tide.

Ref.	Description	Action
1.0	<b>Introductions/Overview</b>	
2.0	<b>Purpose of the meeting</b>	
2.1	Update on crossing design and project. Last meeting was back in January, so looked to update on design development culminating in discussion on single preferred alignment, opening mechanism and bridge height.	
3.0	<b>Design Development</b>	
3.1	TfL went through the option selection process and the current design options for a 12 metre high vertical lifting bridge at C1 and C2 locations	
3.2	<p>TfL explained the reasons they are looking at a 12 metre bridge height: the higher alignment increases ramp length which in turn impacts on user experience, consent risk and makes it difficult to provide a minimal gradient for cyclists and persons with reduced mobility.</p> <p>The C2 alignment provides the more direct route and is also advantageous as it pulls away from the JPMorgan site and Cascades residences.</p> <p>The PLA indicated that this height was not what had been considered acceptable or previously discussed with TfL. The initial position was 20m and, following discussion, 15m was under consideration. A lower height had not been envisaged and will provide issues to river users.</p>	

# Rotherhithe to Canary Wharf Crossing - Meeting Note

Ref.	Description	Action
4.0	<b>Vessel Survey Summary</b>	
4.1	<p>JH provided an overview of the 12 month vessel traffic survey that was undertaken in the vicinity of the crossing (May-2017 – May-2018). The survey objective was to develop a comprehensive full seasonal understanding evidence base of traffic and also collect air draught data of passing vessels to support the bridge height design.</p> <p>Discussion was held on method of vessel air draught assessment and categorisation noting that tidal heights for each transit time were obtained – hence allowing further data analysis.</p> <p>JH noted that vessel categories were selected mindful of categories used by PLA and as also used in the preliminary NRA. PLA questioned whether we are counting every rowing boat as that would skew the statistics, JH advised that a minimum vessel air draught of 5m air draught threshold was applied (hence allowing data to be filtered accordingly for recreational craft).</p>	<p>JH to share Vessel survey report and all monthly reports with PLA for their review</p> <p>JH to confirm the vessel survey report categorises sailing barges and tall ships as commercial (and not recreational) – <i>Post meeting note – confirmed.</i></p>
4.2	<p>PLA questioned whether TfL knew the air draught of the Dixie Queen, as TfL was going to survey it and it's unclear whether it's 13, 15 or 18 metres air draught. PLA advised that TfL talk to Chris Livett (owner of Dixie Queen) as a matter of urgency to get clarity on the air draught, if necessary through a survey</p>	TfL to survey air draught of the Dixie Queen
4.3	<p>PLA stated that the Sustrans bridge was 20 metres, TfL then came with a proposal for 15 metres which the PLA acknowledged so long as there was unrestricted openings (like the way Tower Bridge operates), and now this this has changed to 12 metres without knowing how this would affect the Dixie Queen, plus with restrictions.</p> <p>JG noted that TfL are still exploring the operational concept</p>	
4.4	<p>PLA and the Licencing Committee understand the desire for the bridge but the greater the impacts on the river users then the harder it gets to justify and support. PLA stated that they would not want the option of a 12 metres bridge in the public domain before it had been justified and gone through the Licensing Committee. Essential to this was TfL undertaking the extra work with the evidence and talking to the owner of the Dixie Queen and/or</p>	



# Rotherhithe to Canary Wharf Crossing - Meeting Note

Ref.	Description	Action
	<p>surveying it.</p> <p>TfL queried whether the presentation of the evidence base for a lower height bridge would help when going to the Committee. PLA agreed it would be useful but that they would need to assess and understand the impacts, including on the Dixie Queen</p>	
4.5	<p>PLA questioned whether the bridge would need to be lifted to full height or if there could be stop off points, TfL explained that there could be but it would be more complex and the span would need to be 'locked off' for safety when it lifted.</p>	
4.6	<p>TfL asked the PLA what the maximum required bridge height should be. PLA to confirm</p>	<p>PLA to confirm the maximum height the bridge would need to lift to and whether this needed to only be in the centre of the bridge.</p>
4.7	<p>PLA requested that the bridge pier structures align with tidal flow to minimise hydrodynamic impacts and scour potential.</p>	
4.8	<p>PLA stated that C2 is problematic and would favour an alignment that is more perpendicular to the navigable channel alignment, concern that the perception for pilots changes with a more skewed alignment – less of an opening to aim at and more potential for something to go wrong.</p> <p>PLA to invite a pilot to the next meeting to talk about this in more detail and JH agreed it would be useful to get their input on the simulation too to assess queries of this nature</p>	<p>TfL to share visuals with for C1 and C2 with the PLA</p> <p>Meeting between JH and river pilot to take place after the TfL / PLA meeting on the 12 September to discuss the objectives and workshop method of the bridge simulation model.</p>
4.9	<p>PLA stated that on both the C1 and C2 alignments the pier at the Rotherhithe side would need to be approximately 15m back from the navigational channel as there is a risk that larger boats would hit it if caught by the tide, although this would need to be modelled to assess..</p>	
4.10	<p>PLA asked whether ship impact protection is proposed, RP said there would be independent sacrificial structures to take the load of any collision rather than the bridge/bridge pier itself. PLA needs more information about this as they would have an impact by narrowing the area that a vessel can travel.</p>	<p>TfL/Atkins to provide the PLA with more details on the ship protection and how this would impact on the navigational channel</p>

# Rotherhithe to Canary Wharf Crossing - Meeting Note

<b>Ref.</b>	<b>Description</b>	<b>Action</b>
4.11	RP queried the speed of vessels approaching the bridge to be assumed for bridge impact assessment. PLA confirmed that they would be approximately 6 or 7 knots, up to 8 knots if with the tide. PLA stated that any structure in the river, including the piers for the ramps, need to be designed to withstand some kind of collision even if just from a Thames Clipper. Discussion was held on the design case (ranging from high displacement/low velocity cruise vessels/tug/tow or light displacement/high velocity Thames Clippers)	
<b>5.0</b>	<b>Programme and engagement going forward</b>	
5.1	All agreed that ongoing engagement is very important. Follow up meeting planned for 12 September. PLA asked that all materials are provided sufficiently in advance of the meeting to allow for review.	
5.2	PLA asked what was going to the Mayoral briefing on 6 September. TfL advised that the update would cover a range of project areas including funding, business case, consultation, forward plan and not just design matters. It was confirmed that the PLA's position would be provided to the Mayor.	
5.3	TfL yet to finalise consultation start date but will confirm with PLA asap so that they can set up their licensing committee meeting	TfL to confirm consultation dates to PLA so they can set up licencing committee meeting

# Rotherhithe to Canary Wharf Crossing - Meeting Note



<b>Title: R2CW Port of London Authority Liaison</b>	
<b>Date:</b> 12-09-18	<b>Timing:</b> 14:00-15:00
<b>Type:</b> Meeting	<b>Location:</b> PLA Offices, Pinnacle House, London EC3
<b>Attendees:</b> James Trimmer (JT) Mark Towens (MT) John Sheridan (JS) Nick Evans (NE) Andrew Lunt (AL) Christopher Miles (CM) Jonathan Green (JG) Robin Philips (RP) Adam Wood (AW) Steven Osborn (SE) Jamie Holmes (JH) David Phillips (DP) Ed Rogers (ER)	PLA (Director of Planning and Environment) PLA (Harbour Master) PLA (River Pilot) PLA (Deputy Harbourmaster Upper) TfL (Lead Sponsor) TfL (Head of Engineering) TfL (Principal Sponsor) Atkins (Senior Engineer) (for TfL) Atkins (Senior Systems Engineer) (for TfL) Atkins (Chief Maritime Engineer) (for TfL) Marico Marine (Associate Director) (for TfL) Marico Marine (Principal Consultant) (for TfL) Marico Marine (Operations Director) (for TfL)

**Aim of the meeting:** To update PLA on progress since 15 August meeting including approach to proposed operational concept, how this impacts on bridge openings and proposed bridge alignment and ship impact protections

**Topics of discussion:** Key topics of discussion were: i. Bridge height; ii. Dixie Queen Survey and movements; iii Development of Operational Concept; iv. C2 Bridge Alignment v1 Ship Impact Protection



# Rotherhithe to Canary Wharf Crossing - Meeting Note



No.	Action	Owner	Deadline
1	TfL to present a detailed breakdown of the vessels that would be affected by a bridge 12m above MHWS	RP	19-09-2018
2	TfL to provide details of the cluster of vessels that will require the bridge to be opened just prior to high tide based on the August 2017 vessel survey	RP	19-09-2018
3	TfL to continue to develop operational concept model mirroring the Tower Bridge operating protocols	RP	05-10-2018
4	TfL to review AIS data to understand duration of bridges openings for or large or very large vessel activity	RP	28-09-2018
5	TfL to provide written confirmation of projects operational parameters	AL	20-09-2018
6	TfL to provide cross channel widths for the C1 and C2 alignments	RP	20-09-2018
7	TfL to explore the options of moving the bridge piers on the C2 alignment to increase the cross channel width	RP	20-09-2018
8	Following the completion of Action 6, TfL to provide written confirmation of the alignment that they will be taking forward to public consultation	JG	20-09-2018
9	TfL to continue to progress the ship impact protection proposals, focusing on mitigations of potential damage to vessels and hydrodynamic impacts	RP	05-10-2018
10	TfL to provide written project update to the PLA following the project Mayoral briefing on 20-09	JG	21-09-2018

# Rotherhithe to Canary Wharf Crossing - Meeting Note



## Key outcomes (dis/agreements, notable information shared)

1. TfL confirmed that a bridge height of 12m above MHWS is critical to the project progressing and that, should it secure PLA's acceptance of the 12m height, TfL would accept an operational concept in line with what is currently used at Tower Bridge.
2. PLA stated that on C2 alignment the pier locations need to be move further back from the navigational channel to provide a 'safety buffer' to allow small vessels to operate safely away from large vessels and minimise risk of larger vessels hitting the piers if caught by the tide. TfL to consider implications of changing pier location.

