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Committees: Planning & Transportation – for decision Projects Sub - for decision Culture, Heritage & Libraries – for information	Dates: 02 June 2020 25 June 2020 13 July 2020
Subject: Tower Bridge Service Trenches Refurbishment Unique Project Identifier: 12197	Gateway 3/4: Options Appraisal (Regular)
Report of: Director of the Built Environment Report Author: Mark Bailey	For Information
<h1>PUBLIC</h1>	

1. Status update	<p>Project Description: Refurbishment of the 320m length of service trenches to the footways of the fixed spans of Tower Bridge</p> <p>RAG Status: Green (Green at last report to Committee)</p> <p>Risk Status: Low (Low at last report to committee)</p> <p>Total Estimated Cost of Project (excluding risk): £ 425,000</p> <p>Change in Total Estimated Cost of Project (excluding risk): Within the range of £300,000 to £500,000 at last report to Committee</p> <p>Spend to Date: £ 4,000</p> <p>Costed Risk Provision Utilised: None</p> <p>Slippage: Not applicable</p>
2. Next steps and requested decisions	<p>Next Gateway: Gateway 5: Authority to Start Work</p> <p>Next Steps:</p> <ol style="list-style-type: none"> 1) Complete investigations to test trenches for asbestos containing materials, confirm condition of existing seating frames and to map all existing services. 2) Confirm redundant services to be removed.

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	<p>3) Carry out trial installation of 6no. covers, to demonstrate suitability (including to Local Planning Authority) before commitment to over 300m on new product.</p> <p>4) Gain statutory approvals (Local Planning Authority, Transport for London)</p> <p>5) Agree costs for recommended option, under the term contract for highway works</p> <p>Requested Decisions:</p> <ol style="list-style-type: none"> 1. That additional budget of £40,000 is approved for staff costs, fees, investigations and trial installations, to reach the next Gateway; 2. Note the revised project budget of £50,000 (excluding risk); 3. Note the total estimated cost of the project at £425,000 (excluding risk); 4. Note that no Costed Risk Provision is requested at this stage, although £120,000 of costed risks against asbestos and contamination are identified in the Project Risk Register. These will be reviewed at the next gateway following completion of investigations. 5. That Option 3 is approved (Replace covers with bespoke lightweight ductile iron alternative, within existing seating frames) 																				
<p>3. Resource requirements to reach next Gateway</p>	<p><i>Additional funding required, for recommended option 3:</i></p> <table border="1" data-bbox="528 1335 1390 1939"> <thead> <tr> <th>Item</th> <th>Reason</th> <th>Funds/ Source of Funding</th> <th>Cost (£)</th> </tr> </thead> <tbody> <tr> <td>Staff Costs</td> <td>Project Management</td> <td rowspan="5">BHE 50-year plan</td> <td>10,000</td> </tr> <tr> <td>Fees</td> <td>Statutory Approvals</td> <td>4,000</td> </tr> <tr> <td>Investigations</td> <td>Risk Mitigation</td> <td>6,000</td> </tr> <tr> <td>Trial installation</td> <td>Risk Mitigation</td> <td>20,000</td> </tr> <tr> <td>Total</td> <td></td> <td>40,000</td> </tr> </tbody> </table> <p><i>Full breakdown of current spend and requested additional funding shown in Appendix 4</i></p>	Item	Reason	Funds/ Source of Funding	Cost (£)	Staff Costs	Project Management	BHE 50-year plan	10,000	Fees	Statutory Approvals	4,000	Investigations	Risk Mitigation	6,000	Trial installation	Risk Mitigation	20,000	Total		40,000
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	<p>Costed Risk Provision requested for this Gateway: 0 (as detailed in the Risk Register – Appendix 2)</p>
<p>4. Overview of project options</p>	<p>4 principal options have been considered:-</p> <ol style="list-style-type: none"> 1) Retaining existing covers, after temporarily removing to remove silt and redundant services, 2) Replace existing covers on a like-for-like basis, in heavy steel/cast iron with concrete infill and mastic asphalt surfacing. This option requires breakout and replacement of the existing seating frames, to suit manufacturer’s standard details/products, as well as in-situ concrete infill and mastic asphalt surfacing operations. 3) Replace existing covers using lightweight bespoke ductile iron covers, which are pre-surfaced before arriving on site. These covers do not require replacement of the existing seating frames, as the bespoke covers are manufactured to suit the dimensions and details of the existing frames (which are in good condition). 4) Replace existing covers using lightweight composite materials (e.g. glass reinforced plastic), which are manufactured with anti-slip surface. This option requires breakout and replacement of the existing seating frames, to suit increased bearing requirements and manufacturer’s standard details/products
<p>5. Recommended option</p>	<p>This report recommends option 3, i.e. to replace the existing covers with bespoke ductile iron covers (recessed to accommodate a thin factory-applied surfacing) whilst retaining the existing seating frames which are built into the concrete walls of the service trenches.</p> <p>The existing iron seating frames are believed to be in good condition, with a life expectancy which matches the proposed replacement covers. It is therefore considered overly disruptive and an unnecessary use of funds and time to replace them, if this can be avoided and without compromising the project objectives.</p> <p>Unfortunately, these seating angles do not suit manufacturers details and dimensions for standard products currently available on the market, which dictates that they should be replaced if options 2 and 4 were pursued. The labour-intensive operations to remove and replace the seating frames add considerable cost to these options.</p>

