

Board of Directors

Item 3.8

Subject: Surgical Corridor Floor Capital Project
Date of Meeting: 28th November 2022
Presented by: Karen Edge, Chief Finance Officer
Purpose of Report: For Approval

BAF Reference	Impact on BAF
BAF 3	The escalating cost and anticipated cost risk associated with the Surgical Corridor Floor capital project leads to potential for competing capital projects to be deferred as a result of the fixed capital envelope available from the C&M ICS. An alternative approach of deferring further structural work and introducing a programme of inspection and maintenance to the temporary remedial works (5-10 yrs) is proposed.

Level of assurance (please tick one) <i>To be used when the content of the report provides evidence of assurance</i>					
<input checked="" type="checkbox"/>	Acceptable assurance Controls are suitably designed, with evidence of them being consistently applied and effective in practice	<input type="checkbox"/>	Partial assurance Controls are still maturing – evidence shows that further action is required to improve their effectiveness	<input type="checkbox"/>	Low assurance Evidence indicates poor effectiveness of controls

1. Executive Summary

Following the identification of structural weaknesses in the surgical corridor (the main hospital circulation route) a project was begun to resolve the issues in both the short and longer term. Although it proved difficult initially to secure a contractor willing to undertake the works due to its complexity and potential risk profile, Tilbury Douglas Ltd (TDL) agreed to take on the project given the importance of the relationship between themselves and the Trust. The standard P22 contract was used for the works.

A business case was submitted to the Trust Board in May 2022, informed by initial TDL works to scope the project and develop a preliminary methodology for the scheme. However, it was recognised at this point that due to the overall complexity of the project there would be a need for further decision point 'gateways' to review updated project costs following more detailed design and investigatory work.

The Board approved the recommendations in the paper as follows:

- Approve this business case, and the preferred option 3 to implement temporary structural supports and propping to section 2 of the corridor, mechanical and electrical service diversion and long-term structural repairs to section 1 and section 2 with a £2,664,884 capital requirement, and I&E expenditure of £563,411 over the initial 5 years to cover depreciation and PDC.
- Note the allowances made for Trust IT costs, electrical service diversion and long term structural solution as being robust estimates at this stage and that at each gateway the project will progress unless the costs are outside those approved under this business case for which further approval will be sought
- Note the Trust can also terminate the P22 Stage 4 contract at any time for any reason, which is a standard NEC/P22 clause for the Employer. Assessment of costs at termination will include for any amounts due at that point in time plus any further reasonable costs that TDL would incur in the process of standing down.

Following Trust approval TDL began to implement the solutions identified. The immediate risk to the corridor was removed in June 2022 following the installation of temporary props in the areas giving rise to concerns. Although temporary, these props would provide support for a number of years provided they were subject to annual inspection. TDL also began to develop their long term solution to the corridor in more detail, based on the rerouting of the wet services in the duct over the roof to allow the void to be permanently filled with concrete. However, as the design work on the permanent solution has progressed a number of issues have come to light which impact upon both the programme and the forecast scheme costs.

The project is now expected to complete in February 2024 and the overall capital cost for the works (including Trust side costs) is forecast to be £3,220K. The Trust now needs to decide whether to proceed with the scheme at the higher cost or stop the project now. Both options carry advantages, disadvantages and risks, however in view of the significant capital cost and associated opportunity cost of the scheme the recommendation is that the long term solution for the corridor is not implemented at this point.

In making this recommendation it should be noted that there will be a need for further additional propping in the corridor in the next 1-2 years plus annual inspection of the corridor thereafter. It is therefore further recommended that TDL be asked to complete the additional propping works before they leave site at the end of 2023. It should also be noted that there may be costs associated with demobilisation of the surgical corridor project which TDL would be entitled to, however these are modest given their use of site infrastructure (site cabins etc) already in place for the catheter labs scheme.

2. Background

The surgical corridor is the main circulation route through the Trust and also connects LHCH to Broadgreen estate. Underneath the corridor there is a duct containing a range of mechanical and electrical services including heating and water supply pipework, electricity, fire alarm, IT data and fibre lines, phone lines and medical gas pipework. The duct also contains some asbestos and because of its size it is classified as a confined space, with associated restrictions on how it can be accessed and work undertaken.

The corridor itself can be divided into 2 areas, with differing ages and construction methodologies. Section 1 runs from Theatre Recovery entrance to the junction with Cardiac Hill and section 2 runs from the surgical corridor junction with cardiac hill to Medical Engineering/Research.

Prior to the business case, a structural assessment of the corridor showed a risk of collapse due to corrosion of the steel supporting structure within the duct, exacerbated by the damp

environment and lack of ventilation. However, a subsequent survey clarified that this risk of collapse was confined to section 2 of the duct due to its greater age and its method of construction.