Ref.	Description	Action
<b>1.0</b>	<b>Introductions/Overview</b>	
<b>2.0</b>	<b>Actions from previous meeting</b>	
2.1	All actions from 15 August meeting complete	
<b>3.0</b>	<b>Meeting Purpose</b>	
3.1	To update PLA on progress since 15 August meeting including approach to proposed operational concept, how this impacts on bridge openings and proposed bridge alignment and ship impact protection	
<b>4.0</b>	<b>Bridge Height</b>	
4.1	<p>TfL set out the benefits to the project having a bridge height of 12m above MHWS, (improved user experience, reduce ramp length, consenting risk and cost).</p> <p>PLA acknowledge these but highlight that they are TfL and the project's matters. The PLA 's main responsibility is to manage navigation safely for all river users, so it is important for the PLA is to see detailed analysis of vessel movements that might justify a reduction in the height of the bridge to 12m.</p>	
<b>5.0</b>	<b>Dixie Queen</b>	
5.1	<p>TfL confirmed that the measured Air Draught of the Dixie Queen is 14.95m</p> <p>PLA asked whether TfL have discussed with the Livett group potential modifications to the funnel and lighting mast, so that they could be collapsible and therefore not require the Rotherhithe to Canary Wharf Bridge to open.</p> <p>TfL raised concern about the precedent any agreement may set, but agreed to explore the option further. AL agreed to keep PLA informed on any</p>	

# Rotherhithe to Canary Wharf Crossing - Meeting Note

Ref.	Description	Action
	discussion with Livett.	
6.0	<b>Operational Concept</b>	
6.1	<p>AW presented the analysis of the year's vessel survey data to show number of vessels that would be affected by a bridge height of 12m and 15m above MHWS. Analysis showed that there is circa 500 vessels that would be affected by a bridge height of 12m above MHWS but not a bridge height of 15m above MHWS.</p> <p>It was agreed that TfL would update the presentation materials to provide the PLA with full details (Name, frequency, date, time etc) of the impacted vessels by a bridge 12m above MHWS</p>	TfL to resubmit presentation materials to present a detailed breakdown of the vessels that would be affected by a bridge 12m above MHWS
6.2	<p>AW talked through heat maps demonstrating the average number of times the bridge at 12m and 15m would have needed to be raised in August 17 (based on an open on demand operational concept).</p> <p>Whilst the number of openings within some hours was higher for a 12m bridge there was little difference between the total number hours that required bridge openings for both bridge heights.</p> <p>The heat maps highlighted that the majority of vessels that required openings were travelling just prior to high tide. There were occasions when a high number of vessels arrived at the same time within an hour. TfL agreed to provide details of these clusters of vessels</p>	TfL to provide details of the clusters of vessels that required the bridge to be opened just prior to high tide
6.3	<p>AL explained that next steps for TfL on the operational model would be to build in more detail around the tower bridge operating protocols as well as other factors such as confirmed abort points and procedures for different vessels.</p> <p>MT requested a declaration on operational parameters for the project. AL confirmed that bridge height at 12m is critical to the project progressing. An operational concept in line with what is currently used at Tower Bridge would be acceptable to TfL should it secure PLA's acceptance of a bridge height of 12m above MHWS</p>	TfL to continue to develop operational concept model mirroring the Tower Bridge operating protocols
6.4	PLA asked TfL to review the AIS data to verify the length of time in the model that the bridge would be	TfL to review AIS



# Rotherhithe to Canary Wharf Crossing - Meeting Note



Ref.	Description	Action
	unavailable during the passage of large or very large vessels. 47 minutes was included in the model however the view from the PLA was that this was about right for a vessel that didn't need to turn, but as a vessel will have to back down and turn either on arrival or departure, then about 15 minutes should be added to allow for the turn.	data to understand duration of bridges openings for or large or very large vessel activity
<b>7.0</b>	<b>Ship Impact Protection</b>	
7.1	<p>RP presented the work in progress ship impact protection proposals.</p> <p>PLA were pleased to note that the footprint of the protection was less than expected but they raised concern about the hydrodynamic impact and potential damage to vessels. PLA expect a more integrated design (rather than the two individual buffers) may address these issues. All agreed that the design provides a good basis for development and further assessment and TfL agreed to update PLA at a future meeting.</p>	Atkins to continue to progress the ship impact protection proposals, focusing on mitigations of potential damage to vessels and hydrodynamic impacts
<b>8.0</b>	<b>Bridge Alignment</b>	
8.1	<p>AL confirmed that TfL are currently progressing the C2 alignment to consultation. JT and MT commented that thus far each of the PLA's red lines marked out at the initial meeting in August 2017 had been crossed.</p> <p>AL asked the PLA to set out their rational for the piers to be located 15m from the navigational channel. MT confirmed that 15m clear space either side of the navigational channel will allow small vessels to operate safely away from large vessels and provide a 'safety buffer' for large vessels.</p> <p>MT set out the PLA concerns with the pier locations of C2 alignment, and requested that TfL investigate the option of relocating both piers further out from the navigational channel. PLA also concerned that piers are not aligned to the direction of the natural water flows and stated that the water flows past the pier structures would need to be modelled</p> <p>AL confirmed that TfL will consider the implications of moving the piers further out for the C2 alignment or reverting to the straighter C1 alignment.</p>	<p>TfL to provide cross channel widths for the C1 and C2 alignments</p> <p>/TfL to explore the options of moving the bridge piers on the C2 alignment to increase the cross channel width</p>
<b>9.0</b>	<b>Next steps</b>	
	PLA licensing committee is due to take place on the	TfL to provide

# Rotherhithe to Canary Wharf Crossing - Meeting Note



<b>Ref.</b>	<b>Description</b>	<b>Action</b>
	<p>25 September. JT will be submitting papers a week in advance of the committee.</p> <p>Ahead of the licensing committee TfL will provide an update following the Mayors briefing on the 20 September and the direction of travel on the preferred alignment for consultation which is currently planned to start on the 18 October.</p>	<p>written confirmation of the alignment that they will be taking forward to public consultation and also update PLA following the project briefing to the Mayor</p>

# Rotherhithe to Canary Wharf Crossing - Meeting Note



<b>Title: R2CW Port of London Authority Liaison</b>	
<b>Date</b> 31-01-19	<b>Timing:</b> 14:00-15:00
<b>Type:</b> Meeting	<b>Location:</b> PLA Offices, Pinnacle House, London EC3
<b>Attendees:</b> Mark Towens (MT) Nick Evans (NE) Christopher Miles (CM) Tom Chick (TC) Paul Brown (PB) David Phillips (DP)	PLA (Harbour Master) PLA (River Pilot) TfL (Head of Engineering) TfL (Sponsor) Marico Marine (Project Manager) (for TfL) Marico Marine (Principal Consultant) (for TfL)

**Aim of the meeting:** To update PLA on progress since 8 November meeting including the latest iteration of the operational concept and a review of Marico's comments on this. Additionally, to review the plan regarding the Navigational Simulation.

**Topics of discussion:** Key topics of discussion were: i. TfL responses to previous PLA comments; ii. Development of Operational Concept; iii. Navigation Simulation



# Rotherhithe to Canary Wharf Crossing - Meeting Note



No.	Action	Owner	Deadline
1	Marico to set up a TfL/Marico/PLA meeting on the 14 <sup>th</sup> February	PB	01-02-2019
2	TfL to explain in detail the decisions made concerning the current alignment and the justifications for these decisions.	PB/CM	14-02-2019
3	TfL to respond to previous PLA comments with changes made and justifications why/why not	PB/TC	14-02-2019
4	TfL to examine the possibility of having only one pier on the southern backspan and/or increasing width between piers. The PLA stated that they would like the height available in the side arches to be at least 7.5 metres above MHWS – TfL to investigate	PB/CM	14-02-2019
5	TfL to develop latest draft of operational concept with Marico and PLA amendments incorporated	TC	14-02-2019
6	Marico/TfL to develop plan for Navigational Simulation	PB	14-02-2019
7	TfL to provide side profiles of bridge showing the height profile across the whole length of the bridge and including the side arches	CM	14-02-2019
8	TfL to provide vessel traffic pattern data overlayed onto the bridge design to see how the data compares to the span height	CM	14-02-2019
9	Marico to draw up a code of practice for regulating traffic and to address the potential issue of 'mischievous' bridge lift requests	DP	14-02-2019
10	TfL to provide information detailing where on the bridge and in relation to the river and authorised channel the '40m width at the 12m height' is located.	CM	14-02-2019

# Rotherhithe to Canary Wharf Crossing - Meeting Note

## Key outcomes (dis/agreements, notable information shared)

1. PLA stated that they wanted more space between piers on the southern backspan (potentially with a single pier) in order for smaller river traffic to safely use this channel (at present considered too narrow).

