

Committees: Corporate Projects Board - for decision Projects Sub - for decision Corporate Asset Sub-Committee – for decision	Dates: 31 March 2021 14 April 2021 28 April 2021
Subject: BEMS Upgrade Project-CPG Estate – Phase 1 Unique Project Identifier: PV ID 12268	Gateway 2: Project Proposal Regular
Report of: City Surveyor Report Author: Brendan Crowley / James Rooke	For Decision
<h1>PUBLIC</h1>	

Recommendations

1. Next steps and requested decisions	Project Description: <p>The City Surveyor’s Corporate Energy Team has oversight of the Building Energy Management System (BEMS) which monitors and controls the Heating & Ventilation Plant (HVAC) plant (& other engineering systems) across the Corporate Property Group (CPG) estate. We have commissioned a contractor to conduct a condition survey of 3 of the highest priority sites in terms of business criticality and vulnerability to system failure. Guildhall Yard East (GYE), London Metropolitan Archives (LMA) and Walbrook Wharf make up Phase 1. This is the first phase of a larger estate-wide BEMS upgrade project. The estimated energy and maintenance cost savings resulting from the upgrade of these sites comes to approx. £57,989/ann. See Appendix 3 for additional details.</p> Funding Source: Central funding – Agreed in principle via capital bid. Drawdown of funds via RASC Next Gateway: Gateway 3/4 - Options Appraisal (Regular) Next Steps: Engage Consultants/Building Controls Contractors to develop outline design and provide technical detail (RIBA stage 3) to progress to Gateway 3/4. This will include more accurate project cost estimates.
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	<p>Engage IT networking contractors to assess network capacity in the three buildings to support the new BEMS hardware architecture.</p> <p>Conduct asbestos surveys where deemed necessary</p> <p>Requested Decisions:</p> <p>1.1 That a budget of £16,867 is approved to reach the next Gateway; consisting of £7,442 from City Fund reserves & £9,425 from City Cash reserves</p> <p>1.2 Note the total estimated cost of the project (excluding risk); £823,920</p> <p>1.3 Note the total estimated cost of the project at (including risk); £904,770</p> <p>1.4 That a Costed Risk Provision of £7,250 is approved (to be drawn down via delegation to Chief Officer in consultation with Chamberlains) to be funded by £4,625 from City Fund reserves and £2,625 City's Cash reserves.</p>
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<p>2. Resource requirements to reach next Gateway</p>				
	<p>Item</p>	<p>Reason</p>	<p>Funds/ Source of Fundin g</p>	<p>Cost (£)</p>
<p>Consultant BEMS Engineers</p>	<p>To review the current GHC GYE BEMS DesOps, control software to deliver a Functional Description document for the new system. Consultant must also provide detailed projects costs. The output will be a RIBA design stage 3 IGP proposal, including options appraisal on technical aspects of the project</p>	<p>See below</p>	<p>£11,000</p>	

	Asbestos Survey	Quantify asbestos risk and mitigation cost	See below	£3,000
	IT Network Survey	Determine capacity for increasing IP devices on IT network, and compliance with IT security	See below	£2,867
	Staff Costs	Staff costs are to be covered from existing resource		n/a
	Total	From City Fund Reserves From City Cash Reserves	£12,154 £4,712	16,867
	<p>Item costs are split between City Fund and City Cash in accordance with the works for each sub-project and which funding source there are allocated to.</p> <p>At this stage, staff costs are to be covered from existing resource. From GW 3/4 funding shall be requested for the recruitment of a fixed term client-side Project Manager.</p> <p>Costed Risk Provision requested for this Gateway: £7,250</p> <p>This is to cover the risk of the additional consultancy services being identified by the consulting engineer. This is to be funded £4,625 from City Fund reserves and £2,625 City's Cash reserves.</p>			
3. Governance arrangements	<p>3.1 Corporate Asset Sub-Committee</p> <p>3.2 SRO: James Rooke, Head of Energy & Sustainability.</p> <p>3.3 It is proposed a dedicated client Project Manager is recruited who will update the Project Board. The board may include James Rooke, Pete Collinson, Jonathon Cooper, Guildhall Art Gallery Management representative.</p>			