Following identification of the structural problems a number of construction companies were approached to undertake repairs to the corridor. Unfortunately there was little interest from the market in the work which was recognised as complex and generally unappealing. The construction industry was, and still is, very busy and with significant labour shortages. Tilbury Douglas Ltd (TDL) were therefore approached and asked if they would undertake the works, given the relationship already in place with them and the cost benefit associated with the opportunity to share overhead between the surgical corridor and catheter lab projects.

The TDL Board were initially reluctant to accept the contract due to its complexity, potential risk profile, and lack of fit with their preferred project type. However, following its backing by the North West Business Director who saw it as a means of strengthening the relationship with LHCH, the TDL Board gave approval to undertake the works.

3. LHCH Board Approval

In May 2022 a business case was submitted to the Trust Board which considered 3 options for the remediation of the surgical corridor;

1. Do nothing i.e. continue with a monitoring and maintenance programme
2. Temporary structural supports and propping to section 2 of the corridor and deferral of mechanical and electrical service diversion and long term structural repair to future financial years
3. Temporary structural supports and propping to section 2 of the corridor, mechanical and electrical service diversion and long-term structural repairs to section 1 and section 2

The Trust Board approved the recommendations which were to:

- Approve this business case, and the preferred option 3 to implement temporary structural supports and propping to section 2 of the corridor, mechanical and electrical service diversion and long-term structural repairs to section 1 and section 2 with a £2,664,884 capital requirement, and I&E expenditure of £563,411 over the initial 5 years to cover depreciation and PDC.
- Note the allowances made for Trust IT costs, electrical service diversion and long term structural solution as being robust estimates at this stage and that at each gateway the project will progress unless the costs are outside those approved under this business case for which further approval will be sought
- Note the Trust can also terminate the P22 Stage 4 contract at any time for any reason, which is a standard NEC/P22 clause for the Employer. Assessment of costs at termination will include for any amounts due at that point in time plus any further reasonable costs that TDL would incur in the process of standing down.

This business case anticipated the following phases:

- Phase 1 – installation of ‘temporary’ props in section 2 of the corridor, an asbestos survey and development of a firm and final costed design for the diversion of ‘wet’ services over the roof of the corridor
- Phase 2 – October 2022 - agreement of a stage 4 contract for diversion of the wet services and development of a firm and final costed design for the rerouting of the electrical services
- Phase 3 – December 2022 – agreement of a cost for rerouting of the electrical services
- Phase 4 – June 2023 – August 2023 – agreement of a firm cost for infilling the corridor and completion of the works

Both the project timescale and phases and the forecast works costs were all based on TDL's best assessment of the position at the time the business case was submitted. However, as a result of design development and a more detailed appreciation of the challenges associated with the corridor works, the current project phasing and service diversion proposals have changed significantly from that envisaged earlier in the year. This is described further below.

As might be expected the costs included within the business case have also therefore changed in both quantum and timing and again this is described later in this paper.

4. TDL works to date and their revised approach to the project

TDL were appointed to the project in October 2021 through the P22 framework, on a separate contract to that already in place for the catheter labs. The Trust entered into a stage 3 contract in July and approved expenditure of £157K until the end of September 2022.

Over the summer of 2022, the corridor was resurveyed and a propping design developed and implemented. This removed the immediate risk of collapse and provided a solution which, with annual inspection and potentially further propping in any areas found to have deteriorated significantly, would be expected to last for c. 5-10 years.

TDL also made progress with designing solutions for the treatment of the services in the void to allow its infill and thus provide a long term solution. However, in the course of design development and overall project progress a number of variations to the original business case assumptions emerged.

Variations from the business case scope of works

Firstly, TDL advised that they had not included section 1 of the corridor within their scope of work because its structure was sound and because the services in this section of the duct were routed differently from those in section 2. Although this had disappointingly not been made clear in their original submission the Trust accepted this approach given the cost pressures which would have been presented by including this, noting the advice from structural engineers regarding the soundness of section 1. However, it should be noted that exclusion of this element of the void means that, in the event that section 2 is infilled, the Trust will continue to have services running within a confined space.

Secondly, TDL explored the possibility of leaving the electrical services in situ within the infilled void and confirmed that this could be done safely. Again, the Trust accepted this proposal which avoided the cost of rerouting the services, however TDL were asked to provide a design for an alternative supply in the event of a future problem with the buried cables, and to provide a cost for the implementation of this solution.