Ref.	Description	Action
<b>1.0</b>	<b>Introductions/Overview</b>	
1.1	PB outlined objectives of meeting	
<b>2.0</b>	<b>Project Update</b>	
2.1	TC briefly outlined future plan – consultation beginning end of April and order submission by end of year	
2.2	PLA made it clear they feel as though they are not being listened to with regards to the bridge design.	<b>TfL/Marico to review PLA comments with Project Team</b>
2.3	PLA are still unhappy with the current bridge alignment and design and want more space between piers on the southern backspan.	<b>TfL/Marico to review implications of single pier on southern backspan and/or increasing width between piers</b>
2.4	PB suggested a follow-up meeting within the next few weeks	<b>PB to set up meeting</b>
<b>3.0</b>	<b>Operational Concept</b>	
3.1	PLA comments: <ul style="list-style-type: none"> <li>• Want a Project Requirement (PR) regarding maintaining the ability for vessels to navigate the river</li> <li>• Want a rewording of PR4</li> <li>• Want a rewording of PR5 to state 'marine' traffic instead of 'shipping' traffic</li> <li>• Want to change 'PLA supervisor' to 'Statutory River Authority'</li> <li>• Want an operating principle with similar wording to Tower Bridge Act</li> <li>• Suggested that they would look for a minimum air draught for vessel bookings of roughly 11.5m (though would need to check this) to align with Tower Bridge min. air draught of 9.1m (relative to 9.6m height)</li> <li>• Want Section 6 redrafted with agreed changes (such as removing commercial/recreational vessel distinction)</li> </ul>	<b>TfL to implement proposed changes to Operational Concept</b>

# Rotherhithe to Canary Wharf Crossing - Meeting Note

Ref.	Description	Action
	<ul style="list-style-type: none"> <li>Want 'Extraordinary Vessels' renamed to 'Large Vessels' and a definition of what constitutes this included</li> <li>Want Operating Principle (OP) 2 to be clarified (relating to having a responsible bridge operator)</li> <li>Want OP 7 to be clarified or removed</li> <li>Want OP 11 to be clarified or removed</li> <li>Want OP 12 to be clarified and include a definition of what 'missed' means.</li> <li>Concerned about OP 16 and 17 as may be able to be abused by a future bridge operator – want it made unambiguous.</li> <li>Want all height definitions going forward to use chart datum instead of being relative to MHWS</li> <li>Suggested talking to St Katherine's Dock Marina with regards to managing large numbers of smaller vessels – e.g. when booking in at SKD vessels could be advised to use an appropriate bridge lifting time</li> <li>Suggested adding the potential under Special/Extraordinary events to have events where bridge remains open/closed for longer periods with the express agreement of both TfL and PLA (e.g. tall ships festival, London Marathon)</li> <li>PLA want access to camera feeds from bridge, and suggested possibility of having a radar at the top of one of the towers.</li> </ul>	
4.0	<b>Navigational Simulation</b>	
4.1	PB presented the Navigational Simulation key dates, PLA had no issues with these dates	<b>PB to develop navigational simulation plan</b>
5.0	<b>Navigational Risk Assessment</b>	
5.1	DP discussed the planned river stakeholder meetings for the Navigational Risk Assessment and the PLA had no further suggestions on other stakeholders to meet.	<b>Marico/TfL to begin setting up NRA stakeholder meetings</b>



# Rotherhithe to Canary Wharf Crossing - Meeting Note



<b>Title: R2CW Port of London Authority Liaison</b>	
<b>Date</b> 05-03-19	<b>Timing:</b> 14:00-16:00
<b>Type:</b> Meeting	<b>Location:</b> PLA Offices, Pinnacle House, London EC3
<b>Attendees:</b> Nick Evans (NE) Stephen Milford Tom Chick (TC) Marinas (Various)	PLA (River Pilot) TfL (Sponsor) TfL (Sponsor)

**Aim of the meeting:** To update the London marinas on project progress since the last consultation and gain insight into potential concerns.

**Topics of discussion:** Key topics of discussion were: i. Project Update; ii. Marina concerns

No.	Action	Owner	Deadline
1	TfL to provide information on the minimum height over the main span	SM	31-03-2019
2	TfL to meet/liase with SKD and Limehouse marinas with regards to bridge operation generally, as well as potential of communication between marina lock and bridge bookings specifically	SM	31-03-2019
4			
5			
6			
7			
8			
9			
10			

# Rotherhithe to Canary Wharf Crossing - Meeting Note

## Key outcomes (dis/agreements, notable information shared)

1. Marinas concerned about vessels being unable to make bookings
2. Marinas appreciative of concept of 'proactive bridge operator'
3. PLA and Marinas like idea of communication between bridge and marina lock bookings
4. Marinas expect some form of accommodation for river users awaiting a lift such as mooring buoys

Ref.	Description	Action
<b>1.0</b>	<b>Introductions/Overview</b>	
1.1	NE outlined meeting agenda and gave a brief overview of planned river traffic in 2019 – the majority of commercial traffic will be due to Tideway Tunnel construction	
<b>2.0</b>	<b>PLA Updates</b>	
2.1	PLA/Marinas discussed licencing – all commercial vessels on the Thames must be licenced	
2.2	PLA are currently reviewing the lighting arrangements for tugs	
2.3	PLA gave information about the use of arches at Blackfriars Bridge: Arches 1 and 2 are currently closed for Tideway, with a 'traffic light' system currently on the navigational channel that sometimes requires recreational vessels to wait.	
2.4	PLA are trialling a 'dynamic sign' for vessels to use arch 2 – information will be provided in an 'advice to mariners' notice published in coming days	
<b>2.0</b>	<b>Project Update</b>	
2.1	SM outlined the project and its current design state	
2.2	Various marinas made it clear they are worried that openings will be restricted during rush hour	
2.3	SKD Marina stated that they were concerned about leisure vessels needing to know their own air draught, and said that many that use their marina do not.	<b>TfL to meet with SKD (SM/TC)</b>
2.4	Various marinas, especially SKD and Limehouse, had concerns about vessels being unable to go through due to not being able to arrive at the booked time	<b>TfL to meet with Limehouse Marina (SM/TC)</b>
2.5	SKD Marina raised that they did not view an operating concept 'in line with Tower Bridge' as being sufficient for leisure users as vessels will not turn up when booked	
2.6	The possibility was raised of 'linking' marina lock bookings (especially SKD and Limehouse) with bridge	

# Rotherhithe to Canary Wharf Crossing - Meeting Note



<b>Ref.</b>	<b>Description</b>	<b>Action</b>
	bookings	
2.7	PLA stated that they are looking into the possibility of layover berths but expect some form of communication between marina lock and bridge bookings	
2.8	Limehouse marina stated that they currently track boats on AIS as far as the Thames Barrier to give an idea of when they might arrive (~50% of boats can be tracked this way)	
2.9	Marinas stated they would have an expectation of visitor moorings/facilities for leisure users – potentially both for those waiting for a bridge opening and those not – i.e. overnight moorings. PLA suggested that the northern piers would likely be non-navigable and therefore a potential holding area	
2.10	Marinas stated they would like a booking system where you can see already placed bookings, including the boat name and what direction it would be going	
2.11	It was raised that bridges in Rotterdam have optical detectors that know how high they need to lift and when the boat has safely passed through	
2.12	The marinas agreed that the painted steel option for the final bridge was preferred over weathered steel due to higher visibility for river users.	
<b>3.0</b>	<b>Next PLA/Marinas meeting in September - TBC</b>	



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# Rotherhithe to Canary Wharf Crossing

## Briefing for the Mayor

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## The Mayor's Manifesto Commitment

*“Work to break down some of the city's physical barriers, such as by backing the Rotherhithe-Canary Wharf cycle and pedestrian bridge.”*

## The Mayor's Transport Strategy

*“New crossings for pedestrians and cyclists can help connect local communities and encourage healthier lifestyles....A new crossing for pedestrians and cyclists between Rotherhithe and Canary Wharf can help support growth and encourage more active travel.”*





## Purpose of this briefing

1. To provide an update on our work since our last briefing (22 February), including a preferred alignment and key discussions with the Port of London Authority (PLA) around bridge heights and operations
2. To discuss significant issues around the scheme's current forecast out-turn cost
3. To discuss the next steps for the project, including the timetable for further consultations and the TWAO application



# Contents

1. Actions and progress since February 2018 briefing
2. Points to discuss:
  - A. Preferred alignment
  - B. Costs
  - C. Funding
  - D. Business case
  - E. Programme and consultation
3. Next steps

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## Actions from February briefing

Actions from briefing on 22 February	Update
Return to update on proposal for a single preferred alignment for the scheme	✓ Preferred options to be presented today for discussion
Explore options to bring forward the submission date of the TWAO, particularly around the start of the second consultation	✓ A number of challenges to our programme exist which we wish to discuss
Arrange a specific discussion on funding and finance options for the scheme, including the potential use of retained business rates revenue	✓ Discussions on funding have taken place and options for partial support through the Business Rates Retention pilot scheme proposed
Arrange a discussion with Canary Wharf Group to explore its thinking on the proposals	✓ We have met with Canary Wharf Group and so has the Deputy Mayor
Reconsider engagement approach with JP Morgan, using GLA contacts if necessary	✓ The Deputy Mayor wrote to JP Morgan and we have now met with them

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## Progress since the last meeting

- We published the results of the first consultation in March 2018 and the detailed consultation report in August 2018
- We have appointed Atkins to provide design/engineering support including more robust cost estimates based on indicative bridge designs on the preferred alignments
- We have undertaken a thorough options assessment process using a number of factors:
  - Transport
  - Land, property and environmental impacts
  - Public and stakeholder views
  - Planning policy, including equalities impacts
  - Engineering and urban design
  - Costs and benefits
- We have developed operating arrangements with the PLA to prove the viability of an opening bridge option:
  - Remote control facility at TfL control centre
  - Clear periods between openings
  - Height reduction from 15m to 12m, whilst ensuring the number of openings stays broadly the same (under discussion with PLA).



# Preferred alignment

Option	North	Central	South
Transport	Green	Green	Red
Land	Yellow	Green	Green
Environment	Yellow	Green	Yellow
Stakeholders	Green	Yellow	Red
Planning	Yellow	Yellow	Yellow
Engineering / Design	Yellow	Green	Green

Results of options analysis

- We are now focussing on the **Central alignment** as our preferred option, but think there is merit in retaining a **Northern option**
- The **Southern alignment** provides a weaker transport case and is less supported by stakeholders.