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	<p>As a result, option 3 represents the most economical way of replacing the existing covers, whilst offering technical advantages over the alternatives i.e.</p> <p>a) The covers will be significantly lighter than the existing covers (option 1) and those of option 2 and meet with H&S Manual Handling recommendations. This in turn affords ease of future maintenance of the service trenches, with the minimum of resources and cost</p> <p>b) The factory-applied anti-slip surfacing to these units will visually match similar surfacing to the bascule footways, which is proven to be acceptably hard-wearing. There is anecdotal evidence of composite covers (as option 4) losing their colour and anti-slip properties relatively quickly when used in other busy public areas, which may lead to premature replacement, as these materials do not lend themselves to over-surfacing.</p> <p>Option 1 is discounted as it does not ease future maintenance requirements and merely defers the inevitable, given that a number of existing covers have failed in recent years (upon removal) and that repairing them on an ad-hoc basis is not economical in the longer term.</p>
<p>6. Risk</p>	<p>Overall project risk: Low</p> <p>The risk profile of this project is considered to be low, as the project comprises only low complexity works to replace existing service trench covers, with associated silt removal and striping for redundant services from the service trenches</p> <p>The principal risks to the project, which will be investigated further and clarified prior to Gateway 5 and prior to recommending a Costed Risk Provision (CRP) for the construction stage of the project, include:-</p> <ul style="list-style-type: none"> • Presence of asbestos containing materials (ACM) within the service trenches • Damage/degradation of existing seating frames to covers, making their retention impractical <p>Further information available within the Risk Register (Appendix 2)</p>
<p>7. Procurement approach</p>	<p>As these highway works are of a non-specialist nature, they readily lend themselves to the use of the highways term contract, with the term contractor using its supply chain to procure the manufacture and installation of the bespoke units.</p> <p>Please refer to appended PT4 procurement report</p>

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Appendices

Appendix 1	Project Coversheet
Appendix 2	Risk Register (for recommended option)
Appendix 3	PT4 Procurement Form
Appendix 4	Breakdown of current spend and requested funding