Project Summary

4. Context	The Current BEMS platform is obsolete, end-of-life & increasingly unreliable. Why change is necessary:
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	<p>4.1 To mitigate the Life Safety Risk posed by the failure of the obsolete system which monitors &, in some cases, controls the fire & smoke emergency plant with the installation a new, fit-for-purpose BEMS.</p> <p>4.2 To mitigate this significant business risk to the City with the upgrade of the system to the latest BEMS platform, Schnieder EcoStruxure.</p> <p>4.3 Essential investment in innovation to supporting the City's Climate Action Strategy which is a commitment to reaching net zero carbon by 2027. Having a modern BEMS platform is a key enabling technology for other building energy efficiency measures. The Energy and Sustainability Team are currently working to implement a pipeline of projects & measures in advance of the 2027 target.</p> <p>4.4 To use the new BEMS as a platform to implement further innovative smart building technologies and to allow for integration with other systems e.g. CAFM software, energy management software, lighting controls, IoT sensors etc. To invest in a modern, flexible & easily optimised control system for the CPG estate building assets.</p> <p>4.5 A follow up Phase 2 Project is being developed at present to go towards later this year. This project will involve upgrades to other CPG sites.</p>
<p>5. Brief description of</p>	<p>5.1 The legacy BEMS hardware and software at these sites is now obsolete and unsupported by the provider. To invest in a modern, flexible & easily optimised control system for CPG estate buildings and which removes the risk of failure of business-critical assets. Bringing with it increased occupant comfort and productivity and improved building energy performance and, in doing so, supporting the Carbon Action Strategy which is a commitment to reaching net zero carbon by 2027.</p> <p>5.2 To use the new BEMS as a platform to implement further innovative smart building technologies and to allow for integration with other systems e.g. CAFM software, energy management software and lighting controls.</p>
<p>6 Consequences if project not approved</p>	<p>6.2 Obsolete, ageing & unsupported BEMS hardware has high risk of failure.</p> <p>6.3 The selected sites are particularly vulnerable to BEMS control system failure, putting precious artwork at Guildhall Art Gallery and manuscripts at LMA at risk. There is also a significant risk to business-critical activities at Walbrook Wharf, LMA and GH GYE (Police Offices).</p> <p>6.4 Life safety systems at GYE are at risk due to the failure of the current legacy BEMS hardware</p> <p>6.5 Replacement parts are not available due to obsolescence.</p>

<p>7 SMART project objectives</p>	<p>7.2 To install a secure, resilient BEMS which meets customer needs and improves occupant comfort for the 3 sites selected in phase 1</p> <p>7.3 To optimise the operation of building assets via a new BEMS platform and via integration with energy management software, resulting in energy consumption savings of circa £58,000 in year 1.</p> <p>7.4 To increase the life cycle of building assets through better control resulting and reduce the BEMS reactive cost by circa £8,000 in year 1.</p> <p>7.5 First step towards a centralised BEMS command centre, where assets on all CPG sites are monitored and optimised centrally by a dedicated BEMS team based at Guildhall.</p>
<p>8 Key benefits</p>	<p>8.2 Fully supported modern BEMS system, with webbrowser access for all users offering enhanced graphics, alarms handling and plant schedules interfaces. User access possible from tablet or smart phone devices.</p> <p>8.3 Reduced maintenance costs (circa £8,000 in year 1) and increased asset life cycles.</p> <p>8.4 Reduced building energy consumption, costs (savings of circa £50,150 year 1) and 104.4 tCO₂e reduction in emissions, with optimised asset operation</p> <p>8.5 Key supporting technology for the essential building energy efficiency projects needed reach net zero carbon by 2027, which is set out in the City's Carbon Action Strategy.</p> <p>8.6 Significantly improved environment control within the GH art gallery and LMA, protecting precious artefacts.</p> <p>8.7 Enhanced building occupant well-being, with improved environment control and air quality monitoring</p> <p>8.8 The system will form the bases for a smart building strategy to help the City's various building data be converged together on to one platform for significantly improved building operation and energy performance analysis and improvement.</p>
<p>9 Project category</p>	<p>7a. Asset enhancement/improvement (capital)</p>
<p>10 Project priority</p>	<p>A. Essential</p>
<p>11 Notable exclusions</p>	<p>11.1 GH West wing and GYE CHW plant controls has been excluded as there is a lot of uncertainty about the future of this plant, it is end of life and needs to be replaced, possible by new Chilled Water (CHW) plant on the roof of GHC North Wing</p> <p>11.2 Old Justice Rooms Plant Controls – uncertainty exists around the future of the OJR datacentre and its CHW plant</p> <p>11.3 Also, budget request from GW1 does not allow for these areas to be included in this project</p>