Northern alignment



Central alignment

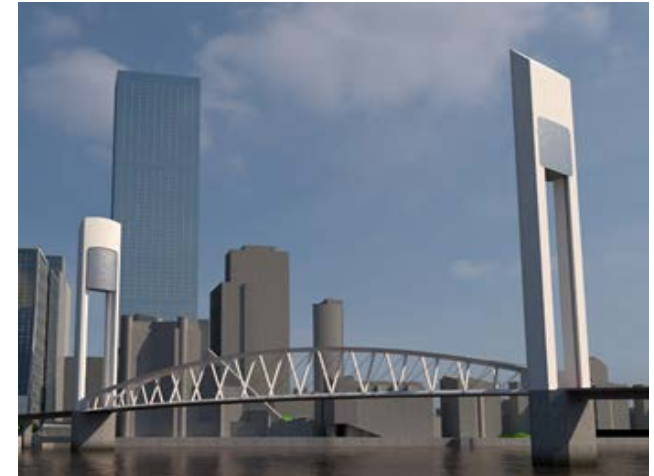


Southern alignment



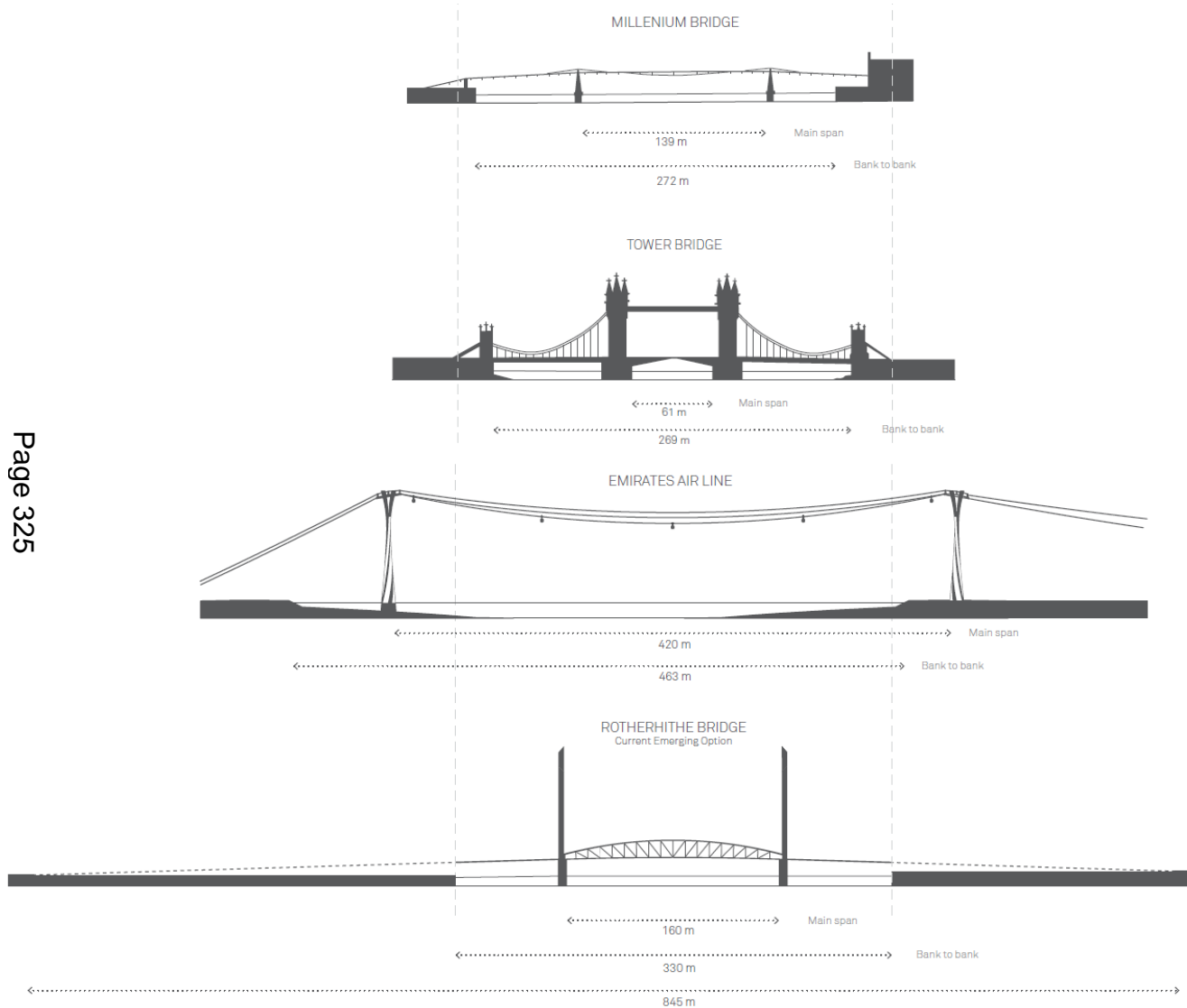
# Preferred opening mechanism

- Three mechanisms were shortlisted:
  1. Bascule (as proposed by reForm Architects)
  2. Swing
  3. Lifting
- We have taken advice from consultants and a moving bridge specialist, as well as undertaking a structured assessment to determine the best solution
- Given the size of the bridge (see next slide), a Bascule mechanism would be high risk, as it would be 65 per cent bigger than the largest existing Bascule in the world. Therefore, whilst we have not ruled out a Bascule at this stage, our assessments show the lifting bridge performs best, offering:
  - A proven concept at this size
  - The lowest design & construction risk
  - The lowest operational & maintenance risks & shortest out-of-service times
  - The best reliability & quickest opening times
  - The greatest opportunity for value engineering & refinement.





# Comparison with other London River Crossings



The opening section of the new crossing is nearly three times greater than Tower Bridge (160m compared with 61m) and the required headroom (allowance for height of vessels) when open is the same as the Emirates Airline.

## Costs

The latest point estimates are between **£355 - 395m** (for the central alignment) and **£480m** (for the northern alignment), including risk. These are broken down on the next slide.

The design and costs have been subject to significant challenge to ensure we are developing the best value solution. However, the estimates are significantly higher than before (previously up to **£260m**) and are largely driven by an assessment that more steel is needed to provide the necessary structural rigidity, more substantial foundations are needed to accommodate the heavier structure, and additional river works are necessary to protect navigation in the river. The estimates also allow for greater land take and higher levels of compensation to local stakeholders.

We are continuing to challenge these costs, with opportunities to reduce the construction costs as the concept design develops further. This includes investigating alternative materials and foundation options, together with different methods of construction.

The increased cost would impact on the Benefit Cost Ratio for the project within its wider business case, which would be closely scrutinised at a TWAO public inquiry. The project has a strong strategic case (alignment with the MTS, regeneration benefits etc), but the estimate of £355 - £395m would produce a Benefit-Cost Ratio of 1.4:1 – 1.2:1\*.

We will also need to demonstrate at the Public Inquiry that we have looked at all the options (including e.g. repurposing the Rotherhithe tunnel or building a ferry) and our reasons for selecting whichever option we want to take forward.

\*including risk, operating costs and optimism bias at 43 per cent to produce a 60 year appraisal



# Breakdown of cost estimates

Alignment @ 12m height	North	Central (C1)	Central (C2)	Comments
Construction	£170 m	£150 m	£140 m	Steelwork, foundations, etc.
Indirect costs	£60 m	£40 m	£40 m	Design, surveys, supervision and associated costs
Inflation	£60 m	£55 m	£50 m	Based on current BCIS indices and developed programme for design and delivery
Risk	£120 m	£95 m	£90 m	Allowance on construction, indirect costs and inflation at 40% in accordance with Treasury & TfL guidance
Land costs (inc. risk)	£70 m	£55 m	£35 m	Includes allowances for disruption & compensation
Point estimate total	£480 m	£395 m	£355 m	

Note: The two variations on the central alignment are shown in Appendix I. Both include an 8.1m deck width, with C1 having ramps, lifts and stairs at both ends and C2 having ramps at both ends and new lifts and stairs at Durands Wharf with the existing lift and stairs utilised at Canary Wharf. Further work is underway on value engineering opportunities relating to the construction methodology. It should be noted that the PLA has raised a number of concerns regarding option C2 that we are working through.





## Funding

The funding position must be confirmed prior to the TWAO application, in summer 2019.

There is currently £53m of confirmed funding in our 2017 Business Plan.

There is the potential to provide additional funding from our Business Plan, if our overall level of funding was to increase, for example, through allocation of surplus Business Rate Retention revenues from GLA to TfL and/or support from the DfT's new Major Roads Network Funding programme.

We could also seek private finance for the project (for example, we could use a Design, Build, Finance and Maintain contract similar to the way the Silvertown Tunnel is being delivered). This would require a new funding stream to meet the majority of the project costs through payments over a c.25 year period, once the new crossing is open.

We are exploring potential recurring funding streams, which are described on the next slide.

This is likely to involve a longer procurement period (by c.12 months) and therefore a decision on whether to pursue this route would need to be taken later this year to minimise delays to the overall programme.