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Options Appraisal Matrix

Option Summary	Option 1	Option 2	Option 3 (Recommended)	Option 4
1. Brief description of option	Retain existing covers.	Replace covers “like for like” using standard “off-the-shelf” service cover units.	Replace covers with bespoke lightweight ductile iron alternative, within existing seating frames.	Replace covers and seating frames with new lightweight composite alternative (e.g. glass reinforced plastic, or GRP).
2. Scope and exclusions	<ul style="list-style-type: none"> Includes only for removal of silt and redundant services from trenches. 	<ul style="list-style-type: none"> Includes for replacing heavy concrete-infilled covers on a like-for-like basis. Includes for replacing seating frames to suit new product Includes for removal of silt and redundant services from trenches. 	<ul style="list-style-type: none"> Includes for retaining existing seating frames and replacing existing covers with lighter ductile iron units, which are recessed to accept a thin surfacing material. Includes for removal of silt and redundant services from trenches. 	<ul style="list-style-type: none"> Includes for replacing seating frames and installing new lightweight composite (GRP) covers. Includes for removal of silt and redundant services from trenches.
Project Planning				
3. Programme and key dates	<ul style="list-style-type: none"> This option could be carried out at any time, consistent with other demands on the public highway network (including busy summer 	<ul style="list-style-type: none"> As this option involves multiple operations to install covers followed by concrete infill, curing and mastic surfacing, this would be one of the most 	<ul style="list-style-type: none"> As this option retains the existing seating frames and as the new cover units would be pre-surfaced, the operations to remove and replace the covers would 	<ul style="list-style-type: none"> As this option involves multiple operations to break out and replace existing seating frames, followed by concrete repairs and subsequent

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	<p>tourist periods), as it does not rely on new materials.</p> <ul style="list-style-type: none"> The works to desilt the trenches and remove redundant service could be carried out incrementally over several months, to suit other scheduled quarterly maintenance closures of Tower Bridge. 	<p>disruptive options, further complicated by the need to break out and replace the existing seating frames if standard manufacturers units are used.</p> <ul style="list-style-type: none"> A programme of 3 months is estimated to complete these works, which could be targeted towards the end of 2020, allowing for lead-in of materials. 	<p>be very efficient and could be conducted over a number of nightly closures of Tower Bridge, using lifting plant located in the adjacent carriageway, potentially during scheduled quarterly maintenance closures.</p> <ul style="list-style-type: none"> Allowing for the lead-in times to manufacture bespoke cover units, programme of 4 weeks near the end of 2020 (to include desilting works) is considered feasible. 	<p>installation of the new covers – but does not involve subsequent surfacing operations - the programme for these works would lie somewhere between that of options 2 and 3.</p> <ul style="list-style-type: none"> A programme of 2 months is estimated to complete these works, which could be targeted towards the end of 2020, allowing for lead-in of materials.
<p>4. Risk implications</p>	<ul style="list-style-type: none"> Overall project option risk: Medium This option carries the risk of ongoing sporadic failure of the ageing brittle units and associated annual maintenance costs to remediate in an ad-hoc fashion. 	<ul style="list-style-type: none"> Overall project option risk: Low Risks of silt contamination and asbestos are common to all options equally. 	<ul style="list-style-type: none"> Overall project option risk: Low Risks of silt contamination and asbestos are common to all options equally. Risks relating to existing frame condition will be investigated and clarified prior to Gateway 5. 	<ul style="list-style-type: none"> Overall project option risk: Medium This option carries the added risk of premature wear of the anti-slip profile to GRP covers under the concentrated and heavy footfall typical of Tower Bridge.

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	<ul style="list-style-type: none"> Risks of silt contamination and asbestos are common to all options equally. 		<ul style="list-style-type: none"> Residual planning risks to be resolved prior to Gateway 5. Further information available within the Risk Register (Appendix 2). 	<ul style="list-style-type: none"> Highest planning risk of the options presented. Risks of silt contamination and asbestos are common to all options equally.
5. Stakeholders and consultees	<ul style="list-style-type: none"> Tower Bridge Exhibition Tower Bridge Operations Transport for London 	<ul style="list-style-type: none"> Local Planning Authorities (Southwark & Tower Hamlets) Historic England Tower Bridge Exhibition Tower Bridge Operations Transport for London 	<ul style="list-style-type: none"> Local Planning Authorities (Southwark & Tower Hamlets) Historic England Tower Bridge Exhibition Tower Bridge Operations Transport for London 	<ul style="list-style-type: none"> Local Planning Authorities (Southwark & Tower Hamlets) Historic England Tower Bridge Exhibition Tower Bridge Operations Transport for London
6. Benefits of option	<ul style="list-style-type: none"> Lowest initial capital cost (no new materials). 	<ul style="list-style-type: none"> Visually, an exact like-for-like replacement of the covers, with concrete filled units surfaced with mastic asphalt, which mitigates planning risks (although formal consultation still recommended). 	<ul style="list-style-type: none"> Most cost-effective option. Retains the existing seating frames. New lightweight covers are recessed to accept a thin aggregated epoxy surfacing which is very similar to the footway surfacing to the bascule footways and easily 	<ul style="list-style-type: none"> New lightweight covers would meet Manual Handling H&S recommendations and lend themselves to regular future maintenance of the service trenches with minimal personnel.