Thirdly, following work by the design team the original proposal to take the services fully over the roof of the corridor was discounted on the grounds of cost, complexity, and impractical maintenance. This is because of the roof construction, which has a series of dormer areas interspersing the simpler flat roof structure. It was therefore decided that as a practical and cost effective alternative, services would be routed over the flat roof and through the underside of the dormer areas. This solution required the roof void to be surveyed for asbestos and for details of the existing service connections therein, however the area has a lathe and plaster floor more typical of a domestic loft which does not provide safe access for the required survey work. Therefore TDL proposed a 'crash deck', in essence a new ceiling, to provide safe access for the asbestos survey and for finalising the new service connections. This would provide a safe working space during the surveys but would also remain in place in perpetuity in the dormer areas, giving permanent safe access to the area.

It should be noted that the dormer areas provide natural light to sections of the corridor and the crash deck will remove this, however costs include for installation of new lights to offset the impact of this.

As well as the services within the void the corridor contains a plethora of wall mounted services throughout its length. These in themselves presented a challenge to the rerouting of services, however this was made more complex by the new ceiling line from the crash deck

Variations to the business case programme and timings

As a result of the above, the TDL programme phases and dates have changed and are now as follows;

Phase 1 – November 2022 - installation of temporary props (complete), completion of the majority of the design for the mechanical and electrical service diversions, market testing of the majority of the overall scheme packages and the development of a firm cost for the next phase of works comprising installation of the crash deck, an asbestos survey and completion of the services design.

Phase 2 – June 2023 - completion of the next phase of works including submission of a price for asbestos removal (March 2023) following the survey and development of a final GMP for the service diversions and corridor infill.

Phase 3 – June – February 2024 - service diversion work and corridor infill to section 2 of the corridor.

Other information to note

There has been liaison with LUHFT regarding the surgical corridor, since the lower part of section 2 leads into the Broadgreen estate. This Trust has indicated that they intend to undertake temporary remedial works to resolve their structural issues but do not plan anything more substantial since they plan to dispose of this part of the site within 5-7 years.

5. Options for consideration

A decision is now needed on whether to complete the remedial works on the surgical corridor as originally agreed by the Board in May. In considering this decision the Trust has broadly 2 options:

1. Pause the remaining works until some later date or
2. Continue with the works as described above.

Each of these options is described more fully below together with its respective risks and benefits:

Option 1	
Description	In this option there would be a need to include some further props in the void at the point of the corridor intersections within the next 12-18 months. In practice it would make most sense for TDL to undertake this work before they leave site, given their knowledge of the duct and the quality of their original propping work. The current estimate for this additional propping is £105K inclusive of Trust fees and VAT. Other than this there would be a need for annual inspection of the duct at a cost of c. £5K/annum and any further remedial work identified as required.
Benefits	<ul style="list-style-type: none">• Avoidance of further capital spend in the short to medium term

Disadvantages	<ul style="list-style-type: none"> • Ongoing annual inspection of a confined and asbestos contaminated space incurring revenue costs • Services running within a confined and asbestos contaminated space
Risks	<ul style="list-style-type: none"> • Availability of capital to complete the works in the future • Availability of a competent contractor to complete the works • Ongoing risk associated with estates staff accessing a restricted and contaminated space when required to do so by operational requirements
Option 2	
Description	Complete the works by i) rerouting wet services over the roof, enabled by the construction of a new ceiling/crash deck and ii) infilling the duct with concrete, retaining the electrical services in situ with a fully designed resilient alternative which could be implemented in the event of a future problem with a buried service
Benefits	<ul style="list-style-type: none"> • Permanent solution to the area of the corridor with structural issues • No need for ongoing access and inspection of the area • Economy due to sharing of overheads between cath lab and surgical corridor projects
Disadvantages	<ul style="list-style-type: none"> • Significant capital resource requirement leading to de-prioritisation of other high risk capital projects in 2023/24
Risks	<p>In considering this option it is important to understand the risks retained by the Trust in completing the works. Key risks retained by the Trust are:</p> <ul style="list-style-type: none"> • General cost risk. Although TDL would commit to the cost at each phase, any unforeseen (and unforeseeable) element within that phase which caused a cost increase would be passed back to the Trust. This includes unforeseen issues relating to the existing building structure and fabric, which have caused material cost increases in the catheter labs project. This general cost risk also includes the potential impact of inflation on work packages for which a firm cost has not been agreed. • Cost risk associated with unpriced works. This risk has been mitigated by the amount of work packages which TDL have already tendered, as shown at appendix 1. However, some costs remain at large as shown and are likely to increase beyond the current forecast. In addition, some inflationary risk remains eg on concrete infill • Cost of work stoppages. The crash deck installation has been priced to take place out of hours, however the Trust would retain the risk of additional costs associated with any interruption to those works for Trust operational reasons. • Cost of asbestos removal. This would be priced following the completion of the survey; it cannot be accurately quantified until the survey is completed in February 2023 however an allowance has been made in the Trust retained contingency for this. The risk remains however that this allowance is incorrect. • Additional costs associated with items which cannot be priced until crash deck installation. This includes the service connections and associated works required in the areas adjacent to the corridor. • Operational risk associated with a problem in an electrical cable running within the void. Although the Trust carries this risk currently, the cables are accessible in the void and could be jointed if a problem arose. In this solution the new design would need to be implemented which would take longer. TDL have given a cost to install the design which would fully remove the