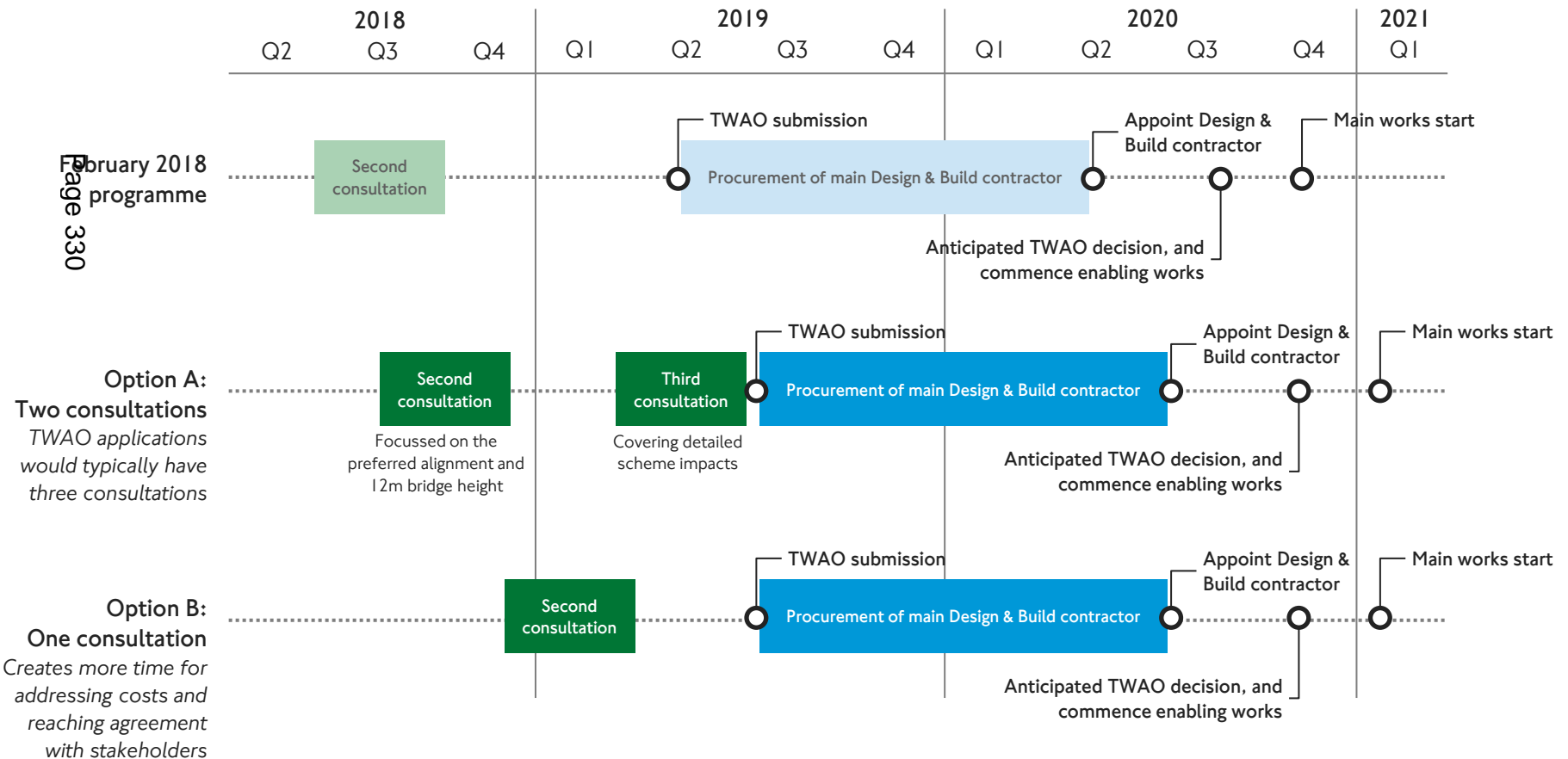
## Funding – potential recurring sources

Source	Potential Income
<b>Borough Community Infrastructure Levy:</b> Southwark has included the project on their Section 123 list. Tower Hamlets (LBTH) has indicated that they are unwilling to contribute funding to the project	£10m - £30m
<b>Workplace Parking Levy (WPL):</b> A WPL is an annual charge on businesses with a certain number of employee car parking spaces. If we focused this on the development areas nearest to the bridge (ie the Isle of Dogs and Canada Water at a charge of £800-£1000 / space) significant contributions could be generated over a 30 year period	£60m- £90m
<b>Commercial development:</b> We are exploring commercial opportunities related to the crossing. This is difficult to justify in planning terms, however, small retail units at either end may be possible	£3m – £6m
<b>Transport for London Network (TLRN) parking charges:</b> The introduction of parking charges would generate a revenue stream that could be dedicated towards helping to fund the costs of the new crossing. This could generate a potential funding contribution over a 30 year period.	£100m - £320m (up to £400m best case)
<b>Total</b>	<b>£173m - £526m</b>



# Programme and consultation

- We have a good understanding of stakeholder issues (see Appendix 2)
- There are two options for consultation, reflecting the need for further work to interrogate the scheme's cost and address stakeholder issues.





## Next Steps

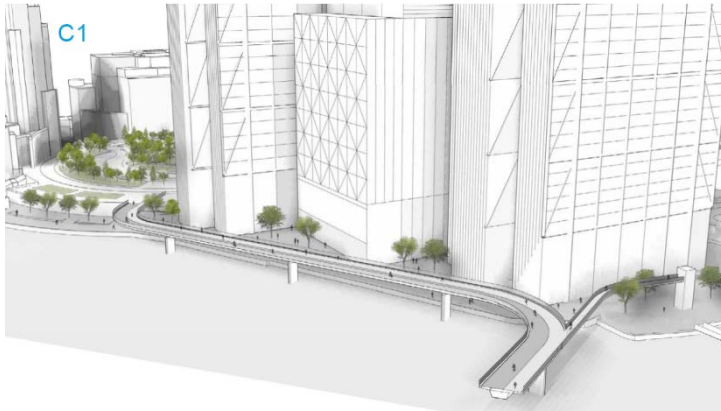
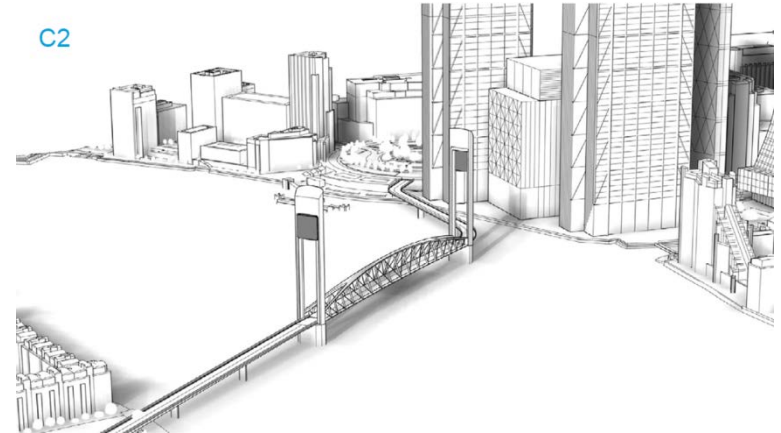
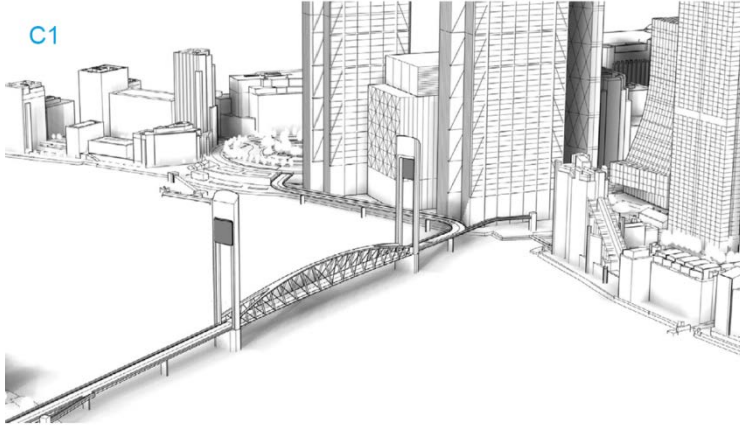
Subject to the discussion at the meeting, next steps would be to:

- Seek endorsement from the Programmes & Investment Committee on 11 October for commencement of a second consultation
- Commence second consultation in mid-October 2018
- Continue meeting with key stakeholders (especially PLA, Tower Hamlets and Southwark) to progress scheme development and explore funding options in more detail.
- Consideration of funding requirements as part of 2018 TfL Business Planning process.



# Appendix I – Design options C1 and C2 for central alignment

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The two variations on the central alignment are shown above. C1 provides the straighter alignment across the river and C2 provides a more direct alignment to West Ferry Circus. The bottom two images highlight how both variations would land on the northern side of the river: C1 runs parallel to the Thames Path, whilst in C2 the ramp is located further away from the Thames Path and the proposed Riverside South development.



# Appendix 2 - Stakeholders and requirements

**Hilton:** They will see benefits but significant impacts from northern alignment and we need to develop detailed designs which address this. Opportunities to integrate with potential development with time.

**Local residents:** there seems to be significant support in general. Rotherhithe groups push for delivery ASAP. Certain Canary Wharf residents are firm opponents to the scheme.

**LBS:** continue to engage positively however we need to carry out detailed environmental and construction assessments to address concerns from residents on impacts to parks and construction nuisance

**PLA:** we are holding positive discussions however key issues of height and river structures must be confirmed through vessel modelling and navigational risk assessment

**CWG:** we are holding pragmatic discussions but they would prefer a ferry in the short term and require detailed junction modelling to address their concerns about traffic impacts

**Yianis Group:** we need to develop measures to minimise impact on Canary Riverside development

**Thames Clippers:** continue to push the viability of the ferry option and have been aligning with potential objectors

**JP Morgan:** positive discussions, but their timescales do not align. We have developed ramp options for central alignment to address their concerns about the value of their site

**Caroline Pidgeon AM:** continues to challenge our options process and push the ReForm/Bascule design

**Neil Coyle MP and Jim Fitzpatrick MP:** very supportive and we continue to update them on the project





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## Notes of River Users Consultative Forum (Upper)

30th November 2017 @ 10.30 hrs aboard HQS Wellington

### Chair

Mark Towns	MT	PLA Harbour Master (Upper)
Nick Evans	NE	PLA Deputy Harbour Master (Upper)
Josh Rylah	JR	PLA Deputy Harbour Master (Upper)
Jon Beckett	JB	PLA SMS Manager
Tanya Ferry	TF	PLA Environment Manager
Duncan Tysall	DT	PLA Environment
Sandra Baker	SB	PLA Executive Assistant (notetaker)

### Attendees

Beverley Gosling	BG	MCA
Adam Stratford	AS	MCA
Derek Mann	DM	MBNA Thames Clippers
Jake Lewis	JL	MBNA Thames Clippers
Chris Livett	CL	Livett Group
Dave Fisher	DF	Transport for London
Mark Berry	MB	Environment Agency
Andrew Lunt	AL	Transport for London
Bob Prentice	BP	Crown River Cruises
Ted Manning	TM	Crown River Cruises
Richard Hart	RH	ATYC
Barry Singleton	BS	The Barge Association
Stuart Smith	SS	London Port Health Authority
Steve Davies	SD	North Kent Yachting Association
Roger Squires	RS	Inland Waterways Association
Graham Faulkner	GF	GPS Marine
Neil Withers	NW	RNLI
Kevin East	KE	British Canoeing
Harry Whelan	HW	London Kayak Company
Neil Caborn	NC	Cory Riverside Energy
Tipu Parvez	TP	Cory Riverside Energy

### 1. **Apologies:**

Andy Batchelor, Gary Spencer, Sean Collins, Russell Robson, Terry Leach, John Potter, Peter Finch, Nick McKie-Smith, Pamela Chart, Stuart Jenkins

### 2. **Minutes of last RUCF (Upper) – 20<sup>th</sup> April 2017**

Minutes from the previous meeting were agreed.