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			<p>maintained. This would be visually consistent with other areas of the bridge.</p> <ul style="list-style-type: none"> Meets Manual Handling H&S recommendations, which lends itself to regular future maintenance of service trench with minimal personnel. 	
<p>7. Disbenefits of option</p>	<ul style="list-style-type: none"> Retains existing units which, at 170kg each, are very difficult to lift and do not conform with manual handling H&S recommendations. This does not lend itself to easy and regular future maintenance of the service trenches. This option carries the risk of ongoing sporadic failure of the ageing brittle units and associated annual maintenance costs to 	<ul style="list-style-type: none"> Like-for-like replacement units would be of a similar weight (approximately 170kg), which would continue to be very difficult to lift and which do not conform with manual handling H&S recommendations. This does not lend itself to easy and regular future maintenance of the service trenches. Unless bespoke products are manufactured to suit existing seating frames, 	<ul style="list-style-type: none"> Slight change in surfacing material (from mastic asphalt to epoxy/aggregate thin surfacing), but consistent with footway surfacing on bascules. May require LPA approval 	<ul style="list-style-type: none"> Requires breakout and replacement of existing seating frames, to accommodate increased bearing requirements of composite covers, which is not economic. High risk of premature wear of the raised anti-slip profile of composite materials under the aggressive footfall conditions of Tower Bridge (evidenced by the performance of similar products at other UK public locations), resulting

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	remediate in an ad-hoc fashion.	<p>this option would also require the existing seating frames to be replaced (for more economic “off-the-shelf” mass-produced standard-length products).</p> <ul style="list-style-type: none"> As these covers require subsequent concrete infill, concrete curing and mastic asphalt operations, this is likely to be a time consuming and disruptive option. 		<p>in low design life and early replacement (as these materials do not readily lend themselves to over-surfacing).</p> <ul style="list-style-type: none"> Requires LPA approval.
Resource Implications				
8. Total estimated cost	<p>Total estimated cost (excluding risk): Less than £50,000, to merely remove silt and redundant services under a succession of quarterly maintenance closures of the bridge.</p> <p>Total estimated cost: (including risk): Approximately £170,000</p>	<p>Total estimated cost (excluding risk): Approximately £940,000.</p> <p>Total estimated cost: (including risk): Approximately £1,060,000 (including £120,000 costed risk to note for asbestos or</p>	<p>Total estimated cost (excluding risk): Approximately £425,000.</p> <p>Total estimated cost: (including risk): Approximately £ 545,000 (including £120,000 costed risk to note for asbestos or</p>	<p>Total estimated cost (excluding risk): Approximately £780,000.</p> <p>Total estimated cost: (including risk): Approximately £ 900,000 (including £120,000 costed risk to note for asbestos or</p>