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Options Appraisal

<p>12 Overview of options</p>	<p><i>List the options that will be explored</i></p> <p>12.2 A specific options appraisal will be carried out for each of the 3 sites mainly focused on the scope of the installation and its impact on the return on investment (capital costs and simple payback). Including replacement of all or a proportion on the terminal control units and installation new Cat 5 communication network.</p>
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Project Planning

<p>13 Delivery period and key dates</p>	<p>Overall project: GW3/4 approval Oct-21, subsequent months for design and procurement, and GW5 approval Mar-22. Delivery scheduled over the next 7 months for expected delivery - Oct 2022</p> <p>Key dates: See Appendix 3 for additional details.</p> <p>Other works dates to coordinate:</p> <p>May Coincide with GHC Guildhall AHU Fans and Humidification Design – project to be completed by March 2022</p> <p>May Coincide with Guildhall Chilling and Humidification Project – time frame for this project is TBC</p>		
<p>14 Risk implications</p>	<p>Overall project risk: Medium</p> <p>14.2 The costed risk post-mitigation is estimated at £80,850</p> <p>4.3 CRP for GW2 is £7,250</p> <p>4.4 Primary risks:</p> <ul style="list-style-type: none"> • Consulting Services Engineers costs higher than requested at GW2 for additional surveys required • System design costs higher than requested for at GW3/4 • Extra IT network infrastructure required CoL IT to meet security policy • Other risks include; Brexit causing delay to BMS IT networking parts delivery and the potential for requirement for removal of asbestos 		
<p>15 Stakeholders and consultees</p>	<p>1. Corporate Property</p>	<p>Pete Collinson, Alison Bunn, Jonathan Cooper,</p>	<p>Pro. Role</p>

		Paul Friend, Mark Lowman	
2. IT		Matt Gosden	Dept. Lead
		Dawn Polain	Service delivery manager
		Adam Fielder	Arch lead
3. Chamberlains		John James Hazel Lerigo Simon Owen	Group Accounts -Chamberlains
4. Procurement		Kayleigh Rippe Mike Harrington James Carter	Category Manager
5. Communications		TBC	
6. Property specific stakeholders		See Appendix 3.	