### 3. **Matters Arising from Previous Minutes**

No outstanding actions

### 4. **PLA Update**

#### 4a **Regulatory & Navigational SMS Update – Jon Beckett**

**Thames Byelaws** – Amendments undergoing approval from the DfT

**Byelaw 49** – One outstanding objection to Byelaw 49 by British Marine on the amendment.

**Pilotage Directions** - Now in force and the PLA are currently in the process of agreeing the exam syllabus for PEC intraport tug and tows – further comments welcomed. A near final draft to be issued in the next few weeks.

**Red Tape Challenge** – the vision for the next 12 months on regulatory framework is to reduce the volume by approx. 50% of byelaws, codes of practice, repetition and produce an online port information book – further consultations in the coming months.

A SMS report has recently been produced covering a trend analysis on inland waterways and work boat vessels- Appendix A  
<http://www.pla.co.uk/assets/atrendanalysisofinlandwaterwaysfreightworkboatandservicecraftoccurrencesintheportoflondon.pdf>

- 4b Security Update – provided by Thames Port Security Chair – Cathryn Spain**  
The UK threat level currently remains at **SEVERE** (an attack is highly likely). Despite the two incidents over the summer where this was raised to the highest level of **CRITICAL** (an attack is expected imminently).  
Due to an increase in maritime activity abroad and an increase in UK terrorism ashore, the DfT is giving more focus to UK maritime security, especially in relation to the threat of a marauding terrorist attack. So even though the maritime security level is low there is still a need for all users of the River Thames to be vigilant and report suspicious activity to their local police on 101, via Crimestoppers or in an emergency, dial 999.  
The Thames Port Security Authority continues to regularly meet with representatives from berth operators and other organisations along the Thames. The last meeting was 11<sup>th</sup> October 2017 and the next is planned for April 2018.

There is additional work ongoing following the attacks on London close to the river in 2017 (Westminster Bridge and London Bridge) following which security has been increased and a Thames Protect Committee has been established.

- 4c Recreational Update – Josh Rylah**  
Recreational incident numbers have increased by 42.3% compared to the same period in 2016 this is due to a number of recreational river users not complying with various byelaws. In response to this the PLA produced a 8-Top Tips to Safe Navigation on the Tidal Thames leaflet (tabled) in partnership with the Coastguard and RNLI. In addition, we have recently witnessed an increasing number of incidents where recreational mariners have navigated through Richmond Lock and Weir and footbridge while the weirs were being operated. In response to this we have now established an Exclusion Zone and further details of this are contained in Notice to Mariner U18 of 2017.

**Recreational codes of Practice**

Following on from the PLA's Red Tape Challenge we will be looking to potentially combine the Rowing and Paddling Codes which both offer similar advice and guidance, when they are next due for review.

**Thames Vision**

The PLA continues to work closely with a number of National Governing Bodies (NGBs) to investigate and encourage further growth of sport and recreational activities along the tideway. The PLA has in addition taken over and expanded the remit of the East London Watersports Forum; supporting clubs and centres with recreational activities.

- 4d Environment Update – Tanya Ferry**

It is unfortunate to report the death of the common dolphin that was spotted in the Upper Thames area – there is an increase in the number of seals and porpoises in the Tidal Thames area (especially in Kew) and a leaflet on dealing with these mammals has been issued for public guidance on mammal behaviour (tabled).

Any sightings to be reported:

- CSIP (Cetacean Stranding Investigation Programme) on 0800 652 0333 (deceased)
- Website: [zsl.org.inthethames/](http://zsl.org.inthethames/) (healthy)

Leaflets available from the PLA Environment team and further Information available:

- #ThamesMammals
- [www. ZIs.org/thamesmammals](http://www.ZIs.org/thamesmammals)



### **Air Quality Strategy**

There is an Air Quality Strategy consultation (released following the meeting) for which feedback would be appreciated – closing date: 23<sup>rd</sup> January 2018.

<http://www.pla.co.uk/environment/Air-Quality-and-Green-Tariff/Air-Quality>

With reference to the Mayor's target of a carbon-free London CL queried whether there would be any planned additional costs to operators. With regard to Air Strategy – no sanctions have as yet been imposed on the River but the PLA will be taking a proactive line to what will become a national project, with no intended additional costs to operators.

On behalf of individuals that cannot take a corporate stance (owners of residential/travelling barges) BS queried whether any consideration would be given to the boats that are currently run on diesel and the difficulty/expense to convert. TF explained that initially the focus is on commercial vessels, where analysis signifies a higher proportion of emissions.

### **Litter Survey**

As previously a report will be released on the latest litter survey and the survey will be re-issued to build a data bank of details regarding economic litter.

### **Thames Vision**

There are environment and heritage goals as part of the Thames Vision - the next conference will be held on January 24<sup>th</sup> 2018 – further details from Environment Team, PLA.

## **5 MCA – Adam Stratford**

AS announced that he had taken over from Mike Greenwood, as Principal Marine Surveyor, and introduced Beverley Gosling as the new Business Manager, who would be overseeing the move of the MCA Orpington Office to Colchester in July/Aug next year (at which time a MIN will be issued). Thames issues will need to be channeled through the Colchester Marine Office following this move.

### **BML/LKE**

AS reported that this year appointments for BMLs and LKEs were alternated monthly which worked well and also the availability of company 'block bookings' together with more examiners had seen an improvement, although any suggestions invited. Dates for 2018 are now available from the MCA.

**BML LKEs are covered by a PLA Pilot + MCA Examiner (Initial Examination)**

**Revalidation: PLA Examiner + Thames Practitioner**

**PLA LKEs are covered by a PLA Examiner (usually a Harbour Master)**

MT reported that there had been a couple of discrepancies/out-of-date BML/LKEs when checked for validation.

**Action: All Operators to check validity of all crew BML/LKEs (this can be done via the MCA Office).**

BML Licences – In order to address the amount of BMLs being lost/damaged AS would prefer full BML/LKE documentation (at least 4 pages/photos) to be held electronically on board vessels (phone/ipad) with back-up of a photocopy - CS requested this to be promulgated in writing to operators.

**Domestic Safety Management Code MSIS 29 (ISM Code)** for the safe operation of ships and for pollution prevention is progressing well with few teething problems on the system. Clarification on the self assessment process will be re-issued. Self Assessments are annual for each boat/each company when not undertaken by the MCA.

**Action: AS to promulgate confirmation of BML documentation to be held on board electronically and clarify paperwork to be used by Offices for assessment.**

**6 Navigational Safety – Incidents – See Appendix A  
SMS Report –A trend analysis of Inland Waterways Freight, workboat and service craft**

Summary:

- Rise of reported incidents in the last year (108) – increase in near miss reporting
- Reduction in the number of wash complaints from residential moorings
- 30% rise in commercial wash complaints in Central London(10 in total)
- Wash complaints against ribs increased – rib operators now supply wake wash assessments
- Contacts (commercial sector) increase from 5 to 15
- Increased enforcement action against rec. users (increase from 9 to 23) – PLA working closely with TLC
- Groundings – significant rise
- Mechanical failure – up from 14 to 21 – majority caused by debris in Thames (breakdown as detailed in appendix)
- Breaches of byelaws increased (2 operators have had Certificates of Compliance withdrawn)

In addition the PLA will be working harder to follow up on near misses and will be taking a tougher stance on enforcement action; in the last year PLA prosecuted 4 masters and 3 to date this year. In the future consideration will be given to increasing the publicity of enforcement orders, as a deterrent – possibility looking towards facebook/twitter/press announcements. Currently they are announced via the website. The MCA have the power to revoke a BML Licence; the PLA to issue monetary fines, or rescind the Certificate of Compliance (for speed incidents). RS questioned whether the names of prosecuted could be detailed in the Annual Report which would be a way of highlighting to insurers persons transgressing the rules.

**Action: PLA/MCA to liaise on enforcement action and consider increased media**

Confirmation was given by the PLA that all the near-miss reports detailed in the trend analysis are genuine (backed-up with evidence of AIS).

With regard to the query on increased mechanical failures reported of the HSL:

- HSL report breakdowns in the same way as everyone else (not just internally)
- HSL boats are now being revamped and modified to try to resolve issues
- For the future the PLA will be looking at Electric Drive/Hybrids (although converting existing boats may not be an option due to the weight of the battery and range of 35 miles).

BS requested that a formal note to be made that there is still concern from residential barge owners about the way the boats speedily depart piers creating excessive wash.

**7a Police Update – Provided in advance by Stuart Jenkins**

- Reminder for Risk Assessment **Form 696** to be completed in advance of NYE (Thank you to all the Operators that have already submitted)
- Reminder to everyone (especially commercial and passenger operators) to review security arrangements and to ensure security plans are reviewed due to current threat levels.

He is happy to be contacted to for advice/assistance: [stuart.jenkins@met.police.uk](mailto:stuart.jenkins@met.police.uk).