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	(including £120,000 costed risk to note for asbestos or other contamination, post-mitigation).	other contamination, post-mitigation).	other contamination, post-mitigation).	other contamination, post-mitigation).
9. Funding strategy	The recommended option would be funded from the Bridge House Estates Bridge Repair & Maintenance Fund (the “50-year plan”).			
10. Investment appraisal	Not applicable			
11. Estimated capital value/return	Not applicable			
12. Ongoing revenue implications	<ul style="list-style-type: none"> Unquantified in terms of cost, but the highest maintenance legacy of the options presented, due to ongoing sporadic failure of existing units, repaired in an ad-hoc fashion, combined with the inefficiencies of removing very heavy covers to adequately maintain the service trenches. 	<ul style="list-style-type: none"> Ongoing revenue costs are not minimised by this option, in spite of the new covers, as the heavy replacement covers make future lifting and maintenance very difficult and inefficient. 	<ul style="list-style-type: none"> Minimal ongoing revenue costs, as improves efficiency of future maintenance operations (compared with existing) due to lightweight covers which lend themselves to safe manual handling with minimum labour requirements. 	<ul style="list-style-type: none"> Minimal ongoing revenue costs, as improves efficiency of future maintenance operations (compared with existing) due to lightweight covers which lend themselves to safe manual handling with minimum labour requirements.
13. Affordability	<ul style="list-style-type: none"> Ample funds are identified in the 50-year plan, 	<ul style="list-style-type: none"> The most expensive option, whilst not 	<ul style="list-style-type: none"> Considered to be the most cost-effective and 	<ul style="list-style-type: none"> Mid-range cost (between options 2 and 3) but

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	although this option is not sustainable in the long-term due to ageing materials. It merely defers replacement of the covers to a later date, whilst attracting increased maintenance costs in the interim.	delivering a solution which aids efficient future maintenance (and reduced costs) by using lightweight materials.	responsible option, by re-using existing seating frames (which are believed to be in sound condition) and providing a lightweight and robust solution which reduces future maintenance costs and has a long life-expectancy.	longevity of the available products on the market (due to surface wear of composite materials) and increased life-cycle costs are a concern.
14. Legal implications	<ul style="list-style-type: none"> • Statutory Approval from Planning Authority not required 	<ul style="list-style-type: none"> • Statutory Approval from Planning Authority probably not required, although consultation recommended to confirm, if option selected. 	<ul style="list-style-type: none"> • Statutory Approval from Planning Authority required due to change in materials 	<ul style="list-style-type: none"> • Statutory Approval from Planning Authority required due to change in materials
15. Corporate property implications	<ul style="list-style-type: none"> • The proposals in this report meet key objectives of the Corporate Property asset Management Strategy; Operational assets remain in a good, safe and statutory compliant condition. • Operational assets are fit for purpose and meet service delivery needs. 			
16. Traffic implications	<ul style="list-style-type: none"> • Minimal traffic implications, as the works to remove silt and redundant services can be programmed incrementally over many months, to align with other pre- 	<ul style="list-style-type: none"> • As these covers require subsequent concrete infill, concrete curing and mastic asphalt operations, this is likely to be a time consuming and disruptive option, particularly if the 	<ul style="list-style-type: none"> • As the existing seating frames are to be re-used, the existing covers could be quickly removed and replaced within nightly road closures using lifting 	<ul style="list-style-type: none"> • As this option requires breakout & replacement of seating frames and an increased programme to accommodate this, this would be considerably

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	scheduled quarterly maintenance closures of Tower Bridge.	seating frames need to be replaced as well to accommodate standard units. <ul style="list-style-type: none"> Lengthy closures and/or restrictions of footway widths would be necessary. 	plant located in the carriageway <ul style="list-style-type: none"> Temporary restrictions to footway widths would be necessary. However, as the new units would be pre-surfaced, this further reduces on-site operations and disruption. As the new units meet Manual Handling requirements, they also lend themselves to easy and efficient removal without lifting plant in the carriageway, if desilting works are programmed to follow cover replacement. 	more disruptive to pedestrians than option 3. <ul style="list-style-type: none"> Lengthy closures and/or restrictions of footway widths would be necessary.
17. Sustainability and energy implications	Not applicable			
18. IS implications	Not applicable			
19. Equality Impact Assessment	Not applicable			

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20. Data Protection Impact Assessment	Not applicable			
21. Recommendation	Not recommended	Not recommended	Recommended	Not recommended