Resource Implications

16 Total estimated cost	Likely cost range (excluding risk): £823,920 Likely cost range (including risk): ££904,770											
17 Funding strategy	Choose 1: All funding fully guaranteed	Choose 1: Internal - Funded wholly by City's own resource										
	<table border="1"> <thead> <tr> <th>Funds/Sources of Funding</th> <th>Cost (£)</th> </tr> </thead> <tbody> <tr> <td>City Cash Reserve incl. Risk</td> <td>579,258</td> </tr> <tr> <td>City Fund Reserve incl. Risk</td> <td>325,511</td> </tr> <tr> <td>BHE</td> <td>-</td> </tr> <tr> <td>Total incl. Risk</td> <td>904,770</td> </tr> </tbody> </table>		Funds/Sources of Funding	Cost (£)	City Cash Reserve incl. Risk	579,258	City Fund Reserve incl. Risk	325,511	BHE	-	Total incl. Risk	904,770
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City Cash Reserve incl. Risk	579,258											
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Total incl. Risk	904,770											
	This project received in principle funding from Resource Allocation Sub Committee meeting in December 2020.											
18 Investment appraisal	Whole-life-cost assessment will be undertaken. This will compare the energy and maintenance cost savings and other relevant revenue implications over the anticipated life of the replaced asset. The business case will be verified through post-installation monitoring of actual energy consumption and the results reported at Gateway 5. Note: This project isn't an energy efficiency (spend to save), project, but it will provide energy and maintenance											

	savings as a by-product and is an enabling project for future energy efficiency projects. It is an essential project to ensure continuity of business operations for these CPG buildings. If the current obsolete BEMS fails, the buildings can't be heated/cooled properly, life safety systems could be prevented from working correctly etc.
19 Procurement strategy/route to market	The Consultant BEMS Engineer can be procured via the Procurement Authorisation Report. Both the Asbestos Survey and IT Network Survey can be procured at the Officer's discretion as they are both below the £10K threshold.
20 Legal implications	21.1 None
21 Corporate property implications	<p>22.1 CWP fund available for project titled 'HEAT SOURCE - CONTROLS REPLACEMENT' valued at circa £145k. This is sitting with the Building Service Engineers (BSE) team within City Surveyors dept. Potential opportunity to combine funds to extend the scope of this project to include West Wing Chillers and/or controls in Old Justice Rooms Building in this phase. We are talking to the BSE team about this opportunity.</p> <p>22.2 There are possible dependencies with the following projects are likely projects.</p> <ol style="list-style-type: none"> a. Public Sector Decarbonisation Scheme (PSDS) grant funded ventilation upgrade projects at GYE and LMA may lead to this project being de-scoped, TBC. b. GHC Master plan - The project has been considered in light of the GH Master plan, but as the upgrade project focuses primarily on the East Wing (GYE) it is unlikely to have a significant effect on it, from a BEMS controls perspective. The Master plan being concerned more on North Wing and West Wing of Guildhall. Building services like hot & chilled water and steam may be affected, however, these are outside the scope of this project. c. Guildhall Chilling/Humidification Plant Replacement – possible opportunities to change control strategies of pumps, chillers, condense equipment during the BEMS upgrade to support the preferred technology solution output from the chilling/humification plant project.
22 Traffic implications	None
23 Sustainability and energy implications	24 This project provides enabling works for upcoming energy projects – colleagues in the Energy Team have input into this project to ensure it aligns with other measures. These including PSDS project at GHC,

	Energy Reduction Phase 1 ventilation & Humidification projects at Guildhall Yard East, Guildhall Chilling & Humidification Plant Replacement Project, LMA Ventilation zone control works (PSDS).
25 IS implications	26.1 IS network will need to be extended to support new BEMS controllers, this may include new/extra managed switches, structure cabling and MCC data points. Will conduct IT surveys to quantify requirements before GW3
26 Equality Impact Assessment	<p>Select one of the following options:</p> <ul style="list-style-type: none"> • An equality impact assessment will not be undertaken
27 Data Protection Impact Assessment	<ul style="list-style-type: none"> • The risk to personal data is less than high or non-applicable and a data protection impact assessment will not be undertaken

Appendices

Appendix 1	Project Briefing (BEMS Upgrade Project Funding Bid - Phase 1. V.2)
Appendix 2	Risk Register
Appendix 3	Addition Project information

Contact

Report Author	James Rooke
Email Address	James.Rooke@cityoflondon.gov.uk
Telephone Number	07725 636975