**7b Coastguard – no representative**

**7c RNLI – Neil Withers**

The Thames Review has been completed and suggested addition to the agenda for the next meeting. In 2017 there was an increase in calls - Tower RNLI received 550 calls (the majority being crisis/self harm) and was also involved in both security incidents, collaborating with Police and PLA. Looking towards 2018 river safety will be high on the agenda – a concern for the fire brigade is the number of boats now being used as Airbnb and guests not familiar with boat safety.

**7d London River Services – Dave Fisher**

Compared to last year the number of passengers carried is 7% down. There have been a series of suspensions of the Woolwich Ferry and complete suspension is scheduled 6<sup>th</sup> October 2018 whilst works take place on a new berth infrastructure and delivery of 2 new hybrid ferries.

Greenwich Pier – currently undergoing maintenance works due to be back in full working order by the end of March 2018 (subject to remedial works on the drydock).

TfL are currently undergoing an organisational change programme. This has resulted in London River Services (LRS) becoming a part of the new Sponsored Services directorate, which includes LRS, Emirates Air Line and Santander Cycle Hire.

Danny Price is the new General Manager of Sponsored Services and Dave Fisher has been appointed Head of London River Services and Emirates Air Line (reporting to Danny Price). there will be a new River Services, headed up by Danny Price and the new structure will be promulgated once newly appointed personnel are in place.

**7e Fire – no representative**

**7f EA – Mark Berry**

One defence closure to date this winter on 5<sup>th</sup> October, but moving into the winter season more to be expected with high risk being in the next couple of months. In 2018 the Annual Test Closure date is scheduled for **Sunday 23<sup>rd</sup> September** – time to be confirmed. Major maintenance is ongoing with the replacement of brighter, more energy efficient lights.

**7g Port Health – Nothing to report (Stuart Smith)**

**8 River Works**

**8a Central/Navigational Channel Arch Closures at Hammersmith Bridge**

NtM issued for works starting early December – there will be further significant works at a later stage next year. To be kept on agenda

**8b Rotherhithe Bridge (Limehouse) – Andrew Lunt, Lead Programmer**

The Mayor's new Transport Strategy 2017 has stimulated the project for another crossing in the Rotherhithe Peninsular/Canary Wharf area with focus on the preferred option of a unique proposal for a high level, opening, bridge for walking/cycling. This would involve significant investment and promotion of change in culture. Currently there is a 'hotel' cruise crossing. The Public Consultation will be open until 8<sup>th</sup> January 2018 and currently surveys are being undertaken on the river to reach a 'data led' decision:

**To have your say:** Visit: [www.tfl.gov.uk/R2CW-crossing](http://www.tfl.gov.uk/R2CW-crossing)

Email: [consultations@tfl.gov.uk](mailto:consultations@tfl.gov.uk)

CL commented that as an operator he would like to see a "zero impact/zero cost" for operators and opening privileges they have as with Tower Bridge.

**8c Nine Elms Footbridge**

There is a proposal by Wandsworth Borough Council to put a footbridge across the river at Nine Elms. Initial liaison took place with the PLA, but final design went to competition with 9 new locations suggested. It is expected that the final design will have a span of approx. 150m slightly downstream of Westminster Boating Basin



(outside the navigational channel). Another meeting is due prior to Xmas – further details to follow.

**8d Fulham Football Club**

RWL granted for stand extension, but a redesign has been requested by the owner. Although the footprint won't change, the overall look of the stadium will be more elaborate - PLA will be considering the impact of wind/sailing in the area – work in progress. Start date in the near future.

**8e Blackfriars Zipline**

There is currently a proposal for a one/two year temporary zipline in the Blackfriars Railway Bridge area – potentially in between the 2 bridges or over the railway, which now has a roof – meetings to take place in the near future to review. (Proposal by same company that offer the O2 experience).

**8f Thames Tideway Tunnel – Report prepared in advance by Terry Lawrence**

**Victoria Embankment** - Cofferdam construction ongoing. No.1 Arch Charing Arch is closed until approx. 23<sup>rd</sup> March 2018 but will reopen for the contractors' Xmas break 22nd Dec to 3<sup>rd</sup> Jan.

GF – Going well, ahead of schedule and will open No. 1 Arch over Xmas maybe earlier (there may be a river closure Dec 16/17)

**Blackfriars** - Deconstruction of pumping station and construction of the cofferdam cells at the western part of the site has started. It is also hoped to open No. 2 Arch Blackfriars Bridge for the contractors' Xmas break – to be confirmed

MT: PLA aware of the challenges of No. 2 arch being closed and will be meeting next week internally to discuss further and make further improvements prior to next summer

**Chambers Wharf** - Continues as an operational berth. Import one rebar barge per fortnight and export 3 barges of shaft arisings per week

**Carnwarth Road** - Installation of the tow sheet wall piles continues. As of 21<sup>st</sup> Nov. construction started on the sheet pile wall for campshed at Eastern end. Discharge of TBM parts planned for 1st December and a promotional event taking place.

**Kirtling Street** - Export of shaft arisings from the previous Cemex Jetty continues.

Installation of additional berthing face piles has been completed. Segment loading barge installation taking place Mid January 2018

**Putney Embankment** - Main work site set up continues ashore. Hope to start main site river works Jan 18 (to be confirmed)

**Albert Embankment** - Hope to start bed levelling outside Tintagel House 1st week December followed by cofferdam wall construction Jan 2018.

**Cory Hop Pole Mooring** - Relocating Cory barge from approach to No. 4 arch Blackfriars Bridges – week commencing 4<sup>th</sup> December as per NtM

**King Edward Memorial Park** - Cofferdam construction and filling ongoing.

**Cremorne Wharf** - Bed levelling planned for January 2018 followed by berth operation

**Heathwall Pumping Station** - Trial pits at the toe of the Embankment are ongoing.

Nine Elms Rail Tube Extension – GF confirmed tunnelling completed.

Diamond Jubilee Footbridge – Back in the news but no discussions/consultation with the PLA

**8g Illuminated Bridges Project – Josh Rylah**

The aim of this new project, which is still in the planning and design phase, is to draw more people to the River and make it a tourist attraction and the illuminations will be replicated on 15 bridges; each bridge having a unique design, based on its history – details to follow early next year. (The artist involved was successful with the San Francisco Bay Bridge)

There was assurance that Tideway Tunnel tug and tows would take priority and there would be no interruption to works and that they would be liaising with over 150 stakeholders. Phase 1 to be completed by Feb 2019, Phase 2 by Jan 2020 and Phase 3 by Dec 2022. The RNLi suggested that thought process for pink lighting (as witnessed in Japan) is given due consideration as there is evidence that pink lighting can help reduce self harm.

**Action: JL to follow up liaison with RNLi on consideration for pink lighting**

**9. Commercial Vessels – Nick Evans**

**9a Passenger Vessels - Timetables**

In conjunction with LRS and the increase in river traffic the PLA/LRS have signed an agreement that changes in timetables have to be signed off by both parties, in an attempt to de-conflict the river.

**Action: Some operators still to submit timetables for approval from PLA/LRS**

**Freight Operations**

Non-passenger, Inland Waterway incident statistics showed an improving trend between 2010-2016 but this did not continue into 2017.

Looking at the trend analysis on the PLA website, there is a rise in machinery breakdowns particularly in 2017 (18%) with occurrences caused by breakdowns accounting for nearly 30%, which are largely workboats, and freight incidents have doubled. Contact is the biggest incident type, however 21% are near misses.

**Full Details – See Appendix A attached**

**9b Communications**

Highlighted is the inappropriate use of VHF 14, which adds to congestion – clarification is recommended for clear, concise use of Ch 14 – the MPU/PLA/Ofcom are working together to improve this. Using DF, Ofcom can identify offenders and any complaints of racism/sexual discrimination will be followed up – this could lead to Ofcom withdrawing the licence from some operators.

**Action: All to take a stance against inappropriate use of CH14**

**9a MCA Document MGN432 – Action: All to take note and have a risk assessment in place for passenger transfers to/from small boats**

**10 Events – Josh Rylah**

Filming on the river has increased. Looking ahead to NYE this will be a similar format to previous years – only change is that the lower closure will finish at the end of the event and upper closure will have an additional 5/10 minute delay to avoid the rush of Class Vs. In 2018 there will be a big filming event for which a NtM will be issued together and an increase in warships and cruise ships in the port. Recommendation for early communication of any event on the river to ensure clarity for other users – please note feedback is welcomed on traffic management following an event.

**11 Any Other Business**

JB reiterated the SMS report and trend analysis details available on the PLA website with a request for continued reporting of near misses.

CL would like noted that although business is down by 7%, there is still an increase in charges of 2.9% and a plea for sympathetic consideration to increases.

**Action: HMU to pass on charges increase for operators to Finance team**

BS mentioned again the need for further moorings and wash considerations.

**Steve Davies**

In order to assist operators or masters that are unfamiliar with sailing boats, Steve Davies (and some colleagues) are offering to meet up and discuss with small groups in order to give a better understanding and familiarisation of sailing. Anyone interested to contact Steve by email: [nkya@ryase.org.uk](mailto:nkya@ryase.org.uk)

**12 Date of Next Meeting**

**Watermen's Hall – Wednesday 25<sup>th</sup> April 2018** – Outlook calendar invitation to follow

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Rotherhithe to Canary Wharf crossing  
Working with the Port of London Authority

Introduction

The purpose of this note is to summarise how we have worked with the Port of London Authority (PLA) over the course of the Rotherhithe to Canary Wharf (R2CW) project.

We have collaboratively worked through the development of the R2CW bridge design with their Harbour Masters, Planning and Development team, and river pilots, meeting to understand their operational parameters for vessels which would require a bridge to lift, their preferences regarding alignment and proximity to the bend in the river, and negotiating key design considerations, for example the height of the bridge to reduce the impact of structures on land.