	<p>electrical cables from the duct and this has been shown as a variation to option 2 below.</p> <ul style="list-style-type: none"> • Maintenance of access to section 1 of the corridor. If section 2 of the corridor is infilled there would be a need to maintain access to section 1. It is believed that an access point already exists and could be reopened for use however this cannot be confirmed until after Trust inspection, due w/c 21st November 2023. An allowance has therefore been shown below the line for the creation of a new access point, should this be identified as being required. <p>Because of the above a Trust retained contingency of c. 10% has been included in the overall cost forecast to mitigate these cost related risks; a provisional sum of £100K has also been included in the forecast outturn cost for asbestos removal. Other mitigations include scrutiny of all cost claims by the cost adviser and ongoing technical review to identify more cost effective solutions.</p>
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Forecast costs for completion of the corridor works

Item	May Board approval £K	Option 2 £K	Option 2 (variation to fully divert the electrical cables) £K
Capital costs			
PSCP costs	1,705	1,888	2,192
Total forecast outturn inc Trust fees & VAT	2,665	3,220¹	3,617¹
Below the line items			
Installation of a new access to corridor section 1 (if required)	N/A	25 ²	25 ²

1. No VAT recovery assumed on works – may be potential to recover c. £80K. Some further betterment possible through further sharing of prelims with cath lab project – unlikely to be very significant.
2. Net cost

Expected cumulative phasing of the costs associated with completion of the corridor scheme

	Committed Costs to end of Nov 22 £K	Financial Year Spend to Mar 23 £K	GMP Submission to June 23 £K	Total Project Cost to Feb 24 £K
PSCPS costs	£214	£510	£555	£1,888
Total costs incl of fees/VAT	£387	£897	£1,016	£3,220

6. Recommendations

In view of the remediation works which have already been carried out on the corridor, the significant increase in forecast outturn costs and the opportunity cost of completing the works it is recommended that the Trust does not continue with the corridor remediation works. It is further recommended that TDL are asked to install further props in the cross corridor areas prior to their leaving site, and that the corridor is subject to an annual inspection by a structural engineer until such times as this review process determines it advisable to complete the remediation works as currently designed.

The Board of Directors is asked to:

- APPROVE the recommendation to proceed under Option 1
- APPROVE any further remedial works to be completed by TDL
- NOTE the approach to inspection and maintenance

Appendix 1.

LHCH Surgical Corridor - Procurement Schedule

BUILDING

1	Undercroft Asbestos Survey	Works completed, cost confirmed
2	Temp Propping Costs	Works completed, cost confirmed
3	Crash Deck	Priced
4	Steels to crash deck	Priced
4a	Pad stones for above	Priced
5	Dog Kennell BWIC to roof	Priced
6	Ceiling	Priced
7	Decoration to ceiling	Priced
8	Access into ceilings and ladder access	Ladder access Priced
9	Asbestos Survey in pitched roof area	Priced on 4 individual visits
10	Asbestos Removal into pitched roof	Dependant on asbestos survey above
11	Scaffolding	Priced
12	Access into Section 1 undercroft (if required?)	Need discussion with client based on investigation into section 1
13	Handrail and stairs externally if required	Need discussion with design team and client following confirmation of Mechanical routes
13a	Handrail internally in void	Priced, AA Woods
14	Stepovers if required	Need discussion with design team and client following confirmation of Mechanical routes
15	Split duct install (AA Woods)	Out for pricing based on indicative information
16	Lath & plaster removal (AA Woods)	Priced
17	Concrete infill	Priced, to be updated to allow for inflation
18	Stop end	Priced
19	Works to window infill	Priced
20	Mods to Internal Partition	Allowances
21	Mods to FF&E/Joinery	Allowances
	M&E	
22	Pipework diversions – Subject to access into pitched roof areas	Priced, subject to valiation in pitched areas
23	Fire Alarm reinstall	Priced
24	Split duct materials provided	Priced
25	GRP enclosure to roof	Priced
26	Relocation of services to corridor areas	Priced
27	Divert LV Cable option as backup	Priced
28	Med Gases	Priced, subject to valiation in pitched areas
29	Lagging	Priced, subject to valiation in pitched areas
30	Prelims	Priced
31	Design	Priced