Engagement and consultation

The remit of the PLA is to ensure navigational safety along the tidal Thames and to protect the ability of their river stakeholders to use the river unimpeded. They were identified as being a key stakeholder early in the development process for the R2CW project and were one of the first organisations we met with to understand the impact of a crossing in this part of the River Thames. Given the provision of an opening bridge on this part of the Thames is unprecedented, there is no existing standard or requirements that could be applied. Instead the PLA outlined some clear considerations with regard to use of the river, operations, alignment and height of the bridge.

The PLA were clear that the Authorised Channel should remain clear of structures; this was a key desire from the outset. Understanding this we developed designs which left this channel clear and this influenced the strength of the structure required to span this length.

We worked with the PLA over the duration of the design development to inform aspects of the project such as the alignment of the bridge. The PLA had a clear desire for an alignment that was perpendicular to the river, which would be easier for vessels to traverse. Conversely, we preferred a more direct, diagonal alignment stretching from Durand's Wharf to Westferry Circus. A number of options were worked through, subject to analysis and risk assessment, and reviewed by river pilots to arrive at the final solution that satisfied both parties. Likewise, the development of ship impact protection for the bridge piers went through the same process in conjunction with the alignment, ensuring at all stages that the protection was safe and sufficient, but also not over-designed and suitable to its environment.

The PLA also desired a wide area between bridge piers underneath the southern span of the bridge for smaller vessels to pass through without needing to use the Authorised Channel. A wider space between piers would however require a significantly stronger and therefore more costly span. Through discussions with a number of river user groups including tow companies and rowing clubs, we determined who would be using this southern span and therefore what area would be appropriate, which informed discussions with the PLA to arrive at a suitable proposal for the southern span.

The baseline height of a bridge at the beginning of the design process was circa 20 metres above Mean High Water Springs (MHWS). The reason for this height was an assumption by the PLA that the majority of river traffic was under 20 metres in height and would not therefore need the bridge to open, giving vessels uninterrupted travel along the river. It was clear that a bridge this high would require large structures (ramps) on land in order to make the bridge accessible for all users. In order to understand whether this height could be reduced we conducted surveys of vessels on the river, measuring their height and the frequency which they used this part of the river, and plotted this against a bridge height of 20 metre, 15 metres and 12 metres above MHWS. With the evidence that a lower bridge height would not significantly impact river users, as the majority of vessels were actually less than 12 metres in height, we successfully negotiated a 12 metres bridge height with the PLA and therefore reduced the impact on land and on the journey times for pedestrians and cyclists.

Following the negotiation on bridge height, we had extensive discussions with the PLA on the how the bridge would operate. This formed the majority of our meetings, and the PLA had a clear desire for the bridge operations to mirror those of Tower Bridge as closely as possible. This was a sensible proposition from an operational perspective but a number of details required further discussion, such as how the bridges would interact when large vessels, such as cruise liners seek passage.

There were also additional meetings the PLA were involved in, such as a meeting held at the PLA offices with representatives of the various marinas that operate on the river. Representatives from TfL attended this meeting to update the marina representatives on the project progress and gain insights into any potential concerns. The PLA aided in the facilitation of this meeting and participated in the discussion around the potential implications of the project on the marinas.

# Subject: London's Transport Now and in the Future

**Report to: Transport Committee**

**Report of: Executive Director of Secretariat**

**Date: 11 September 2019**

**This report will be considered in public**

## 1. Summary

- 1.1 This report sets out the background to a discussion on London's transport now and in the future.

## 2. Recommendations

- 2.1 **That the Committee notes the report as background to putting questions to guests on London's transport now and in the future and notes the subsequent discussion.**

## 3. Background

- 3.1 The Transport Committee is investigating London's transport now and in the future. In this investigation, the Committee will look at how London's transport system will need to adapt to future constraints and help address challenges facing the capital. The Committee will consider how people's experiences of moving around the capital could be improved. The Committee will also look at which future transport projects in the capital should be prioritised and how these could be delivered and paid for.
- 3.2 This is the second public meeting for this investigation. During this meeting, the Committee will explore people's experiences on the transport network, looking at issues such as crowding and congestion, accessibility, and walking and cycling. Further, the meeting will examine the potential solutions to some of the biggest challenges Londoners face when using the city's transport network.

## 4. Issues for Consideration

4.1 The following guests have been invited to today's meeting:

- Diarmid Swainson, Central London Forward
- Paul Goulden, Age UK London
- Sarah Sturrock, South London Partnership
- Joe Irvin, Living Streets

## 5. Legal Implications

5.1 The Committee has the power to do what is recommended in this report.

## 6. Financial Implications

6.1 There are no direct financial implications to the GLA arising from this report.

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**List of appendices to this report:** None.

<b>Local Government (Access to Information) Act 1985</b>
List of Background Papers: None
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# Subject: Tram and Bus Safety in London

**Report to: Transport Committee**

**Report of: Executive Director of Secretariat**

**Date: 11 September 2019**

**This report will be considered in public**

## 1. Summary

- 1.1 This report sets out the background to a discussion on tram and bus safety in London.

## 2. Recommendations

- 2.1 **That the Committee notes the report as background to putting questions to guests on tram and bus safety in London and notes the subsequent discussion.**

## 3. Background

- 3.1 The Transport Committee is investigating tram and bus safety in London. Today's meeting will focus on tram safety, and aims to better understand the process followed by TfL to respond to the Croydon tram derailment in 2016. Additionally, the meeting aims to identify wider learning for safety across the transport network.

## 4. Issues for Consideration

- 4.1 The meeting will focus on tram safety in London. The following guests have been invited to today's meeting:
- Michael Liebreich, former Board Member, TfL
  - Heidi Alexander, Deputy Mayor for Transport

## 5. Legal Implications

- 5.1 The Committee has the power to do what is recommended in this report.

## 6. Financial Implications

6.1 There are no direct financial implications to the GLA arising from this report.

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**List of appendices to this report:** None.

<b>Local Government (Access to Information) Act 1985</b>
List of Background Papers: None
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# Subject: Transport Committee Work Programme

**Report to: Transport Committee**

**Report of: Executive Director of Secretariat**

**Date: 11 September 2019**

**This report will be considered in public**

## 1. Summary

- 1.1 This report provides details of planned scrutiny work by the Transport Committee and the schedule of Committee meetings for the remainder of the 2019/20 Assembly year.

## 2. Recommendations

- 2.1 **That the Committee notes its work programme.**

## 3. Background

- 3.1 The Committee receives a report monitoring the progress of its work programme at each meeting. This is the first such report for this Assembly year.

## 4. Issues for Consideration

- 4.1 The following is a list of topics that the Committee is aiming to explore in this Assembly year:
- Tram and bus safety;
  - London's transport now and in the future; and
  - Accessibility of London's transport network.
- 4.2 The Committee will also seek to hold a meeting with the Commissioner of Transport for London (TfL) towards the end of 2019/20.
- 4.3 The Committee's remaining work programme will be developed over the year. The exact scope and timings for work on any of these other possible topics will be determined in due course and more detailed work programme reports submitted to future meetings. The Committee seeks to maintain flexibility in its work programme to take account of any relevant developments when scheduling its work and has a rolling work programme so work on any topics may continue beyond each Assembly year.
- Tram and bus safety**
- 4.4 The Committee is investigating tram and bus safety in London. The Committee's first meeting on the issue was on 12 June. On 10 July, the committee visited a tram depot, where safety technology,

such as the Guardian device, was demonstrated. The Committee also received a briefing on hazard braking and an opportunity to try safety training tram simulators. The meeting today will partly focus on tram safety and will contribute to this investigation.

#### **London's transport now and in the future**

- 4.5 The Committee started its investigation into London's transport now and in the future. This investigation will look at the factors that will impact London's transport, and explore what Londoners want to see from the transport network in the future. The meeting today involves a roundtable with the aim of discussing Londoners' experience with moving around the city.

#### **Accessibility of London's transport network**

- 4.6 The Committee will conduct an investigation into accessibility on the transport network in London, exploring visible and invisible disabilities. This investigation will start in October 2019. More information will be available following scoping of this investigation over the next few months.

#### **Rotherhithe to Canary Wharf bridge**

- 4.7 On 21 June 2019, the Deputy Mayor for Transport, Heidi Alexander, wrote to the Chair of the Committee to inform her that TfL had "paused" development work on the proposed bridge over the Thames between Rotherhithe and Canary Wharf. The Committee will continue to monitor the implications of this announcement.

#### **Responses to recent Transport Committee work**

- 4.8 The table below provides details of any responses due from the Mayor, TfL and/or others to Committee work.

<b>Transport Committee work</b>	<b>Details of responses due</b>
N/A	The Committee is not waiting for any responses at this time.

#### **London TravelWatch**

- 4.9 The GLA Act establishes London TravelWatch as an arms-length body of the London Assembly. London TravelWatch provides regular reports to the Transport Committee. Following the appointment of a new Chief Executive of LTW, officers will be working to establish a work programme with LTW for the coming year.

#### **Schedule of meetings**

- 4.10 The schedule of the remaining Transport Committee meetings for 2019/20 is set out below with details of the main prospective topics identified to date, with the remainder to be confirmed:
- Wednesday, 10 July 2019, 10.00am - London's transport now and in the future
  - Wednesday 11 September 2019, 10.00am - London's transport now and in the future
  - Wednesday 9 October 2019, 10.00am - Accessibility of London's transport network
  - Tuesday 12 November 2019, 10.00am - Accessibility of London's transport network
  - Tuesday 17 December 2019, 10.00am
  - Wednesday 8 January 2020, 10.00am
  - Tuesday 4 February 2020, 10.00am
  - Thursday 12 March 2020, 10.00am – Meeting with the Transport Commissioner



## 5. Legal Implications

5.1 The Committee has the power to do what is recommended in this report.

## 6. Financial Implications

6.1 There are no financial implications arising from this report.

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### List of appendices to this report:

None

<b>Local Government (Access to Information) Act 1985</b>
List of Background Papers: None
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